

ScienceDaily

周二, 10 10月 2017

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Latest Science News

Breaking science news and articles on global warming, extrasolar planets, stem cells, bird flu, autism, nanotechnology, dinosaurs, evolution -- the latest discoveries in astronomy, anthropology, biology, chemistry, climate and environment, computers, engineering, health and medicine, math, physics, psychology, technology, and more -- from the world's leading universities and research organizations.

- [**What soot-covered, hundred-year-old birds can tell us about saving the environment**](#) [周二, 10 10月 03:50]

Birds in museum collections from Rust Belt cities around the turn of the century are covered with black soot from air pollution at the time. Scientists have compared the amount of soot on birds through the years to track environmental pollution over the last 135 years.

- [**Genetically boosting the nutritional value of corn could benefit millions**](#) [周二, 10 10月 03:49]

Scientists have found an efficient way to enhance the nutritional value of corn -- the world's largest commodity crop -- by inserting a bacterial gene that causes it to produce a key nutrient called methionine, according to a new study.

- [**Huge energy potential in open ocean wind farms in the North Atlantic**](#) [周二, 10 10月 03:49]

Because wind speeds are higher on average over ocean than over land, wind turbines in the open ocean could in theory intercept more than five times as much energy as wind turbines over land. This presents an enticing opportunity for generating renewable energy through wind turbines. But it was unknown whether the faster ocean winds could actually be converted to increased amounts of electricity.

- [**Human brain recalls visual features in reverse order than it detects them**](#) [周二, 10 10月 03:49]

New research has contributed to solving a paradox of perception, literally upending models of how the brain constructs interpretations of the outside world. When observing a scene, the brain first processes details -- spots, lines and simple shapes -- and uses that information to build internal representations of more complex objects, like cars and people. But during recall, the brain remembers those larger concepts first. This could shed light on concepts such as eyewitness testimony to autism.

- [**'Turbo charge' for your brain?**](#) [周二, 10 10月 03:49]

Two brain regions -- the medial frontal and lateral prefrontal cortices -- control most executive function. Researchers used high-definition transcranial alternating current stimulation (HD-tACS) to synchronize oscillations between them, improving brain processing. De-synchronizing did the opposite.

- [**Alzheimer's gene poses both risk and benefits**](#) [周二, 10 10月 03:48]

Scientists studying the molecular roots of Alzheimer's disease have encountered a good news/bad news scenario. The bad news is that in the early stages of the disease, high-risk TREM2 variants can hobble the immune system's ability to protect the brain from amyloid beta. The good news, according to researchers, is that later in the disease, the absence of TREM2 protein seems to protect the brain from damage.

- [**Amazon farmers discovered the secret of domesticating wild rice 4,000 years ago**](#) [周二, 10 10月 03:47]

Amazonian farmers discovered how to manipulate wild rice so the plants could provide more food 4,000 years ago, long before Europeans colonized America, archaeologists have discovered.

- [**How honeybees read the waggle dance**](#) [周二, 10 10月 01:54]

Neurons that enable honeybees to sense the waggle dance -- a form of symbolic communication used by female bees to inform the hivemates about the location of a food source -- have now been investigated.

- [**A spoonful of oil: Fats and oils help to unlock full nutritional benefits of veggies, study suggests**](#)

[周二, 10 10月 00:40]

Some dressing with your greens may help you absorb more nutrients, according to a new study. The research found enhanced absorption of multiple fat-soluble vitamins in addition to beta-carotene and three other carotenoids. The results may ease the guilt of countless dieters who fret about adding dressing to their salads.

- [**Farsighted children struggle with attention, study finds**](#)

[周二, 10 10月 00:40]

Farsighted preschoolers and kindergartners have a harder time paying attention and that could put them at risk of slipping behind in school, a new study suggests.

- [**Novel treatment causes cancer to self-destruct without affecting healthy cells**](#)

[周二, 10 10月 00:39]

Scientists have discovered the first compound that directly makes cancer cells commit suicide while sparing healthy cells. The new treatment approach, described in today's issue of Cancer Cell, was directed against acute myeloid leukemia (AML) cells but may also have potential for attacking other types of cancers.

- [**Blood samples may provide patient radiosensitivity answers**](#)

[周二, 10 10月 00:34]

How much radiation or chemotherapy can a certain person handle? With help from blood or tissue testing, it may be possible to answer this question in advance, which in turn could improve treatment, say researchers.

- [**Type 1 diabetes and the microbiota: MAIT cells as biomarkers and new therapeutic targets**](#)

[周二, 10 10月 00:34]

Scientists have discovered that the onset of type 1 diabetes is preceded by modification of MAIT lymphocytes. These cells—associated with mucosae and able to recognize elements of the microbiota—could

therefore serve as new biomarkers for early detection and prevention of the illness.

- [**The female brain reacts more strongly to prosocial behavior than the male brain, study finds**](#) [周二, 10 10月 00:32]

Women are more generous than men, behavioral experiments show. Now, researchers have been able to demonstrate that female and male brains process prosocial and selfish behavior differently. For women, prosocial behavior triggers a stronger reward signal, while male reward systems respond more strongly to selfish behavior.

- [**Solar energy: Prototype shows how tiny photodetectors can double their efficiency**](#) [周二, 10 10月 00:32]

Physicists have developed a photodetector -- a device that converts light into electrons -- by combining two distinct inorganic materials and producing quantum mechanical processes that could revolutionize the way solar energy is collected. The researchers stacked two atomic layers of tungsten diselenide on a single atomic layer of molybdenum diselenide. Such stacking results in properties vastly different from those of the parent layers, allowing for customized electronic engineering at the tini...

- [**Making fat mice lean: Novel immune cells control neurons responsible for fat breakdown**](#) [周二, 10 10月 00:31]

The biological causes underlying obesity have been under intense scrutiny with studies suggesting a link between the nervous and the immune systems. Now, in a breakthrough study to be published in Nature Medicine on Oct. 9, a research team led by Ana Domingos, from Instituto Gulbenkian de Ciência, discovered an unforeseen population of immune cells associated with neurons that play a direct role in obesity.

- [**New congenital heart disease genes uncovered**](#) [周二, 10 10月 00:31]

A new study has helped shed new light on some of the underlying genetic causes of cases of CHD as well as the long-term outlook for

patients who carry these mutations.

- [**Droughts and wildfires: How global warming is drying up the North American monsoon**](#) [周二, 10 10月 00:31]

Previous researchers had concluded that global warming was simply delaying the North American monsoon, which brings summer rains to the southwestern US and northwestern Mexico. But a new, high-resolution climate model that corrects for persistent sea surface temperature (SST) biases now accurately reflects current rainfall conditions and demonstrates that the monsoon is not simply delayed, but that the region's total rainfall is facing a dramatic reduction.

- [**Durable end to the HIV/AIDS pandemic likely will require an HIV vaccine**](#) [周二, 10 10月 00:31]

Despite remarkable gains in the treatment and prevention of HIV infection, development of an effective HIV vaccine likely will be necessary to achieve a durable end to the HIV/AIDS pandemic, according to experts.

- [**Nerve cells' gatekeepers take many forms**](#) [周二, 10 10月 00:31]

Scientists track the conformations of proteins that stand guard at transmembrane channels in the walls of nerve cells. The research could lead to refined drugs to treat neurological conditions.

- [**Novel circuit design boosts wearable thermoelectric generators**](#) [周一, 09 10月 21:33]

Using flexible conducting polymers and novel circuitry patterns printed on paper, researchers have demonstrated proof-of-concept wearable thermoelectric generators that can harvest energy from body heat to power simple biosensors for measuring heart rate, respiration or other factors.

- [**A new kind of influenza vaccine: One shot might do the trick**](#) [周一, 09 10月 21:33]

Certain proteins in the influenza virus remain constant year after year. Researchers are taking one of those conserved proteins, Matrix-2 (M2),

and packaging it in a nanoscale, controlled-release "capsule" in an attempt to create a quick-acting, long-lasting, multi-strain vaccine against pandemic influenza A.

- **[Disease-carrying mosquitoes abound in deforested lands](#)** [周一, 09 10月 21:32]

UF scientists synthesized and examined data from prior studies that had looked at how many pathogen-carrying mosquito species made their homes in forested lands vs. non-forested lands in 12 countries worldwide, including the United States.

- **[A safe optical fiber for delivering light and drugs into the body](#)** [周一, 09 10月 21:32]

An electrical engineer and a biomaterials engineer have joined their expertise to develop a flexible, biodegradable optical fiber to deliver light into the body for medical applications.

- **[Surgery: Sticking instead of stitching](#)** [周一, 09 10月 21:32]

In spite of medical advances, wound-related complications arising after operations can still be life-threatening. In order to avoid these complications in the future, a new nanoparticle-based tissue glue has been developed by researchers at Empa.

- **[Molecular basis for memory and learning: Brain development and plasticity share similar signalling pathways](#)** [周一, 09 10月 21:32]

Learning and memory are two important functions of the brain that are based on the brain's plasticity. Scientists now report on how a trio of key molecules directs these processes. Their findings provide new leads for the therapy of Alzheimer's disease.

- **[E-cigarettes should be promoted as a method of stopping smoking](#)** [周一, 09 10月 21:32]

E-cigarettes should be promoted as a method of stopping smoking according to a new report.

• **[Digital services collect unnecessary personal information](#)** [周一, 09 10月 21:29]

Digital services that require users to log in with a personal account often collect more information about users than is needed. Certain policies may encroach on our privacy.

• **[Official fish trade 'hugely underestimates' global catches](#)** [周一, 09 10月 21:29]

Conservation of dwindling fish stocks is being severely hampered by poor controls on global trade, according to new research.

• **[Safe to treat dementia patients with clot-busting drugs, study shows](#)** [周一, 09 10月 21:29]

Stroke patients with dementia treated with intravenous thrombolysis using powerful clot-busting drugs are at no higher risk of brain haemorrhage or death than other patients receiving the same treatment, a new study reports.

• **[The risk of type 1 diabetes not increased by swine flu vaccine Pandemrix](#)** [周一, 09 10月 21:29]

There has been a fear that the swine flu vaccine, Pandemrix, would increase the risk of autoimmune diseases other than narcolepsy. However, a new study of children from Sweden and Finland shows that the vaccine increased neither the risk of developing autoantibodies against insulin-producing beta cells nor the occurrence of type 1 diabetes.

• **[Establishing a conservation breeding program to save the last saola](#)** [周一, 09 10月 21:29]

The saola (*Pseudoryx nghetinhensis*), a primitive wild cattle endemic to the Annamite mountain range in Vietnam and Lao People's Democratic Republic (PDR), is in immediate danger of extinction. The primary threat to its survival is intensive commercial snaring to supply the thriving wild meat trade in Indochina. In order to save the saola it is essential to establish a conservation breeding program.

- [**Human minibrains reveal effects of psychedelic substance**](#) [周一, 09 10月 20:44]

Scientists have identified changes in signaling pathways associated with neural plasticity, inflammation and neurodegeneration triggered by a compound from the family of dimethyltryptamine known as 5-MeO-DMT.

- [**Global kids study: More trees, less disease**](#) [周一, 09 10月 20:44]

A study of 300,000 children in 35 nations says children whose watersheds have greater tree cover are less likely to experience diarrheal disease, the second leading cause of death for kids under the age of five. The study is the first to quantify the connection between watershed quality and individual health outcomes of children at the global scale. The study results from a major new database that enables 'big data' approaches.

- [**Sustainable irrigation may harm other development goals**](#) [周一, 09 10月 20:43]

Pursuing sustainable irrigation without significant irrigation efficiency gains could negatively impact environmental and development goals in many areas of the world, a new study has found.

- [**How brain cells die in Alzheimer's and FTD**](#) [周一, 09 10月 20:43]

Removal of a regulatory gene called LSD1 in adult mice induces changes in gene activity that that look unexpectedly like Alzheimer's. Another surprise: LSD1 is tangled up in brain samples from humans with Alzheimer's and frontotemporal dementia (FTD), suggesting LSD1 as a central downstream player in these diseases and a drug target.

- [**Reported penicillin allergy appears to increase the risk of surgical site infections**](#) [周一, 09 10月 20:43]

Investigators found that surgical patients believed to be allergic to penicillin were significantly more likely to develop surgical site infections than were patients with no documented allergy, a difference totally attributable to the alternative antibiotics used to prevent such

infections.

• [**Fruit fly muscles with a hypertrophic cardiomyopathy mutation don't relax properly**](#) [周一, 09 10月 20:43]

Using fruit flies, researchers have figured out why a particular inherited human heart condition that is almost always due to genetic mutations causes the heart to enlarge, thicken and fail. They found that one such mutation interferes with heart muscle's ability to relax after contracting, and prevents the heart from fully filling with blood and pumping it out.

• [**Double mastectomy tied to more missed work**](#) [周一, 09 10月 20:43]

As more breast cancer patients are choosing to remove both breasts, researchers examine the impact this aggressive surgery has on their employment.

• [**Dads are often having fun while moms work around the house**](#) [周一, 09 10月 20:43]

For the first time, researchers have evidence of exactly what dads are doing while moms are taking care of housework or tending to their child. The results will be disappointing for those who expected more gender equity in modern society.

• [**New biomarker predicts metastatic prostate cancers**](#) [周一, 09 10月 07:27]

Many prostate cancers, which generally are diagnosed in older men, are "indolent," slow-growing tumors that aren't destined to be fatal. But some tumors are prone to becoming aggressive and spreading beyond the prostate, making them difficult to treat and life-threatening. Currently, doctors have limited ability to predict which newly diagnosed tumors will progress slowly and which will probably undergo dangerous spread.

• [**Indigenous Nations' environmental stewardship in tackling invasive species**](#) [周日, 08 10月 23:33]

As invasive species are threatening ecological habitats throughout the US and Canada, the role of Indigenous nations as environmental

stewards has often been overlooked, according to a new study. The findings provide examples of the many ways Indigenous nations are adapting to invasive species, documenting their impact and implementing active response strategies based on an online survey of over 140 Indigenous respondents.

. [**US Olympians at 2016 Rio Games were infected with West Nile virus, not Zika**](#) [周日, 08 10月 05:29]

US Olympic and Paralympic athletes and staff who traveled to Rio de Janeiro, Brazil, for the 2016 Summer Games did not become infected with Zika virus but did test positive for other tropical, mosquito-borne viral infections, including West Nile Virus, Dengue Fever and Chikungunya.

. [**New electro-organic synthesis allows sustainable and green production of fine chemicals**](#) [周六, 07 10月 04:49]

Scientists have succeeded in developing a state-of-the-art and innovative electro-organic synthesis.

. [**Cannabis consumption increases violent behavior in young people in psychiatric care**](#) [周六, 07 10月 04:48]

A new study on cannabis use that involved 1,136 patients (from 18 to 40 years of age) with mental illnesses who had been seen five times during the year after discharge from a psychiatric hospital demonstrates that sustained use of cannabis is associated with an increase in violent behavior in young people. Moreover, the association between persistent cannabis use and violence is stronger than that associated with alcohol or cocaine.

. [**Antibiotics for dental procedures linked to superbug infection**](#) [周六, 07 10月 04:48]

Dental procedures are an overlooked source of antibiotic prescribing, which is a concern as these medications increase the risk of developing *C. difficile*.

. [**DNA barcoding technology helping monitor**](#)

[health of all-important boreal forest](#) [周六, 07 10月 04:48]

The Boreal forest is essential to Canada and the world, storing carbon, purifying water and air and regulating climate. But keeping tabs on the health of this vulnerable biome has proven to be a painstaking and time-consuming undertaking - until now. Cutting-edge DNA metabarcoding technology can help speed up and improve the monitoring process, according to a new study.

• [Genetic body/brain connection identified in genomic region linked to autism](#) [周六, 07 10月 04:48]

For the first time, scientists have documented a direct link between deletions in two genes--*fam57ba* and *doc2a*--in zebrafish and certain brain and body traits, such as seizures, hyperactivity, large head size, and increased fat content. Both genes reside in the 16p11.2 region of the genome, which has been linked to multiple brain and body disorders in humans, including autism spectrum disorder, developmental delays, seizures, and obesity.

• [Mars study yields clues to possible cradle of life](#) [周六, 07 10月 03:49]

The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth. The research offers evidence that these deposits were formed by heated water from a volcanically active part of the planet's crust entering the bottom of a large sea long ago.

What soot-covered, hundred-year-old birds can tell us about saving the environment: Museum collections track soot in the atmosphere throughout the 20th century -- ScienceDaily

Horned Larks are cute little songbirds with white bellies and yellow chins -- at least, now they are. A hundred years ago, at the height of urban smoke pollution in the US, their pale feathers were stained dark gray by the soot in the atmosphere. A new paper in the *Proceedings of the National Academy of Sciences* shows that the discoloration of birds in museum collections can be used to trace the amount of black carbon in the

air over time and the effects of environmental policy upon pollution.

"The soot on these birds' feathers allowed us to trace the amount of black carbon in the air over time, and we

found that the air at the turn of the century was even more polluted than scientists previously thought," says Shane DuBay, a graduate student at The Field Museum and the University of Chicago and one of the authors of the study. He and co-author Carl Fuldner, also a graduate student at UChicago, analyzed over a thousand birds collected over the last 135 years to determine and quantify the effects of soot in the air over cities in the Rust Belt.

"If you look at Chicago today, the skies are blue. But when you look at pictures of Beijing and Dehli, you get a sense for what US cities like Chicago and Pittsburgh were once like," says DuBay. "Using museum collections, we were able to reconstruct that history."

Ornithologists at The Field Museum have long known that bird specimens in the collection from the early 1900s were visibly darker than expected, and atmospheric soot was the suspect.

"When you touch these birds, you get traces of soot on your hands. We'd wear white gloves while handling them, and the gloves would come away stained, like when you get ink on your fingertips reading a newspaper," says DuBay. That's because the soot in the

air clung to the birds' feathers like dust to a feather duster. "These birds were acting as air filters moving through the environment," adds DuBay.

Birds were also ideal candidates for the study because they molt and grow a new set of feathers every year, meaning that the soot on them had only been accumulating for the past year when they were collected. And there was an apparent trend: old birds were dirtier, and new birds were cleaner.

To measure the changes in sootiness over the years, DuBay and Fuldner turned to a novel approach: photographing the birds and measuring the light reflected off of them. Fuldner, a photo historian who focuses on images of the environment, worked with DuBay to develop a method for analyzing the birds using photography. The birds photographed, numbering over a thousand, were all from five species that breed in the Manufacturing Belt and have lots of white feathers that showed off the soot.

The images, depicting the contrast between the soiled gray birds and the clean white ones, are dramatic. "The photographs give the project a visceral dimension -- you make a connection to the images," says Fuldner.

DuBay and Fuldner plotted the amount of light bouncing off the birds' feathers according to the year the birds were collected. To make sense of their findings, the pair of researchers then delved into the social history of urban air pollution.

"The changes in the birds reflect efforts, first at the city level but eventually growing into a national movement, to address the smoke problem," says Fuldner. "We are actually able to go back and see how effective certain policy approaches were."

"We were surprised by the precision we were able to achieve," says DuBay. "The soot on the birds closely tracks the use of coal over time. During the Great Depression, there's a sharp drop in black carbon on the birds because coal consumption dropped -- once we saw that, it clicked." The amount of soot on the birds rebounded around World War II, when wartime manufacturing drove up coal use, and dropped off quickly after the war, around when people in the Rust Belt began heating their homes with natural gas piped in from the West rather than with coal.

"The fact that the more recent birds are cleaner doesn't mean we're in the clear," DuBay notes. "While the US

releases far less black carbon into the atmosphere than we used to, we continue to pump less-conspicuous pollutants into our atmosphere -- those pollutants just aren't as visible as soot. Plus, many people around the world still experience soot-choked air in their cities."

Analysis of atmospheric black carbon might assist scientists studying climate change. "We know black carbon is a powerful agent of climate change, and at the turn of the century, black carbon levels were worse than previously thought," says DuBay. "I hope that these results will help climate and atmospheric scientists better understand the effects of black carbon on climate."

And for both DuBay and Fuldner, being able to apply their research beyond their respective fields of evolutionary biology and photographic history was both unexpected and rewarding.

"As a historian, one of the questions I always ask is, 'What is the point of this research to the way we live now?' In this case the answer quickly became clear," says Fuldner. "Filling in a blank space in the historical record of something as large as air pollution in American cities, and being able to share that with

atmospheric scientists who study the effects of black carbon on the climate, is extraordinary."

"This study shows a tipping point when we moved away from burning dirty coal, and today, we're at a similar pivotal moment with fossil fuels," says DuBay. "In the middle of the 20th century, we made an investment in infrastructure and regulated fuel sources -- hopefully, we can take that lesson and make a similar transition now to more sustainable, renewable energy sources that are more efficient and less harmful to our environment."

DuBay notes that in addition to the environmental implications of the project, their work also shows the importance of museum collections like those they used from The Field Museum in Chicago, the Carnegie Museum of Natural History in Pittsburgh, and the University of Michigan Museum of Zoology in Ann Arbor. "I hope this study exposes collections as a valuable resource to address present day environmental concerns," says DuBay. "This paper shows the ways that natural history collections can be used, underlining the value in collections and in continuing to build collections, to help us improve our understanding of human impacts on the natural world."

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Genetically boosting the nutritional value of corn could benefit millions: Scientists discover way to reduce animal feed and food production costs by increasing a key nutrient in corn -- ScienceDaily

Rutgers scientists have found an efficient way to enhance the nutritional value of corn -- the world's largest commodity crop -- by inserting a bacterial gene that causes it to produce a key nutrient called methionine, according to a new study.

The Rutgers University-New Brunswick discovery could benefit millions of people in developing countries, such as in South America and Africa, who depend on corn as a staple. It could also significantly reduce worldwide animal feed costs.

"We improved the nutritional value of corn, the largest commodity crop grown on Earth," said Thomas Leustek, study co-author and professor in the

Department of Plant Biology in the School of Environmental and Biological Sciences. "Most corn is used for animal feed, but it lacks methionine -- a key amino acid -- and we found an effective way to add it."

The study, led by Jose Planta, a doctoral student at the Waksman Institute of Microbiology, was published online today in the *Proceedings of the National Academy of Sciences*.

Methionine, found in meat, is one of the nine essential amino acids that humans get from food, according to the National Center for Biotechnology Information. It is needed for growth and tissue repair, improves the tone and flexibility of skin and hair, and strengthens nails. The sulfur in methionine protects cells from pollutants, slows cell aging and is essential for absorbing selenium and zinc.

Every year, synthetic methionine worth several billion dollars is added to field corn seed, which lacks the substance in nature, said study senior author Joachim Messing, a professor who directs the Waksman Institute of Microbiology. The other co-author is Xiaoli Xiang of the Rutgers Department of Plant Biology and Sichuan Academy of Agricultural Sciences in China.

"It is a costly, energy-consuming process," said Messing, whose lab collaborated with Leustek's lab for this study. "Methionine is added because animals won't grow without it. In many developing countries where corn is a staple, methionine is also important for people, especially children. It's vital nutrition, like a vitamin."

Chicken feed is usually prepared as a corn-soybean mixture, and methionine is the sole essential sulfur-containing amino acid that's missing, the study says.

The Rutgers scientists inserted an E. coli bacterial gene into the corn plant's genome and grew several generations of corn. The E. coli enzyme -- 3'-phosphoadenosine-5'-phosphosulfate reductase (EcPAPR) -- spurred methionine production in just the plant's leaves instead of the entire plant to avoid the accumulation of toxic byproducts, Leustek said. As a result, methionine in corn kernels increased by 57 percent, the study says.

Then the scientists conducted a chicken feeding trial at Rutgers and showed that the genetically engineered corn was nutritious for them, Messing said.

"To our surprise, one important outcome was that corn plant growth was not affected," he said.

In the developed world, including the U.S., meat proteins generally have lots of methionine, Leustek said. But in the developing world, subsistence farmers grow corn for their family's consumption.

"Our study shows that they wouldn't have to purchase methionine supplements or expensive foods that have higher methionine," he said.

Story Source:

[Materials](#) provided by [Rutgers University](#). *Note: Content may be edited for style and length.*

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Huge energy potential in open ocean wind farms in the North Atlantic: In wintertime, North Atlantic wind farms could provide sufficient energy to meet all of civilization's current needs -- ScienceDaily

There is considerable opportunity for generating wind power in the open ocean, particularly the North Atlantic, according to new research from Carnegie's Anna Possner and Ken Caldeira. Their work is published by *Proceedings of the National Academy of Sciences*.

Because wind speeds are higher on average over ocean than over land, wind turbines in the open ocean could in theory intercept more than five times as much energy as wind turbines over land. This presents an enticing opportunity for generating renewable energy through wind turbines. But it was unknown whether the faster ocean winds could actually be converted to increased amounts of electricity.

"Are the winds so fast just because there is nothing out there to slow them down? Will sticking giant wind farms out there just slow down the winds so much that it is no better than over land?" Caldeira asked.

Most of the energy captured by large wind farms originates higher up in the atmosphere and is transported down to the surface where the turbines may extract this energy. Other studies have estimated that there is a maximum rate of electricity generation for land-based wind farms, and have concluded that this maximum rate of energy extraction is limited by the rate at which energy is moved down from faster, higher up winds.

"The real question is," Caldeira said, "can the atmosphere over the ocean move more energy downward than the atmosphere over land is able to?"

Possner and Caldeira's sophisticated modeling tools compared the productivity of large Kansas wind farms to massive, theoretical open-ocean wind farms and found that in some areas ocean-based wind farms could generate at least three times more power than the ones on land.

In the North Atlantic, in particular, the drag introduced by wind turbines would not slow down winds as much as they would on land, Possner and Caldeira found. This is largely due to the fact that large amounts of heat pour out of the North Atlantic Ocean and into the overlying atmosphere, especially during the winter. This contrast in surface warming along the U.S. coast drives the frequent generation of cyclones, or low-pressure systems, that cross the Atlantic and are very efficient in drawing the upper atmosphere's energy down to the height of the turbines.

"We found that giant ocean-based wind farms are able to tap into the energy of the winds throughout much of the atmosphere, whereas wind farms onshore remain constrained by the near-surface wind resources," Possner explained.

However, this tremendous wind power is very seasonal. While in the winter, North Atlantic wind farms could provide sufficient energy to meet all of civilization's current needs, in the summer such wind farms could merely generate enough power to cover the electricity demand of Europe, or possibly the United States alone.

Wind power production in the deep waters of the open ocean is in its infancy of commercialization. The huge wind power resources identified by the Possner and Caldeira study provide strong incentives to develop lower-cost technologies that can operate in the open-ocean environment and transmit this electricity to land where it can be used.

Story Source:

Materials provided by [Carnegie Institution for Science](#). *Note: Content may be edited for style and length.*

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Human brain recalls visual features in reverse order than it detects them: Study challenges traditional hierarchy of brain decoding; offers insight into how the brain makes perceptual judgements -- ScienceDaily

Scientists at Columbia's Zuckerman Institute have contributed to solving a paradox of perception, literally upending models of how the brain constructs interpretations of the outside world. When observing a scene, the brain first processes details -- spots, lines and simple shapes -- and uses that information to build internal representations of more complex objects, like cars and people. But when recalling that information, the brain remembers those larger concepts first to then reconstruct the details -- representing a reverse order of processing. The research, which involved people and employed mathematical modeling, could shed light on phenomena ranging from eyewitness testimony to stereotyping to autism.

This study was published in *Proceedings of the National Academy of Sciences*.

"The order by which the brain reacts to, or encodes, information about the outside world is very well understood," said Ning Qian, PhD, a neuroscientist and a principal investigator at Columbia's Mortimer B. Zuckerman Mind Brain Behavior Institute. "Encoding always goes from simple things to the more complex. But recalling, or decoding, that information is trickier to understand, in large part because there was no method -- aside from mathematical modeling -- to relate the activity of brain cells to a person's perceptual judgment."

Without any direct evidence, researchers have long assumed that decoding follows the same hierarchy as encoding: you start from the ground up, building up from the details. The main contribution of this work with Misha Tsodyks, PhD, the paper's co-senior author who performed this work while at Columbia and is at the Weizmann Institute of Science in Israel, "is to show that this standard notion is wrong," Dr. Qian said. "Decoding actually goes backward, from high levels to low."

As an analogy of this reversed decoding, Dr. Qian cites last year's presidential election as an example.

"As you observed the things one candidate said and did over time, you may have formed a categorical negative or positive impression of that person. From that moment forward, the way in which you recalled the candidate's words and actions are colored by that overall impression," said Dr. Qian. "Our findings revealed that higher-level categorical decisions -- 'this candidate is trustworthy' -- tend to be stable. But lower-level memories -- 'this candidate said this or that' -- are not as reliable. Consequently, high-level decoding constrains low-level decoding."

To explore this decoding hierarchy, Drs. Qian and Tsodyks and their team conducted an experiment that was simple in design in order to have a clear interpretation of the results. They asked 12 people to perform a series of similar tasks. In the first, they viewed a line angled at 50 degrees on a computer screen for half a second. Once it disappeared, the participants repositioned two dots on the screen to match what they remembered to be the angle of the line. They then repeated this task 50 more times. In a second task, the researchers changed the angle of the

line to 53 degrees. And in a third task, the participants were shown both lines at the same time, and then had to orient pairs of dots to match each angle.

Previously held models of decoding predicted that in the two-line task, people would first decode the individual angle of each line (a lower-level feature) and then use that information to decode the two lines' relationship (a higher-level feature).

"Memories of exact angles are usually imprecise, which we confirmed during the first set of one-line tasks. So, in the two-line task, traditional models predicted that the angle of the 50-degree line would frequently be reported as greater than the angle of the 53-degree line," said Dr. Qian.

But that is not what happened. Traditional models also failed to explain several other aspects of the data, which revealed bi-directional interactions between the way participants recalled the angle of the two lines. The brain appeared to encode one line, then the other, and finally encode their relative orientation. But during decoding, when participants were asked to report the individual angle of each line, their brains used that the lines' relationship -- which angle is greater -- to

estimate the two individual angles.

"This was striking evidence of participants employing this reverse decoding method," said Dr. Qian.

The authors argue that reverse decoding makes sense, because context is more important than details. Looking at a face, you want to assess quickly if someone is frowning, and only later, if need be, estimate the exact angles of the eyebrows. "Even your daily experience shows that perception seems to go from high to low levels," Dr. Qian added.

To lend further support, the authors then constructed a mathematical model of what they think happens in the brain. They used something called Bayesian inference, a statistical method of estimating probability based on prior assumptions. Unlike typical Bayesian models, however, this new model used the higher-level features as the prior information for decoding lower-level features. Going back to the visual line task, they developed an equation to estimate individual lines' angles based on the lines' relationship. The model's predictions fit the behavioral data well.

In the future, the researchers plan to extend their work

beyond these simple tasks of perception and into studies of long-term memory, which could have broad implications -- from how we assess a presidential candidate, to if a witness is offering reliable testimony.

"The work will help to explain the brain's underlying cognitive processes that we employ every day," said Dr. Qian. "It might also help to explain complex disorders of cognition, such as autism, where people tend to overly focus on details while missing important context."

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'Turbo charge' for your brain? Synchronizing specific brain oscillations enhances executive function -- ScienceDaily

Two brain regions -- the medial frontal and lateral prefrontal cortices -- control most executive function. Researchers used high-definition transcranial alternating current stimulation (HD-tACS) to synchronize oscillations between them, improving brain processing. De-synchronizing did the opposite.

Robert Reinhart calls the medial frontal cortex the "alarm bell of the brain."

"If you make an error, this brain area fires," says Reinhart, an assistant professor of psychological and brain sciences at Boston University. "If I tell you that you make an error, it also fires. If something surprises you, it fires." Hit a sour note on the piano and the medial frontal cortex lights up, helping you correct your mistake as fast as possible. In healthy people, this region of the brain works hand in hand (or perhaps lobe

in lobe) with a nearby region, the lateral prefrontal cortex, an area that stores rules and goals and also plays an important role in changing our decisions and actions.

"These are maybe the two most fundamental brain areas involved with executive function and self-control," says Reinhart, who used a new technique called high-definition transcranial alternating current stimulation (HD-tACS) to stimulate these two regions with electrodes placed on a participant's scalp. Using this new technology, he found that improving the synchronization of brain waves, or oscillations, between these two regions enhanced their communication with each other, allowing participants to perform better on laboratory tasks related to learning and self-control. Conversely, de-synchronizing or disrupting the timing of the brain waves in these regions impaired participants' ability to learn and control their behavior, an effect that Reinhart could quickly fix by changing how he delivered the electrical stimulation. The work, published October 9, 2017, in the journal *Proceedings of the National Academy of Sciences* (PNAS), suggests that electrical stimulation can quickly -- and reversibly -- increase or decrease executive function in healthy people and change their

behavior. These findings may someday lead to tools that can enhance normal brain function, possibly helping treat disorders from anxiety to autism.

"We're always looking for a link between brain activity and behavior -- it's not enough to have just one of those things. That's part of what makes this finding so exciting," says David Somers, a BU professor of psychological and brain sciences, who was not involved with the study. Somers likens the stimulation to a "turbo charge" for your brain. "It's really easy to mess things up in the brain but much harder to actually improve function."

Research has recently suggested that populations of millions of cells in the medial frontal cortex and the lateral prefrontal cortex may communicate with each other through the precise timing of their synchronized oscillations, and these brain rhythms appear to occur at a relatively low frequency (about four to eight cycles per second). While scientists have studied these waves before, Reinhart is the first to use HD-tACS to test how these populations of cells interact and whether their interactions are behaviorally useful for learning and decision-making. In his work, funded by the National Institutes of Health, Reinhart is able to use HD-tACS

to isolate and alter these two specific brain regions, while also recording participants' electrical brain activity via electroencephalogram (EEG).

"The science is much stronger, much more precise than what's been done earlier," says Somers.

In his first round of studies, Reinhart tested 30 healthy participants. Each subject wore a soft cap fitted with electrodes that stimulated brain activity, while additional electrodes monitored brain waves. (The procedure is safe, noninvasive, and doesn't hurt, says Reinhart. "There's a slight tingling for the first 30 seconds," he says, "and then people habituate to it.") Then, for 40 minutes, participants performed a time-estimation learning task, pressing a button when they thought 1.7 seconds had passed. Each time, the computer gave them feedback: too fast, too slow, or just right.

Reinhart tested each of the 30 participants three times, once up-regulating the oscillations, once disrupting them, and once doing nothing. In tests where Reinhart cranked up the synchrony between the two brain regions, people learned faster, made fewer errors, and - when they did make an error -- adjusted their

performance more accurately. And, when he instead disrupted the oscillations and decreased the synchrony -- in a very rough sense, flicking the switch from "smart" to "dumb" -- subjects made more errors and learned slower. The effects were so subtle that the people themselves did not notice any improvement or impairment in the task, but the results were statistically significant.

Reinhart then replicated the experiment in 30 new participants, adding another study parameter by looking at only one side of the brain at a time. In all cases, he found that the right hemisphere of the brain was more relevant to changing behavior.

Then came the most intriguing part of the study. Thirty more participants came in and tried the task. First, Reinhart temporarily disrupted each subject's brain activity, watching as their brain waves de-synchronized and their performance on the task declined. But this time, in the middle of the task, Reinhart switched the timing of the stimulation -- again, turning the knob from "dumb" to "smart." Participants recovered their original levels of brain synchrony and learning behavior within minutes.

"We were shocked by the results and how quickly the effects of the stimulation could be reversed," says Reinhart.

Though Reinhart cautions that these results are very preliminary, he notes that many psychiatric and neurological disorders -- including anxiety, Parkinson's, autism, schizophrenia, ADHD, and Alzheimer's -- demonstrate disrupted oscillations. Currently, most of these disorders are treated with drugs that act on receptors throughout the brain. "Drugs are really messy," says Reinhart. "They often affect very large regions of brain." He imagines, instead, a future with precisely targeted brain stimulation that acts only on one critical node of a brain network, "like a finer scalpel." Reinhart's next line of research will test the technology on people with anxiety disorders.

There is also, of course, the promise of what the technology might offer to healthy brains. Several companies already market brain stimulation devices that claim to both enhance learning and decrease anxiety. YouTube videos show how to make your own, with double-A batteries and off-the-shelf electronics, a practice Reinhart discourages. "You can hurt yourself,"

he says. "You can get burned and have current ringing around your head for days."

He does, however, see the appeal. "I had volunteers in previous research who came back and said, 'Hey, where can I get one of these? I'd love to have it prior to an exam,'" he says. "That was after we debriefed them and they were reading the papers about it."

Somers notes that there are still many questions to answer about the technology before it goes mainstream: How long can the effect last? How big can you make it? Can you generalize from a simple laboratory task to much more complicated endeavors? "But the biggest question," says Somers, "is how far you can go with this technology."

"Think about any given workday," says Somers. "You need to be really 'on' for one meeting, so you set aside some time on your lunch break for some brain stimulation. I think a lot of people would be really into that -- it would be like three cups of coffee without the jitters."

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All Top News

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- [**Genetically boosting the nutritional value of corn could benefit millions**](#) [周二, 10 10月 03:49]

Scientists have found an efficient way to enhance the nutritional value of corn -- the world's largest commodity crop -- by inserting a bacterial gene that causes it to produce a key nutrient called methionine, according to a new study.

- [**Huge energy potential in open ocean wind farms in the North Atlantic**](#) [周二, 10 10月 03:49]

Because wind speeds are higher on average over ocean than over land, wind turbines in the open ocean could in theory intercept more than five times as much energy as wind turbines over land. This presents an enticing opportunity for generating renewable energy through wind turbines. But it was unknown whether the faster ocean winds could actually be converted to increased amounts of electricity.

- [**Human brain recalls visual features in reverse order than it detects them**](#) [周二, 10 10月 03:49]

New research has contributed to solving a paradox of perception, literally upending models of how the brain constructs interpretations of the outside world. When observing a scene, the brain first processes details -- spots, lines and simple shapes -- and uses that information to build internal representations of more complex objects, like cars and people. But during recall, the brain remembers those larger concepts first. This could shed light on concepts such as eyewitness testimony to autism.

- [**'Turbo charge' for your brain?**](#) [周二, 10 10月 03:49]

Two brain regions -- the medial frontal and lateral prefrontal cortices -- control most executive function. Researchers used high-definition transcranial alternating current stimulation (HD-tACS) to synchronize oscillations between them, improving brain processing. De-synchronizing did the opposite.

- [**Amazon farmers discovered the secret of domesticating wild rice 4,000 years ago**](#) [周二, 10 10月 03:47]

Amazonian farmers discovered how to manipulate wild rice so the plants could provide more food 4,000 years ago, long before Europeans colonized America, archaeologists have discovered.

- [**Farsighted children struggle with attention, study finds**](#) [周二, 10 10月 00:40]

Farsighted preschoolers and kindergartners have a harder time paying attention and that could put them at risk of slipping behind in school, a new study suggests.

- [**The female brain reacts more strongly to prosocial behavior than the male brain, study finds**](#) [周二, 10 10月 00:32]

Women are more generous than men, behavioral experiments show. Now, researchers have been able to demonstrate that female and male brains process prosocial and selfish behavior differently. For women, prosocial behavior triggers a stronger reward signal, while male reward systems respond more strongly to selfish behavior.

- [**Bacteria self-organize to build working sensors**](#) [周二, 10 10月 00:32]

By programming bacteria with a synthetic gene circuit that can recruit gold nanoparticles to the surface of their colony, researchers can build functional devices. A proof-of-concept study uses this technique to build dome-shaped pressure sensors with the help of living bacteria.

- [**Solar energy: Prototype shows how tiny photodetectors can double their efficiency**](#) [周二, 10 10月 00:32]

Physicists have developed a photodetector -- a device that converts light into electrons -- by combining two distinct inorganic materials and producing quantum mechanical processes that could revolutionize the way solar energy is collected. The researchers stacked two atomic layers of tungsten diselenide on a single atomic layer of molybdenum diselenide. Such stacking results in properties vastly different from those of the parent layers, allowing for customized electronic engineering at the tini...

• [**Droughts and wildfires: How global warming is drying up the North American monsoon**](#) [周二, 10 10月 00:31]

Previous researchers had concluded that global warming was simply delaying the North American monsoon, which brings summer rains to the southwestern US and northwestern Mexico. But a new, high-resolution climate model that corrects for persistent sea surface temperature (SST) biases now accurately reflects current rainfall conditions and demonstrates that the monsoon is not simply delayed, but that the region's total rainfall is facing a dramatic reduction.

• [**Novel circuit design boosts wearable thermoelectric generators**](#) [周一, 09 10月 21:33]

Using flexible conducting polymers and novel circuitry patterns printed on paper, researchers have demonstrated proof-of-concept wearable thermoelectric generators that can harvest energy from body heat to power simple biosensors for measuring heart rate, respiration or other factors.

• [**Official fish trade 'hugely underestimates' global catches**](#) [周一, 09 10月 21:29]

Conservation of dwindling fish stocks is being severely hampered by poor controls on global trade, according to new research.

• [**Mars study yields clues to possible cradle of life**](#) [周

六, 07 10月 03:49]

The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth. The research offers evidence that these deposits

were formed by heated water from a volcanically active part of the planet's crust entering the bottom of a large sea long ago.

- [**New telescope attachment allows ground-based observations of new worlds**](#) [周六, 07 10月 02:22]

A new, low-cost attachment to telescopes allows previously unachievable precision in ground-based observations of planets beyond our solar system. With it, ground-based telescopes can produce measurements of light intensity that rival the highest quality photometric observations from space.

- [**Breast cancer linked to bacterial imbalances**](#) [周六, 07 10月 00:40]

Researchers have uncovered differences in the bacterial composition of breast tissue of healthy women vs. women with breast cancer. The research team has discovered for the first time that healthy breast tissue contains more of the bacterial species *Methylobacterium*, a finding which could offer a new perspective in the battle against breast cancer.

- [**Exotic quantum particle observed in bilayer graphene**](#) [周五, 06 10月 21:22]

Physicists have definitively observed an intensely studied anomaly in condensed matter physics -- the even-denominator fractional quantum Hall state -- via transport measurement in bilayer graphene.

- [**Old Faithful's geological heart revealed**](#) [周五, 06 10月 07:02]

Scientists have mapped the near-surface geology around Old Faithful, revealing the reservoir of heated water that feeds the geyser's surface vent and how the ground shaking behaves in between eruptions.

- [**3-D quantum gas atomic clock offers new dimensions in measurement**](#) [周五, 06 10月 02:18]

Physicists have created an entirely new design for an atomic clock, in which strontium atoms are packed into a tiny three-dimensional cube at 1,000 times the density of previous one-dimensional clocks. In doing so, they are the first to harness the ultra-controlled behavior of a so-called 'quantum gas' to make a practical measurement device.

- [**Carbon feedback from forest soils to accelerate global warming**](#) [周五, 06 10月 02:18]

After 26 years, the world's longest-running experiment to discover how warming temperatures affect forest soils has revealed a surprising, cyclical response: Soil warming stimulates periods of abundant carbon release from the soil to the atmosphere alternating with periods of no detectable loss in soil carbon stores. The study indicates that in a warming world, a self-reinforcing and perhaps uncontrollable carbon feedback will occur between forest soils and the climate system, accelerating global...

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [**Prehistoric humans are likely to have formed mating networks to avoid inbreeding**](#) [周五, 06 10月 02:17]

Early humans seem to have recognized the dangers of inbreeding at least 34,000 years ago, and developed surprisingly sophisticated social and mating networks to avoid it, new research has found.

- [**12,000 years ago, Florida hurricanes heated up despite chilly seas**](#) [周五, 06 10月 00:50]

Category 5 hurricanes may have slammed Florida repeatedly during the chilly Younger Dryas, 12,000 years ago. The cause? Hurricane-suppressing effects of cooler sea surface were out-weighed by side effects of slowed ocean circulation.

- [**Brain study reveals how insects make beeline for home**](#) [周五, 06 10月 00:50]

Scientists have discovered how the wiring of bees' brains helps them plot the most direct route back to their hive.

- [**Once declared extinct, Lord Howe Island stick**](#)

[**insects really do live**](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead Lord Howe Island stick insects have some good news: those rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

• [**More traits associated with your Neanderthal DNA**](#) [周五, 06 10月 00:11]

After humans and Neanderthals met many thousands of years ago, the two species began interbreeding. Recent studies have shown that some of those Neanderthal genes have contributed to human immunity and modern diseases. Now researchers have found that our Neanderthal inheritance has contributed to other characteristics, too, including skin tone, hair color, sleep patterns, mood, and even a person's smoking status.

• [**Violent helium reaction on white dwarf surface triggers supernova explosion**](#) [周四, 05 10月 23:11]

Astronomers have found solid evidence about what triggered a star to explode, which will contribute to a further understanding of supernova history and behavior.

• [**'Squirtable' elastic surgical glue seals wounds in 60 seconds**](#) [周四, 05 10月 22:27]

A highly elastic and adhesive surgical glue that quickly seals wounds without the need for common staples or sutures could transform how surgeries are performed.

• [**Who fatally undermined Scott's Antarctic expedition?**](#) [周四, 05 10月 22:26]

What doomed Captain Robert Falcon Scott's British Antarctic Expedition in 1912? Scientists have uncovered documents and diary

entries that suggest a team member stole food Scott needed, failed to pass on orders that would have sent out a dog team to meet the men and then changed his story over time to cover up his role in their deaths.

- [**Too much sugar? Even 'healthy people' are at risk of developing heart disease**](#) [周四, 05 10月 08:20]

Healthy people who consume high levels of sugar are at an increased risk of developing cardiovascular disease.

- [**Milky Way's 'most-mysterious star' continues to confound**](#) [周四, 05 10月 07:05]

In 2015, a star called KIC 8462852 caused quite a stir in and beyond the astronomy community due to a series of rapid, unexplained dimming events. The latest findings from astronomers take a longer look at the star, going back to 2006 -- before its strange behavior was detected by Kepler.

- [**No clear evidence that most new cancer drugs extend or improve life**](#) [周四, 05 10月 07:04]

The majority of cancer drugs approved in Europe between 2009 and 2013 entered the market without clear evidence that they improved survival or quality of life for patients, finds a study.

- [**Sunlight and 'right' microbes convert Arctic carbon into carbon dioxide**](#) [周四, 05 10月 04:38]

A new study outlines the mechanisms and points to the importance of both sunlight and the right microbial community as keys to converting permafrost carbon to CO₂.

- [**New nanomaterial can extract hydrogen fuel from seawater**](#) [周四, 05 10月 04:20]

A new hybrid nanomaterial harvests solar energy and uses it to extract hydrogen from seawater, cheaply and efficiently. Future commercialization could mean a new source of environmentally friendly fuel and less dependence on fossil fuels.

- [**Ancient humans left Africa to escape drying climate**](#) [周四, 05 10月 03:12]

Humans migrated out of Africa as the climate shifted from wet to dry about 60,000 years ago, according to new paleoclimate research. What the northeast Africa climate was like when people migrated from Africa into Eurasia between 70,000 and 55,000 years ago is still uncertain. The new research shows around 70,000 years ago, the Horn of Africa climate shifted from a wet phase called 'Green Sahara' to even drier than the region is now.

- [**Why does divorce run in families? The answer may be genetics**](#) [周四, 05 10月 03:12]

Children of divorced parents are more likely to get divorced when compared to those who grew up in two-parent families -- and genetic factors are the primary explanation, according to a new study.

- [**The super-Earth that came home for dinner**](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire solar system to one side. It is a possible "Planet Nine" -- a world perhaps 10 times the mass of Earth and 20 times farther from the sun than Neptune.

- [**Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

- [**Bumblebees shed light on why some individuals are smarter than others**](#) [周四, 05 10月 01:28]

By examining the brains of bees trained to different tasks, the

researchers found that the number of connections between nerve cells may hold the answer to questions about individual cognitive differences. Bees with a greater density of nerve connections (known as synaptic complexes) in a specific part of their brains had better memories and learned faster than bees with fewer connections in these areas.

• [**In Iceland stream, possible glimpse of warming future**](#) [周四, 05 10月 01:26]

When a normally cold stream in Iceland was warmed, the make-up of life inside changed as larger organisms thrived while smaller ones struggled. The findings carry implications for life in a warming climate.

• [**Anxiety and depression caused by childhood bullying decline over time**](#) [周四, 05 10月 00:05]

A new study has provided the strongest evidence to date that exposure to bullying causes mental health issues such as anxiety years later.

• [**Flights worldwide face increased risk of severe turbulence due to climate change**](#) [周四, 05 10月 00:04]

Flights all around the world could be encountering lots more turbulence in the future, according to the first ever global projections of in-flight bumpiness.

• [**Hurricane exposes and washes away thousands of sea turtle nests**](#) [周四, 05 10月 00:04]

Marine biologists have released estimates of sea turtle nests lost to Hurricane Irma, finding that 56 percent of green turtle nests and 24 percent of loggerhead nests were lost within Archie Carr National Wildlife Refuge. Both are endangered species. The losses put a damper on what had been a record year for green turtle nesting.

• [**Nobel Prize in Chemistry 2017: Cryo-electron microscopy**](#) [周三, 04 10月 21:02]

The Nobel Prize in Chemistry 2017 goes to Jacques Dubochet, Joachim Frank, and Richard Henderson "for developing cryo-electron microscopy for the high-resolution structure determination of

biomolecules in solution."

- [**'CRISPR-Gold' fixes Duchenne muscular dystrophy mutation in mice**](#) [周三, 04 10月 08:29]

Scientists have engineered a new way to deliver CRISPR-Cas9 gene-editing technology inside cells and have demonstrated in mice that the technology can repair the mutation that causes Duchenne muscular dystrophy, a severe muscle-wasting disease.

- [**Livestock grazing harming giant panda habitat**](#) [周三, 04 10月 00:54]

One third of the giant panda habitat in China's Wanglang National Nature Reserve has been degraded and lost to livestock grazing, a new study finds. Livestock numbers in the park have increased ninefold in the last 15 years.

- [**First evidence of the body's waste system in the human brain discovered**](#) [周二, 03 10月 23:11]

By scanning the brains of healthy volunteers, researchers saw the first, long-sought evidence that our brains may drain some waste out through lymphatic vessels, the body's sewer system. The results further suggest the vessels could act as a pipeline between the brain and the immune system.

- [**Large volcanic eruptions in Tropics can trigger El Niño events**](#) [周二, 03 10月 23:11]

Explosive volcanic eruptions in the tropics can lead to El Niño events, those notorious warming periods in the Pacific Ocean with dramatic global impacts on the climate, according to a new study.

- [**House sparrow decline linked to air pollution and poor diet**](#) [周二, 03 10月 23:10]

House sparrows are well-adapted to living in urban areas, so it is surprising their numbers have fallen significantly over the past decades. An investigation into this worrying trend finds that sparrows living in urban areas are adversely affected by pollution and poor nutrition. The study also finds the birds suffer more during the breeding season, when

resources are needed to produce healthy eggs.

• [**To breed or not to breed? Migratory female butterflies face a monsoonal dilemma**](#) [周二, 03 10月 23:10]

Female butterflies make smart investments, finds a new study.

• [**Astronomers reveal evidence of dynamical dark energy**](#) [周二, 03 10月 23:10]

Astronomers found that the nature of dark energy may not be the cosmological constant introduced by Albert Einstein 100 years ago. This is crucial for the study of dark energy.

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Health News

Top stories featured on ScienceDaily's Health & Medicine, Mind & Brain, and Living Well sections.

- [**Human brain recalls visual features in reverse order than it detects them**](#) [周二, 10 10月 03:49]

New research has contributed to solving a paradox of perception, literally upending models of how the brain constructs interpretations of the outside world. When observing a scene, the brain first processes details -- spots, lines and simple shapes -- and uses that information to build internal representations of more complex objects, like cars and people. But during recall, the brain remembers those larger concepts first. This could shed light on concepts such as eyewitness testimony to autism.

- [**'Turbo charge' for your brain?**](#) [周二, 10 10月 03:49]

Two brain regions -- the medial frontal and lateral prefrontal cortices -- control most executive function. Researchers used high-definition transcranial alternating current stimulation (HD-tACS) to synchronize oscillations between them, improving brain processing. De-synchronizing did the opposite.

- [**Alzheimer's gene poses both risk and benefits**](#) [周二, 10 10月 03:48]

Scientists studying the molecular roots of Alzheimer's disease have encountered a good news/bad news scenario. The bad news is that in the early stages of the disease, high-risk TREM2 variants can hobble the immune system's ability to protect the brain from amyloid beta. The good news, according to researchers, is that later in the disease, the absence of TREM2 protein seems to protect the brain from damage.

- [**A spoonful of oil: Fats and oils help to unlock**](#)

[full nutritional benefits of veggies, study suggests](#)

[周二, 10 10月 00:40]

Some dressing with your greens may help you absorb more nutrients, according to a new study. The research found enhanced absorption of multiple fat-soluble vitamins in addition to beta-carotene and three other carotenoids. The results may ease the guilt of countless dieters who fret about adding dressing to their salads.

• [Farsighted children struggle with attention, study finds](#)

[周二, 10 10月 00:40]

Farsighted preschoolers and kindergartners have a harder time paying attention and that could put them at risk of slipping behind in school, a new study suggests.

• [Novel treatment causes cancer to self-destruct without affecting healthy cells](#)

[周二, 10 10月 00:39]

Scientists have discovered the first compound that directly makes cancer cells commit suicide while sparing healthy cells. The new treatment approach, described in today's issue of Cancer Cell, was directed against acute myeloid leukemia (AML) cells but may also have potential for attacking other types of cancers.

• [Blood samples may provide patient radiosensitivity answers](#)

[周二, 10 10月 00:34]

How much radiation or chemotherapy can a certain person handle? With help from blood or tissue testing, it may be possible to answer this question in advance, which in turn could improve treatment, say researchers.

• [Type 1 diabetes and the microbiota: MAIT cells as biomarkers and new therapeutic targets](#)

[周二, 10 10月 00:34]

Scientists have discovered that the onset of type 1 diabetes is preceded by modification of MAIT lymphocytes. These cells—associated with mucosae and able to recognize elements of the microbiota—could therefore serve as new biomarkers for early detection and prevention of the illness.

- [**The female brain reacts more strongly to prosocial behavior than the male brain, study finds**](#) [周二, 10 10月 00:32]

Women are more generous than men, behavioral experiments show. Now, researchers have been able to demonstrate that female and male brains process prosocial and selfish behavior differently. For women, prosocial behavior triggers a stronger reward signal, while male reward systems respond more strongly to selfish behavior.

- [**Making fat mice lean: Novel immune cells control neurons responsible for fat breakdown**](#) [周二, 10 10月 00:31]

The biological causes underlying obesity have been under intense scrutiny with studies suggesting a link between the nervous and the immune systems. Now, in a breakthrough study to be published in Nature Medicine on Oct. 9, a research team led by Ana Domingos, from Instituto Gulbenkian de Ciência, discovered an unforeseen population of immune cells associated with neurons that play a direct role in obesity.

- [**New congenital heart disease genes uncovered**](#) [周二, 10 10月 00:31]

A new study has helped shed new light on some of the underlying genetic causes of cases of CHD as well as the long-term outlook for patients who carry these mutations.

- [**Durable end to the HIV/AIDS pandemic likely will require an HIV vaccine**](#) [周二, 10 10月 00:31]

Despite remarkable gains in the treatment and prevention of HIV infection, development of an effective HIV vaccine likely will be necessary to achieve a durable end to the HIV/AIDS pandemic, according to experts.

- [**Nerve cells' gatekeepers take many forms**](#) [周二, 10 10月 00:31]

Scientists track the conformations of proteins that stand guard at transmembrane channels in the walls of nerve cells. The research could lead to refined drugs to treat neurological conditions.

- [**Novel circuit design boosts wearable thermoelectric generators**](#) [周一, 09 10月 21:33]

Using flexible conducting polymers and novel circuitry patterns printed on paper, researchers have demonstrated proof-of-concept wearable thermoelectric generators that can harvest energy from body heat to power simple biosensors for measuring heart rate, respiration or other factors.

- [**A new kind of influenza vaccine: One shot might do the trick**](#) [周一, 09 10月 21:33]

Certain proteins in the influenza virus remain constant year after year. Researchers are taking one of those conserved proteins, Matrix-2 (M2), and packaging it in a nanoscale, controlled-release "capsule" in an attempt to create a quick-acting, long-lasting, multi-strain vaccine against pandemic influenza A.

- [**Surgery: Sticking instead of stitching**](#) [周一, 09 10月 21:32]

In spite of medical advances, wound-related complications arising after operations can still be life-threatening. In order to avoid these complications in the future, a new nanoparticle-based tissue glue has been developed by researchers at Empa.

- [**Molecular basis for memory and learning: Brain development and plasticity share similar signalling pathways**](#) [周一, 09 10月 21:32]

Learning and memory are two important functions of the brain that are based on the brain's plasticity. Scientists now report on how a trio of key molecules directs these processes. Their findings provide new leads for the therapy of Alzheimer's disease.

- [**E-cigarettes should be promoted as a method of stopping smoking**](#) [周一, 09 10月 21:32]

E-cigarettes should be promoted as a method of stopping smoking according to a new report.

- [**Safe to treat dementia patients with clot-busting**](#)

[drugs, study shows](#) [周一, 09 10月 21:29]

Stroke patients with dementia treated with intravenous thrombolysis using powerful clot-busting drugs are at no higher risk of brain haemorrhage or death than other patients receiving the same treatment, a new study reports.

• [The risk of type 1 diabetes not increased by swine flu vaccine Pandemrix](#) [周一, 09 10月 21:29]

There has been a fear that the swine flu vaccine, Pandemrix, would increase the risk of autoimmune diseases other than narcolepsy. However, a new study of children from Sweden and Finland shows that the vaccine increased neither the risk of developing autoantibodies against insulin-producing beta cells nor the occurrence of type 1 diabetes.

• [Human minibrains reveal effects of psychedelic substance](#) [周一, 09 10月 20:44]

Scientists have identified changes in signaling pathways associated with neural plasticity, inflammation and neurodegeneration triggered by a compound from the family of dimethyltryptamine known as 5-MeO-DMT.

• [How brain cells die in Alzheimer's and FTD](#) [周一, 09 10月 20:43]

Removal of a regulatory gene called LSD1 in adult mice induces changes in gene activity that look unexpectedly like Alzheimer's. Another surprise: LSD1 is tangled up in brain samples from humans with Alzheimer's and frontotemporal dementia (FTD), suggesting LSD1 as a central downstream player in these diseases and a drug target.

• [Reported penicillin allergy appears to increase the risk of surgical site infections](#) [周一, 09 10月 20:43]

Investigators found that surgical patients believed to be allergic to penicillin were significantly more likely to develop surgical site infections than were patients with no documented allergy, a difference totally attributable to the alternative antibiotics used to prevent such

infections.

• [**Fruit fly muscles with a hypertrophic cardiomyopathy mutation don't relax properly**](#) [周一, 09 10月 20:43]

Using fruit flies, researchers have figured out why a particular inherited human heart condition that is almost always due to genetic mutations causes the heart to enlarge, thicken and fail. They found that one such mutation interferes with heart muscle's ability to relax after contracting, and prevents the heart from fully filling with blood and pumping it out.

• [**Double mastectomy tied to more missed work**](#) [周一, 09 10月 20:43]

As more breast cancer patients are choosing to remove both breasts, researchers examine the impact this aggressive surgery has on their employment.

• [**Dads are often having fun while moms work around the house**](#) [周一, 09 10月 20:43]

For the first time, researchers have evidence of exactly what dads are doing while moms are taking care of housework or tending to their child. The results will be disappointing for those who expected more gender equity in modern society.

• [**New biomarker predicts metastatic prostate cancers**](#) [周一, 09 10月 07:27]

Many prostate cancers, which generally are diagnosed in older men, are "indolent," slow-growing tumors that aren't destined to be fatal. But some tumors are prone to becoming aggressive and spreading beyond the prostate, making them difficult to treat and life-threatening. Currently, doctors have limited ability to predict which newly diagnosed tumors will progress slowly and which will probably undergo dangerous spread.

• [**US Olympians at 2016 Rio Games were infected with West Nile virus, not Zika**](#) [周日, 08 10月 05:29]

US Olympic and Paralympic athletes and staff who traveled to Rio de Janeiro, Brazil, for the 2016 Summer Games did not become infected

with Zika virus but did test positive for other tropical, mosquito-borne viral infections, including West Nile Virus, Dengue Fever and Chikungunya.

• [**Cannabis consumption increases violent behavior in young people in psychiatric care**](#) [周六, 07 10月 04:48]

A new study on cannabis use that involved 1,136 patients (from 18 to 40 years of age) with mental illnesses who had been seen five times during the year after discharge from a psychiatric hospital demonstrates that sustained use of cannabis is associated with an increase in violent behavior in young people. Moreover, the association between persistent cannabis use and violence is stronger than that associated with alcohol or cocaine.

• [**Antibiotics for dental procedures linked to superbug infection**](#) [周六, 07 10月 04:48]

Dental procedures are an overlooked source of antibiotic prescribing, which is a concern as these medications increase the risk of developing *C. difficile*.

• [**Genetic body/brain connection identified in genomic region linked to autism**](#) [周六, 07 10月 04:48]

For the first time, scientists have documented a direct link between deletions in two genes--*fam57ba* and *doc2a*--in zebrafish and certain brain and body traits, such as seizures, hyperactivity, large head size, and increased fat content. Both genes reside in the 16p11.2 region of the genome, which has been linked to multiple brain and body disorders in humans, including autism spectrum disorder, developmental delays, seizures, and obesity.

• [**Ebola vaccine tested in adults and children in Africa hailed a success**](#) [周六, 07 10月 02:23]

Experts have reported that an Ebola vaccine is safe for children as well as adults and produces an immune response.

• [**DNA damage caused by cancer treatment**](#)

[reversed by ZATT protein](#) [周六, 07 10月 02:22]

An international team has discovered a new way that cells fix an important and dangerous type of DNA damage known as a DNA-protein cross-link (DPC). The researchers found that a protein named ZATT can eliminate DPCs with the help of another protein, TDP2.

• [Preeclampsia triggered by an overdose of gene activity](#) [周六, 07 10月 02:22]

Preeclampsia, the most dangerous form of hypertension during a pregnancy, is known to originate in the placenta. But the root causes remain largely a mystery. Findings reveal that it is not a single disease caused solely by genetic factors: Epigenetically regulated genes play an important role. The research team also developed an in vitro model of the disorder which demonstrates the dysregulation of an important transcription factor.

• [Asymmetric sound absorption lets in the light](#) [周六, 07 10月 02:22]

Many asymmetric absorbers are currently based on a single-port system, where sound enters one side and is absorbed before a rigid wall. In this design, however, light and air are unable to pass through the system. But new research shows that asymmetric absorption can be realized within a straight transparent waveguide.

• [Gluten intolerance appears largely undiagnosed in Canada](#) [周六, 07 10月 00:40]

Research on a large sample of Canadians suggests that most people with celiac disease don't know they have it.

• [Breast cancer linked to bacterial imbalances](#) [周六, 07 10月 00:40]

Researchers have uncovered differences in the bacterial composition of breast tissue of healthy women vs. women with breast cancer. The research team has discovered for the first time that healthy breast tissue contains more of the bacterial species *Methylobacterium*, a finding which could offer a new perspective in the battle against breast cancer.

• [Sensitivity to time improves performance at](#)

[remotely controlling devices](#) [周五, 06 10月 23:23]

A new study finds that people who are more sensitive to the passage of time are better at accounting for the latency -- or time lag -- inherent in remotely controlling robots or other tools.

• [New antifungal drug](#) [周五, 06 10月 22:18]

Medical researchers have developed a new antifungal drug to help in the treatment of life threatening invasive fungal infections such as invasive aspergillosis.

• [Beyond bullying: Study shows damaging affects of multiple forms of victimization on school climate](#) [周五, 06 10月 21:04]

School officials focused exclusively on bullying prevention efforts might want to consider the findings of a new study showing the highly damaging effects of multiple forms of victimization on school climate.

• [Social acceptance more important than economic factors in fertility treatment availability](#) [周五, 06 10月 20:59]

A new British study has shed light on some of the reasons why Assisted Reproductive Technologies (ART) usage varies across Europe -- pinpointing moral and social acceptance of the treatment and religion as key. Scientists have, for the first time, assessed the relative importance of the role that economic, demographic and cultural normative factors play in the process.

• [Is your partner's hearing loss driving you mad?](#) [周五, 06 10月 20:59]

The impact of a person's hearing loss on their nearest and dearest should be considered when personalizing rehabilitation plans for patients with deafness, suggest researchers.

• [How seemingly acute viral infections can persist](#) [周五, 06 10月 20:59]

Scientists have resolved a paradox of viral infection. They've identified how a viral product can both trigger an immune response aimed at

eliminating the virus or, conversely, allow the virus to survive and persist.

- [**Discovery advances understanding of inflammatory bowel disease**](#) [周五, 06 10月 07:06]

New findings could help guide doctors to determine how best to treat patients with Crohn's disease, outlines a new report.

- [**Pushy or laid back? Economic factors influence parenting style**](#) [周五, 06 10月 07:03]

A new study argues that parenting styles are shaped by economic factors that incentivize one strategy over others.

- [**How to decrease the discard rate of donated organs**](#) [周五, 06 10月 07:02]

From 2008-2015, the number of kidneys donated after circulatory death that were obtained by the country's 58 donor service areas varied substantially. The outcomes associated with these organs were generally excellent. The use of these organs could be increased if 'cold ischemia times' are limited.

- [**Women who get frequent UTIs may reduce risk by drinking plenty of water**](#) [周五, 06 10月 07:02]

Women who suffer from recurrent urinary tract infections may reduce their risk by drinking more water, according to a new study.

- [**Screen children with reading difficulties for hearing problems**](#) [周五, 06 10月 07:02]

A new study found 25 percent of its young participants who had reading difficulties showed mild or moderate hearing impairment, of which their parents and teachers were unaware.

- [**Study challenges long-standing concept in cancer metabolism**](#) [周五, 06 10月 04:11]

Scientists have discovered that lactate provides a fuel for growing tumors, challenging a nearly century-old observation known as the

Warburg effect.

• [**New research to combat pancreatic cancer**](#) [周五, 06 10月

04:11]

New research is underway that could help scientists combat the most lethal of cancers: pancreatic cancer. In a recent study, scientists demonstrated that bacteria in pancreatic tumors degrade a chemotherapy drug -- Gemcitabine -- most commonly used to treat patients who have pancreatic cancer.

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [**Huge energy potential in open ocean wind farms in the North Atlantic**](#) [周二, 10 10月 03:49]

Because wind speeds are higher on average over ocean than over land, wind turbines in the open ocean could in theory intercept more than five times as much energy as wind turbines over land. This presents an enticing opportunity for generating renewable energy through wind turbines. But it was unknown whether the faster ocean winds could actually be converted to increased amounts of electricity.

- [**Bacteria self-organize to build working sensors**](#) [周二, 10 10月 00:32]

By programming bacteria with a synthetic gene circuit that can recruit gold nanoparticles to the surface of their colony, researchers can build functional devices. A proof-of-concept study uses this technique to build dome-shaped pressure sensors with the help of living bacteria.

- [**Solar energy: Prototype shows how tiny photodetectors can double their efficiency**](#) [周二, 10 10月 00:32]

Physicists have developed a photodetector -- a device that converts light into electrons -- by combining two distinct inorganic materials and producing quantum mechanical processes that could revolutionize the way solar energy is collected. The researchers stacked two atomic layers of tungsten diselenide on a single atomic layer of molybdenum diselenide. Such stacking results in properties vastly different from those of the parent layers, allowing for customized electronic engineering at the tini...

- [**Novel circuit design boosts wearable thermoelectric generators**](#) [周一, 09 10月 21:33]

Using flexible conducting polymers and novel circuitry patterns printed on paper, researchers have demonstrated proof-of-concept wearable thermoelectric generators that can harvest energy from body heat to power simple biosensors for measuring heart rate, respiration or other factors.

- [**A safe optical fiber for delivering light and drugs into the body**](#) [周一, 09 10月 21:32]

An electrical engineer and a biomaterials engineer have joined their expertise to develop a flexible, biodegradable optical fiber to deliver light into the body for medical applications.

- [**Surgery: Sticking instead of stitching**](#) [周一, 09 10月 21:32]

In spite of medical advances, wound-related complications arising after operations can still be life-threatening. In order to avoid these complications in the future, a new nanoparticle-based tissue glue has been developed by researchers at Empa.

- [**Digital services collect unnecessary personal information**](#) [周一, 09 10月 21:29]

Digital services that require users to log in with a personal account often collect more information about users than is needed. Certain policies may encroach on our privacy.

- [**New electro-organic synthesis allows sustainable and green production of fine chemicals**](#) [周六, 07 10月 04:49]

Scientists have succeeded in developing a state-of-the-art and innovative electro-organic synthesis.

- [**Mars study yields clues to possible cradle of life**](#) [周六, 07 10月 03:49]

The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth. The research offers evidence that these deposits were formed by heated water from a volcanically active part of the

planet's crust entering the bottom of a large sea long ago.

- [**A dash of gold improves microlasers**](#) [周六, 07 10月 02:22]

By attaching gold nanoparticles to the surface of a microlaser, researchers demonstrated a frequency comb that takes up less space and requires 1000 times less power than current comb technology.

- [**New telescope attachment allows ground-based observations of new worlds**](#) [周六, 07 10月 02:22]

A new, low-cost attachment to telescopes allows previously unachievable precision in ground-based observations of planets beyond our solar system. With it, ground-based telescopes can produce measurements of light intensity that rival the highest quality photometric observations from space.

- [**Breakthrough in direct activation of CO₂ and CH₄ into liquid fuels and chemicals**](#) [周六, 07 10月 00:40]

Researchers have made a significant breakthrough in the direct conversion of carbon dioxide (CO₂) and methane (CH₄) into liquid fuels and chemicals which could help industry to reduce greenhouse gas emissions whilst producing valuable chemical feedstocks.

- [**Energy against the current on a quantum scale, without contradicting the laws of physics**](#) [周五, 06 10月 23:23]

In a classical thermodynamic system, the heat current flows from the hotter body to the colder one, or electricity from the higher voltage to the lower one. The same thing happens in quantum systems, but this state can be changed, and the flow of energy and particles can be reversed if a quantum observer is inserted into the system.

- [**Sensitivity to time improves performance at remotely controlling devices**](#) [周五, 06 10月 23:23]

A new study finds that people who are more sensitive to the passage of time are better at accounting for the latency -- or time lag -- inherent in remotely controlling robots or other tools.

- [**Predicting insect feeding preferences after deforestation**](#) [周五, 06 10月 22:18]

Understanding how parasitoids and hosts interact, and how their interactions change with human influence, is critically important to understanding ecosystems. New research finds mathematical models can predict complex insect behavioral changes using a simple description of insect preferences.

- [**Segregation-induced ordered superstructures at general grain boundaries in a Ni-Bi alloy**](#) [周五, 06 10月 22:18]

Randomly selected, high-angle, general grain boundaries in a nickel-bismuth (Ni-Bi) polycrystalline alloy can undergo interfacial reconstruction to form ordered superstructures, a discovery that enriches the theories and fundamental understandings of both grain boundary segregation and liquid metal embrittlement in physical metallurgy.

- [**Exotic quantum particle observed in bilayer graphene**](#) [周五, 06 10月 21:22]

Physicists have definitively observed an intensely studied anomaly in condensed matter physics -- the even-denominator fractional quantum Hall state -- via transport measurement in bilayer graphene.

- [**Electron behavior under extreme conditions described for the first time**](#) [周五, 06 10月 21:02]

Researchers have modeled the actions of electrons under extreme temperatures and densities, such as those found within planets and stars.

- [**Engineers invent breakthrough millimeter-wave circulator IC**](#) [周五, 06 10月 20:59]

Researchers continue to break new ground in developing magnet-free non-reciprocal components in modern semiconductor processes. They have built the first magnet-free non-reciprocal circulator on a silicon chip that operates at millimeter-wave frequencies, enabling circulators to be built in conventional semiconductor chips and operate at millimeter-wave frequencies, enabling full-duplex or two-way wireless.

- [**Shrinking the proton again**](#) [周五, 06 10月 07:04]

Scientists, using high precision laser spectroscopy of atomic hydrogen, confirm the surprisingly small value of the proton radius determined from muonic hydrogen.

- [**'Transformative' research unrealistic to predict, scientists tell granting agencies**](#) [周五, 06 10月 07:03]

Research-funding agencies that require scientists to declare at the proposal stage how their projects will be 'transformative' may actually be hindering discovery.

- [**Smartphone-controlled smart bandage for better, faster healing**](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [**New technology uses mouth gestures to interact in virtual reality**](#) [周五, 06 10月 02:42]

Researchers have developed a new technology that allows users to interact in a virtual reality environment using only mouth gestures.

- [**Simulating a brain-cooling treatment that could one day ease epilepsy**](#) [周五, 06 10月 02:18]

Using computer simulation techniques, scientists have gained new insights into the mechanism by which lowering the temperature of specific brain regions could potentially treat epileptic seizures.

- [**3-D quantum gas atomic clock offers new dimensions in measurement**](#) [周五, 06 10月 02:18]

Physicists have created an entirely new design for an atomic clock, in which strontium atoms are packed into a tiny three-dimensional cube at 1,000 times the density of previous one-dimensional clocks. In doing so, they are the first to harness the ultra-controlled behavior of a so-called 'quantum gas' to make a practical measurement device.

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [**Why lab researchers should talk with industry counterparts**](#) [周五, 06 10月 02:17]

A research team has found both obstacles and lessons from the process of getting a novel membrane for chemical processing out of the lab into the commercial world.

- [**Scientists enlist supercomputers, machine learning to automatically identify brain tumors**](#) [周五, 06 10月 02:17]

Researchers have developed a brain tumor identification method that combines biophysical models of tumor growth with machine learning algorithms.

- [**Road pricing most effective in reducing vehicle emissions**](#) [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

- [**New test opens path for better 2-D catalysts**](#) [周五, 06 10月 02:17]

Scientists have developed technology for rapid screening of two-dimensional materials for electrocatalysis of hydrogen. The method could accelerate the development of 2-D materials for energy applications.

- [**Heart: No evidence for piezoelectricity or**](#)

[ferroelectricity in the aorta](#) [周五, 06 10月 02:17]

While some studies have supported the idea that the walls of the aorta are piezoelectric or ferroelectric, the most recent research finds no evidence of these properties. Researchers investigated by testing samples of pig aorta using a traditional setup, known as Sawyer-Tower, to detect ferroelectricity. Their experiments suggest the aorta has no special properties, and instead acts as a standard dielectric material that does not conduct current.

· ['Body-on-a-chip' system to accelerate testing of new drugs](#) [周五, 06 10月 00:10]

Being able to test new drugs in a 3-D model of the body has the potential to speed up drug discovery, reduce the use of animal testing and advance personalized medicine.

· [Paper-based supercapacitor uses metal nanoparticles to boost energy density](#) [周五, 06 10月 00:10]

Using a simple layer-by-layer coating technique, researchers have developed a paper-based flexible supercapacitor that could be used to help power wearable devices. The device uses metallic nanoparticles to coat cellulose fibers in the paper, creating supercapacitor electrodes with high energy and power densities -- and the best performance so far in a textile-based supercapacitor.

· [Violent helium reaction on white dwarf surface triggers supernova explosion](#) [周四, 05 10月 23:11]

Astronomers have found solid evidence about what triggered a star to explode, which will contribute to a further understanding of supernova history and behavior.

· [Fingerprints lack scientific basis for legal certainty](#) [周四, 05 10月 23:11]

A new report on the quality of latent fingerprint analysis says that courtroom testimony and reports stating or even implying that fingerprints collected from a crime scene belong to a single person are

indefensible and lack scientific foundation.

- [**New 'molecular trap' cleans more radioactive waste from nuclear fuel rods**](#) [周四, 05 10月 23:10]

A new method for capturing radioactive waste from nuclear power plants is cheaper and more effective than current methods, a potential boon for the energy industry, according to new research.

- [**Machinery that repairs itself**](#) [周四, 05 10月 22:38]

Scientists are developing maintenance technology capable of forecasting machine downtimes in production before they occur. This allows plant managers to rectify faults before the machine breaks down. The system even corrects some defects automatically.

- [**Safety assistance system warns of dirty bombs**](#) [周四, 05 10月 22:38]

The threat of terrorism has been on the rise in recent years, with experts and politicians particularly worried that terrorists might make use of dirty bombs. Researchers have developed a new system that will be able to detect possible carriers of radioactive substances, even in large crowds of people.

- [**Spray drying: Perfect dosing thanks to drug capsules**](#) [周四, 05 10月 22:38]

Instant coffee and powdered milk are produced by spray drying. Researchers have adapted this technique to the tricky question of incorporating insoluble substances in core-shell particles. The new method helps reduce the concentration of active ingredients in therapeutic medications.

- [**Tracking debris in the Earth's orbit with centimeter precision using efficient laser technology**](#) [周四, 05 10月 22:38]

Uncontrollable flying objects in orbit are a massive risk for modern space travel, and, due to our dependence on satellites today, it is also a risk to global economy. Scientists have now developed a fiber laser that reliably determines the position and direction of the space debris'

movement to mitigate these risks.

- [**Mitigating the unpleasant scent of adhesives**](#) [周四, 05 10月 22:38]

It is a known fact that adhesives may smell unpleasant. However, as researchers have recently discovered, this doesn't need to be the case. Through extensive research on acrylic adhesives they were able to identify the substances responsible for the offensive odors. So far, very little research has been conducted on the subject, but now manufacturers finally have the opportunity to optimize their production process.

- [**Using elastomer films to generate electricity**](#) [周四, 05 10月 22:35]

Water is still the most important source of renewable energy in Bavaria, Germany, accounting for some 33 percent of all renewable energy produced in the region, as showed by the Bavarian Energy Map. But conventional hydroelectric plants, especially micro hydro generators, are a subject of controversy due to their low output volumes and their interference with the ecosystem. Researchers are working on an environmentally friendly alternative: in the future, innovative elastomer materials are set to...

- [**New nanoplatelets improve the brightness of LEDs, lasers and LCD screens, researchers show**](#) [周四, 05 10月 22:35]

New semiconductor nanoplatelets synthesized in laboratories can improve the brightness of LEDs, lasers and LCD screens of computers or televisions because they allow to minimize energy losses compared to current semiconductor materials.

- [**'Squirtable' elastic surgical glue seals wounds in 60 seconds**](#) [周四, 05 10月 22:27]

A highly elastic and adhesive surgical glue that quickly seals wounds without the need for common staples or sutures could transform how surgeries are performed.

- [**Completing the drug design jigsaw**](#) [周四, 05 10月 22:27]

A powerful new way of analysing how drugs interact with molecules in the body could aid the design of better treatments with fewer side-

effects.

- [**Computer model unravels knotty problems in DNA**](#) [周四, 05 10月 22:27]

If you've ever tried to untangle a pair of earbuds, you'll understand how loops and cords can get twisted up. DNA can get tangled in the same way, and in some cases, has to be cut and reconnected to resolve the knots. Now a team of mathematicians, biologists and computer scientists has unraveled how E. coli bacteria can unlink tangled DNA by a local reconnection process. The math behind the research could have implications far beyond biology.

- [**Mars' moon Phobos examined in a different light**](#) [周四, 05 10月 22:27]

NASA's longest-lived mission to Mars has gained its first look at the Martian moon Phobos, pursuing a deeper understanding by examining it in infrared wavelengths.

- [**How much can watching hockey stress your heart?**](#) [周四, 05 10月 22:27]

A new study suggests that both the thrill of victory and the agony of defeat can have a substantial effect on the cardiovascular system. Investigators took the pulse of fans during a hockey game and found that on average, their heart rate increased by 75 percent when watching on TV, and by a whopping 110 percent (more than doubled, equivalent to the cardiac stress with vigorous exercise) when watching in person.

- [**Caution ahead: The growing challenge for drivers' attention**](#) [周四, 05 10月 22:27]

Many of the infotainment features in most 2017 vehicles are so distracting they should not be enabled while a vehicle is in motion, according to a new study. The study found In-Vehicle Information Systems take drivers' attention off the road for too long to be safe.

- [**A novel textile material that keeps itself germ-free**](#) [周四, 05 10月 22:27]

Scientists have developed a novel weapon in the battle against deadly hospital-acquired infections -- a textile that disinfects itself. And independent tests show it can reduce bacteria levels by more than 90 per cent. By incorporating the specially-engineered textile in a device designed to be used on hospital doors instead of the traditional aluminum door plate, that part of the door that people push to open it -- they aim to bolster hand hygiene.

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [**What soot-covered, hundred-year-old birds can tell us about saving the environment**](#) [周二, 10 10月 03:50]

Birds in museum collections from Rust Belt cities around the turn of the century are covered with black soot from air pollution at the time. Scientists have compared the amount of soot on birds through the years to track environmental pollution over the last 135 years.

- [**Genetically boosting the nutritional value of corn could benefit millions**](#) [周二, 10 10月 03:49]

Scientists have found an efficient way to enhance the nutritional value of corn -- the world's largest commodity crop -- by inserting a bacterial gene that causes it to produce a key nutrient called methionine, according to a new study.

- [**Huge energy potential in open ocean wind farms in the North Atlantic**](#) [周二, 10 10月 03:49]

Because wind speeds are higher on average over ocean than over land, wind turbines in the open ocean could in theory intercept more than five times as much energy as wind turbines over land. This presents an enticing opportunity for generating renewable energy through wind turbines. But it was unknown whether the faster ocean winds could actually be converted to increased amounts of electricity.

- [**Amazon farmers discovered the secret of domesticating wild rice 4,000 years ago**](#) [周二, 10 10月 03:47]

Amazonian farmers discovered how to manipulate wild rice so the

plants could provide more food 4,000 years ago, long before Europeans colonized America, archaeologists have discovered.

- [**How honeybees read the waggle dance**](#) [周二, 10 10月 01:54]

Neurons that enable honeybees to sense the waggle dance -- a form of symbolic communication used by female bees to inform the hive mates about the location of a food source -- have now been investigated.

- [**A spoonful of oil: Fats and oils help to unlock full nutritional benefits of veggies, study suggests**](#) [周二, 10 10月 00:40]

Some dressing with your greens may help you absorb more nutrients, according to a new study. The research found enhanced absorption of multiple fat-soluble vitamins in addition to beta-carotene and three other carotenoids. The results may ease the guilt of countless dieters who fret about adding dressing to their salads.

- [**Type 1 diabetes and the microbiota: MAIT cells as biomarkers and new therapeutic targets**](#) [周二, 10 10月 00:34]

Scientists have discovered that the onset of type 1 diabetes is preceded by modification of MAIT lymphocytes. These cells—associated with mucosae and able to recognize elements of the microbiota—could therefore serve as new biomarkers for early detection and prevention of the illness.

- [**Bacteria self-organize to build working sensors**](#) [周二, 10 10月 00:32]

By programming bacteria with a synthetic gene circuit that can recruit gold nanoparticles to the surface of their colony, researchers can build functional devices. A proof-of-concept study uses this technique to build dome-shaped pressure sensors with the help of living bacteria.

- [**Solar energy: Prototype shows how tiny photodetectors can double their efficiency**](#) [周二, 10 10月 00:32]

Physicists have developed a photodetector -- a device that converts light into electrons -- by combining two distinct inorganic materials and producing quantum mechanical processes that could revolutionize the

way solar energy is collected. The researchers stacked two atomic layers of tungsten diselenide on a single atomic layer of molybdenum diselenide. Such stacking results in properties vastly different from those of the parent layers, allowing for customized electronic engineering at the tini...

- [**Droughts and wildfires: How global warming is drying up the North American monsoon**](#) [周二, 10 10月 00:31]

Previous researchers had concluded that global warming was simply delaying the North American monsoon, which brings summer rains to the southwestern US and northwestern Mexico. But a new, high-resolution climate model that corrects for persistent sea surface temperature (SST) biases now accurately reflects current rainfall conditions and demonstrates that the monsoon is not simply delayed, but that the region's total rainfall is facing a dramatic reduction.

- [**Disease-carrying mosquitoes abound in deforested lands**](#) [周一, 09 10月 21:32]

UF scientists synthesized and examined data from prior studies that had looked at how many pathogen-carrying mosquito species made their homes in forested lands vs. non-forested lands in 12 countries worldwide, including the United States.

- [**Official fish trade 'hugely underestimates' global catches**](#) [周一, 09 10月 21:29]

Conservation of dwindling fish stocks is being severely hampered by poor controls on global trade, according to new research.

- [**Establishing a conservation breeding program to save the last saola**](#) [周一, 09 10月 21:29]

The saola (*Pseudoryx nghetinhensis*), a primitive wild cattle endemic to the Annamite mountain range in Vietnam and Lao People's Democratic Republic (PDR), is in immediate danger of extinction. The primary threat to its survival is intensive commercial snaring to supply the thriving wild meat trade in Indochina. In order to save the saola it is essential to establish a conservation breeding program.

• [**Global kids study: More trees, less disease**](#) [周一, 09 10月 20:44]

A study of 300,000 children in 35 nations says children whose watersheds have greater tree cover are less likely to experience diarrheal disease, the second leading cause of death for kids under the age of five. The study is the first to quantify the connection between watershed quality and individual health outcomes of children at the global scale. The study results from a major new database that enables 'big data' approaches.

• [**Sustainable irrigation may harm other development goals**](#) [周一, 09 10月 20:43]

Pursuing sustainable irrigation without significant irrigation efficiency gains could negatively impact environmental and development goals in many areas of the world, a new study has found.

• [**Indigenous Nations' environmental stewardship in tackling invasive species**](#) [周日, 08 10月 23:33]

As invasive species are threatening ecological habitats throughout the US and Canada, the role of Indigenous nations as environmental stewards has often been overlooked, according to a new study. The findings provide examples of the many ways Indigenous nations are adapting to invasive species, documenting their impact and implementing active response strategies based on an online survey of over 140 Indigenous respondents.

• [**US Olympians at 2016 Rio Games were infected with West Nile virus, not Zika**](#) [周日, 08 10月 05:29]

US Olympic and Paralympic athletes and staff who traveled to Rio de Janeiro, Brazil, for the 2016 Summer Games did not become infected with Zika virus but did test positive for other tropical, mosquito-borne viral infections, including West Nile Virus, Dengue Fever and Chikungunya.

• [**DNA barcoding technology helping monitor health of all-important boreal forest**](#) [周六, 07 10月 04:48]

The Boreal forest is essential to Canada and the world, storing carbon, purifying water and air and regulating climate. But keeping tabs on the health of this vulnerable biome has proven to be a painstaking and time-consuming undertaking - until now. Cutting-edge DNA metabarcoding technology can help speed up and improve the monitoring process, according to a new study.

• [**Mars study yields clues to possible cradle of life**](#) [周

六, 07 10月 03:49]

The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth. The research offers evidence that these deposits were formed by heated water from a volcanically active part of the planet's crust entering the bottom of a large sea long ago.

• [**Deer prefer native plants leaving lasting damage on forests**](#) [周六, 07 10月 02:21]

When rampant white-tailed deer graze in forests, they prefer to eat native plants over certain unpalatable invasive plants, such as garlic mustard and Japanese stiltgrass. These eating habits lower native plant diversity and abundance, while increasing the proportion of plant communities made up of non-native species, according to a new study.

• [**Breakthrough in direct activation of CO₂ and CH₄ into liquid fuels and chemicals**](#) [周六, 07 10月 00:40]

Researchers have made a significant breakthrough in the direct conversion of carbon dioxide (CO₂) and methane (CH₄) into liquid fuels and chemicals which could help industry to reduce greenhouse gas emissions whilst producing valuable chemical feedstocks.

• [**Breast cancer linked to bacterial imbalances**](#) [周六, 07

10月 00:40]

Researchers have uncovered differences in the bacterial composition of breast tissue of healthy women vs. women with breast cancer. The research team has discovered for the first time that healthy breast tissue contains more of the bacterial species *Methylobacterium*, a finding which could offer a new perspective in the battle against breast cancer.

- [**'Lost chapel' of Westminster Palace revealed in new 3-D model**](#) [周五, 06 10月 23:23]

The first dedicated House of Commons chamber, destroyed in the 1834 Palace of Westminster fire, has been reconstructed with the help of 3-D visualization technology.

- [**Predicting insect feeding preferences after deforestation**](#) [周五, 06 10月 22:18]

Understanding how parasitoids and hosts interact, and how their interactions change with human influence, is critically important to understanding ecosystems. New research finds mathematical models can predict complex insect behavioral changes using a simple description of insect preferences.

- [**Plant cells survive but stop dividing upon DNA damage**](#) [周五, 06 10月 22:18]

The cell cycle is how a cell passes its DNA but ceases if the DNA is damaged, as otherwise it risks passing this damage to daughter cells. Scientists report a new molecular mechanism that explains how this cessation occurs. The study shows that the transcription factor family MYB3R is normally degraded, but accumulates upon DNA damage to prevent cell cycle progression.

- [**New study analyzes volcanic fatalities in more detail than ever before**](#) [周五, 06 10月 22:18]

Building on existing information and databases relating to volcanic fatalities, scientists have, for the first time, been able to classify victims by activity or occupation and look at the distance of their death from the volcano.

- [**Microbes dictate regime shifts causing anoxia in lakes and seas**](#) [周五, 06 10月 21:03]

Gradual environmental changes due to eutrophication and global warming can cause a rapid depletion of oxygen levels in lakes and coastal waters. A new study shows that microorganisms play a key role

in these disastrous regime shifts.

- [**How seemingly acute viral infections can persist**](#)

[周五, 06 10月 20:59]

Scientists have resolved a paradox of viral infection. They've identified how a viral product can both trigger an immune response aimed at eliminating the virus or, conversely, allow the virus to survive and persist.

- [**Old Faithful's geological heart revealed**](#)

[周五, 06 10月 07:02]

Scientists have mapped the near-surface geology around Old Faithful, revealing the reservoir of heated water that feeds the geyser's surface vent and how the ground shaking behaves in between eruptions.

- [**Interpreting hurricane forecast displays can be difficult for general public**](#)

[周五, 06 10月 03:11]

The 2017 hurricane season has highlighted the critical need to communicate a storm's impact path and intensity accurately, but new research shows significant misunderstandings of the two most commonly used storm forecast visualization methods.

- [**Do earthquakes have a 'tell'?**](#)

[周五, 06 10月 03:11]

Data scientists and seismologists could potentially forecast strong earthquakes through algorithms designed to detect and monitor 'deep tremor.'

- [**Cost-effectiveness of guinea worm disease eradication**](#)

[周五, 06 10月 02:18]

Eradication of guinea worm disease (dracunculiasis), targeted by the World Health Organization (WHO) for the year 2015, is finally within reach, with only 25 reported human transmissions in 2016. Now, researchers have re-asserted the cost-effectiveness of the global Guinea Worm Eradication Programme (GWEP), some 30 years after it started.

- [**Carbon feedback from forest soils to accelerate global warming**](#)

[周五, 06 10月 02:18]

After 26 years, the world's longest-running experiment to discover how warming temperatures affect forest soils has revealed a surprising,

cyclical response: Soil warming stimulates periods of abundant carbon release from the soil to the atmosphere alternating with periods of no detectable loss in soil carbon stores. The study indicates that in a warming world, a self-reinforcing and perhaps uncontrollable carbon feedback will occur between forest soils and the climate system, accelerating global...

- [**Decision to rescind Waters of the United States rule \(WOTUS\) based on flawed analysis**](#) [周五, 06 10月 02:18]

New evidence suggests that the Trump Administration's proposal to rescind the 2015 Waters of the United States (WOTUS) rule that would limit the scope of the Clean Water Act inappropriately overlooks wetlands-related values.

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [**Prehistoric humans are likely to have formed mating networks to avoid inbreeding**](#) [周五, 06 10月 02:17]

Early humans seem to have recognized the dangers of inbreeding at least 34,000 years ago, and developed surprisingly sophisticated social and mating networks to avoid it, new research has found.

- [**Road pricing most effective in reducing vehicle emissions**](#) [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

- [**New 'movie' technique reveals bacterial signalling in sharper resolution**](#) [周五, 06 10月 02:17]

Researchers used a study of the plant-growth promoting bacterium *Pseudomonas fluorescens* to develop an advanced analysis method which, they hope, will increase our capacity to understand plant and human diseases.

- [**Faster Salmonella test boosts food safety for humans and animals**](#) [周五, 06 10月 02:17]

A new test allows accurate, rapid testing for *Salmonella*, a bacteria that is one of the leading causes of food-borne illness across all regions of the world.

- [**Planning for the future**](#) [周五, 06 10月 02:17]

Over the past decade, increasing temperatures across much of Africa and decreasing rainfall across East Africa have come to represent an alarming climate trend. Chief among concerns is the impact such conditions have on human health.

- [**Key plant species may be important for supporting wildflower pollinators**](#) [周五, 06 10月 02:17]

Increased agricultural production has likely led to loss, fragmentation, and degradation of flower-rich habitats for pollinators. To counteract these negative effects of modern agricultural practices, efforts to maintain and restore diverse plants in agricultural landscapes -- called agri-environmental schemes -- have been implemented in numerous European countries.

- [**12,000 years ago, Florida hurricanes heated up despite chilly seas**](#) [周五, 06 10月 00:50]

Category 5 hurricanes may have slammed Florida repeatedly during the chilly Younger Dryas, 12,000 years ago. The cause? Hurricane-suppressing effects of cooler sea surface were out-weighed by side effects of slowed ocean circulation.

- [**Brain study reveals how insects make beeline for**](#)

[home](#) [周五, 06 10月 00:50]

Scientists have discovered how the wiring of bees' brains helps them plot the most direct route back to their hive.

• [Air pollution exposure on home-to-school routes reduces the growth of working memory](#) [周五, 06 10月 00:50]

A new study has demonstrated that exposure to air pollution on the way to school can have damaging effects on children's cognitive development. The study found an association between a reduction in working memory and exposure to fine particulate matter (PM2.5) and black carbon during the walking commute to and from school.

• [Liverwort genes and land plant evolution](#) [周五, 06 10月 00:11]

The common liverwort is a living link to the transition from marine algae to land plants. Biologists have analyzed the genome sequence of the common liverwort (*Marchantia polymorpha*) to identify genes and gene families that were deemed crucial to plant evolution and have been conserved over millions of years and across plant lineages.

• [Germs in the kitchen: Salmonella better known than Campylobacter](#) [周五, 06 10月 00:11]

What health risks are consumers aware of? What are they concerned about?

• [How yellow and blue make green in parrots](#) [周五, 06 10月 00:11]

Many brightly colored birds get their pigments from the foods that they eat, but that's not true of parrots. Now, researchers reporting a study of familiar pet store parakeets -- also known as budgies -- have new evidence to explain how the birds produce their characteristic yellow, blue, and green feathers.

• [Once declared extinct, Lord Howe Island stick insects really do live](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead

Lord Howe Island stick insects have some good news: those rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

• [**Novel PET tracer identifies most bacterial infections**](#) [周四, 05 10月 23:11]

Medical scientists have developed a novel imaging agent that could be used to identify most bacterial infections.

• [**New 'molecular trap' cleans more radioactive waste from nuclear fuel rods**](#) [周四, 05 10月 23:10]

A new method for capturing radioactive waste from nuclear power plants is cheaper and more effective than current methods, a potential boon for the energy industry, according to new research.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [**Huge energy potential in open ocean wind farms in the North Atlantic**](#) [周二, 10 10月 03:49]

Because wind speeds are higher on average over ocean than over land, wind turbines in the open ocean could in theory intercept more than five times as much energy as wind turbines over land. This presents an enticing opportunity for generating renewable energy through wind turbines. But it was unknown whether the faster ocean winds could actually be converted to increased amounts of electricity.

- [**'Turbo charge' for your brain?**](#) [周二, 10 10月 03:49]

Two brain regions -- the medial frontal and lateral prefrontal cortices -- control most executive function. Researchers used high-definition transcranial alternating current stimulation (HD-tACS) to synchronize oscillations between them, improving brain processing. De-synchronizing did the opposite.

- [**The female brain reacts more strongly to prosocial behavior than the male brain, study finds**](#) [周二, 10 10月 00:32]

Women are more generous than men, behavioral experiments show. Now, researchers have been able to demonstrate that female and male brains process prosocial and selfish behavior differently. For women, prosocial behavior triggers a stronger reward signal, while male reward systems respond more strongly to selfish behavior.

- [**A new kind of influenza vaccine: One shot might**](#)

[do the trick](#) [周一, 09 10月 21:33]

Certain proteins in the influenza virus remain constant year after year. Researchers are taking one of those conserved proteins, Matrix-2 (M2), and packaging it in a nanoscale, controlled-release "capsule" in an attempt to create a quick-acting, long-lasting, multi-strain vaccine against pandemic influenza A.

[Official fish trade 'hugely underestimates' global catches](#) [周一, 09 10月 21:29]

Conservation of dwindling fish stocks is being severely hampered by poor controls on global trade, according to new research.

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Building on existing information and databases relating to volcanic fatalities, scientists have, for the first time, been able to classify victims by activity or occupation and look at the distance of their death from the volcano.

[Social acceptance more important than economic factors in fertility treatment availability](#) [周五, 06 10月 20:59]

A new British study has shed light on some of the reasons why Assisted Reproductive Technologies (ART) usage varies across Europe -- pinpointing moral and social acceptance of the treatment and religion as key. Scientists have, for the first time, assessed the relative importance of the role that economic, demographic and cultural normative factors play in the process.

[Pushy or laid back? Economic factors influence](#)

[parenting style](#) [周五, 06 10月 07:03]

A new study argues that parenting styles are shaped by economic factors that incentivize one strategy over others.

• ['Transformative' research unrealistic to predict, scientists tell granting agencies](#) [周五, 06 10月 07:03]

Research-funding agencies that require scientists to declare at the proposal stage how their projects will be 'transformative' may actually be hindering discovery.

• [Screen children with reading difficulties for hearing problems](#) [周五, 06 10月 07:02]

A new study found 25 percent of its young participants who had reading difficulties showed mild or moderate hearing impairment, of which their parents and teachers were unaware.

• [Multiple research approaches are key to pandemic preparedness](#) [周五, 06 10月 03:11]

Preparedness in the face of major disease outbreaks can save thousands of lives. A new article examines the multifaceted nature of effective preparedness and the role that biomedical research plays. Specifically, the article examines three approaches to pandemic preparedness: pathogen-specific work, platform-based technologies, and prototype-pathogen efforts.

• [Interpreting hurricane forecast displays can be difficult for general public](#) [周五, 06 10月 03:11]

The 2017 hurricane season has highlighted the critical need to communicate a storm's impact path and intensity accurately, but new research shows significant misunderstandings of the two most commonly used storm forecast visualization methods.

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New evidence suggests that the Trump Administration's proposal to rescind the 2015 Waters of the United States (WOTUS) rule that would limit the scope of the Clean Water Act inappropriately overlooks wetlands-related values.

- **[Middle managers may turn to unethical behavior to face unrealistic expectations](#)** [周五, 06 10月 02:17]

While unethical behavior in organizations is often portrayed as flowing down from top management, or creeping up from low-level positions, a team of researchers suggest that middle management also can play a key role in promoting wide-spread unethical behavior among their subordinates.

- **[Why lab researchers should talk with industry counterparts](#)** [周五, 06 10月 02:17]

A research team has found both obstacles and lessons from the process of getting a novel membrane for chemical processing out of the lab into the commercial world.

- **[Delivering bad news? Don't beat around the bush](#)** [周五, 06 10月 02:17]

New research shows that when it comes to receiving bad news, most people prefer directness, candor and very little -- if any -- buffer.

- **[Road pricing most effective in reducing vehicle emissions](#)** [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

- **[Identifying ways to minimize the harm of energy drinks](#)** [周五, 06 10月 02:17]

Because many countries allow the sale of energy drinks to young people, identifying ways to minimize potential harm from energy drinks is critical. A new study provided unique insights into intervention strategies suggested by young people themselves to reduce consumption. In addition to more research and education, these strategies included policy changes targeting energy drink sales, packaging, price, and visibility.

- **[Planning for the future](#)** [周五, 06 10月 02:17]

Over the past decade, increasing temperatures across much of Africa and decreasing rainfall across East Africa have come to represent an alarming climate trend. Chief among concerns is the impact such conditions have on human health.

- **[Something universal occurs in the brain when it processes stories, regardless of language](#)** [周五, 06 10月 02:17]

New brain research shows that reading stories generates activity in the same regions of the brain for speakers of three different languages.

- **[Air pollution exposure on home-to-school routes reduces the growth of working memory](#)** [周五, 06 10月 00:50]

A new study has demonstrated that exposure to air pollution on the way to school can have damaging effects on children's cognitive development. The study found an association between a reduction in working memory and exposure to fine particulate matter (PM2.5) and black carbon during the walking commute to and from school.

- **[Fingerprints lack scientific basis for legal certainty](#)** [周四, 05 10月 23:11]

A new report on the quality of latent fingerprint analysis says that courtroom testimony and reports stating or even implying that fingerprints collected from a crime scene belong to a single person are indefensible and lack scientific foundation.

• [**Perpetrators of genocide say they're 'good people'**](#) [周四, 05 10月 22:33]

The men who were tried for their role in the 1994 Rwandan genocide that killed up to 1 million people want you to know that they're actually very good people. That's the most common way accused men try to account for their actions in testimony before the International Criminal Tribunal for Rwanda, a new study has found.

• [**Beer brands popular among youth violate code with youth-appealing ads**](#) [周四, 05 10月 22:27]

Alcohol brands popular among underage drinkers are more likely to air television advertisements that violate the industry's voluntary code by including youth-appealing content, according to a new study.

• [**Low-cost, high-volume services make up big portion of spending on unneeded health care**](#) [周四, 05 10月 22:27]

Low-cost, high-volume health services account for a high percentage of unnecessary health spending, adding strain to the health care system.

• [**Caution ahead: The growing challenge for drivers' attention**](#) [周四, 05 10月 22:27]

Many of the infotainment features in most 2017 vehicles are so distracting they should not be enabled while a vehicle is in motion, according to a new study. The study found In-Vehicle Information Systems take drivers' attention off the road for too long to be safe.

• [**DNA-based Zika vaccine is safe and effective at inducing immune response**](#) [周四, 05 10月 07:05]

A new generation DNA-based Zika vaccine demonstrated both safety and ability to elicit an immune response against Zika in humans in a phase 1 clinical trial.

• [**Teleoperating robots with virtual reality: Making it easier for factory workers to**](#)

[**telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

• [**Parole violations, not new crimes, help drive prison's revolving door**](#) [周四, 05 10月 02:27]

Failing a drug test, associating with felons and other technical parole violations are among the key drivers of prison's 'revolving door,' according to new American research.

• [**Win-win for spotted owls and forest management**](#) [周四, 05 10月 02:01]

Remote sensing technology has detected what could be a win for both spotted owls and forestry management, according to a study.

• [**In warmer climates, Greenlandic deltas have grown**](#) [周四, 05 10月 01:35]

Unlike most other deltas worldwide, Greenland's are growing -- a trend with major consequences for both fishing and tourism.

• [**Assessing regional earthquake risk and hazards in the age of exascale**](#) [周四, 05 10月 00:05]

Researchers are building the first-ever end-to-end simulation code to precisely capture the geology and physics of regional earthquakes, and how the shaking impacts buildings.

• [**Albatross feces show diet of fishery discards**](#) [周四, 05 10月 00:04]

The first-ever analysis of fish DNA in albatross scat indicates a high level of interaction between seabirds and commercial fisheries. This non-invasive method could be used to assess whether fisheries are complying with discard policies. Extending the analysis to other marine predators could help monitor marine biodiversity and broader marine ecosystem changes.

- [**Safe motherhood campaign associated with more prenatal visits, birth planning, study finds**](#)

[周四, 05 10月 00:04]

In Tanzania, pregnant women who were exposed to a national safe motherhood campaign designed to get them to visit health facilities for prenatal care and delivery were more likely to create birth plans and to attend more prenatal appointments.

- [**Rampant consumption of hippo teeth**](#)

[周三, 04 10月 22:14]

Investigators have examined the case of hippo teeth and revealed discordance in trade volumes declared between importers and exporters -- a scenario that could threaten the survival of the species.

- [**Doing homework is associated with change in students' personality**](#)

[周三, 04 10月 22:07]

Homework may have a positive influence on students' conscientiousness. Students who do more homework than their peers show positive changes in conscientiousness, according to new research. Thus, schools may be doing more than contributing to students' learning, but they may also be effecting changes of their students' personality.

- [**What is STEM education?**](#)

[周三, 04 10月 21:51]

Everyone needs a good teacher -- including teachers. Two new studies show how digging deeper into what STEM education means and strategically designing online classrooms can enhance teaching science, technology, engineering, and math.

- [**Too little is known about wildfire smoke**](#)

[周三, 04 10月 21:29]

How do fire-suppression chemicals and pesticides affect wildfire smoke and the health of those who breathe it? New research has discovered that this question cannot be answered based on current scientific evidence, say investigators.

- [**Neighborhood affluence linked to positive birth outcomes**](#)

[周三, 04 10月 02:48]

It's not uncommon for new parents to relocate in search of

neighborhoods with better schools, safer streets and healthier, more kid-friendly activities. But a new study has found that living in such neighborhoods before a baby is born protects against the risks of poor birth outcomes.

- [**Women firefighters can improve safety, but department culture must change**](#) [周三, 04 10月 02:45]

A new study has discerned that gender may be a unique contributor to safety, but hypermasculine fire service culture creates barriers.

- [**Twitter a hotbed of anti-vaccine sentiment**](#) [周二, 03 10月 23:11]

Anti-vaccine sentiment is alive and growing on social media, with California, Connecticut, Massachusetts, New York and Pennsylvania showing the most negative tweets, according to a new 5-year study.

- [**Social action may give youth a career edge, education faculty research suggests**](#) [周二, 03 10月 23:11]

When disadvantaged youth engage in social activism, they tend to have high-status occupations in adulthood, according to researchers. The findings also suggest there's a place for more discussion of social issues in our educational systems.

- [**New method to quantify life cycle land use of natural gas**](#) [周二, 03 10月 23:10]

A case study of the Barnett Shale region in Texas, where hydraulic fracturing was first implemented, for the first time provides quantifiable information on the life cycle land use of generating electricity from natural gas based on physical measurements instead of using assumptions and averages that were previously used for evaluation.

- [**U.S. breast cancer death rates dropped 39 percent between 1989 and 2015**](#) [周二, 03 10月 23:10]

Breast cancer death rates dropped 39 percent between 1989 and 2015, averting 322,600 breast cancer deaths during those 26 years. Death rates in several states are now statistically equivalent, perhaps reflecting an elimination of disparities in those states.

• [**Incidence of measles in the United States**](#) [周二, 03 10月 23:10]

From 2001 to 2015, the overall annual incidence of measles in the United States remained extremely low (less than 1 case/million population) compared with incidence worldwide (40 cases/million population). Relative increases in measles rates were observed over the period, and the findings suggest that failure to vaccinate may be the main driver of measles transmission, according to a study.

• [**European sea bass show chronic impairment after exposure to crude oil**](#) [周二, 03 10月 21:46]

We may be underestimating the long-term impact of oil spills on fish, particularly their ability to tolerate low oxygen environments, according to research.

• [**New method could help disrupt opioid crisis**](#) [周二, 03 10月 21:40]

Researchers have zeroed in on a unique component of heroin that could help zero in on the locations of origin for individual batches.

• [**Program for parents improves ADHD behaviors in young children**](#) [周二, 03 10月 21:39]

Effective early intervention is crucial for young children with ADHD, due to the unfavorable short-term and long-term outcomes associated with the disorder.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- [What soot-covered, hundred-year-old birds can tell us about saving the environment](#) [周二, 10 10月 03:50]

Birds in museum collections from Rust Belt cities around the turn of the century are covered with black soot from air pollution at the time. Scientists have compared the amount of soot on birds through the years to track environmental pollution over the last 135 years.

- ['Turbo charge' for your brain?](#) [周二, 10 10月 03:49]

Two brain regions -- the medial frontal and lateral prefrontal cortices -- control most executive function. Researchers used high-definition transcranial alternating current stimulation (HD-tACS) to synchronize oscillations between them, improving brain processing. De-synchronizing did the opposite.

- [Human minibrains reveal effects of psychedelic substance](#) [周一, 09 10月 20:44]

Scientists have identified changes in signaling pathways associated with neural plasticity, inflammation and neurodegeneration triggered by a compound from the family of dimethyltryptamine known as 5-MeO-DMT.

- [Smartphone-controlled smart bandage for better, faster healing](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [**New technology uses mouth gestures to interact in virtual reality**](#) [周五, 06 10月 02:42]

Researchers have developed a new technology that allows users to interact in a virtual reality environment using only mouth gestures.

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [**How yellow and blue make green in parrots**](#) [周五, 06 10月 00:11]

Many brightly colored birds get their pigments from the foods that they eat, but that's not true of parrots. Now, researchers reporting a study of familiar pet store parakeets -- also known as budgies -- have new evidence to explain how the birds produce their characteristic yellow, blue, and green feathers.

- [**Once declared extinct, Lord Howe Island stick insects really do live**](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead Lord Howe Island stick insects have some good news: those rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

- [**More traits associated with your Neanderthal DNA**](#) [周五, 06 10月 00:11]

After humans and Neanderthals met many thousands of years ago, the two species began interbreeding. Recent studies have shown that some of those Neanderthal genes have contributed to human immunity and modern diseases. Now researchers have found that our Neanderthal inheritance has contributed to other characteristics, too, including skin

tone, hair color, sleep patterns, mood, and even a person's smoking status.

- [**How much can watching hockey stress your heart?**](#) [周四, 05 10月 22:27]

A new study suggests that both the thrill of victory and the agony of defeat can have a substantial effect on the cardiovascular system. Investigators took the pulse of fans during a hockey game and found that on average, their heart rate increased by 75 percent when watching on TV, and by a whopping 110 percent (more than doubled, equivalent to the cardiac stress with vigorous exercise) when watching in person.

- [**Milky Way's 'most-mysterious star' continues to confound**](#) [周四, 05 10月 07:05]

In 2015, a star called KIC 8462852 caused quite a stir in and beyond the astronomy community due to a series of rapid, unexplained dimming events. The latest findings from astronomers take a longer look at the star, going back to 2006 -- before its strange behavior was detected by Kepler.

- [**The super-Earth that came home for dinner**](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire solar system to one side. It is a possible "Planet Nine" -- a world perhaps 10 times the mass of Earth and 20 times farther from the sun than Neptune.

- [**Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

• [**Female fish like males who sing**](#) [周四, 05 10月 00:05]

Noisier seas seem to hamper fish reproduction. New research shows that noise pollution impedes reproduction in sand and common gobies, both of which are important food sources for juvenile cod.

• [**Burmese python's hungry escapades may have consequences for human health**](#) [周三, 04 10月 22:12]

As the large, invasive Burmese python eats its way through south Florida's mammals, the mosquitoes in the area have fewer types of animals to bite. Now, more mosquitoes are drawing blood from a rat that carries a virus dangerous to humans.

• [**Prehistoric squid was last meal of newborn ichthyosaur 200 million years ago**](#) [周二, 03 10月 21:39]

Scientists have identified the smallest and youngest specimen of Ichthyosaurus communis on record and found an additional surprise preserved in its stomach.

• [**Ancient petrified salamander reveals its last meal**](#) [周二, 03 10月 21:39]

A new study on an exceptionally preserved salamander from the Eocene of France reveals that its soft organs are conserved under its skin and bones. Organs preserved in three dimensions include the lung, nerves, gut, and within it, the last meal of the animal, according to a new study.

• [**Monstrous crocodile fossil points to early rise of ancient reptiles**](#) [周二, 03 10月 08:22]

A newly identified prehistoric marine predator has shed light on the origins of the distant relatives of modern crocodiles.

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- [**Physically active white men at high risk for plaque buildup in arteries**](#) [周二, 17 10月 02:48]

White men who exercise at high levels are 86 percent more likely than people who exercise at low levels to experience a buildup of plaque in the heart arteries by middle age, a new study suggests.

- [**Tweeting rage: How immigration policies can polarize public discourse**](#) [周二, 17 10月 02:48]

A study of tweets in the months before and after the 2010 passage of Arizona's "show me your papers" law, findings showed that the average tweet about Mexican immigrants and Hispanics, in general, became more negative. Researchers said the social media data was useful in determining whether people had changed their attitudes about immigrants as a result of the law or whether they had begun behaving differently.

- [**Clues to the Innate Drug Resistance of a Cocoa-Fermenting Pathogen**](#) [周二, 17 10月 02:48]

At first glance, the yeast *Candida krusei* seems as innocuous as microbes come: it's used for fermenting cocoa beans and gives chocolate its pleasant aroma. But it's increasingly being found as a pathogen in immunocompromised patients — and *C. krusei* infections aren't always

easy to cure.

- [**Women in science ask fewer questions than men, according to new research**](#) [周二, 17 10月 02:24]

Stereotypes suggest that women love to talk, with some studies even finding that women say three times as much as men. But, new research shows there is an exception to this rule: professional STEM events, which could be indicative of the wider problem of gender inequality in the field.

- [**Brain training shows promise for patients with bipolar disorder**](#) [周二, 17 10月 01:27]

Computerized brain training can result in improved cognitive skills in individuals with bipolar disorder, researchers have discovered for the first time.

- [**Catch a fleeting kilonova**](#) [周二, 17 10月 01:26]

Alerted by the first-ever gravitational waves caused by two neutron stars merging, astronomers detect the resulting optical flash.

- [**Toward efficient high-pressure desalination**](#) [周二, 17 10月 01:26]

One of the biggest operational challenges for desalination plants is the fouling of membranes by microbes. New research suggests a novel approach to reducing the rate of fouling, and thus improving desalination plant efficiency.

- [**Break the attachment before selling your stuff**](#) [周二, 17 10月 01:26]

Ever tried to sell something you've owned for a while on Craigslist and found that no one is willing to pony up what you're asking? It's because you're asking too much.

- [**Chemical treatment improves quantum dot lasers**](#) [周二, 17 10月 01:26]

One of the secrets to making tiny laser devices such as ophthalmic surgery scalpels work even more efficiently is the use of tiny semiconductor particles, called quantum dots. In new research the

~nanometer-sized dots are being doctored, or 'doped,' with additional electrons, a treatment that nudges the dots ever closer to producing the desired laser light with less stimulation and energy loss.

- [**Family members play important role in managing chronic illness**](#) [周二, 17 10月 01:26]

Family members often play an important role in managing chronic illnesses, and a family approach may produce more effective, long-term benefits for the patient, according to a researcher.

- [**How many opioid painkillers do surgery patients need? New prescribing recommendations unveiled**](#) [周二, 17 10月 00:45]

Surgeons performing 11 common operations can turn to a free new prescribing tool based on data about how many opioid painkillers patients across Michigan actually took after their operations.

- [**Neutrons observe vitamin B6-dependent enzyme activity useful for drug development**](#) [周二, 17 10月 00:44]

Scientists have performed neutron structural analysis of a vitamin B6-dependent protein, potentially opening avenues for new antibiotics and drugs to battle diseases such as drug-resistant tuberculosis, malaria and diabetes. Specifically, the team used neutron crystallography to study the location of hydrogen atoms in aspartate aminotransferase, or AAT, an enzyme vital to the metabolism of certain amino acids.

- [**Whales and dolphins have rich 'human-like' cultures and societies**](#) [周二, 17 10月 00:22]

Whales and dolphins (cetaceans) live in tightly-knit social groups, have complex relationships, talk to each other and even have regional dialects -- much like human societies. A major new study has linked the complexity of Cetacean culture and behavior to the size of their brains.

- [**Gestational diabetes and cardiovascular disease risk**](#) [周二, 17 10月 00:21]

A history of gestational diabetes was associated with a modest higher

long-term risk of cardiovascular disease in women in a new study, although the absolute rate of cardiovascular disease was low in the study's younger group of predominantly white women and adhering to a healthy lifestyle over time appeared to help mitigate the risk, according to a new article.

- [**Auto-fix tool gets more programmers to upgrade code, study finds**](#) [周二, 17 10月 00:21]

Failure to make necessary upgrades to software code can have dire consequences, such as the major data breach at Equifax. A recent study finds that auto-fix tools are effective ways to get programmers to make the relevant upgrades -- if programmers opt to use them.

- [**Seeing the light of neutron star collisions**](#) [周二, 17 10月 00:21]

When two neutron stars collided on Aug. 17, a widespread search for electromagnetic radiation from the event led to observations of light from the afterglow of the explosion, finally connecting a gravitational-wave-producing event with conventional astronomy using light, according to an international team of astronomers.

- [**Bite on this: Alligators actually eat sharks**](#) [周二, 17 10月 00:21]

Jaws, beware! Alligators may be coming for you. A new study documents American alligators on the Atlantic and Gulf coasts are eating small sharks and stingrays. This is the first scientific documentation of a widespread interaction between the two predators.

- [**Marketing study examines what types of searches click for car buyers**](#) [周二, 17 10月 00:21]

A new study examines how consumers allocated their time when searching offline and on the internet as they shopped for a new automobile, and what the outcomes were for price satisfaction.

- [**How cells induce inflammation upon detection of cytoplasmic DNA**](#) [周二, 17 10月 00:21]

A research team has elucidated the mechanism by which human cells induce inflammation upon detection of cytoplasmic DNA. Notably, the

signal network involved differs from that used in the same context in mice.

- [**Childhood poverty, poor support may drive up pregnant woman's biological age**](#) [周二, 17 10月 00:21]

Pregnant women who had low socioeconomic status during childhood and who have poor family social support appear to prematurely age on a cellular level, potentially raising the risk for complications, a new study has found.

- [**Nanoantenna arrays power a new generation of fluorescence-based sensors**](#) [周二, 17 10月 00:21]

Researchers have designed and tested a series of plasmonic nanoantenna arrays that could lead to the development of a new generation of ultrasensitive and low-cost fluorescence sensors that could be used to monitor water quality.

- [**Hubble observes source of gravitational waves for the first time**](#) [周二, 17 10月 00:21]

The NASA/ESA Hubble Space Telescope has observed for the first time the source of a gravitational wave, created by the merger of two neutron stars. This merger created a kilonova -- an object predicted by theory decades ago -- that ejects heavy elements such as gold and platinum into space. This event also provides the strongest evidence yet that short duration gamma-ray bursts are caused by mergers of neutron stars.

- [**Nidoviruses redundantly express genes and encode more proteins than previously believed, study finds**](#) [周二, 17 10月 00:21]

Arteriviruses, a family of single-stranded RNA viruses that belongs to the order Nidovirales, produce more proteins and messenger RNAs than previously reported, a finding that provides important insights about a virus that could potentially evolve to infect humans in the future, according to a new research study.

- [**Gravitational waves plus new clues from space**](#)

[reveal new way to make a black hole](#) [周一, 16 10月 22:28]

For the first time, scientists have detected both gravitational waves and light shooting toward our planet from the birthplace of a new black hole created by the merger of two neutron stars. The discovery marks the beginning of a new era of

• [Scientists identify biomarker for progression, drug response in brain cancer](#) [周一, 16 10月 22:28]

Scientists have reported results from a glioblastoma study in which they validated a biomarker indicative of a patient's prognosis and likely response to specific therapies.

• [Gamma-ray burst detection just what researchers exclusively predicted](#) [周一, 16 10月 22:28]

More than a month before a game-changing detection of a short gamma-ray burst, scientists predicted such a discovery would occur.

• [Radio 'eyes' unlocking secrets of neutron-star collision](#) [周一, 16 10月 22:28]

When a pair of superdense neutron stars collided and potentially formed a black hole in a galaxy 130 million light-years from Earth, they unleashed not only a train of gravitational waves but also an ongoing torrent of radio waves that are answering some of the biggest questions about the nature of such a cataclysmic event.

• [Astronomers strike cosmic gold, confirm origin of precious metals in neutron star mergers](#) [周一, 16 10月 22:28]

What many thought would be a long way off, the detection of gravitational waves from the merger of binary neutron stars, actually happened on Aug. 17. The observation of a blue and then red glow from the radioactive debris cloud left behind matched simulations of what the merger should look like, proving that such mergers are the source of most of the very heavy elements in the universe, including gold.

• [Study reveals risk factors for substance use](#)

[problems, as well as resilience](#) [周一, 16 10月 22:28]

A new study explores factors increasing the risk for substance use problems among African-American/Black and Latino adults residing in a high-risk urban community, as well as patterns of resilience. It reveals that serious risk factors are highly prevalent and strongly associated with substance misuse; however, a substantial proportion could be characterized as resilient, and evidenced substance use problems at rates comparable to the general U.S. population.

• [Scientists demonstrate path to linking the genome to healthy tissues, disease](#) [周一, 16 10月 22:28]

A study has reached a major milestone in establishing a baseline understanding of gene expression across healthy human tissues, and linking genes to disease.

• [Harvey runoff menaces Texas' coral reefs](#) [周一, 16 10月 22:28]

The more than 13 trillion gallons of floodwater from Hurricane Harvey have created a massive plume of freshwater in the Gulf of Mexico that is threatening the coral reefs of the Flower Garden Banks National Marine Sanctuary about 100 miles offshore of Galveston.

• [First observations of merging neutron stars mark a new era in astronomy](#) [周一, 16 10月 22:28]

After LIGO detected gravitational waves from the merger of two neutron stars, the race was on to detect a visible counterpart, because unlike the colliding black holes responsible for LIGO's four previous detections, this event was expected to produce an explosion of visible light. Researchers have now found the source of the gravitational waves, capturing the first images of the event with the Swope Telescope in Chile.

• [Fanged kangaroo research could shed light on extinction](#) [周一, 16 10月 21:27]

Fanged kangaroos -- an extinct family of small fanged Australian kangaroos -- might have survived at least five million years longer than

previously thought. A new study has found the species might have competed for resources with ancestors of modern kangaroos.

• **Cocktail tests on toxic waste called for** [周一, 16 10月 21:27]

Surprisingly low concentrations of toxic chemicals -- from fungicides to antidepressants -- can change the way some aquatic creatures swim and feed, according to new research. In addition, depending on the cocktail of toxins they can produce unexpected results.

• **Quantum simulator: First functioning component** [周一, 16 10月 21:24]

Hurricanes, traffic jams, demographic development – to predict the effect of such events, computer simulations are required. Many processes in nature, however, are so complicated that conventional computers fail. Quantum simulators may solve this problem. One of the basic phenomena in nature is the interaction between light and matter in photosynthesis. Physicists have now made a big step towards quantum mechanics understanding of plant metabolism.

• **Blood pressure medication does not completely restore vascular function** [周一, 16 10月 20:32]

Treatments for high blood pressure do not totally reverse its damaging effects on the vascular rhythms that help circulation of the blood say researchers.

• **Sleep duration may affect the integrity of sperm DNA** [周一, 16 10月 20:32]

A new study found a link between sleep duration and a measure of chromosomal health in sperm. In the study of 2020 semen samples provided by 796 male volunteers from colleges in Chongqing (China) from 2013 to 2015, volunteers with more than 9 hours per day of sleep and those with 6.5 hours or less per day sleep had 41% and 30% lower High DNA Stainability — an index that represents the proportion of sperm with abnormal chromatin — than did volunteers with 7 to 7.5 hours per day of sleep.

• **Germ-free hatching eggs: An alternative to**

[formaldehyde application](#) [周一, 16 10月 20:31]

Hatching eggs in large-scale hatcheries are currently treated with formaldehyde to eliminate germs. Researchers have now developed a natural alternative.

[One in five witness someone collapse who requires CPR but the majority do not act](#) [周一, 16 10月 20:20]

An estimated one in five adults in the UK witness someone collapse who needs immediate CPR, yet the majority of people do not act, according to new research. Researchers carried out a survey of 2,000 people across the country to find out how likely people are to witness a life-threatening cardiac arrest.

[How to save giant tropical fruit bats: Work with local hunters who use bat teeth as money](#) [周一, 16 10月 20:19]

Flying foxes -- giant fruit bats that look like winged German shepherd puppies -- are in trouble. But scientists suggest a new way to help protect the bats on the Solomon Islands: working with local hunters who use the bats' teeth as currency. The traditional practice, it turns out, is a positive thing for bat conservation.

[New exercises help athletes manage dangerous breathing disorder](#) [周一, 16 10月 20:19]

A novel set of breathing techniques help athletes overcome vocal cord dysfunction and improve performance during high-intensity exercise. Vocal cord dysfunction, now also referred to as exercise-induced laryngeal obstruction (EILO), has been shown to improve for athletes after being trained to use the new techniques.

[New antibiotic resistance genes found](#) [周一, 16 10月 20:19]

Researchers have found several previously unknown genes that make bacteria resistant to last-resort antibiotics. The genes were found by searching large volumes of bacterial DNA.

[Is rushing your child to the ER the right](#)

[response?](#) [周一, 16 10月 20:19]

If a child gets a small burn, starts choking or swallows medication, parents may struggle to decide whether to provide first aid at home or rush them to the hospital, suggests a new national poll.

• [How dopamine tells you it isn't worth the wait](#) [周一, 16 10月 20:19]

A new study sheds light on how dopamine cells in the brain signal the passage of time.

• [Inpatient satisfaction improved by five-minute intervention, study finds](#) [周一, 16 10月 20:19]

As hospitals seek to improve inpatient satisfaction, one effective way takes only a few minutes and no expensive equipment. A study recently found that a daily five-minute conversation that focused on hospitalized patients 'as people' significantly improved their satisfaction with their medical care.

• [How scientists used NASA data to predict the corona of the Aug. 21 Total Solar Eclipse](#) [周六, 14 10月 23:17]

When the total solar eclipse swept across the United States on Aug. 21, 2017, NASA satellites captured a diverse set of images from space. But days before the eclipse, some NASA satellites also enabled scientists to predict what the corona -- the Sun's outer atmosphere -- would look like during the eclipse, from the ground. In addition to offering a case study to test our predictive abilities, the predictions also enabled some eclipse scientists to choose their study targets in advance.

• [MS risk in children spotted with MRI brain scans](#) [周六, 14 10月 23:17]

By the time multiple sclerosis (MS) is diagnosed in children, it may be difficult to prevent the disabilities and relapses that come with the disease. In a new study, researchers examined MRI brain scans to identify children at high risk of developing MS before symptoms appear, which may lead to earlier diagnosis and treatment.

• [Detailed look at 2-D structure of turbulence in](#)

[**tokamaks**](#) [周六, 14 10月 23:17]

A key hurdle for fusion researchers is understanding turbulence, the ripples and eddies that can cause the superhot plasma that fuels fusion reactions to leak heat and particles and keep fusion from taking place. Comprehending and reducing turbulence will facilitate the development of fusion as a safe, clean and abundant source of energy for generating electricity from power plants around the world.

· [**A dietary supplement dampens the brain hyperexcitability seen in seizures or epilepsy**](#) [周六, 14 10月 23:17]

Researchers have found that inducing a biochemical alteration in brain proteins via the dietary supplement glucosamine was able to rapidly dampen that pathological hyperexcitability in rat and mouse models. These results represent a potentially novel therapeutic target for the treatment of seizure disorders, and they show the need to better understand the physiology underlying these neural and brain circuit changes.

· [**Giant sea bass worth more alive as undersea wonders than as commercial catch**](#) [周六, 14 10月 23:16]

An investigation of the different economic values of giant sea bass finds they are worth more alive as undersea wonders than as commercial catch.

Physically active white men at high risk for plaque buildup in arteries -- ScienceDaily

White men who exercise at high levels are 86 percent more likely than people who exercise at low levels to experience a buildup of plaque in the heart arteries by middle age, a new study suggests.

Led by researchers at the University of Illinois at Chicago and Kaiser Permanente, the study looked at the physical activity trajectories of 3,175 black and white participants in the multicenter, community-based, longitudinal cohort CARDIA study, and assessed the presence of coronary artery calcification, or CAC, among participants.

CAC is a clinical measure of the accumulation of calcium and plaque in the arteries of the heart. The presence and amount of CAC, is a significant warning sign to doctors that a patient may be at risk for developing heart disease and a signal to consider early preventive care.

Heart disease is the leading cause of death for both men and women in the U.S.

The study group consisted of CARDIA participants who self-reported physical activity during at least three of eight follow-up examinations over 25 years, from 1985 through 2011. At baseline, participants were ages 18 to 30 living in Birmingham, Alabama; Chicago; Minneapolis; and Oakland, California.

Researchers categorized participants into three distinct trajectory groups, based on physical activity patterns: trajectory group one was defined as exercising below the national guidelines (less than 150 minutes a week), group two as meeting the national guidelines for exercise (150 minutes a week), and group three was defined as exercising three-times above the national guidelines (more than 450 minutes a week).

"We expected to see that higher levels of physical activity over time would be associated with lower levels of CAC," said Deepika Laddu, assistant professor of physical therapy in the UIC College of Applied Health Sciences.

Instead, Laddu and her colleagues found that

participants in trajectory group three, or those who exercised the most, were 27 percent more likely than those in trajectory group one to develop CAC by middle age. CAC was measured during the participants' 25th year in the study using computed tomography, a CT scan, of the chest. At year 25, participants were ages 43 to 55.

When these findings were stratified by race and gender, they found that white men were at the highest risk—they were 86 percent more likely to have CAC. There was no higher odds of CAC for black participants who exercised at this level, and while there was a similar trend for white women it was not statistically significant.

According to Laddu and study co-author Dr. Jamal Rana, similar population-based cohort studies on cumulative exercise dose have caused some controversy by showing U-shaped trends of association between physical activity and disease risk.

"So we performed this study to see if we can solve part of this puzzle," said Rana, a cardiologist at Kaiser Permanente in Oakland.

Unique to the new study is the evaluation of long-term exercise patterns, from young adulthood into middle age.

"Because the study results show a significantly different level of risk between black and white participants based on long-term exercise trajectories, the data provides rationale for further investigation, especially by race, into the other biological mechanisms for CAC risk in people with very high levels of physical activity," said Laddu.

"High levels of exercise over time may cause stress on the arteries leading to higher CAC," said Rana, "however this plaque buildup may well be of the more stable kind, and thus less likely to rupture and causes heart attack, which was not evaluated in this study." Rana says they plan to evaluate for outcomes, such as heart attacks and death, next.

While the study suggests that white men who exercise at high levels may have a higher burden of CAC, "it does not suggest that anyone should stop exercising," Laddu said.

The findings are published in *Mayo Clinic*

Proceedings.

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Tweeting rage: How immigration policies can polarize public discourse -- ScienceDaily

Before a border wall became a budget bargaining chip, before the presidential pardon of a controversial sheriff and before federal policies were announced on social media, there was Arizona Senate Bill 1070, the "show me your papers" law.

And of course, there was Twitter.

To René D. Flores, an assistant professor of sociology at the University of Washington, Twitter is a trove of insight into people's beliefs and their willingness to express them. By analyzing tweets in the months before and after the 2010 passage of the controversial Arizona law, Flores found that the average tweet about Mexican immigrants and Hispanics, in general, became more negative. Social media data, Flores found, was useful in determining whether people had changed their attitudes about immigrants as a result of the law or whether they had begun behaving differently.

"The public discourse about immigrants became more negative, but this was not driven by people changing their mind about immigrants: It was driven by people changing the way they acted. Anti-immigrant users tweeted more as a result of the law," Flores said.

"Scholars and journalists were saying there's more harassment and name-calling of immigrants, and they weren't wrong about that. But the shift was behavioral, not attitudinal."

Flores' research was published in the September issue of the *American Journal of Sociology*. He recently spoke about his ongoing study of politics for No Jargon, a podcast of the Scholars Strategy Network.

In embarking on his study of SB 1070, Flores set out to determine whether punitive policies can shape people's attitudes about immigrants. Since there were no available surveys to test this hypothesis, he turned to social media data. He sorted through 250,000 tweets from more than 24,000 users, starting from three months prior to the law's passage and ending three months afterward. Officially named the Support our Law Enforcement and Safe Neighborhoods Act, the law required immigrants to carry their documents and allowed law enforcement officers to detain anyone

suspected of lacking papers. (The U.S. Supreme Court has since struck down several parts of the law, though law enforcement officers still may check an individual's immigration status during a traffic stop or other police action.)

As part of the UW study, Flores identified a "control" state -- neighboring Nevada -- with similar politics and demographics to Arizona, including a nearly 30 percent Hispanic population. But in Nevada, there was one key difference: No SB 1070. This allowed him to rule out general trends in public opinion unrelated to the law.

In Arizona, the number of tweets about immigrants jumped from about 3,000 in March 2010 to peak at nearly 18,000 in May, a month after then-Gov. Jan Brewer signed SB 1070 into law. But instead of demonstrating the ways SB 1070 changed what people in Arizona merely thought, Flores said, the tweets showed how it changed the way they acted. Arizonans who'd already expressed anti-immigrant beliefs posted more negative statements, more often.

To gauge the attitudes reflected in tweets, Flores used sentiment analysis, a technique that determines whether a piece of text is positive, negative or neutral

based on the kinds of terms it contains. Flores added to the lexicon bank used in the analysis to capture nuances in negativity and positivity, establishing an intensity measurement for each word. The word *hate*, for example, would score higher on the negative scale than the word *skeptical*.

Examples of negative tweets identified in the study included "illegal aliens are criminals" and "deport illegal aliens," among other, more stridently anti-immigrant statements. Positive statements included "in love with immigrants, I love soccer!," but those were less prevalent.

"If anything, pro-immigrant people became somewhat more silent, while the anti-immigrant people became more mobilized," Flores said. "It's almost like the already-converted became more active. When you feel the center is moving, it can become harder to have a minority viewpoint and to express a view that's different from the consensus. The pro-immigrant side may have felt increasingly uncomfortable."

Another trend Flores noted: The anti-immigrant statements often extended to tweets about Hispanics, in general, but not about Asian Americans or African

Americans. This may reflect a greater association with Hispanics as immigrants, Flores wrote in his study.

Flores' paper also points out the value of Twitter as a sociological tool. Phone surveys, once the staple of social science research, have been met with more resistance in recent years as people avoid phone solicitations, the time commitment of a survey or a call from a number they don't recognize. Twitter, on the other hand, is a completely voluntary sharing of one's thoughts and is fast becoming a valuable historical archive of public opinion, Flores said, which can allow researchers to examine how the public reacted to specific events.

"People are providing data about how they think, which provides kind of a telescope for social scientists. It gives us a window into human expression and behavior we didn't have in the past," Flores said.

But it's not necessarily representative of the population, Flores said. Twitter users -- an estimated 328 million are considered monthly active users -- are typically younger (often under 30), more likely to live in urban and suburban communities and more likely to be racial or ethnic minorities than Internet users overall.

Therefore, it can be harder for researchers to generalize from tweets in the way that, statistically speaking, they can generalize from surveys, Flores said. Depending on the research question, then, tweets might serve more as a complement to, not a substitute for, surveys or other data sources.

The findings from this study, though, highlight a social consequence of a law that targets a specific group of people, Flores said. While such punitive laws may be an attempt to placate a vocal constituency, they also appear to spur mobilization against the targeted group.

Flores' next project: analyzing whether Donald Trump's rhetoric toward immigrants (he has described them as "criminals" and "rapists") is affecting public opinion toward immigration.

"Political polarization is seemingly growing. Some political figures are increasingly using Twitter as a way to spread controversial ideas; fringe groups from both the left and the right are also using Twitter to recruit. It is important for social scientists, I think, to study these new developments both for theoretical but also civic reasons," Flores said.

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Clues to the Innate Drug Resistance of a Cocoa-Fermenting Pathogen -- ScienceDaily

With their new draft in hand, Brand *et al.* searched the *C. krusei* genome for genes that are associated with pathogenesis in the more familiar *Candida albicans* -- the cause of thrush, vaginal yeast infections, and sometimes potentially lethal systemic infections. *C. krusei*, they found, has few copies of gene families associated with pathogenesis in *C. albicans*, including oligopeptide transporters, aspartyl proteases, and phospholipase B genes. *Candida* species that often cause disease usually have expansions in these gene families, so given that *C. krusei* is rarely pathogenic, this finding makes sense.

When they focused on genes involved in drug resistance, the group found that *C. krusei* differs from *C. albicans*; many of the sites that are often mutated in the target of azole drugs in resistant *C. albicans* are not mutated in *C. krusei*. This implies the cocoa-fermenting yeast's natural resistance to fluconazole

arises from a different mechanism than the one that commonly allows *C. albicans* to resist azole drugs.

The researchers also didn't find the gene *MDR1*, which encodes a drug transporter often responsible for resistance to multiple drugs. They did, however, find copies of genes related to *CDR1*, *CDR2*, and few others that encode other transporters associated with drug resistance -- although the way they function in *C. krusei* is unknown. These genes could be a starting point for discovering the mechanisms behind antifungal resistance in *C. krusei*, potentially leading to better treatments and preventive measures for highly vulnerable populations.

Story Source:

[Materials](#) provided by [Genetics Society of America](#).

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Women in science ask fewer questions than men, according to new research -- ScienceDaily

Stereotypes suggest that women love to talk, with some studies even finding that women say three times as much as men. But, new research from a team from the Universities of Oxford and Cambridge, shows there is an exception to this rule: professional STEM events, which could be indicative of the wider problem of gender inequality in the field.

In new research published in *PLOS ONE*, the scientists studied question-asking behaviour at a large international conference. The conference, the 2015 International Congress for Conservation Biology, had a clear code of conduct for its 2000 attendees, which promoted equality and prohibited any form of discrimination.

The team observed 31 sessions across the four day conference, counting how many questions were asked and whether men or women were asking them.

Accounting for the number of men and women in the audience, the findings show that male attendees asked 80% more questions than female attendees. The same pattern was also found in younger researchers, suggesting that it is not simply due to senior researchers, a large proportion of whom are men, asking all of the questions.

The researchers note that the recognised and ongoing issues of gender inequality in STEM fields and the wider world may be affecting female scientists' confidence and willingness to speak publically.

Another interpretation may be that women are more assured in their expertise and do not feel the need to ask as many questions. However, asking questions at conferences is a visible activity that may increase the profile of the questioners. Therefore, regardless of the reason for the gender differences, the fact they exist may be another factor in favour of men in the competitive academic arena.

The study includes a reputational model that evaluates the factors that affect professional standing within the scientific community. While these include tangibles such as the number of articles published, and your academic position, they also include social reputation,

which is more linked to appearance and public profile, and therefore potentially more prone to discrimination and stereotyping.

Dr Amy Hinsley, the paper's lead-author and a postdoctoral researcher at Oxford's Department of Zoology, said: 'Previous research has shown that men are more likely to be invited to speak at conferences, which is likely to lead to them having a higher social reputation than their female peers. If women feel that they are low status, and have suffered discrimination and bias throughout their career then they may be less likely to participate in public discussions, which will in turn affect their scientific reputation. This negative feedback loop can affect women and men, but the evidence in this study suggests that women are affected more.'

The researchers feel strongly that the study should be used as an opportunity to raise awareness of the issue and inspire discussion about why it is happening.

Dr Alison Johnston, senior author of the study, said: 'We want our research to inspire conference organisers to encourage participation among all attendees. For example, questions over Twitter or other creative

solutions could be tested. Session chairs could also be encouraged to pick participants that represent the gender in the audience. However, these patterns of behaviour we observed are only a symptom of the bigger issue. Addressing this alone will not solve the problem. We should continue to research and investigate the underlying causes, so we can implement actions that change the bigger picture for women in science. If we are to level the playing field for women in STEM the complex issue of gender inequality has to stay on the agenda.'

Story Source:

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Brain training shows promise for patients with bipolar disorder -- ScienceDaily

Researchers at McLean Hospital, an affiliate of Harvard Medical School, have discovered for the first time that computerized brain training can result in improved cognitive skills in individuals with bipolar disorder.

In a paper published in the October 17, 2017, edition of *The Journal of Clinical Psychiatry*, the researchers suggest that brain exercises could be an effective non-pharmaceutical treatment for helping those with bipolar disorder function more effectively in everyday life.

"Problems with memory, executive function, and processing speed are common symptoms of bipolar disorder, and have a direct and negative impact on an individual's daily functioning and overall quality of life," said lead investigator Eve Lewandowski, PhD, director of clinical programming for one of McLean's schizophrenia and bipolar disorder programs and an

assistant professor at Harvard Medical School.

"Improving these cognitive dysfunctions is crucial to helping patients with bipolar disorder improve their ability to thrive in the community," Lewandowski added.

Lewandowski and her colleagues knew from previous studies that this type of intervention had helped patients with schizophrenia improve cognitive functions. "There is considerable overlap in cognitive symptoms between bipolar disorder and schizophrenia," Lewandowski noted.

The researchers therefore decided to test the impact of brain exercises in the bipolar population. They randomly assigned patients with bipolar disorder, aged 18-50, to either an intervention group or an active comparison group (used as a control). The intervention group was asked to use a special regimen of neuroplasticity-based exercises from Posit Science -- maker of the BrainHQ online exercises and apps -- for a total of 70 hours over the course of 24 weeks. These exercises use a "bottom-up" approach, targeting more basic cognitive processes early in the treatment to strengthen cognitive foundations, then moving on to training focused on more complex cognitive functions

later in the program. The control group was asked to spend an equivalent amount of time on computerized exercises that focused on quiz-style games, like identifying locations on maps, solving basic math problems, or answering questions about popular culture.

At the end of the study, the participants in the intervention group displayed significant improvements in their overall cognitive performance as well as in specific domains, such as cognitive speed, visual learning, and memory. "The intervention group maintained cognitive improvements six months after the end of the treatment, and in some areas even showed continued improvements," Lewandowski reported.

Lewandowski is encouraged by the findings, as they demonstrate that "this type of non-pharmaceutical intervention can significantly improve cognition in patients with bipolar disorder," she said. "These findings suggest that once the brain is better able to perform cognitive tasks, it will continue to strengthen those processes even after patients stop using the treatment." In addition, Lewandowski said, "The study indicates that affordable and easily accessible web-

based interventions can be effective for a broad group of patients."

Lewandowski noted that further research is needed to determine how the improvements in these cognitive skills impact work and leisure activities and daily functioning in patients with bipolar disorder.

Story Source:

[Materials](#) provided by [McLean Hospital](#). *Note: Content may be edited for style and length.*

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All Top News

Top science stories featured on ScienceDaily's home page.

- [**Whales and dolphins have rich 'human-like' cultures and societies**](#) [周二, 17 10月 00:22]

Whales and dolphins (cetaceans) live in tightly-knit social groups, have complex relationships, talk to each other and even have regional dialects -- much like human societies. A major new study has linked the complexity of Cetacean culture and behavior to the size of their brains.

- [**Bite on this: Alligators actually eat sharks**](#) [周二, 17 10月 00:21]

Jaws, beware! Alligators may be coming for you. A new study documents American alligators on the Atlantic and Gulf coasts are eating small sharks and stingrays. This is the first scientific documentation of a widespread interaction between the two predators.

- [**Hubble observes source of gravitational waves for the first time**](#) [周二, 17 10月 00:21]

The NASA/ESA Hubble Space Telescope has observed for the first time the source of a gravitational wave, created by the merger of two neutron stars. This merger created a kilonova -- an object predicted by theory decades ago -- that ejects heavy elements such as gold and platinum into space. This event also provides the strongest evidence yet that short duration gamma-ray bursts are caused by mergers of neutron stars.

- [**Radio 'eyes' unlocking secrets of neutron-star collision**](#) [周一, 16 10月 22:28]

When a pair of superdense neutron stars collided and potentially formed a black hole in a galaxy 130 million light-years from Earth, they unleashed not only a train of gravitational waves but also an ongoing

torrent of radio waves that are answering some of the biggest questions about the nature of such a cataclysmic event.

- [**Astronomers strike cosmic gold, confirm origin of precious metals in neutron star mergers**](#) [周一, 16 10月 22:28]

What many thought would be a long way off, the detection of gravitational waves from the merger of binary neutron stars, actually happened on Aug. 17. The observation of a blue and then red glow from the radioactive debris cloud left behind matched simulations of what the merger should look like, proving that such mergers are the source of most of the very heavy elements in the universe, including gold.

- [**Harvey runoff menaces Texas' coral reefs**](#) [周一, 16 10月 22:28]

The more than 13 trillion gallons of floodwater from Hurricane Harvey have created a massive plume of freshwater in the Gulf of Mexico that is threatening the coral reefs of the Flower Garden Banks National Marine Sanctuary about 100 miles offshore of Galveston.

- [**First observations of merging neutron stars mark a new era in astronomy**](#) [周一, 16 10月 22:28]

After LIGO detected gravitational waves from the merger of two neutron stars, the race was on to detect a visible counterpart, because unlike the colliding black holes responsible for LIGO's four previous detections, this event was expected to produce an explosion of visible light. Researchers have now found the source of the gravitational waves, capturing the first images of the event with the Swope Telescope in Chile.

- [**Fanged kangaroo research could shed light on extinction**](#) [周一, 16 10月 21:27]

Fanged kangaroos -- an extinct family of small fanged Australian kangaroos -- might have survived at least five million years longer than previously thought. A new study has found the species might have competed for resources with ancestors of modern kangaroos.

- [**Melting ice makes the sea around Greenland less**](#)

[**saline**](#) [周五, 13 10月 23:30]

For the first time, ocean data from Northeast Greenland reveals the long-term impact of the melting of the Greenland ice sheet. The observed increase in freshwater content will affect the conditions in all Greenland fjords and may ultimately affect the global ocean currents that keep Europe warm.

• [**Star Dust Helps Explain Mysterious Dimming**](#)

[**Star**](#) [周五, 13 10月 21:19]

Astronomers are working to understand the mysterious dimming of Tabby's Star. The astronomers report that space dust orbiting the star -- not alien megastructures -- is the likely cause of the star's long-term dimming.

• [**New insight into the limits of possible life on**](#)

[**Mars**](#) [周五, 13 10月 21:10]

Researchers investigating whether liquid water could exist on Mars have provided new insight into the limits of life on the red planet.

• [**Learning and staying in shape key to longer lifespan, study finds**](#) [周五, 13 10月 21:10]

People who are overweight cut their life expectancy by two months for every extra kilogram of weight they carry, research suggests. A major study has also found that education leads to a longer life, with almost a year added for each year spent studying beyond school.

• [**Is it gonna blow? Measuring volcanic emissions from space**](#) [周五, 13 10月 08:02]

Carbon dioxide measured by a NASA satellite pinpoints sources of the gas from human and volcanic activities, which may help monitor greenhouse gases responsible for climate change.

• [**Intense storms batter Saturn's largest moon, scientists report**](#) [周五, 13 10月 05:25]

Titan, the largest of Saturn's more than 60 moons, has surprisingly intense rainstorms, according to research by a team of UCLA planetary

scientists and geologists. Although the storms are relatively rare -- they occur less than once per Titan year, which is 29 and a half Earth years -- they occur much more frequently than the scientists expected.

- [**Spotting the spin of the Majorana fermion under the microscope**](#) [周五, 13 10月 02:33]

Using a new twist on a technique for imaging atomic structures, researchers have detected a unique quantum property of the Majorana fermion, an elusive particle with the potential for use in quantum information systems.

- [**Newfoundland populated multiple times by distinct groups, DNA evidence shows**](#) [周五, 13 10月 02:33]

Researchers who've examined genetic evidence from mitochondrial DNA provide evidence that two groups of indigenous people in Canada, known as the Maritime Archaic and Beothuk, brought different matrilineal lineages to the island, adding further support to the notion that those groups had distinct population histories.

- [**Baby talk in any language: Shifting the timbre of our voices**](#) [周五, 13 10月 02:33]

When talking with their young infants, parents instinctively use 'baby talk,' a unique form of speech including exaggerated pitch contours and short, repetitive phrases. Now, researchers have found another unique feature of the way mothers talk to their babies: they shift the timbre of their voice in a rather specific way. The findings hold true regardless of a mother's native language.

- [**Genes responsible for diversity of human skin colors identified**](#) [周五, 13 10月 02:33]

A study of diverse African groups by geneticists has identified new genetic variants associated with skin pigmentation. The findings help explain the vast range of skin color on the African continent, shed light on human evolution and inform an understanding of the genetic risk factors for conditions such as skin cancer.

- [**Engineers develop a programmable 'camouflaging' material inspired by octopus skin**](#)

[周五, 13 10月 02:33]

Engineers have invented stretchable surfaces with programmable 3-D texture morphing, a synthetic 'camouflaging skin' inspired by studying and modeling the real thing in octopus and cuttlefish.

- [**Paleogenomic analysis sheds light on Easter Island mysteries**](#)

[周五, 13 10月 00:30]

New paleogenomic research appears to rule out the likelihood that inhabitants of Easter Island intermixed with South Americans prior to the arrival of Europeans on the island in 1722.

- [**Devourer of planets? Astronomers dub star 'Kronos'**](#)

[周五, 13 10月 00:28]

'Kronos' is enhanced in metals and other rock-forming elements but not in volatiles, prompting a team of researchers to conclude that it absorbed as much as 15 Earth masses worth of rocky planets. Its twin, 'Krios,' does not show this unusual pattern of enhancement.

- [**Brain waves reflect different types of learning**](#)

[周五, 13 10月 00:28]

Researchers have, for the first time, identified neural signatures of explicit and implicit learning.

- [**Geologic evidence is the forerunner of ominous prospects for a warming Earth**](#)

[周四, 12 10月 23:48]

While strong seasonal hurricanes have devastated many of the Caribbean and Bahamian islands this year, geologic studies on several of these islands illustrate that more extreme conditions existed in the past. A new analysis shows that the limestone islands of the Bahamas and Bermuda experienced climate changes that were even more extreme than historical events.

- [**Scientists begin bold conservation effort to save the vaquita porpoise from extinction**](#)

[周四, 12 10月 22:37]

An international team of experts has gathered in San Felipe, Mexico at

the request of the Mexican government (SEMARNAT) and has begun a bold, compassionate plan known as VaquitaCPR to save the endangered vaquita porpoise from extinction.

- [**Pumas found to exhibit behaviors like social animals**](#) [周四, 12 10月 22:36]

Pumas, long known as solitary carnivores, are more social than previously thought, according to a new study. The findings provide the first evidence of complex social strategies in any solitary carnivore -- and may have implications for multiple species, including other wild cats around the world.

- [**Haumea, the most peculiar of Pluto companions, has a ring around it**](#) [周四, 12 10月 21:33]

The trans-neptunian belt contains four dwarf planets, among which Haumea stands out for its extremely elongated shape and rapid rotation. A stellar occultation makes it possible to establish the main physical characteristics of this previously little known body -- among which most surprising was the presence of a ring.

- [**New threat to the ozone layer**](#) [周四, 12 10月 21:10]

'Ozone depletion is a well-known phenomenon and, thanks to the success of the Montreal Protocol, is widely perceived as a problem solved,' say some. But an international team of researchers, has now found an unexpected, growing danger to the ozone layer from substances not regulated by the treaty.

- [**Last common ancestor of humans and apes weighed about five kilograms**](#) [周四, 12 10月 21:09]

New research suggests that the last common ancestor of apes -- including great apes and humans -- was much smaller than previously thought, about the size of a gibbon. The findings, published today in the journal Nature Communications, are fundamental to understanding the evolution of the human family tree.

- [**Experimental Ebola vaccines elicit year-long**](#)

[**immune response**](#) [周四, 12 10月 06:06]

Results from a large randomized, placebo-controlled clinical trial in Liberia show that two candidate Ebola vaccines pose no major safety concerns and can elicit immune responses by one month after initial vaccination that last for at least one year. The findings are based on a study of 1,500 adults that began during the West Africa Ebola outbreak.

• [**'Killer' toothaches likely cause misery for captive orca: Whales chew concrete and steel tank surfaces**](#) [周四, 12 10月 06:05]

An international research team has undertaken the first in-depth investigation of the teeth of captive orca (killer whales) and have found them a sorry state, which raises serious concerns for these majestic mammals' overall health and welfare.

• [**Engineers identify key to albatross' marathon flight**](#) [周四, 12 10月 06:02]

Engineers have developed a new model to simulate dynamic soaring, and have used it to identify the optimal flight pattern that an albatross should take in order to harvest the most wind and energy. They found that as an albatross banks or turns to dive down and soar up, it should do so in shallow arcs, keeping almost to a straight, forward trajectory.

• [**Giant exoplanet hunters: Look for debris disks**](#) [周四, 12 10月 01:52]

There's no map showing all the billions of exoplanets hiding in our galaxy -- they're so distant and faint compared to their stars, it's hard to find them. Now, astronomers hunting for new worlds have established a possible signpost for giant exoplanets.

• [**New type of stem cell line produced offers expanded potential for research and treatments**](#) [周四, 12 10月 01:17]

Researchers have created expanded potential stem cells (EPSCs) in mice, for the first time, that have a greater potential for development than current stem cell lines. These stem cells have the features of the very first cells in the developing embryo, and can develop into any type

of cell.

- [**Bycatch responsible for decline of endangered New Zealand sea lion**](#) [周四, 12 10月 01:17]

Getting caught in fishing nets is a major cause of death for the increasingly endangered New Zealand sea lion, according to new research.

- [**'Ridiculously healthy' elderly have the same gut microbiome as healthy 30-year-olds**](#) [周四, 12 10月 00:37]

In one of the largest microbiota studies conducted in humans, researchers have shown a potential link between healthy aging and a healthy gut.

- [**Kune Kune piglets possess social learning skills and have an astonishingly good memory**](#) [周四, 12 10月 00:03]

Pigs are socially competent and capable of learning. But the combination of these skills, learning by observing others, has been insufficiently studied so far. Exact copying and understanding of demonstrated actions -- highly developed learning abilities -- could not be proven. A new study with Kune Kune pigs, has now shown for the first time that pigs do learn from each other. The intelligent animals also possess remarkable long-term memory after internalizing a technique.

- [**Scientists discover one of the most luminous 'new stars' ever**](#) [周四, 12 10月 00:03]

Astronomers have discovered possibly the most luminous 'new star' ever -- a nova discovered in the direction of one of our closest neighboring galaxies: The Small Magellanic Cloud.

- [**One of planet's largest volcanic eruptions**](#) [周三, 11 10月 21:11]

Researchers have determined that the Pacific Northwest was home to one of the Earth's largest known volcanic eruptions, a millennia-long spewing of sulfuric gas that blocked out the sun and cooled the planet. Only two other eruptions -- the basalt floods of the Siberian Traps and the Deccan Traps -- were larger, and they led to two of the Earth's great

extinctions.

- [**Anticipated social media buzz can drive tourism**](#)

[周三, 11 10月 10:45]

How much positive feedback travelers think they'll get on social media can predict whether they intend to visit a tourism destination, a new study has found.

- [**World will have more obese children and adolescents than underweight by 2022**](#)

[周三, 11 10月 10:44]

The number of obese children and adolescents (aged 5 to 19 years) worldwide has risen tenfold in the past four decades, according to a new study. If current trends continue, more children and adolescents will be obese than moderately or severely underweight by 2022.

- [**Better mini brains could help scientists identify treatments for Zika-related brain damage**](#)

[周三, 11 10月 08:01]

Researchers have developed an improved technique for creating simplified human brain tissue from stem cells. Because these so-called 'mini brain organoids' mimic human brains in how they grow and develop, they're vital to studying complex neurological diseases.

- [**How fever in early pregnancy causes heart, facial birth defects**](#)

[周三, 11 10月 02:44]

Researchers have known for decades that fevers in the first trimester of pregnancy increase risk for some heart defects and facial deformities such as cleft lip or palate. Exactly how this happens is unclear. Scientists have debated whether a virus or other infection source causes the defects, or if fever alone is the underlying problem.

- [**Humpback whale blow microbiome described**](#)

[周三, 11 10月 01:39]

For the first time, scientists have identified an extensive conserved group of bacteria within healthy humpback whales' blow -- the moist breath that whales spray out of their blowholes when they exhale.

- [**Breath instead of a blood test**](#)

[周三, 11 10月 00:41]

Blow into the tube, please. In the future, the procedure will not just be

used by police checking for alcohol intoxication, but also for testing the condition of athletes and for people who want to lose that extra bit of weight. A new sensor makes it possible to measure when the body starts burning fat with a convenient breathalyser.

- [**Mass extinctions led to low species diversity, dinosaur rule**](#) [周三, 11 10月 00:40]

Two of Earth's five mass extinction events -- times when more than half of the world's species died -- resulted in the survival of a low number of so-called 'weedy' species that spread their sameness across the world as the Earth recovered from these dramatic upheavals. The findings could shed light on modern high extinction rates and how biological communities may change in the future.

- [**Diversity of large animals plays an important role in carbon cycle**](#) [周二, 10 10月 22:56]

With abundant data on plants, large animals and their activity, and carbon soil levels in the Amazon, research suggests that large animal diversity influences carbon stocks and contributes to climate change mitigation.

- [**Size doesn't matter, at least for hammerheads and swimming performance**](#) [周二, 10 10月 22:56]

Different head shapes and different body sizes of hammerhead sharks should result in differences in their swimming performance right? Researchers have conducted the first study to examine the whole body shape and swimming kinematics of two closely related yet very different hammerhead sharks, with some unexpected results.

- [**Best way to recognize emotions in others: Listen**](#) [周二, 10 10月 22:56]

If you want to know how someone is feeling, it might be better to close your eyes and use your ears: People tend to read others' emotions more accurately when they listen and don't look, according to research.

- [**'Fake fin' discovery reveals new ichthyosaur species**](#) [周二, 10 10月 22:56]

An ichthyosaur first discovered in the 1970s but then dismissed and consigned to museum storerooms across the country has been re-examined and found to be a new species.

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Health News

Top stories featured on ScienceDaily's Health & Medicine, Mind & Brain, and Living Well sections.

- [**Physically active white men at high risk for plaque buildup in arteries**](#) [周二, 17 10月 02:48]

White men who exercise at high levels are 86 percent more likely than people who exercise at low levels to experience a buildup of plaque in the heart arteries by middle age, a new study suggests.

- [**Women in science ask fewer questions than men, according to new research**](#) [周二, 17 10月 02:24]

Stereotypes suggest that women love to talk, with some studies even finding that women say three times as much as men. But, new research shows there is an exception to this rule: professional STEM events, which could be indicative of the wider problem of gender inequality in the field.

- [**Brain training shows promise for patients with bipolar disorder**](#) [周二, 17 10月 01:27]

Computerized brain training can result in improved cognitive skills in individuals with bipolar disorder, researchers have discovered for the first time.

- [**Break the attachment before selling your stuff**](#) [周二, 17 10月 01:26]

Ever tried to sell something you've owned for a while on Craigslist and found that no one is willing to pony up what you're asking? It's because you're asking too much.

- [**Family members play important role in**](#)

[managing chronic illness](#) [周二, 17 10月 01:26]

Family members often play an important role in managing chronic illnesses, and a family approach may produce more effective, long-term benefits for the patient, according to a researcher.

[How many opioid painkillers do surgery patients need? New prescribing recommendations unveiled](#) [周二, 17 10月 00:45]

Surgeons performing 11 common operations can turn to a free new prescribing tool based on data about how many opioid painkillers patients across Michigan actually took after their operations.

[Neutrons observe vitamin B6-dependent enzyme activity useful for drug development](#) [周二, 17 10月 00:44]

Scientists have performed neutron structural analysis of a vitamin B6-dependent protein, potentially opening avenues for new antibiotics and drugs to battle diseases such as drug-resistant tuberculosis, malaria and diabetes. Specifically, the team used neutron crystallography to study the location of hydrogen atoms in aspartate aminotransferase, or AAT, an enzyme vital to the metabolism of certain amino acids.

[Gestational diabetes and cardiovascular disease risk](#) [周二, 17 10月 00:21]

A history of gestational diabetes was associated with a modest higher long-term risk of cardiovascular disease in women in a new study, although the absolute rate of cardiovascular disease was low in the study's younger group of predominantly white women and adhering to a healthy lifestyle over time appeared to help mitigate the risk, according to a new article.

[Marketing study examines what types of searches click for car buyers](#) [周二, 17 10月 00:21]

A new study examines how consumers allocated their time when searching offline and on the internet as they shopped for a new automobile, and what the outcomes were for price satisfaction.

- **[How cells induce inflammation upon detection of cytoplasmic DNA](#)** [周二, 17 10月 00:21]

A research team has elucidated the mechanism by which human cells induce inflammation upon detection of cytoplasmic DNA. Notably, the signal network involved differs from that used in the same context in mice.

- **[Childhood poverty, poor support may drive up pregnant woman's biological age](#)** [周二, 17 10月 00:21]

Pregnant women who had low socioeconomic status during childhood and who have poor family social support appear to prematurely age on a cellular level, potentially raising the risk for complications, a new study has found.

- **[Nidoviruses redundantly express genes and encode more proteins than previously believed, study finds](#)** [周二, 17 10月 00:21]

Arteriviruses, a family of single-stranded RNA viruses that belongs to the order Nidovirales, produce more proteins and messenger RNAs than previously reported, a finding that provides important insights about a virus that could potentially evolve to infect humans in the future, according to a new research study.

- **[Scientists identify biomarker for progression, drug response in brain cancer](#)** [周一, 16 10月 22:28]

Scientists have reported results from a glioblastoma study in which they validated a biomarker indicative of a patient's prognosis and likely response to specific therapies.

- **[Study reveals risk factors for substance use problems, as well as resilience](#)** [周一, 16 10月 22:28]

A new study explores factors increasing the risk for substance use problems among African-American/Black and Latino adults residing in a high-risk urban community, as well as patterns of resilience. It reveals that serious risk factors are highly prevalent and strongly associated with

substance misuse; however, a substantial proportion could be characterized as resilient, and evidenced substance use problems at rates comparable to the general U.S. population.

- [**Scientists demonstrate path to linking the genome to healthy tissues, disease**](#) [周一, 16 10月 22:28]

A study has reached a major milestone in establishing a baseline understanding of gene expression across healthy human tissues, and linking genes to disease.

- [**Cocktail tests on toxic waste called for**](#) [周一, 16 10月 21:27]

Surprisingly low concentrations of toxic chemicals -- from fungicides to antidepressants -- can change the way some aquatic creatures swim and feed, according to new research. In addition, depending on the cocktail of toxins they can produce unexpected results.

- [**Blood pressure medication does not completely restore vascular function**](#) [周一, 16 10月 20:32]

Treatments for high blood pressure do not totally reverse its damaging effects on the vascular rhythms that help circulation of the blood say researchers.

- [**Sleep duration may affect the integrity of sperm DNA**](#) [周一, 16 10月 20:32]

A new study found a link between sleep duration and a measure of chromosomal health in sperm. In the study of 2020 semen samples provided by 796 male volunteers from colleges in Chongqing (China) from 2013 to 2015, volunteers with more than 9 hours per day of sleep and those with 6.5 hours or less per day sleep had 41% and 30% lower High DNA Stainability — an index that represents the proportion of sperm with abnormal chromatin — than did volunteers with 7 to 7.5 hours per day of sleep.

- [**One in five witness someone collapse who requires CPR but the majority do not act**](#) [周一, 16 10月 20:20]

An estimated one in five adults in the UK witness someone collapse

who needs immediate CPR, yet the majority of people do not act, according to new research. Researchers carried out a survey of 2,000 people across the country to find out how likely people are to witness a life-threatening cardiac arrest.

• [**New exercises help athletes manage dangerous breathing disorder**](#) [周一, 16 10月 20:19]

A novel set of breathing techniques help athletes overcome vocal cord dysfunction and improve performance during high-intensity exercise. Vocal cord dysfunction, now also referred to as exercise-induced laryngeal obstruction (EILO), has been shown to improve for athletes after being trained to use the new techniques.

• [**New antibiotic resistance genes found**](#) [周一, 16 10月 20:19]

Researchers have found several previously unknown genes that make bacteria resistant to last-resort antibiotics. The genes were found by searching large volumes of bacterial DNA.

• [**Is rushing your child to the ER the right response?**](#) [周一, 16 10月 20:19]

If a child gets a small burn, starts choking or swallows medication, parents may struggle to decide whether to provide first aid at home or rush them to the hospital, suggests a new national poll.

• [**How dopamine tells you it isn't worth the wait**](#) [周一, 16 10月 20:19]

A new study sheds light on how dopamine cells in the brain signal the passage of time.

• [**Inpatient satisfaction improved by five-minute intervention, study finds**](#) [周一, 16 10月 20:19]

As hospitals seek to improve inpatient satisfaction, one effective way takes only a few minutes and no expensive equipment. A study recently found that a daily five-minute conversation that focused on hospitalized patients 'as people' significantly improved their satisfaction with their medical care.

• [**MS risk in children spotted with MRI brain**](#)

[scans](#) [周六, 14 10月 23:17]

By the time multiple sclerosis (MS) is diagnosed in children, it may be difficult to prevent the disabilities and relapses that come with the disease. In a new study, researchers examined MRI brain scans to identify children at high risk of developing MS before symptoms appear, which may lead to earlier diagnosis and treatment.

• [A dietary supplement dampens the brain hyperexcitability seen in seizures or epilepsy](#) [周六, 14 10月 23:17]

Researchers have found that inducing a biochemical alteration in brain proteins via the dietary supplement glucosamine was able to rapidly dampen that pathological hyperexcitability in rat and mouse models. These results represent a potentially novel therapeutic target for the treatment of seizure disorders, and they show the need to better understand the physiology underlying these neural and brain circuit changes.

• [Importance of studying sleep and eating in tandem](#) [周六, 14 10月 01:22]

A new study offers important insights into possible links between sleep and hunger.

• ['Roadmap' to aid osteoporosis treatment development](#) [周六, 14 10月 01:22]

Scientists have developed a molecular model that may provide a new framework for improving the design of osteoporosis treatments.

• [Genetic clues to spinal stenosis](#) [周六, 14 10月 01:21]

A new study indicates that certain genetic changes are linked with an increased risk of developing lumbar spinal stenosis, a narrowing of the open spaces in the lower spine that can lead to pain in the legs when individuals walk.

• [Worms reveal secrets of aging](#) [周六, 14 10月 00:51]

Investigators have identified a new molecular pathway that controls lifespan and healthspan in worms and mammals. Researchers have

shown that worms with excess levels of certain proteins lived longer and healthier than normal worms. In addition, mice with excess levels of these proteins demonstrated a delay in blood vessel dysfunction associated with aging. The study has major implications for our understanding of aging and age-associated disorders.

- [**Augmented tongue ultrasound for speech therapy**](#) [周六, 14 10月 00:32]

Researchers have developed a system that can display the movements of our own tongues in real time. These movements are processed by a machine learning algorithm that controls an 'articulatory talking head.' This avatar shows the tongue, palate and teeth, which are usually hidden inside the vocal tract.

- [**Surgeries performed later in the day have more complications**](#) [周六, 14 10月 00:32]

A new study finds that patients who undergo a neurosurgical procedure with surgical start times between 9 pm and 7 am are at an increased risk of developing complications compared to patients with a surgical start time earlier in the day.

- [**Scientists reveal the relationship between sugar, cancer**](#) [周五, 13 10月 22:36]

A nine-year joint research project has led to a crucial breakthrough in cancer research. Scientists have clarified how the Warburg effect, a phenomenon in which cancer cells rapidly break down sugars, stimulates tumor growth. This discovery provides evidence for a positive correlation between sugar and cancer, which may have far-reaching impacts on tailor-made diets for cancer patients.

- [**First atomic structure from cryo-EM facility**](#) [周五, 13 10月 22:33]

Researchers have outlined a 3-D atomic structure of the ion channel found in mammals that is implicated in a rare, inherited neurodegenerative disease in humans.

- [**Usutu virus is back: Not only in blackbirds but**](#)

[also in humans](#) [周五, 13 10月 22:33]

Usutu virus, a flavivirus of African origin, was first detected in Austria in 2001, when it caused a severe bird die-off, mainly of blackbirds. The virus was active in the eastern part of Austria until 2005, killing many blackbirds, but also other songbirds. During 10 subsequent years no Usutu virus associated bird mortality was observed in Austria -- contrary to neighboring Hungary. Last year Usutu virus was identified again in two blackbirds -- and in 2017 already in sixteen songbirds. In another...

• [Making healthier decisions, step by step](#) [周五, 13 10月 21:52]

For 10 days, scientists posted signs at the bottom of a set of airport stairs and escalators encouraging them to take the stairs. They found when the signs were present, people were about twice as likely to use the stairs.

• [Cell biology: Proteins may prevent dysfunction, disease by relaxing, study shows](#) [周五, 13 10月 21:19]

A team of researchers used simulations and X-rays to conclude that disordered proteins remain unfolded and expanded as they float loose in the cytoplasm of a cell. The answer affects how we envision the movement of a protein through its life--essential for understanding how proteins fold, what goes wrong during disorders and disease and how to model their behavior.

• [Higher dose of vitamin D increases bone density in premature babies, study finds](#) [周五, 13 10月 21:18]

If the standard supplementation of 400 IUs of vitamin D is increased to 800 IUs daily there are reductions in the number of premature and preterm babies with extremely low bone density, new research has found.

• [New mechanism detected in Alzheimer's disease](#) [周五, 13 10月 21:10]

Researchers have discovered a cellular mechanism that may contribute to the breakdown of communication between neurons in Alzheimer's disease. In the brain tissue of Alzheimer's patients, the RNAs that encode synaptic proteins are degraded more rapidly than in healthy brain cells, the researchers found. Their findings indicate that inadequate

levels of a protein known as RBFOX1 may be a factor in the faulty connections that are a hallmark of Alzheimer's disease.

- ['Magic mushrooms' may 'reset' the brains of depressed patients, study suggests](#) [周五, 13 10月 21:10]

Patients taking psilocybin to treat depression show reduced symptoms weeks after treatment following a 'reset' of their brain activity.

- [Restless legs syndrome study identifies 13 new genetic risk variants](#) [周五, 13 10月 21:10]

A new study into the genetics underlying restless legs syndrome has identified 13 previously-unknown genetic risk variants, while helping inform potential new treatment options for the condition.

- [Learning and staying in shape key to longer lifespan, study finds](#) [周五, 13 10月 21:10]

People who are overweight cut their life expectancy by two months for every extra kilogram of weight they carry, research suggests. A major study has also found that education leads to a longer life, with almost a year added for each year spent studying beyond school.

- [Possible new treatment pathway for severe allergic asthma](#) [周五, 13 10月 08:02]

Research demonstrates that blocking the action of two pro-inflammatory molecules significantly reduces symptoms of allergic asthma in mice, which could lead to development of a new treatment for people with a severe form of the condition.

- [Combination of El Niño and 2016 Ecuador earthquake likely worsened Zika outbreak](#) [周五, 13 10月 08:02]

A Zika virus outbreak in coastal Ecuador in 2016 was likely worsened by a strong El Niño and a magnitude 7.8 earthquake that struck the region in April, according to a new study.

- [New protein study broadens knowledge of molecular basis for disease](#) [周五, 13 10月 04:40]

Scientists are one step closer to unraveling the mystery of how intrinsically disordered proteins work, according to new research.

- [**Fighting racism: Teaching kids to identify individual black people can reduce racial bias**](#) [周五, 13 10月 04:39]

Many times, those who hold racially biased views of other people see them as all the same. Instead of thinking of them as specific individuals, they lump them into a group -- seeing them as 'those people.' Now an international team of researchers suggests one way to reduce racial bias in kids is by teaching them to identify individual faces of those of other races.

- [**Liquid biopsy for retinoblastoma**](#) [周五, 13 10月 03:27]

A new study provides proof of concept for a safe and effective way to derive genetic information from a retinoblastoma tumor.

- [**International team reconstructs nanoscale virus features from correlations of scattered X-rays**](#) [周五, 13 10月 03:18]

Key algorithms have been developed which helped scientists achieve a goal first proposed more than 40 years ago -- using angular correlations of X-ray snapshots from non-crystalline molecules to determine the 3-D structure of important biological objects.

- [**3D packaging of DNA regulates cell identity**](#) [周五, 13 10月 03:18]

The ability of a stem cell to differentiate into cardiac muscle (and by extension other cell types) depends on what portions of the genome are available for activation, which is controlled by the location of DNA in a cell's nucleus, new research suggests.

- [**Like it or not: Broccoli may be good for the gut**](#) [周五, 13 10月 03:17]

For the broccoli haters of the world, researchers may have more bad news: the vegetable may also help promote a healthy gut.

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [**Tweeting rage: How immigration policies can polarize public discourse**](#) [周二, 17 10月 02:48]

A study of tweets in the months before and after the 2010 passage of Arizona's "show me your papers" law, findings showed that the average tweet about Mexican immigrants and Hispanics, in general, became more negative. Researchers said the social media data was useful in determining whether people had changed their attitudes about immigrants as a result of the law or whether they had begun behaving differently.

- [**Brain training shows promise for patients with bipolar disorder**](#) [周二, 17 10月 01:27]

Computerized brain training can result in improved cognitive skills in individuals with bipolar disorder, researchers have discovered for the first time.

- [**Catch a fleeting kilonova**](#) [周二, 17 10月 01:26]

Alerted by the first-ever gravitational waves caused by two neutron stars merging, astronomers detect the resulting optical flash.

- [**Toward efficient high-pressure desalination**](#) [周二, 17 10月 01:26]

One of the biggest operational challenges for desalination plants is the fouling of membranes by microbes. New research suggests a novel approach to reducing the rate of fouling, and thus improving desalination plant efficiency.

- [**Chemical treatment improves quantum dot**](#)

[lasers](#) [周二, 17 10月 01:26]

One of the secrets to making tiny laser devices such as ophthalmic surgery scalpels work even more efficiently is the use of tiny semiconductor particles, called quantum dots. In new research the ~nanometer-sized dots are being doctored, or 'doped,' with additional electrons, a treatment that nudges the dots ever closer to producing the desired laser light with less stimulation and energy loss.

• [Neutrons observe vitamin B6-dependent enzyme activity useful for drug development](#) [周二, 17 10月 00:44]

Scientists have performed neutron structural analysis of a vitamin B6-dependent protein, potentially opening avenues for new antibiotics and drugs to battle diseases such as drug-resistant tuberculosis, malaria and diabetes. Specifically, the team used neutron crystallography to study the location of hydrogen atoms in aspartate aminotransferase, or AAT, an enzyme vital to the metabolism of certain amino acids.

• [Seeing the light of neutron star collisions](#) [周二, 17 10月 00:21]

When two neutron stars collided on Aug. 17, a widespread search for electromagnetic radiation from the event led to observations of light from the afterglow of the explosion, finally connecting a gravitational-wave-producing event with conventional astronomy using light, according to an international team of astronomers.

• [Marketing study examines what types of searches click for car buyers](#) [周二, 17 10月 00:21]

A new study examines how consumers allocated their time when searching offline and on the internet as they shopped for a new automobile, and what the outcomes were for price satisfaction.

• [Nanoantenna arrays power a new generation of fluorescence-based sensors](#) [周二, 17 10月 00:21]

Researchers have designed and tested a series of plasmonic nanoantenna arrays that could lead to the development of a new generation of ultrasensitive and low-cost fluorescence sensors that could be used to

monitor water quality.

- [**Hubble observes source of gravitational waves for the first time**](#) [周二, 17 10月 00:21]

The NASA/ESA Hubble Space Telescope has observed for the first time the source of a gravitational wave, created by the merger of two neutron stars. This merger created a kilonova -- an object predicted by theory decades ago -- that ejects heavy elements such as gold and platinum into space. This event also provides the strongest evidence yet that short duration gamma-ray bursts are caused by mergers of neutron stars.

- [**Gravitational waves plus new clues from space reveal new way to make a black hole**](#) [周一, 16 10月 22:28]

For the first time, scientists have detected both gravitational waves and light shooting toward our planet from the birthplace of a new black hole created by the merger of two neutron stars. The discovery marks the beginning of a new era of

- [**Gamma-ray burst detection just what researchers exclusively predicted**](#) [周一, 16 10月 22:28]

More than a month before a game-changing detection of a short gamma-ray burst, scientists predicted such a discovery would occur.

- [**Radio 'eyes' unlocking secrets of neutron-star collision**](#) [周一, 16 10月 22:28]

When a pair of superdense neutron stars collided and potentially formed a black hole in a galaxy 130 million light-years from Earth, they unleashed not only a train of gravitational waves but also an ongoing torrent of radio waves that are answering some of the biggest questions about the nature of such a cataclysmic event.

- [**Astronomers strike cosmic gold, confirm origin of precious metals in neutron star mergers**](#) [周一, 16 10月 22:28]

What many thought would be a long way off, the detection of gravitational waves from the merger of binary neutron stars, actually happened on Aug. 17. The observation of a blue and then red glow from

the radioactive debris cloud left behind matched simulations of what the merger should look like, proving that such mergers are the source of most of the very heavy elements in the universe, including gold.

- [**First observations of merging neutron stars mark a new era in astronomy**](#) [周一, 16 10月 22:28]

After LIGO detected gravitational waves from the merger of two neutron stars, the race was on to detect a visible counterpart, because unlike the colliding black holes responsible for LIGO's four previous detections, this event was expected to produce an explosion of visible light. Researchers have now found the source of the gravitational waves, capturing the first images of the event with the Swope Telescope in Chile.

- [**Quantum simulator: First functioning component**](#) [周一, 16 10月 21:24]

Hurricanes, traffic jams, demographic development – to predict the effect of such events, computer simulations are required. Many processes in nature, however, are so complicated that conventional computers fail. Quantum simulators may solve this problem. One of the basic phenomena in nature is the interaction between light and matter in photosynthesis. Physicists have now made a big step towards quantum mechanics understanding of plant metabolism.

- [**How scientists used NASA data to predict the corona of the Aug. 21 Total Solar Eclipse**](#) [周六, 14 10月 23:17]

When the total solar eclipse swept across the United States on Aug. 21, 2017, NASA satellites captured a diverse set of images from space. But days before the eclipse, some NASA satellites also enabled scientists to predict what the corona -- the Sun's outer atmosphere -- would look like during the eclipse, from the ground. In addition to offering a case study to test our predictive abilities, the predictions also enabled some eclipse scientists to choose their study targets in advance.

- [**Detailed look at 2-D structure of turbulence in**](#)

[**tokamaks**](#) [周六, 14 10月 23:17]

A key hurdle for fusion researchers is understanding turbulence, the ripples and eddies that can cause the superhot plasma that fuels fusion reactions to leak heat and particles and keep fusion from taking place. Comprehending and reducing turbulence will facilitate the development of fusion as a safe, clean and abundant source of energy for generating electricity from power plants around the world.

• [**Solar research: NASA sounding rocket instrument spots signatures of long-sought small solar flares**](#) [周六, 14 10月 02:03]

Like most solar sounding rockets, the second flight of the FOXSI instrument -- short for Focusing Optics X-ray Solar Imager -- lasted 15 minutes, with just six minutes of data collection. But in that short time, the cutting-edge instrument found the best evidence to date of a phenomenon scientists have been seeking for years: signatures of tiny solar flares that could help explain the mysterious extreme heating of the Sun's outer atmosphere.

• [**Astronomers find potential solution into how planets form**](#) [周六, 14 10月 00:32]

The quest to discover how planets found in the far reaches of the universe are born has taken a new, crucial twist.

• [**Spin current detection in quantum materials unlocks potential for alternative electronics**](#) [周六, 14 10月 00:31]

A new method that precisely measures the mysterious behavior and magnetic properties of electrons flowing across the surface of quantum materials could open a path to next-generation electronics. A team of scientists has developed an innovative microscopy technique to detect the spin of electrons in topological insulators, a new kind of quantum material that could be used in applications such as spintronics and quantum computing.

• [**Solar research: On the generation of solar**](#)

[spicules and Alfvénic waves](#) [周六, 14 10月 00:31]

Combining computer observations and simulations, a new model shows that the presence of neutrals in the gas facilitates the magnetic fields to penetrate through the surface of the Sun producing the spicules.

• [First atomic structure from cryo-EM facility](#) [周五, 13 10月 22:33]

Researchers have outlined a 3-D atomic structure of the ion channel found in mammals that is implicated in a rare, inherited neurodegenerative disease in humans.

• [Space radiation won't stop NASA's human exploration](#) [周五, 13 10月 21:52]

While it's true that space radiation is one of the biggest challenges for a human journey to Mars, it's also true that NASA is developing technologies and countermeasures to ensure a safe and successful journey to the red planet.

• [Purple power: Synthetic 'purple membranes' transform sunlight to hydrogen fuel](#) [周五, 13 10月 21:19]

A new way has been found to produce solar fuels by developing “synthetic purple membranes.” These membranes involve an assembly of lipid nanodiscs, man-made proteins, and semiconducting nanoparticles that, when taken together, can transform sunlight into hydrogen fuel.

• [Star Dust Helps Explain Mysterious Dimming Star](#) [周五, 13 10月 21:19]

Astronomers are working to understand the mysterious dimming of Tabby's Star. The astronomers report that space dust orbiting the star -- not alien megastructures -- is the likely cause of the star's long-term dimming.

• [Wildlife in the ditches need a detox cure](#) [周五, 13 10月 21:17]

When it's raining on the roads, slops of road dust and contaminants drain into the road trenches. What does it do to wildlife living by the road?

- [**Cold molecules on collision course**](#) [周五, 13 10月 21:15]

Using a new cooling technique scientists succeed at observing collisions in a dense beam of cold and slow dipolar molecules.

- [**New insight into the limits of possible life on Mars**](#) [周五, 13 10月 21:10]

Researchers investigating whether liquid water could exist on Mars have provided new insight into the limits of life on the red planet.

- [**Single photon reveals quantum entanglement of 16 million atoms**](#) [周五, 13 10月 21:10]

Quantum theory predicts that a vast number of atoms can be entangled and intertwined by a very strong quantum relationship even in a macroscopic structure. Until now, experimental evidence has been mostly lacking, despite recent advances have shown the entanglement of 2,900 atoms. Scientists recently reengineered their data processing, demonstrating that 16 million atoms were entangled in a one-centimeter crystal.

- [**Tweets can help predict the outcome of soccer matches**](#) [周五, 13 10月 08:02]

Twitter activity can help predict the result of soccer matches when combined with betting market prices, new study shows. The tone of Twitter posts can predict when a team is more likely to win and soccer bets are mispriced, the study found.

- [**Direct Numerical Simulations enhance combustion efficiency, reduces pollution**](#) [周五, 13 10月 08:02]

Researchers use Direct Numerical Simulations to enhance efficiency, reduce pollution in diesel engines.

- [**Mantis shrimp-inspired camera enables glimpse into hidden world**](#) [周五, 13 10月 08:02]

By mimicking the eye of the mantis shrimp, researchers have developed an ultra-sensitive camera capable of sensing both color and polarization. The bioinspired imager can potentially improve early cancer detection

and help provide a new understanding of underwater phenomena, the researchers said. See a video of describing the study on YouTube.

- [**Converting carbon dioxide to carbon monoxide using water, electricity**](#) [周五, 13 10月 08:02]

Researchers have determined how electrocatalysts can convert carbon dioxide to carbon monoxide using water and electricity. The discovery can lead to the development of efficient electrocatalysts for large scale production of synthesis gas -- a mixture of carbon monoxide and hydrogen.

- [**Understanding rare Earth emulsions**](#) [周五, 13 10月 08:02]

Through a series of theoretical simulations, researchers discovered that surface polarization in mixed media increases attraction among elements.

- [**Intense storms batter Saturn's largest moon, scientists report**](#) [周五, 13 10月 05:25]

Titan, the largest of Saturn's more than 60 moons, has surprisingly intense rainstorms, according to research by a team of UCLA planetary scientists and geologists. Although the storms are relatively rare -- they occur less than once per Titan year, which is 29 and a half Earth years -- they occur much more frequently than the scientists expected.

- [**New headway in desalination technology**](#) [周五, 13 10月 04:40]

Engineers have taken a step forward in developing a saltwater desalination process that is potentially cheaper than reverse osmosis and borrows from battery technology. In their study, the researchers are focusing on new materials that could make desalination of brackish waters economically desirable and energy efficient.

- [**International team reconstructs nanoscale virus features from correlations of scattered X-rays**](#) [周五, 13 10月 03:18]

Key algorithms have been developed which helped scientists achieve a goal first proposed more than 40 years ago -- using angular correlations of X-ray snapshots from non-crystalline molecules to determine the 3-D

structure of important biological objects.

- **[Satellites map photosynthesis at high resolution](#)**

[周五, 13 10月 02:34]

Life on Earth is impossible without photosynthesis. It provides food and oxygen to all higher life forms and plays an important role in the climate system, since this process regulates the uptake of carbon dioxide from the Earth's atmosphere and its fixation in biomass. However, quantification of photosynthesis at the ecosystem-to-global scale remains uncertain. Now an international team of scientists have made a major step forward.

- **[Measurement promises complete picture of Milky Way](#)**

[周五, 13 10月 02:34]

Distance measured out to the far side of our Milky Way means that radio astronomers now can work on producing an accurate map of the full extent of our galaxy's structure for the first time.

- **[In a first for wearable optics, researchers develop stretchy fiber to capture body motion](#)**

[周五, 13 10月 02:33]

New research offers the first demonstration of optical fibers sturdy enough to sense a wide range of human motion.

- **[Spotting the spin of the Majorana fermion under the microscope](#)**

[周五, 13 10月 02:33]

Using a new twist on a technique for imaging atomic structures, researchers have detected a unique quantum property of the Majorana fermion, an elusive particle with the potential for use in quantum information systems.

- **[Laser cavities take on new shapes and functionalities](#)**

[周五, 13 10月 02:33]

Researchers have demonstrated the first laser cavity that can confine and propagate light in any shape imaginable, even pathways with sharp bends and angles. The new cavity, called a topological cavity, could enable laser components to be packed more densely on a chip, leading to higher speed optical communication technologies that can be fabricated

in an efficient and scalable manner using photonic integration techniques.

- [Engineers develop a programmable 'camouflaging' material inspired by octopus skin](#)

[周五, 13 10月 02:33]

Engineers have invented stretchable surfaces with programmable 3-D texture morphing, a synthetic 'camouflaging skin' inspired by studying and modeling the real thing in octopus and cuttlefish.

- [Using Facebook data as a real-time census](#) [周五, 13 10月 00:30]

A new study is believed to be the first to demonstrate how present-day migration statistics can be obtained by compiling the same data that advertisers use to target their audience on Facebook, and by combining that source with information from the Census Bureau.

- [Devourer of planets? Astronomers dub star 'Kronos'](#) [周五, 13 10月 00:28]

'Kronos' is enhanced in metals and other rock-forming elements but not in volatiles, prompting a team of researchers to conclude that it absorbed as much as 15 Earth masses worth of rocky planets. Its twin, 'Krios,' does not show this unusual pattern of enhancement.

- [A better understanding of space, via helicopter](#) [周五, 13 10月 00:26]

An algorithm that helps engineers design better helicopters may help astronomers more precisely envision the formation of planets and galaxies. Researchers have created a new model for understanding how black holes, planets, and galaxies emerge from the vortex-rich environments of space.

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [**Clues to the Innate Drug Resistance of a Cocoa-Fermenting Pathogen**](#) [周二, 17 10月 02:48]

At first glance, the yeast *Candida krusei* seems as innocuous as microbes come: it's used for fermenting cocoa beans and gives chocolate its pleasant aroma. But it's increasingly being found as a pathogen in immunocompromised patients — and *C. krusei* infections aren't always easy to cure.

- [**Toward efficient high-pressure desalination**](#) [周二, 17 10月 01:26]

One of the biggest operational challenges for desalination plants is the fouling of membranes by microbes. New research suggests a novel approach to reducing the rate of fouling, and thus improving desalination plant efficiency.

- [**Whales and dolphins have rich 'human-like' cultures and societies**](#) [周二, 17 10月 00:22]

Whales and dolphins (cetaceans) live in tightly-knit social groups, have complex relationships, talk to each other and even have regional dialects -- much like human societies. A major new study has linked the complexity of Cetacean culture and behavior to the size of their brains.

- [**Bite on this: Alligators actually eat sharks**](#) [周二, 17 10月 00:21]

Jaws, beware! Alligators may be coming for you. A new study documents American alligators on the Atlantic and Gulf coasts are eating small sharks and stingrays. This is the first scientific documentation of a widespread interaction between the two predators.

- [**How cells induce inflammation upon detection of cytoplasmic DNA**](#) [周二, 17 10月 00:21]

A research team has elucidated the mechanism by which human cells induce inflammation upon detection of cytoplasmic DNA. Notably, the signal network involved differs from that used in the same context in mice.

- [**Harvey runoff menaces Texas' coral reefs**](#) [周一, 16 10月 22:28]

The more than 13 trillion gallons of floodwater from Hurricane Harvey have created a massive plume of freshwater in the Gulf of Mexico that is threatening the coral reefs of the Flower Garden Banks National Marine Sanctuary about 100 miles offshore of Galveston.

- [**Fanged kangaroo research could shed light on extinction**](#) [周一, 16 10月 21:27]

Fanged kangaroos -- an extinct family of small fanged Australian kangaroos -- might have survived at least five million years longer than previously thought. A new study has found the species might have competed for resources with ancestors of modern kangaroos.

- [**Quantum simulator: First functioning component**](#) [周一, 16 10月 21:24]

Hurricanes, traffic jams, demographic development – to predict the effect of such events, computer simulations are required. Many processes in nature, however, are so complicated that conventional computers fail. Quantum simulators may solve this problem. One of the basic phenomena in nature is the interaction between light and matter in photosynthesis. Physicists have now made a big step towards quantum mechanics understanding of plant metabolism.

- [**Germ-free hatching eggs: An alternative to formaldehyde application**](#) [周一, 16 10月 20:31]

Hatching eggs in large-scale hatcheries are currently treated with formaldehyde to eliminate germs. Researchers have now developed a natural alternative.

- [**How to save giant tropical fruit bats: Work with local hunters who use bat teeth as money**](#) [周一, 16 10月 20:19]

Flying foxes -- giant fruit bats that look like winged German shepherd puppies -- are in trouble. But scientists suggest a new way to help protect the bats on the Solomon Islands: working with local hunters who use the bats' teeth as currency. The traditional practice, it turns out, is a positive thing for bat conservation.

- [**New antibiotic resistance genes found**](#) [周一, 16 10月 20:19]

Researchers have found several previously unknown genes that make bacteria resistant to last-resort antibiotics. The genes were found by searching large volumes of bacterial DNA.

- [**Giant sea bass worth more alive as undersea wonders than as commercial catch**](#) [周六, 14 10月 23:16]

An investigation of the different economic values of giant sea bass finds they are worth more alive as undersea wonders than as commercial catch.

- [**Gutters teem with inconspicuous life**](#) [周六, 14 10月 01:22]

Scientists have shown that Parisian street gutters are oases of microscopic life, home to microalgae, fungi, sponges, and mollusks. Grouped into communities, these microorganisms may help clean rainwater and urban waste by decomposing solid debris and pollutants. A deeper understanding of the role and composition of these communities could help elucidate the services rendered by gutter ecosystems. The researchers' findings are the first to reveal the unsuspected biodiversity of microscopic life i...

- [**Worms reveal secrets of aging**](#) [周六, 14 10月 00:51]

Investigators have identified a new molecular pathway that controls lifespan and healthspan in worms and mammals. Researchers have shown that worms with excess levels of certain proteins lived longer and healthier than normal worms. In addition, mice with excess levels of these proteins demonstrated a delay in blood vessel dysfunction associated with aging. The study has major implications for our

understanding of aging and age-associated disorders.

- [**Atrazine alters the sex ratio in Blanchard's cricket frogs**](#) [周六, 14 10月 00:32]

A study found that Blanchard's cricket frogs are highly sensitive to atrazine. When exposed, there were up to 55 percent fewer males than females compared with the control group, indicating that atrazine can affect the sex ratio. However, cricket frog populations do persist in areas with widespread atrazine application, despite reports of range contractions for enigmatic reasons.

- [**Melting ice makes the sea around Greenland less saline**](#) [周五, 13 10月 23:30]

For the first time, ocean data from Northeast Greenland reveals the long-term impact of the melting of the Greenland ice sheet. The observed increase in freshwater content will affect the conditions in all Greenland fjords and may ultimately affect the global ocean currents that keep Europe warm.

- [**Usutu virus is back: Not only in blackbirds but also in humans**](#) [周五, 13 10月 22:33]

Usutu virus, a flavivirus of African origin, was first detected in Austria in 2001, when it caused a severe bird die-off, mainly of blackbirds. The virus was active in the eastern part of Austria until 2005, killing many blackbirds, but also other songbirds. During 10 subsequent years no Usutu virus associated bird mortality was observed in Austria -- contrary to neighboring Hungary. Last year Usutu virus was identified again in two blackbirds -- and in 2017 already in sixteen songbirds. In anoth...

- [**Cell biology: Proteins may prevent dysfunction, disease by relaxing, study shows**](#) [周五, 13 10月 21:19]

A team of researchers used simulations and X-rays to conclude that disordered proteins remain unfolded and expanded as they float loose in the cytoplasm of a cell. The answer affects how we envision the movement of a protein through its life--essential for understanding how proteins fold, what goes wrong during disorders and disease and how to

model their behavior.

- [**Contests for female attention turns males into better performers in fruit flies**](#) [周五, 13 10月 21:17]

Giving females an opportunity to choose the male they mate with leads to the evolution of better performing males, according to new research into the behavior of fruit flies.

- [**Wildlife in the ditches need a detox cure**](#) [周五, 13 10月 21:17]

When it's raining on the roads, slops of road dust and contaminants drain into the road trenches. What does it do to wildlife living by the road?

- [**Does size matter? Bigger cod fish contain more mercury**](#) [周五, 13 10月 21:17]

The levels of mercury in the Oslofjord cod has increased over the last 30 years, despite reduced emissions of this toxic element. In the same period, the average size of sampled cod has increased. Are the elevated levels of mercury simply a result of larger cod?

- [**Baltic clams, worms release as much greenhouse gas as 20,000 dairy cows**](#) [周五, 13 10月 21:10]

Ocean clams and worms are releasing a significant amount of potentially harmful greenhouse gas into the atmosphere, scientists have shown.

- [**'Magic mushrooms' may 'reset' the brains of depressed patients, study suggests**](#) [周五, 13 10月 21:10]

Patients taking psilocybin to treat depression show reduced symptoms weeks after treatment following a 'reset' of their brain activity.

- [**Scientists uncover a centuries-old case of mistaken identity in the Chesapeake Bay**](#) [周五, 13 10月 21:10]

Scientists recently discovered that some jellyfish in the Bay are quite different from their ocean cousins. This led scientists to declare them as two different species.

- [**How E. coli bacteria adapt under stress**](#) [周五, 13 10月 21:10]

Researchers have developed a genome-scale model that can accurately predict how E. coli bacteria respond to temperature changes and genetic mutations. The work sheds light on how cells adapt under environmental stress and has applications in precision medicine, where adaptive cell modeling could provide patient-specific treatments for bacterial infections.

- [**Mantis shrimp-inspired camera enables glimpse into hidden world**](#) [周五, 13 10月 08:02]

By mimicking the eye of the mantis shrimp, researchers have developed an ultra-sensitive camera capable of sensing both color and polarization. The bioinspired imager can potentially improve early cancer detection and help provide a new understanding of underwater phenomena, the researchers said. See a video of describing the study on YouTube.

- [**Is it gonna blow? Measuring volcanic emissions from space**](#) [周五, 13 10月 08:02]

Carbon dioxide measured by a NASA satellite pinpoints sources of the gas from human and volcanic activities, which may help monitor greenhouse gases responsible for climate change.

- [**Understanding rare Earth emulsions**](#) [周五, 13 10月 08:02]

Through a series of theoretical simulations, researchers discovered that surface polarization in mixed media increases attraction among elements.

- [**Combination of El Niño and 2016 Ecuador earthquake likely worsened Zika outbreak**](#) [周五, 13 10月 08:02]

A Zika virus outbreak in coastal Ecuador in 2016 was likely worsened by a strong El Niño and a magnitude 7.8 earthquake that struck the region in April, according to a new study.

- [**New headway in desalination technology**](#) [周五, 13 10月 04:40]

Engineers have taken a step forward in developing a saltwater desalination process that is potentially cheaper than reverse osmosis and borrows from battery technology. In their study, the researchers are

focusing on new materials that could make desalination of brackish waters economically desirable and energy efficient.

- [**Livestock grazing management compatible with nesting greater sage-grouse**](#) [周五, 13 10月 04:39]

A new study looks at whether management of livestock grazing may help protect sagebrush and birds that depend on it.

- [**Lead fishing tackle may be threatening loon populations**](#) [周五, 13 10月 04:39]

A new study reveals the devastating effects of lead fishing tackle on loon populations.

- [**Even modest oil exposure can harm coastal and marine birds**](#) [周五, 13 10月 03:18]

Many birds and other wildlife die following an oil spill, but there are also other potential long-term effects of oil exposure on animals.

- [**International team reconstructs nanoscale virus features from correlations of scattered X-rays**](#) [周五, 13 10月 03:18]

Key algorithms have been developed which helped scientists achieve a goal first proposed more than 40 years ago -- using angular correlations of X-ray snapshots from non-crystalline molecules to determine the 3-D structure of important biological objects.

- [**Warming seas could lead to 70 percent increase in hurricane-related financial loss**](#) [周五, 13 10月 03:18]

Hurricane-related financial loss could increase more than 70 percent by 2100 if oceans warm at the worst-case-scenario rate predicted by the Intergovernmental Panel on Climate Change, according to a new study. The study used a combination of hurricane modeling and information in FEMA's HAZUS database to reach its conclusions.

- [**3D packaging of DNA regulates cell identity**](#) [周五, 13 10月 03:18]

The ability of a stem cell to differentiate into cardiac muscle (and by extension other cell types) depends on what portions of the genome are

available for activation, which is controlled by the location of DNA in a cell's nucleus, new research suggests.

- [**Tropical tree roots represent an underappreciated carbon pool**](#) [周五, 13 10月 03:17]

Estimates of the carbon stored by tropical forests rarely take tree roots into consideration. Scientists report that almost 30 percent of the total biomass of tropical trees may be in the roots.

- [**Like it or not: Broccoli may be good for the gut**](#) [周五, 13 10月 03:17]

For the broccoli haters of the world, researchers may have more bad news: the vegetable may also help promote a healthy gut.

- [**Luring hornets: Scientists unlock sex pheromone of notorious honey bee predator**](#) [周五, 13 10月 02:34]

Biologists have developed a solution for controlling the invasive Asian hornet *Vespa velutina* based on the insect's natural chemical mating instincts. They deciphered the sex pheromone of the insect and devised a method of luring males into traps baited with synthesized versions of the pheromones. *Vespa velutina* has recently spread its presence with invasions in Europe and Korea, posing risks to honey bees, humans and related economics.

- [**Satellites map photosynthesis at high resolution**](#) [周五, 13 10月 02:34]

Life on Earth is impossible without photosynthesis. It provides food and oxygen to all higher life forms and plays an important role in the climate system, since this process regulates the uptake of carbon dioxide from the Earth's atmosphere and its fixation in biomass. However, quantification of photosynthesis at the ecosystem-to-global scale remains uncertain. Now an international team of scientists have made a major step forward.

- [**Cell biology: Cell contacts in embryonic development determine cellular fate**](#) [周五, 13 10月 02:33]

The average human consists of about 37.2 trillion cells. But not all cells are created equal: while muscle cells contain the molecular machinery to

contract and relax your muscles, some neurons send meter-long axons from the spinal cord to the tip of your toes, and red blood cells bind oxygen and transport it around the body. How does a cell 'know' which function to fulfill?

- [**The sea cucumber genome points to genes for tissue regeneration**](#) [周五, 13 10月 02:33]

A new high-definition genome sequence of the sea cucumber provides molecular insights into its ability to regenerate.

- [**Leishmania: Immune reaction to sandfly saliva varies between individuals living in endemic areas**](#) [周五, 13 10月 02:33]

The Phlebotomus papatasi sandfly is responsible for spreading Leishmania throughout the tropics and subtropics. How individuals in areas endemic for Leishmania infection react to sandfly saliva depends on their long-term exposure to the flies.

- [**Newfoundland populated multiple times by distinct groups, DNA evidence shows**](#) [周五, 13 10月 02:33]

Researchers who've examined genetic evidence from mitochondrial DNA provide evidence that two groups of indigenous people in Canada, known as the Maritime Archaic and Beothuk, brought different matrilineal lineages to the island, adding further support to the notion that those groups had distinct population histories.

- [**Engineers develop a programmable 'camouflaging' material inspired by octopus skin**](#) [周五, 13 10月 02:33]

Engineers have invented stretchable surfaces with programmable 3-D texture morphing, a synthetic 'camouflaging skin' inspired by studying and modeling the real thing in octopus and cuttlefish.

- [**Thunderstorm activity is highest at foot of the Zugspitze**](#) [周五, 13 10月 00:39]

Those who are afraid of thunderstorms should move to Kiel, whereas

those who do not feel threatened by thunder and lightning should settle in Garmisch-Partenkirchen, because average thunderstorm activity is lowest in the city in Northern Germany and highest in the city in Bavaria, report scientists who evaluated data on thunderstorm occurrences.

- [**Rainfall trends in arid regions buck commonly held climate change theories**](#) [周五, 13 10月 00:30]

To explore the links between climatic warming and rainfall in drylands, scientists analysed more than 50 years of detailed rainfall data (measured every minute) from a semi-arid drainage basin in south east Arizona exhibiting an upward trend in temperatures during that period.

- [**Paleogenomic analysis sheds light on Easter Island mysteries**](#) [周五, 13 10月 00:30]

New paleogenomic research appears to rule out the likelihood that inhabitants of Easter Island intermixed with South Americans prior to the arrival of Europeans on the island in 1722.

- [**An evolving sticky situation**](#) [周五, 13 10月 00:30]

While many animals try to avoid sticky situations, lizards evolved to seek them out. An evolutionary biologist shows how different groups of lizards -- geckos and anoles -- took two completely different evolutionary paths to developing the beneficial trait of sticky toe pads.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [**Tweeting rage: How immigration policies can polarize public discourse**](#) [周二, 17 10月 02:48]

A study of tweets in the months before and after the 2010 passage of Arizona's "show me your papers" law, findings showed that the average tweet about Mexican immigrants and Hispanics, in general, became more negative. Researchers said the social media data was useful in determining whether people had changed their attitudes about immigrants as a result of the law or whether they had begun behaving differently.

- [**Women in science ask fewer questions than men, according to new research**](#) [周二, 17 10月 02:24]

Stereotypes suggest that women love to talk, with some studies even finding that women say three times as much as men. But, new research shows there is an exception to this rule: professional STEM events, which could be indicative of the wider problem of gender inequality in the field.

- [**Break the attachment before selling your stuff**](#) [周二, 17 10月 01:26]

Ever tried to sell something you've owned for a while on Craigslist and found that no one is willing to pony up what you're asking? It's because you're asking too much.

- [**Marketing study examines what types of searches click for car buyers**](#) [周二, 17 10月 00:21]

A new study examines how consumers allocated their time when

searching offline and on the internet as they shopped for a new automobile, and what the outcomes were for price satisfaction.

- [**Study reveals risk factors for substance use problems, as well as resilience**](#) [周一, 16 10月 22:28]

A new study explores factors increasing the risk for substance use problems among African-American/Black and Latino adults residing in a high-risk urban community, as well as patterns of resilience. It reveals that serious risk factors are highly prevalent and strongly associated with substance misuse; however, a substantial proportion could be characterized as resilient, and evidenced substance use problems at rates comparable to the general U.S. population.

- [**Is rushing your child to the ER the right response?**](#) [周一, 16 10月 20:19]

If a child gets a small burn, starts choking or swallows medication, parents may struggle to decide whether to provide first aid at home or rush them to the hospital, suggests a new national poll.

- [**Making healthier decisions, step by step**](#) [周五, 13 10月 21:52]

For 10 days, scientists posted signs at the bottom of a set of airport stairs and escalators encouraging them to take the stairs. They found when the signs were present, people were about twice as likely to use the stairs.

- [**Wildlife in the ditches need a detox cure**](#) [周五, 13 10月 21:17]

When it's raining on the roads, slops of road dust and contaminants drain into the road trenches. What does it do to wildlife living by the road?

- [**Tweets can help predict the outcome of soccer matches**](#) [周五, 13 10月 08:02]

Twitter activity can help predict the result of soccer matches when combined with betting market prices, new study shows. The tone of Twitter posts can predict when a team is more likely to win and soccer bets are mispriced, the study found.

- [**Fighting racism: Teaching kids to identify individual black people can reduce racial bias**](#) [周五,

13 10月 04:39]

Many times, those who hold racially biased views of other people see them as all the same. Instead of thinking of them as specific individuals, they lump them into a group -- seeing them as 'those people.' Now an international team of researchers suggests one way to reduce racial bias in kids is by teaching them to identify individual faces of those of other races.

- [**Warming seas could lead to 70 percent increase in hurricane-related financial loss**](#) [周五, 13 10月 03:18]

Hurricane-related financial loss could increase more than 70 percent by 2100 if oceans warm at the worst-case-scenario rate predicted by the Intergovernmental Panel on Climate Change, according to a new study. The study used a combination of hurricane modeling and information in FEMA's HAZUS database to reach its conclusions.

- [**Using Facebook data as a real-time census**](#) [周五, 13 10月 00:30]

A new study is believed to be the first to demonstrate how present-day migration statistics can be obtained by compiling the same data that advertisers use to target their audience on Facebook, and by combining that source with information from the Census Bureau.

- [**Climate change may accelerate infectious disease outbreaks, say researchers**](#) [周五, 13 10月 00:28]

Aside from inflicting devastating natural disasters on often vulnerable communities, climate change can also spur outbreaks of infectious diseases like Zika , malaria and dengue fever, according to a new study.

- [**Scientists begin bold conservation effort to save the vaquita porpoise from extinction**](#) [周四, 12 10月 22:37]

An international team of experts has gathered in San Felipe, Mexico at the request of the Mexican government (SEMARNAT) and has begun a bold, compassionate plan known as VaquitaCPR to save the endangered vaquita porpoise from extinction.

- [**New threat to the ozone layer**](#) [周四, 12 10月 21:10]

'Ozone depletion is a well-known phenomenon and, thanks to the

success of the Montreal Protocol, is widely perceived as a problem solved,' say some. But an international team of researchers, has now found an unexpected, growing danger to the ozone layer from substances not regulated by the treaty.

- [**Reducing racial bias in children**](#) [周四, 12 10月 21:10]

An international team of researchers suggests that one way to reduce implicit racial bias in young children is by teaching them to distinguish among faces of a different race and identify them as individuals.

- [**Electric cars can become more eco-friendly through life cycle assessment**](#) [周四, 12 10月 21:09]

It is time to stop discussing whether electric cars are good or bad. Instead industry, authorities and policy-makers need to work together to make them as eco-friendly as possible. One researcher now provides concrete advice and tools showing how life cycle assessment can assist in the development of electric cars.

- [**Lost in translation: When humor kills the message**](#) [周四, 12 10月 21:09]

Getting a laugh may not help get the road safety message across, with a new study showing humorous driver sleepiness advertisements via social media and other means can get lost in translation.

- [**Autism prevalence and socioeconomic status: What's the connection?**](#) [周四, 12 10月 06:05]

Children living in neighborhoods where incomes are low and fewer adults have bachelor's degrees are less likely to be diagnosed with autism spectrum disorder compared to kids from more affluent neighborhoods.

- [**'Killer' toothaches likely cause misery for captive orca: Whales chew concrete and steel tank surfaces**](#) [周四, 12 10月 06:05]

An international research team has undertaken the first in-depth investigation of the teeth of captive orca (killer whales) and have found

them a sorry state, which raises serious concerns for these majestic mammals' overall health and welfare.

- [**New conservation method empowers indigenous peoples**](#) [周四, 12 10月 03:14]

Environmental social scientists worked with indigenous people in the rural Peruvian Amazon and determined that local people meet their basic needs through diverse subsistence activities, such as hunting, fishing, and farming, and over centuries they have developed sophisticated natural resource management systems that protect the robust rainforest ecosystem. Through the study, the scientists hope to overturn traditional notions about development and industrialization.

- [**Risk of tsunamis in Mediterranean Sea has been overstated, say experts**](#) [周四, 12 10月 02:48]

A review of geological evidence for tsunamis during the past 4500 years in the Mediterranean Sea has revealed that as many as 90 per cent of these inundation events may have been misinterpreted by scientists and were due to storm activity instead.

- [**Boost in collateral, not 'feeling richer,' drives consumers to borrow as home prices rise**](#) [周四, 12 10月 02:48]

Boost in collateral rather than feeling richer drives borrowing as home prices rise, an economist finds.

- [**Beyond EPA's Clean Power decision: Climate action window could close as early as 2023**](#) [周四, 12 10月 00:38]

As the Trump administration repeals the US Clean Power Plan, a new study underscores the urgency of reducing greenhouse gas emissions -- from both environmental and economic perspectives.

- [**Study shows untapped creativity in workforce**](#) [周四, 12 10月 00:04]

With the U.S. economy less reliant on manufacturing, creativity and innovation are of increasing value. Arts graduates, and others who have developed and honed their creative skills, can be critical assets.

- [**Experts express concerns over infant mental health assessment**](#) [周四, 12 10月 00:03]

Forty world experts on child development and mental health have released a joint statement calling for caution when applying an influential classification for assessing infant mental health and potential cases of abuse.

- [**Criminal offenders with genetic mental disorders judged more negatively**](#) [周四, 12 10月 00:03]

Popular literature and crime dramas imply that defense attorneys who portray their clients as victims may have better outcomes. The belief is that jurors assign less blame to defendants they feel have been wronged. New research has shown that offenders with genetic mental disorders that predispose them to criminal behavior are judged more negatively than mentally disordered offenders whose criminal behavior may have been caused by environmental factors.

- [**Major cities concentrate less scientific production**](#) [周四, 12 10月 00:00]

The world's major cities, such as New York, London, and Tokyo, are losing their dominant position in the production and circulation of scientific articles, according to a new study.

- [**Drivers are less cautious at railway crossings**](#) [周三, 11 10月 22:07]

Drivers aren't as cautious approaching a railway level crossing compared to a road intersection despite the greater risk of fatality if a collision occurs, a new study has found.

- [**World's 'better' countries have higher rates of cancer**](#) [周三, 11 10月 22:07]

The world's 'better' countries, with greater access to healthcare, experience much higher rates of cancer incidence than the world's 'worse off' countries, according to new research.

- [**What is a safe following distance?**](#) [周三, 11 10月 22:07]

Confusion over what is a 'safe following distance' has road safety

researchers calling for a standardized definition to prevent tailgating.

- [**Average wages for all workers, men and women, have increased as a result of women joining the workforce**](#) [周三, 11 10月 21:17]

Economists are continually examining the effect of the economy on women, but this male-dominated field seems to be failing to ask what impact women in turn have on the economy? Researchers have examined how women's participation in the workforce has affected economic growth and productivity in cities across the US. They estimate that every 10% increase in female labor force participation rates increases average real wage growth in cities by approximately 5%.

- [**Homicide is the largest contributor to years of lost life among black Americans**](#) [周三, 11 10月 08:01]

Homicide is the largest contributor to potential years of life lost among black Americans, according to a new study published in PLOS ONE and conducted by researchers at the Indiana University School of Public Health-Bloomington.

- [**Doctors need a nudge to reduce antibiotic prescriptions, study finds**](#) [周三, 11 10月 03:29]

An update to a behavioral economics study on clinicians' prescriptions of antibiotics showed that the clinicians may, without long-term interventions, return to bad prescription habits.

- [**The costs of transporting petroleum products by pipelines and rail**](#) [周三, 11 10月 03:29]

While the policy debate surrounding crude oil transportation costs has emphasized accidents and spills, a new study indicates the debate is overlooking a far more serious external cost -- air pollution and greenhouse gas emissions.

- [**Raging Bull: First study to find link between testosterone and stock market instability**](#) [周三, 11 10月 03:27]

In the U.S. today, the majority of professional stock market traders are young males and new evidence suggests biology strongly influences their trading behavior. According to a new study this could be a significant contributor to fluctuations in the market, as high testosterone levels can cause these traders to overestimate future stock values and change their trading behavior, leading to dangerous price bubbles and subsequent crashes.

- [**Noncompliance thwarts comprehensive background check policy for private-party sales, study finds**](#) [周三, 11 10月 02:14]

Only one state with expanded background check policies for all gun transfers is compliant, outlines a new report.

- [**More than half of police killings not officially documented on US death certificates, study finds**](#) [周三, 11 10月 02:14]

Official death certificates in the US failed to count more than half of the people killed by police in 2015 -- and the problem of undercounting is especially pronounced in lower-income counties and for deaths that are due to Tasers, according to a new study.

- [**Sharing of science is most likely among male scientists**](#) [周三, 11 10月 00:54]

Even though science is becoming increasingly competitive, scientists are still very willing to share their work with colleagues. This is especially true for male scientists among each other and less so for females among each other or between the sexes.

- [**Indian government needs to do more to tackle rising sale of unapproved antibiotics, experts say**](#) [周三, 11 10月 00:41]

In India, the sale of antibiotics requiring the tightest control and regulation is rising the fastest, according to a new analysis. The correspondence highlights serious hurdles for controlling antimicrobial resistance in the country.

- [**Stepped care beneficial after hurricanes**](#) [周三, 11 10月 00:38]

Stepped care is more effective than usual care in reducing the prevalence of posttraumatic stress disorder in the aftermath of hurricanes, according to a new study.

- [**Conservationists' eco-footprints suggest education alone won't change behavior**](#) [周二, 10 10月 23:46]

A new study shows that even those presumably best informed on the environment find it hard to consistently 'walk the walk,' prompting scientists to question whether relying solely on information campaigns will ever be enough.

- [**Green gentrification can limit the favorable effects of green areas on health**](#) [周二, 10 10月 22:58]

A new study suggests that more socially disadvantaged neighbors do not benefit equally from the effects newly created green areas have on health. Scientists consider that greener cities are not healthier and more equal for everyone.

- [**No 'narcissism epidemic' among college students, study finds**](#) [周二, 10 10月 22:57]

Today's college students are slightly less narcissistic than their counterparts were in the 1990s, researchers report in a new study - not significantly more, as some have proposed. The study analyzed data from 1,166 students at the University of California, Berkeley in the 1990s, and from tens of thousands of students at the University of Illinois at Urbana-Champaign and the University of California, Davis in the 2000s and 2010s.

- [**A lesson for Canada: Quebec pharmacare system creates winners and losers**](#) [周二, 10 10月 22:56]

Quebec spends \$200 more per person than the rest of Canada to provide prescription drug coverage to everyone in the province, finds new research that could inform plans for a nationwide universal drug plan.

- [**Illegal use of natural resources in the protected**](#)

[Brazilian Amazon mapped](#) [周二, 10 10月 20:55]

New research uses law enforcement data collected from 2010 to 2015 to understand the geographical distribution of the illegal use of natural resources across the region's protected area network. In the study, a total of 4,243 reports of illegal use of natural resources were evaluated and mapped. These reports generated US \$224.6 million in fines.

• [Heads-up, ceos: Corporate social responsibility may get you fired, study finds](#) [周二, 10 10月 07:20]

Investing in product safety, employee diversity and carbon footprint reduction are all examples of corporate social responsibility (CSR) that can result in high praise for a chief executive — or get them fired — according to new research.

• [School year 'relative age' causing bias in ADHD diagnosis, says research](#) [周二, 10 10月 07:15]

Younger primary school children are more likely to be diagnosed with attention deficit hyperactivity disorder (ADHD) than their older peers within the same school year, new research has shown.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- [Bite on this: Alligators actually eat sharks](#) [周二, 17 10月 00:21]

Jaws, beware! Alligators may be coming for you. A new study documents American alligators on the Atlantic and Gulf coasts are eating small sharks and stingrays. This is the first scientific documentation of a widespread interaction between the two predators.

- [Fanged kangaroo research could shed light on extinction](#) [周一, 16 10月 21:27]

Fanged kangaroos -- an extinct family of small fanged Australian kangaroos -- might have survived at least five million years longer than previously thought. A new study has found the species might have competed for resources with ancestors of modern kangaroos.

- [Gutters teem with inconspicuous life](#) [周六, 14 10月 01:22]

Scientists have shown that Parisian street gutters are oases of microscopic life, home to microalgae, fungi, sponges, and mollusks. Grouped into communities, these microorganisms may help clean rainwater and urban waste by decomposing solid debris and pollutants. A deeper understanding of the role and composition of these communities could help elucidate the services rendered by gutter ecosystems. The researchers' findings are the first to reveal the unsuspected biodiversity of microscopic life i...

- [New insight into the limits of possible life on Mars](#) [周五, 13 10月 21:10]

Researchers investigating whether liquid water could exist on Mars have provided new insight into the limits of life on the red planet.

• [**In a first for wearable optics, researchers develop stretchy fiber to capture body motion**](#) [周五, 13 10月 02:33]

New research offers the first demonstration of optical fibers sturdy enough to sense a wide range of human motion.

• [**Engineers develop a programmable 'camouflaging' material inspired by octopus skin**](#) [周五, 13 10月 02:33]

Engineers have invented stretchable surfaces with programmable 3-D texture morphing, a synthetic 'camouflaging skin' inspired by studying and modeling the real thing in octopus and cuttlefish.

• [**Paleogenomic analysis sheds light on Easter Island mysteries**](#) [周五, 13 10月 00:30]

New paleogenomic research appears to rule out the likelihood that inhabitants of Easter Island intermixed with South Americans prior to the arrival of Europeans on the island in 1722.

• [**Devourer of planets? Astronomers dub star 'Kronos'**](#) [周五, 13 10月 00:28]

'Kronos' is enhanced in metals and other rock-forming elements but not in volatiles, prompting a team of researchers to conclude that it absorbed as much as 15 Earth masses worth of rocky planets. Its twin, 'Krios,' does not show this unusual pattern of enhancement.

• [**Dangerous trend: The placenta is not suitable as a 'superfood'**](#) [周四, 12 10月 21:13]

More and more women want to take their own placenta with them after childbirth in order to eat it for "health reasons". This phenomenon is growing, especially in the USA, but also in Europe, although physicians are increasingly expressing concerns about it.

• [**Scorpions target their venom**](#) [周四, 12 10月 21:10]

In the first study of its kind, scientists have shown scorpions can fine-tune their venom to suit different predators and prey.

- **[Last common ancestor of humans and apes weighed about five kilograms](#)** [周四, 12 10月 21:09]

New research suggests that the last common ancestor of apes -- including great apes and humans -- was much smaller than previously thought, about the size of a gibbon. The findings, published today in the journal Nature Communications, are fundamental to understanding the evolution of the human family tree.

- **[Chemists use modified DNA nucleotides to create new materials](#)** [周四, 12 10月 06:01]

Chemists have demonstrate that they can repurpose DNA to create new substances with possible medical applications.

- **['Obscure' stalked filter feeder lived in Utah some 500 million years ago](#)** [周四, 12 10月 00:04]

The only fossilized specimen of a species previously unknown to science -- an 'obscure' stalked filter feeder -- has just been detailed for the first time.

- **[Our brain omits grammatical elements when it has limited resources](#)** [周四, 12 10月 00:03]

A study of the use of pronouns by French speakers with agrammatic aphasia shows that grammatical pronouns are significantly more impaired in speech than lexical ones. The findings support a new theory of grammar which suggests that grammatical elements contain secondary information that speakers with limited cognitive resources can omit from their speech and still make sense.

- **[Kune Kune piglets possess social learning skills and have an astonishingly good memory](#)** [周四, 12 10月 00:03]

Pigs are socially competent and capable of learning. But the combination of these skills, learning by observing others, has been insufficiently studied so far. Exact copying and understanding of demonstrated actions -- highly developed learning abilities -- could not be proven. A new study with Kune Kune pigs, has now shown for the

first time that pigs do learn from each other. The intelligent animals also possess remarkable long-term memory after internalizing a technique.

- [**The making of medieval bling**](#) [周四, 12 10月 00:03]

Gold has long been valued for its luxurious glitter and hue, and threads of the gleaming metal have graced clothing and tapestries for centuries. Determining how artisans accomplished these adornments in the distant past can help scientists restore, preserve and date artifacts, but solutions to these puzzles have been elusive. Now scientists have revealed that medieval artisans used a gilding technology that has endured for centuries.

- [**Some plants grow bigger -- and 'meaner' -- when clipped, study finds**](#) [周四, 12 10月 00:03]

Some plants behave like the mythical monster Hydra: Cut off their heads and they grow back, bigger and better than before. A new study finds that these 'overcompensators,' as they are called, also augment their defensive chemistry -- think plant venom -- when they are clipped. The discovery could lead to the development of new methods for boosting plant growth while reducing the need for insecticides, the researchers said.

- [**Step toward creating planes that travel at hypersonic speed**](#) [周三, 11 10月 03:29]

A recent study could lead to a drastic decrease in flight times. The study is one of the first steps toward the creation of planes able to move at hypersonic speeds, five to 10 times the speed of sound.

- [**Do male fish prefer them big and colorful?**](#) [周三, 11 10月 00:41]

Male black-finned goodeid or mexcalpique fish know what they want when they pick a female to mate with; they prefer them big-bellied and as orange as possible. Interestingly, females displaying these traits are the ones most able to produce more offspring that survive, two researchers from the National Autonomous University of Mexico have found.

- [**A self-propelled catheter with earthworm-like**](#)

[peristaltic motion](#) [周二, 10 10月 23:46]

A research team has developed a mechanism of a self-propelled catheter capable of generating peristaltic motion just like an earthworm by applying pneumatic pressure inside only one tube. The goal is to develop an AutoGuide robot that propels itself inside bronchi, automatically reaching the target lesion within the lungs, and can take a lesion sample and provide treatment.

• [This soft robotic gripper can screw in your light bulbs for you](#) [周二, 10 10月 23:46]

How many robots does it take to screw in a light bulb? The answer: just one, assuming you're talking about a newly created robotic gripper. The engineering team has designed and built a gripper that can pick up and manipulate objects without needing to see them and needing to be trained.

• [Salt marsh research warns of pumpkin-colored 'zombies'](#) [周二, 10 10月 22:57]

Salt marsh research shows that growing abundance of tiny shrimp infected by a microscopic parasite may portend future threats to humankind through disease.

• ['Fake fin' discovery reveals new ichthyosaur species](#) [周二, 10 10月 22:56]

An ichthyosaur first discovered in the 1970s but then dismissed and consigned to museum storerooms across the country has been re-examined and found to be a new species.

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ScienceDaily

周二, 24 10月 2017

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Latest Science News

Breaking science news and articles on global warming, extrasolar planets, stem cells, bird flu, autism, nanotechnology, dinosaurs, evolution -- the latest discoveries in astronomy, anthropology, biology, chemistry, climate and environment, computers, engineering, health and medicine, math, physics, psychology, technology, and more -- from the world's leading universities and research organizations.

- [**Gun deaths, injuries in California spike following Nevada gun shows**](#) [周二, 24 10月 06:27]

When gun shows are held in Nevada, gun-related deaths and injuries spike across the state line in California for at least the next two weeks. A new study examined gun deaths and injuries in California before and after gun shows in California and Nevada, and their results show a nearly 70 percent increase in deaths and injuries from firearms in California communities within convenient driving distance of Nevada gun shows.

- [**Brain patterns underlying mothers' responses to infant cries**](#) [周二, 24 10月 06:27]

Infant cries activate specific brain regions related to movement and speech, according to a study of mothers in 11 countries. The findings identify behaviors and underlying brain activities that are consistent among mothers from different cultures.

- [**To grasp water scarcity, researchers probe links between human and natural systems**](#) [周二, 24 10月 06:26]

Understanding the fine-level interactions between nature and people is essential in determining whether a region will suffer water scarcity in the future.

- [**Running on autopilot: Scientists find important new role for 'daydreaming' network**](#) [周二, 24 10月 06:26]

A brain network previously associated with daydreaming has been found to play an important role in allowing us to perform tasks on autopilot. Scientists showed that far from being just 'background activity', the so-called 'default mode network' may be essential to helping us perform routine tasks.

- [**Five new malaria targets that could lead to an effective vaccine**](#) [周二, 24 10月 06:26]

In the largest study of its kind, five new malaria vaccine targets have been discovered. Researchers studied the malaria parasite at its most vulnerable stage -- when invading human red blood cells -- and identified five targets that lead to a reduction in the parasite's ability to enter red blood cells.

- [**Why did the 2014 Oso, WA, landslide travel so far?**](#) [周二, 24 10月 06:25]

On Saturday, 22 March 2014, a devastating landslide roared across the North Fork of the Stillaguamish River, near Oso, Washington. The landslide killed 43 people as it plowed through the Steelhead Haven neighborhood. When it stopped, after crossing the river, the neighborhood, and State Route 530, the Oso landslide had traveled 1.4 kilometers.

- [**Florida needs more pet-friendly shelters**](#) [周二, 24 10月 06:25]

Florida needs more pet-friendly shelters, especially for older adults who represent 50 to 75 percent of deaths following disasters like hurricanes, according to a recent study.

- [**New asthma biomarkers identified from lung bacteria**](#) [周二, 24 10月 06:25]

New research suggests that the lung microbiome plays a significant role in asthma severity and response to treatment.

- [**Older Neanderthal survived with a little help**](#)

[from his friends](#) [周二, 24 10月 06:15]

An older Neanderthal from about 50,000 years ago, who had suffered multiple injuries and other degenerations, became deaf and must have relied on the help of others to avoid prey and survive well into his 40s, indicates a new analysis.

• [Archaeologists uncover cuneiform archive in Iraq's Kurdish region](#) [周二, 24 10月 06:03]

Archaeologists have made sensational finds in the Kurdistan region of northern Iraq. The researchers found a cuneiform archive of 93 clay tablets dating from 1250 BCE -- the period of the Middle Assyrian Empire. What the tablets record remains a mystery for the time being. The researchers will have to decipher them -- a long and difficult task.

• [People with autism at greater risk of attempting suicide](#) [周二, 24 10月 06:01]

People who show characteristics of autism are more at risk of attempting suicide, according to a new study.

• [Fruit-eating increases biodiversity](#) [周二, 24 10月 03:05]

By dispersing the seeds of plants, fruit-eating animals contribute to the possibility of increased plant speciation and thus biodiversity, investigators have discovered.

• [New magma pathways after giant lateral volcano collapses](#) [周二, 24 10月 02:55]

Giant lateral collapses are huge landslides occurring at the flanks of a volcano. Such collapses are rather common events during the evolution of a large volcanic edifice, often with dramatic consequences such as tsunami and volcano explosions. These catastrophic events interact with the magmatic activity of the volcano, as new research suggests.

• [Better sleep, less fear](#) [周二, 24 10月 02:09]

Higher quality sleep patterns are associated with reduced activity in brain regions involved in fear learning, according to a study of young adults. The results suggest that baseline sleep quality may be a useful

predictor of susceptibility to post-traumatic stress disorder (PTSD).

- [**New study shows how cells can be led down non-cancer path**](#) [周二, 24 10月 02:09]

As cells with a propensity for cancer break down food for energy, they reach a fork in the road: they can either continue energy production as healthy cells, or shift to the energy production profile of cancer cells. In a new study, researchers map out the molecular events that direct cells' energy metabolism down the cancerous path. Their findings could lead to ways to interrupt the process.

- [**Moment of impact: A journey into the Chicxulub Crater**](#) [周二, 24 10月 02:09]

When the Chicxulub asteroid slammed into Earth about 66 million years ago, it obliterated 80 percent of Earth's species, blasted out a crater 200 kilometers across, and signaled an abrupt end to the Cretaceous Period. The impact, its catastrophic effects, and its aftermath have engrossed scientists and the public alike since it was first discovered.

- [**Scientists discover superconductor with bounce**](#) [周二, 24 10月 02:09]

Scientists have discovered extreme 'bounce,' or super-elastic shape-memory properties in a material that could be applied for use as an actuator in the harshest of conditions, such as outer space, and might be the first in a whole new class of shape memory materials.

- [**New Peruvian bird species discovered by its song**](#) [周二, 24 10月 02:09]

A new species of bird from the heart of Peru remained undetected for years until researchers identified it by its unique song.

- [**Possible new anti-TB treatment path**](#) [周二, 24 10月 02:09]

As part of the long effort to improve treatment of tuberculosis (TB), microbiologists report that they have for the first time characterized a protein involved in making a glycolipid compound found in the TB cell wall, which is critical for the disease-causing Mycobacterium to become infectious.

- [**Better food choices near schools for healthier**](#)

[**teeth**](#) [周二, 24 10月 02:09]

There's something endearing about the crooked, gapped-tooth smiles of children whose permanent teeth are coming in. While it's normal for adult teeth to show up at very different times, should we expect the same good oral health conditions for all children at all times?

- [**Herbicide's link to Parkinson's disease**](#) [周二, 24 10月 02:07]

Scientists have revealed how oxidative stress explains a common herbicide's link to risk of Parkinson's disease.

- [**'Mind-reading' brain-decoding tech**](#) [周二, 24 10月 01:20]

Researchers have demonstrated how to decode what the human brain is seeing by using artificial intelligence to interpret fMRI scans from people watching videos, representing a sort of mind-reading technology.

- [**Study links mutations in notch gene to role in B cell cancers**](#) [周二, 24 10月 01:20]

In B cell tumors, mutated overactive versions of the Notch protein directly drive the expression of the Myc gene and many other genes that participate in B cell signaling pathways, researchers have found. Myc is a critical gene in governing cell proliferation and survival.

- [**Rethinking well-being and sustainability measurements from local to global scales**](#) [周二, 24 10月 01:20]

A new study suggests that standard ways of measuring well-being and sustainability in communities used by global organizations may be missing critical information and could lead to missteps in management actions. The article suggests alternative and complementary approaches that use indicators grounded in the values of a particular community.

- [**Smart birds: Canada geese give hunters the slip by hiding out in Chicago**](#) [周二, 24 10月 01:20]

It's open season for Canada geese in Illinois from mid-October to mid-January. Unfortunately for hunters, Canada geese are finding a new way to stay out of the line of fire. Rather than being 'sitting ducks' in a rural pond, they're setting up residence in the city. Ornithologists conducted a

recent study to try to find out why there were so many Canada geese in Chicago in the winter.

- [**Rising sea levels creating first Native American climate refugees**](#) [周二, 24 10月 01:20]

Rising sea levels and human activities are fast creating a 'worst case scenario' for Native Americans of the Mississippi Delta who stand to lose not just their homes, but their irreplaceable heritage, to climate change.

- [**Scientists update four key fundamental constants**](#) [周二, 24 10月 01:20]

Paving the way for transforming the world's measurement system, an international task force has determined updated values for four fundamental constants of nature.

- [**Drug can dramatically reduce weight of people with obesity**](#) [周二, 24 10月 01:19]

A drug that targets the appetite control system in the brain could bring about significant weight loss in people with clinical obesity, according to new research.

- [**Support for populist ideologies linked to feelings of disadvantage and national narcissism**](#) [周二, 24 10月 01:19]

People who perceive they are part of a disadvantaged group are more likely to have an unrealistic belief in the greatness of their nation and support populist ideologies, new research shows.

- [**Enough vitamin D when young associated with lower risk of diabetes-related autoimmunity**](#) [周二, 24 10月 01:19]

Getting enough vitamin D during infancy and childhood is associated with a reduced risk of islet autoimmunity among children at increased genetic risk for type 1 diabetes, according to a study.

- [**Scheme would make new high-capacity data caches 33 to 50 percent more efficient**](#) [周二, 24 10月 01:19]

A memory management scheme would increase by 33 to 50 percent the efficiency of data caches that use the massive new memory banks known as 'in-package DRAM.'

- [**Protein regulates vitamin A metabolic pathways, prevents inflammation**](#) [周二, 24 10月 01:19]

Researchers have discovered how uncontrolled vitamin A metabolism in the gut can cause harmful inflammation. The discovery links diet to inflammatory diseases, like Crohn's disease and inflammatory bowel syndromes, and could inform nutritional interventions.

- [**Antimicrobial gel could improve root canal results**](#) [周二, 24 10月 01:19]

The results of root canal treatments could improve because of an antimicrobial gel recently discovered and developed. A research team has developed an injectable antimicrobial gel that could disinfect a tooth during a root canal procedure.

- [**Scientists develop new theory of molecular evolution**](#) [周二, 24 10月 00:38]

Researchers have developed a new theory of molecular evolution, offering insights into how genes function, how the rates of evolutionary divergence can be predicted, and how harmful mutations arise at a basic level.

- [**Optical communication coming to silicon chips**](#) [周二, 24 10月 00:38]

Ultrathin films of a semiconductor that emits and detects light can be stacked on top of silicon wafers, researchers report in a study that could help bring optical communication onto silicon chips.

- [**So my brain amyloid level is elevated: What does that mean?**](#) [周二, 24 10月 00:38]

Testing drugs to prevent or delay the onset of Alzheimer's dementia and using them in the clinic will mean identifying and informing adults who have a higher risk of Alzheimer's but are still cognitively normal. A new study has shed light on how seniors cope with such information.

• [**Exploring disease predisposition to deliver personalized medicine**](#) [周二, 24 10月 00:38]

Exploring the links between diseases and tissue-specific gene activity, geneticists have been able to build a model that constitutes a first step towards the identification of specific sequences in the non-coding genome signalling their pathogenicity in the context of a specific disease. In a second study, they went even further by associating particular disease risks - including schizophrenia, cardiovascular disease and diabetes - to the variability of genome activity in various cell types.

• [**More iron in lakes is making them brown, study shows**](#) [周二, 24 10月 00:37]

The iron concentration in lakes is increasing in many parts of northern Europe. This has been shown in a study in which researchers in Sweden examined 23 years of data from 10 countries. High iron levels contribute to browner water; furthermore, iron binds environmental toxins such as lead and arsenic.

• [**New gene linked to debilitating lung disease**](#) [周二, 24 10月 00:37]

Health scientists have heralded the discovery of a gene associated with lung fibrosis as 'a potential new avenue of treatment for further research into this terrible disease.'

• [**Patients at risk over failure to recognize important diabetes subtype**](#) [周二, 24 10月 00:37]

The health of people with diabetes is being put at risk due to the failure of doctors to recognize which type of diabetes they have, a new study.

• [**How hospitals respond when it's uncertain if the newborn is a boy or a girl**](#) [周二, 24 10月 00:37]

When babies are born with atypical sex anatomy, the hospital's response has a major impact on a family's experience and decisions about sometimes irreversible procedures.

• [**These shrews have heads that shrink with the**](#)

[season](#) [周二, 24 10月 00:36]

If any part of the body would seem ill equipped to shrink, it would probably be the head and skull. And, yet, researchers have found that the skulls of red-toothed shrews do shrink in anticipation of winter, by up to 20 percent. As spring approaches, their heads grow again to approach their previous size.

. [Resistive memory components the computer industry can't resist](#) [周二, 24 10月 00:36]

For years, the computer industry has sought memory technologies with higher endurance, lower cost, and better energy efficiency than commercial flash memories. Now, an international collaboration of scientists may have solved many of those challenges with the discovery of thin, molecular films that can store information.

. [Reduced impact logging still harms biodiversity in tropical rainforests](#) [周二, 24 10月 00:35]

Even low levels of logging in the Amazon rainforest may lead to great losses in biodiversity, new research has found. The research looked at 34 different plots in the state of Pará -- a focal point for Amazon protection efforts in the last decades. They found that even low levels of logging led to negative effects on dung beetle diversity and rates of dung beetle-mediated

. [Scientists warn that saline lakes in dire situation worldwide](#) [周二, 24 10月 00:35]

Saline lakes around the world are shrinking in size at alarming rates. But what -- or who -- is to blame? Lakes like Utah's Great Salt Lake, Asia's Aral Sea, the Dead Sea in Jordan and Israel, China's huge Lop Nur and Bolivia's Lake Popo are just a few that are in peril. These lakes and others like them are suffering massive environmental problems according to a group of scientists and water managers.

. [Mongolian microfossils point to the rise of animals on Earth](#) [周二, 24 10月 00:35]

A cache of embryo-like microfossils has been discovered in northern Mongolia that may shed light on questions about the long-ago shift from microbes to animals on Earth.

• [**Transparent solar technology represents 'wave of the future'**](#) [周二, 24 10月 00:35]

See-through solar materials that can be applied to windows represent a massive source of untapped energy and could harvest as much power as bigger, bulkier rooftop solar units, scientists report.

• [**How the brain learns to fear: New understanding**](#) [周二, 24 10月 00:35]

What happens in the brain when we learn that fire is very hot and can hurt us? It's the kind of learning that results from the association of a sensory stimulus and the perception of threat. New research in mice suggests that the accepted understanding of that critical operation is incorrect in important respects.

• [**Boost for lipid research: Researchers facilitate lipid data analysis**](#) [周二, 24 10月 00:35]

Illnesses such as cancer and multiple sclerosis may also be associated with lipids. Disorders are difficult to assess due to the diversity of lipids. Scientists now present a new tool for the analysis of lipids.

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Brain patterns underlying mothers' responses to infant cries: Behaviors and brain activity consistent between mothers from different countries -- ScienceDaily

Infant cries activate specific brain regions related to movement and speech, according to a National Institutes of Health study of mothers in 11 countries. The findings, led by researchers at NIH's Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), identify behaviors and underlying brain activities that are consistent among mothers from different cultures. Understanding these reactions may help in identifying and treating caregivers at risk for child maltreatment and other problematic behaviors.

The study team conducted a series of behavioral and brain imaging studies using functional magnetic resonance imaging (fMRI). In a group of 684 new mothers in Argentina, Belgium, Brazil, Cameroon,

France, Israel, Italy, Japan, Kenya, South Korea and the United States, researchers observed and recorded one hour of interaction between the mothers and their 5-month-old babies at home. The team analyzed whether mothers responded to their baby's cries by showing affection, distracting, nurturing (like feeding or diapering), picking up and holding, or talking. Regardless of which country they came from, mothers were likely to pick up and hold or talk to their crying infant.

Through fMRI studies of other groups of women, the team found that infant cries activated similar brain regions in new and experienced mothers: the supplementary motor area, which is associated with the intention to move and speak; the inferior frontal regions, which are involved in the production of speech; and the superior temporal regions that are linked to sound processing.

Overall, the findings suggest that mothers' responses to infant cries are hard-wired and generalizable across cultures. The study also builds upon earlier work showing that women's and men's brains respond differently to infant cries.

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To grasp water scarcity, researchers probe links between human and natural systems -- ScienceDaily

Understanding the fine-level interactions between nature and people is essential in determining whether a region will suffer water scarcity in the future. That's a key finding of a study titled "Finding Water Scarcity Amid Abundance Using Human-Natural System Models," to be published next week in *Proceedings of the National Academy of Sciences*.

Up to 2 billion people around the world face water shortages now and in the future, said the study's lead author, William Jaeger, an economist in Oregon State University's College of Agricultural Sciences.

Emerging scarcities are tied to factors such as growing populations, rising standards of living and climate change.

"Recent droughts across the West have underscored the vulnerability of even highly developed economies to water scarcity," Jaeger said. "And climate change will

only heighten the need to anticipate water shortages worldwide." It's a daunting task, he said, because the interactions between natural water supply and human water demands are complex, and involve "linkages and feedbacks" that are difficult to anticipate.

The paper draws on a large 6-year modeling study, called Willamette Water 2100, that projected water scarcity in the Willamette River basin of western Oregon through the year 2100. Researchers developed a computer model called Willamette Envision to represent the fine-level interactions between the basin's natural water supply and the human system's water demands.

How fine a level? "We modeled daily flows of water down to the stream reach and parcel level," Jaeger said. "We modeled the quantity of water diverted down to a given farmer's field on a given day, reflecting what that farmer had planted and when, when it last rained, and taking account of that farmer's likely profits and water right priority. That level of detail is rare in a model, especially having similar detail for both the natural and human parts of the system."

Anne Nolin, OSU hydrologist and co-researcher on the

project, said, "We learned things from this coupled modeling that we couldn't have learned from projections from either natural dynamics or human systems alone."

Willamette Water 2100 modeled 20 different scenarios based on a variety of assumptions, including assumptions of low, medium and high population and income growth, and low, medium and high warming from climate change.

A key finding of the study was the importance of economics for understanding water scarcity. "Water is highly abundant in the basin overall," Jaeger said, "But because of the cost to store and transport water, scarcity can occur at specific locations or times, even though excess water can be found at other times or in other locations."

The modeling turned up some counterintuitive findings, Jaeger said. One was that urban expansion could result in less overall water use, rather than more - because an acre of houses consumes less water than an acre of irrigated fields. "Urban growth and expansion means increased water demand," Jaeger said, "but our model showed that some or all of this

increase could be offset when nearby irrigation is displaced."

Another eye-opening finding was that the amount of water consumed by forests, and the water left in the streams to protect habitat of threatened fish species under federal law, far exceeds the quantities of water consumed in cities and farms.

In modeling the effects of climate change -- an obvious external factor in water scarcity worldwide -- the researchers found, again, that the human components of the model -- economic realities and society's laws and institutions that can create or block opportunities -- make a big difference in where, when and how severely the impacts will be felt.

"You wouldn't discern the importance of these things from a 10,000-foot view of water in the Willamette basin," Jaeger said. "That's why it's so crucial to look at those fine-level interactions of the human with the natural system."

Jaeger hopes Willamette Water 2100 will be a model -- in the largest sense of the word -- for other regions as they anticipate and mitigate threats from water scarcity.

"Our project is specific to the Willamette Basin," he said, "but we think many of our insights could help people in other parts of the world come to grips with the complexity of their own water scarcity issues."

Story Source:

Materials provided by [Oregon State University](#). *Note: Content may be edited for style and length.*

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Running on autopilot: Scientists find important new role for 'daydreaming' network -- ScienceDaily

A brain network previously associated with daydreaming has been found to play an important role in allowing us to perform tasks on autopilot. Scientists at the University of Cambridge showed that far from being just 'background activity', the so-called 'default mode network' may be essential to helping us perform routine tasks.

When we are performing tasks, specific regions of the brain become more active -- for example, if we are moving, the motor cortex is engaged, while if we are looking at a picture, the visual cortex will be active. But what happens when we are apparently doing nothing?

In 2001, scientists at the Washington University School of Medicine found that a collection of brain regions appeared to be more active during such states of rest. This network was named the 'default mode network'

(DMN). While it has since been linked to, among other things, daydreaming, thinking about the past, planning for the future, and creativity, its precise function is unclear.

Abnormal activity in the DMN has been linked to an array of disorders including Alzheimer's disease, schizophrenia, attention-deficit/hyperactivity disorder (ADHD) and disorders of consciousness. However, scientists have been unable to show a definitive role in human cognition.

Now, in research published today in the *Proceedings of National Academy of Sciences*, scientists at the University of Cambridge have shown that the DMN plays an important role in allowing us to switch to 'autopilot' once we are familiar with a task.

In the study, 28 volunteers took part in a task while lying inside a magnetic resonance imaging (MRI) scanner. Functional MRI (fMRI) measures changes in brain oxygen levels as a proxy for neural activity.

In the task, participants were shown four cards and asked to match a target card (for example, two red diamonds) to one of these cards. There were three

possible rules -- matching by colour, shape or number. Volunteers were not told the rule, but rather had to work it out for themselves through trial and error.

The most interesting differences in brain activity occurred when comparing the two stages of the task -- acquisition (where the participants were learning the rules by trial and error) and application (where the participants had learned the rule and were now applying it). During the acquisition stage, the dorsal attention network, which has been associated with the processing of attention-demanding information, was more active. However, in the application stage, where participants utilised learned rules from memory, the DMN was more active.

Crucially, during the application stage, the stronger the relationship between activity in the DMN and in regions of the brain associated with memory, such as the hippocampus, the faster and more accurately the volunteer was able to perform the task. This suggested that during the application stage, the participants could efficiently respond to the task using the rule from memory.

"Rather than waiting passively for things to happen to

us, we are constantly trying to predict the environment around us," says Dr Deniz Vatansever, who carried out the study as part of his PhD at the University of Cambridge and who is now based at the University of York.

"Our evidence suggests it is the default mode network that enables us do this. It is essentially like an autopilot that helps us make fast decisions when we know what the rules of the environment are. So for example, when you're driving to work in the morning along a familiar route, the default mode network will be active, enabling us to perform our task without having to invest lots of time and energy into every decision."

"The old way of interpreting what's happening in these tasks was that because we know the rules, we can daydream about what we're going to have for dinner later and the DMN kicks in," adds senior author Dr Emmanuel Stamatakis from the Division of Anaesthesia at the University Of Cambridge. "In fact, we showed that the DMN is not a bystander in these tasks: it plays an integral role in helping us perform them."

This new study supports an idea expounded upon by

Daniel Kahneman, Nobel Memorial Prize in Economics laureate 2002, in his book *Thinking, Fast and Slow*, that there are two systems that help us make decisions: a rational system that helps us reach calculated decisions, and a fast system that allows us to make intuitive decisions -- the new research suggests this latter system may be linked with the DMN.

The researchers believe their findings have relevance to brain injury, particularly following traumatic brain injury, where problems with memory and impulsivity can substantially compromise social reintegration. They say the findings may also have relevance for mental health disorders, such as addiction, depression and obsessive compulsive disorder, where particular thought patterns drive repeated behaviours, and the mechanisms of anaesthetic agents and other drugs on the brain.

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Five new malaria targets that could lead to an effective vaccine: Scientists have identified five targets that reduce the parasite's ability to invade red blood cells -- ScienceDaily

In the largest study of its kind, five new malaria vaccine targets have been discovered by scientists at the Wellcome Trust Sanger Institute and their collaborators. Researchers studied the malaria parasite at its most vulnerable stage -- when invading human red blood cells -- and identified five targets that lead to a reduction in the parasite's ability to enter red blood cells.

The results, published today (23 October) in the *Proceedings of the National Academy of Sciences (PNAS)* show that future malaria vaccines may be most effective if they target multiple parasite factors.

Nearly half of the world's population is at risk of malaria and more than 200 million people are infected each year. The disease caused the deaths of almost half

a million people globally in 2015*.

Despite the large number of deaths, there is no highly effective vaccine currently available for malaria. Over the last 50 years, most attempts to develop vaccines have only focussed on single targets.

In the new study, scientists have discovered five targets for future malaria vaccine development, which they suggest should be targeted in combination. An effective vaccine is urgently needed due to an expanding problem of drug resistance in the parasite.

The team screened 29 potential targets that were all thought to play a role in the parasite's ability to invade human red blood cells. Red blood cell invasion is an essential step in the parasite's lifecycle, and is a stage when the parasite is at its most vulnerable and exposed to the immune system.

Researchers raised rabbit antibodies against all 29 targets, then tested the antibodies against two different strains of the deadly *Plasmodium falciparum* malaria, one from Africa and one from Asia. Of the 29 antibodies, the team discovered five that reduced the parasite's ability to invade red blood cells in both

malaria strains.

Dr Gavin Wright, an author from the Wellcome Trust Sanger Institute, said: "Producing a successful vaccine against parasites is challenging because they are very complex organisms with many components, making it difficult to know which ones to target. By studying the parasite's genome and working backwards, in a process known as reverse vaccinology, we have discovered five vaccine targets which, if combined, show promise for further development."

People naturally exposed to malaria can develop immunity over time. The team worked with collaborators in the US and Mali to see whether the five antibodies they identified were associated with natural protection against malaria in people.

Scientists found that alone, no single antibody gave protection against malaria in people, however combinations of the antibodies did protect against the parasite.

To investigate what was happening at the cellular level, researchers used video microscopy to watch the parasite attempt to invade red blood cells with and

without the presence of antibodies. The team discovered that the different antibodies were attacking the parasite at different steps as it invaded the red blood cell. Scientists found that pairing antibodies that each acted at different steps led to a more effective combination.

Professor Pietro Cicutta, an author from the University of Cambridge, said: "Using video microscopy, we were able to see the different antibodies attacking the parasite at various stages as it attempted to invade red blood cells. These results give insight into a new, synergistic view of vaccine development. We believe a new vaccine would be the most effective if it put roadblocks at several points along the parasite's path into the red blood cells."

Dr Julian Rayner, lead author from the Wellcome Trust Sanger Institute, said: "This study was only possible due to the scale of studying multiple vaccine targets, and the huge collaborative effort. By bringing together multiple areas of expertise, from genomics to large field studies of patients in Mali, and down to advanced video microscopy observing individual parasites, we have discovered several new vaccine targets that warrant further investigation. It's a great example of

collaborative international science and its potential impact.

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All Top News

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- [**Older Neanderthal survived with a little help from his friends**](#) [周二, 24 10月 06:15]

An older Neanderthal from about 50,000 years ago, who had suffered multiple injuries and other degenerations, became deaf and must have relied on the help of others to avoid prey and survive well into his 40s, indicates a new analysis.

- [**Archaeologists uncover cuneiform archive in Iraq's Kurdish region**](#) [周二, 24 10月 06:03]

Archaeologists have made sensational finds in the Kurdistan region of northern Iraq. The researchers found a cuneiform archive of 93 clay tablets dating from 1250 BCE -- the period of the Middle Assyrian Empire. What the tablets record remains a mystery for the time being. The researchers will have to decipher them -- a long and difficult task.

- [**'Mind-reading' brain-decoding tech**](#) [周二, 24 10月 01:20]

Researchers have demonstrated how to decode what the human brain is seeing by using artificial intelligence to interpret fMRI scans from people watching videos, representing a sort of mind-reading technology.

- [**Smart birds: Canada geese give hunters the slip by hiding out in Chicago**](#) [周二, 24 10月 01:20]

It's open season for Canada geese in Illinois from mid-October to mid-January. Unfortunately for hunters, Canada geese are finding a new way to stay out of the line of fire. Rather than being 'sitting ducks' in a rural pond, they're setting up residence in the city. Ornithologists conducted a recent study to try to find out why there were so many Canada geese in Chicago in the winter.

- [**Drug can dramatically reduce weight of people with obesity**](#) [周二, 24 10月 01:19]

A drug that targets the appetite control system in the brain could bring about significant weight loss in people with clinical obesity, according to new research.

- [**Scientists warn that saline lakes in dire situation worldwide**](#) [周二, 24 10月 00:35]

Saline lakes around the world are shrinking in size at alarming rates. But what -- or who -- is to blame? Lakes like Utah's Great Salt Lake, Asia's Aral Sea, the Dead Sea in Jordan and Israel, China's huge Lop Nur and Bolivia's Lake Popo are just a few that are in peril. These lakes and others like them are suffering massive environmental problems according to a group of scientists and water managers.

- [**Mongolian microfossils point to the rise of animals on Earth**](#) [周二, 24 10月 00:35]

A cache of embryo-like microfossils has been discovered in northern Mongolia that may shed light on questions about the long-ago shift from microbes to animals on Earth.

- [**Transparent solar technology represents 'wave of the future'**](#) [周二, 24 10月 00:35]

See-through solar materials that can be applied to windows represent a massive source of untapped energy and could harvest as much power as bigger, bulkier rooftop solar units, scientists report.

- [**Western US Quake? Fifty simulations of the 'Really Big One' show how a 9.0 Cascadia earthquake could play out**](#) [周一, 23 10月 22:18]

The largest number yet of detailed simulations for how a Cascadia Subduction Zone earthquake might play out provides a clearer picture of what the region can expect when the fault unleashes a 9.0 earthquake.

- [**Crops evolving ten millennia before experts**](#)

[thought](#) [周一, 23 10月 21:49]

Ancient hunter-gatherers began to systemically affect the evolution of crops up to thirty thousand years ago -- around ten millennia before experts previously thought -- according to new research.

• [Taming 'wild' electrons in graphene](#) [周一, 23 10月 21:44]

Graphene -- a one-atom-thick layer of carbon -- is a better conductor than copper and is very promising for electronic devices, but with one catch: Electrons that move through it can't be stopped. Until now, that is. Scientists have learned how to tame the unruly electrons in graphene, paving the way for the ultra-fast transport of electrons with low loss of energy in novel systems.

• [Pollution responsible for 16 percent of early deaths globally](#) [周六, 21 10月 06:25]

Diseases caused by pollution were responsible in 2015 for an estimated 9 million premature deaths -- 16 percent of all deaths worldwide, according to a report.

• [Mountain glaciers shrinking across Western U.S.](#) [周六, 21 10月 06:25]

A technique using satellites to create twice-yearly elevation maps of US mountain glaciers provides new insight into thinning of glaciers in the lower 48 states.

• [Life goes on for marine ecosystems after cataclysmic mass extinction](#) [周五, 20 10月 21:22]

One of the largest global mass extinctions did not fundamentally change marine ecosystems, scientists have found.

• [NASA's MAVEN mission finds Mars has a twisted magnetic tail](#) [周五, 20 10月 06:18]

Mars has an invisible magnetic 'tail' that is twisted by interaction with the solar wind, according to new research using data from NASA's MAVEN spacecraft.

- [**New NASA study improves search for habitable worlds**](#) [周五, 20 10月 06:18]

New NASA research is helping to refine our understanding of candidate planets beyond our solar system that might support life.

- [**Climate shifts shorten marine food chain off California**](#) [周五, 20 10月 05:16]

Environmental disturbances such as El Niño shake up the marine food web off Southern California, new research shows, countering conventional thinking that the hierarchy of who-eats-who in the ocean remains largely constant over time.

- [**Field trips of the future?**](#) [周五, 20 10月 04:42]

A biologist examines the benefits and drawbacks of virtual and augmented reality in teaching environmental science.

- [**DNA damage found in veterans with Gulf War illness**](#) [周五, 20 10月 04:41]

Researchers say they have found the 'first direct biological evidence' of damage in veterans with Gulf War illness to DNA within cellular structures that produce energy in the body.

- [**New tyrannosaur fossil is most complete found in Southwestern US**](#) [周五, 20 10月 02:30]

A fossilized skeleton of a tyrannosaur discovered in Utah's Grand Staircase-Escalante National Monument was airlifted by helicopter Oct 15, and delivered to the Natural History Museum of Utah where it will be uncovered, prepared, and studied. The fossil is approximately 76 million years old and is likely an individual of the species *Teratophoneus curriei*.

- [**Ancient DNA offers new view on saber-toothed cats' past**](#) [周五, 20 10月 02:30]

Researchers who've analyzed the complete mitochondrial genomes from ancient samples representing two species of saber-toothed cats have a new take on the animals' history over the last 50,000 years. The data

suggest that the saber-toothed cats shared a common ancestor with all living cat-like species about 20 million years ago. The two saber-toothed cat species under study diverged from each other about 18 million years ago.

- [**Evolution in your back garden: Great tits may be adapting their beaks to birdfeeders**](#) [周五, 20 10月 02:30]

A British enthusiasm for feeding birds may have caused UK great tits to have evolved longer beaks than their European counterparts, according to new research. The findings identify for the first time the genetic differences between UK and Dutch great tits which researchers were then able to link to longer beaks in UK birds.

- [**H7N9 influenza is both lethal and transmissible in animal model for flu**](#) [周五, 20 10月 02:30]

In 2013, an influenza virus began circulating among poultry in China. It caused several waves of human infection and as of late July 2017, nearly 1,600 people had tested positive for avian H7N9. Nearly 40 percent of those infected had died. In 2017, a medical researcher received a sample of H7N9 virus isolated from a patient in China who had died of the flu. He and his research team subsequently began work to characterize and understand it.

- [**Liquid metal discovery ushers in new wave of chemistry and electronics**](#) [周五, 20 10月 02:30]

Researchers use liquid metal to create atom-thick 2-D never before seen in nature. The research could transform how we do chemistry and could also be applied to enhance data storage and make faster electronics.

- [**Six degrees of separation: Why it is a small world after all**](#) [周四, 19 10月 23:10]

This study examines how small-world networks occur within bigger and more complex structures.

- [**Itsy bitsy spider: Fear of spiders and snakes is deeply embedded in us**](#) [周四, 19 10月 23:09]

Snakes and spiders evoke fear and disgust in many people, even in developed countries where hardly anybody comes into contact with them. Until now, there has been debate about whether this aversion is innate or learnt. Scientists have recently discovered that it is hereditary: Even babies feel stressed when seeing these creatures - long before they could have learnt this reaction.

- [**A mosquito's secret weapon: a light touch and strong wings**](#) [周四, 19 10月 22:10]

How do mosquitoes land and take off without our noticing? Using high-speed video cameras, researchers have found part of the answer: mosquitoes' long legs allow them to slowly and gently push off, but their wings provide the majority of the lift, even when fully laden with a blood meal. For comparison, mosquitoes push off with forces much less than those of an escaping fruit fly.

- [**Noxious ice cloud on Saturn's moon Titan**](#) [周四, 19 10月 22:10]

Researchers with NASA's Cassini mission found evidence of a toxic hybrid ice in a wispy cloud high above the south pole of Saturn's largest moon, Titan.

- [**Scientists see order in complex patterns of river deltas**](#) [周四, 19 10月 22:10]

River deltas, with their intricate networks of waterways, coastal barrier islands, wetlands and estuaries, often appear to have been formed by random processes, but scientists see order in the apparent chaos.

- [**Scientists pinpoint jealousy in the monogamous mind**](#) [周四, 19 10月 22:10]

Scientists find that in male titi monkeys, jealousy is associated with heightened activity in the cingulate cortex, an area of the brain associated with social pain in humans, and the lateral septum, associated with pair bond formation in primates. A better understanding of jealousy may provide important clues on how to approach health and welfare problems such as addiction and domestic violence, as well as autism.

- **[Slow Internet? New technology to speed up home broadband dramatically](#)** [周四, 19 10月 22:10]

Slow internet speeds and the Internet 'rush hour' -- the peak time when data speeds drop by up to 30 percent -- could be history with new hardware that provides consistently high-speed broadband connectivity.

- **[Fossil coral reefs show sea level rose in bursts during last warming](#)** [周四, 19 10月 22:09]

Scientists have discovered that Earth's sea level did not rise steadily when the planet's glaciers last melted during a period of global warming; rather, sea level rose sharply in punctuated bursts.

- **[Dogs are more expressive when someone is looking](#)** [周四, 19 10月 22:09]

Dogs produce more facial expressions when humans are looking at them, according to new research.

- **[More than 75 percent decrease in total flying insect biomass over 27 years across Germany](#)** [周四, 19 10月 22:09]

The total flying insect biomass decreased by more than 75 percent over 27 years in protected areas in Germany, according to a new study.

- **[Salmon sex linked to geological change](#)** [周四, 19 10月 22:08]

It turns out that sex can move mountains. Researchers have found that the mating habits of salmon can alter the profile of stream beds, affecting the evolution of an entire watershed. The study is one of the first to quantitatively show that salmon can influence the shape of the land.

- **[Want to control your dreams? Here's how you can](#)** [周四, 19 10月 22:08]

New research has found that a specific combination of techniques will increase people's chances of having lucid dreams, in which the dreamer is aware they're dreaming while it's still happening and can control the experience.

- [**More teens than ever aren't getting enough sleep**](#)

[周四, 19 10月 22:04]

Researchers found that about 40 percent of adolescents in 2015 slept less than 7 hours a night, which is 58 percent more than in 1991 and 17 percent more than in 2009. They further learned that the more time young people reported spending online, the less sleep they got. Teens who spent 5 hours a day online were 50 percent more likely to not sleep enough than their peers who only spent an hour online each day.

- [**Worldwide change in shallow reef ecosystems predicted as waters warm**](#)

[周四, 19 10月 03:18]

A new study based on the first global survey of marine life by scuba divers has provided fresh insights into how climate change is affecting the distribution of marine life. The research predicts that as the oceans warm fish -- which appear to be superior predators in warm water -- will extend their ranges away from the equator and cause a decline in the diversity of invertebrates such as crabs, lobsters, sea urchins and whelks.

- [**Scientists dig into the origin of organics on dwarf planet Ceres**](#)

[周四, 19 10月 03:18]

Since NASA's Dawn spacecraft detected localized organic-rich material on Ceres, scientists have been digging into the data to explore different scenarios for its origin. After considering the viability of comet or asteroid delivery, the preponderance of evidence suggests the organics are most likely native to Ceres.

- [**Understanding the coevolving web of life as a network**](#)

[周四, 19 10月 01:32]

Coevolution, which occurs when species interact and adapt to each other, is often studied in the context of pair-wise interactions between mutually beneficial symbiotic partners. But many species have mutualistic interactions with multiple partners, leading to complex networks of interacting species.

- [**Nature or nurture? Innate social behaviors in the mouse brain**](#)

[周四, 19 10月 01:29]

The brain circuitry that controls innate, or instinctive, behaviors such as mating and fighting was thought to be genetically hardwired. Not so, neuroscientists now say.

• [**Inflammation trains the skin to heal faster**](#) [周四, 19 10月 01:28]

Stem cells in the skin remember an injury, helping them close recurring wounds faster, researchers have found. The discovery could advance research and treatment of psoriasis and other inflammatory diseases.

• [**Petals produce a 'blue halo' that helps bees find flowers**](#) [周四, 19 10月 01:28]

Latest research has found that several common flower species have nanoscale ridges on the surface of their petals that meddle with light when viewed from certain angles.

• [**Stiff fibers spun from slime**](#) [周三, 18 10月 23:35]

Nanoparticles from the secretion of velvet worms form recyclable polymer fibers.

• [**Potential human habitat located on the moon**](#) [周三, 18 10月 22:43]

A new study confirms the existence of a large open lava tube in the Marius Hills region of the moon, which could be used to protect astronauts from hazardous conditions on the surface.

• [**Ancient preen oil: Researchers discover 48-million-year-old lipids in a fossil bird**](#) [周三, 18 10月 21:12]

As a rule, soft parts do not withstand the ravages of time; hence, the majority of vertebrate fossils consist only of bones. Under these circumstances, a new discovery from the UNESCO World Heritage Site “Messel Pit” near Darmstadt in Germany comes as an even bigger surprise: a 48-million-year old skin gland from a bird, containing lipids of the same age. The oldest lipids ever recorded in a fossil vertebrate were used by the bird to preen its plumage.

• [**Battling flames increases firefighters' exposure to carcinogens**](#) [周三, 18 10月 21:02]

The threat of getting burned by roaring flames is an obvious danger of firefighting, but other health risks are more subtle. For example, firefighters have been found to develop cancer at higher rates than the general population. Now researchers have measured how much firefighters' exposure to carcinogens and other harmful compounds increases when fighting fires. Their study also points to one possible way to reduce that exposure.

[**Navigational view of the brain thanks to powerful X-rays**](#) [周三, 18 10月 04:37]

Imagine Google Earth with only the street view and a far-away satellite view but not much of a map view. Brain imaging, for the most part, has been missing just that, and a lot of research on how the brain computes happens on that map-like level. New imaging tackles this special view of the brain with the highest-energy X-rays in the country that illuminate thick sections of a mouse brain.

[**New research opens the door to 'functional cure' for HIV**](#) [周三, 18 10月 03:30]

Scientists have for the first time shown that a novel compound effectively suppresses production of the virus in chronically infected cells.

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Health News

Top stories featured on ScienceDaily's Health & Medicine, Mind & Brain, and Living Well sections.

- [**Gun deaths, injuries in California spike following Nevada gun shows**](#) [周二, 24 10月 06:27]

When gun shows are held in Nevada, gun-related deaths and injuries spike across the state line in California for at least the next two weeks. A new study examined gun deaths and injuries in California before and after gun shows in California and Nevada, and their results show a nearly 70 percent increase in deaths and injuries from firearms in California communities within convenient driving distance of Nevada gun shows.

- [**Brain patterns underlying mothers' responses to infant cries**](#) [周二, 24 10月 06:27]

Infant cries activate specific brain regions related to movement and speech, according to a study of mothers in 11 countries. The findings identify behaviors and underlying brain activities that are consistent among mothers from different cultures.

- [**To grasp water scarcity, researchers probe links between human and natural systems**](#) [周二, 24 10月 06:26]

Understanding the fine-level interactions between nature and people is essential in determining whether a region will suffer water scarcity in the future.

- [**Running on autopilot: Scientists find important new role for 'daydreaming' network**](#) [周二, 24 10月 06:26]

A brain network previously associated with daydreaming has been found

to play an important role in allowing us to perform tasks on autopilot. Scientists showed that far from being just 'background activity', the so-called 'default mode network' may be essential to helping us perform routine tasks.

- [**Five new malaria targets that could lead to an effective vaccine**](#) [周二, 24 10月 06:26]

In the largest study of its kind, five new malaria vaccine targets have been discovered. Researchers studied the malaria parasite at its most vulnerable stage -- when invading human red blood cells -- and identified five targets that lead to a reduction in the parasite's ability to enter red blood cells.

- [**Florida needs more pet-friendly shelters**](#) [周二, 24 10月 06:25]

Florida needs more pet-friendly shelters, especially for older adults who represent 50 to 75 percent of deaths following disasters like hurricanes, according to a recent study.

- [**New asthma biomarkers identified from lung bacteria**](#) [周二, 24 10月 06:25]

New research suggests that the lung microbiome plays a significant role in asthma severity and response to treatment.

- [**People with autism at greater risk of attempting suicide**](#) [周二, 24 10月 06:01]

People who show characteristics of autism are more at risk of attempting suicide, according to a new study.

- [**Better sleep, less fear**](#) [周二, 24 10月 02:09]

Higher quality sleep patterns are associated with reduced activity in brain regions involved in fear learning, according to a study of young adults. The results suggest that baseline sleep quality may be a useful predictor of susceptibility to post-traumatic stress disorder (PTSD).

- [**New study shows how cells can be led down non-cancer path**](#) [周二, 24 10月 02:09]

As cells with a propensity for cancer break down food for energy, they

reach a fork in the road: they can either continue energy production as healthy cells, or shift to the energy production profile of cancer cells. In a new study, researchers map out the molecular events that direct cells' energy metabolism down the cancerous path. Their findings could lead to ways to interrupt the process.

- [**Possible new anti-TB treatment path**](#) [周二, 24 10月 02:09]

As part of the long effort to improve treatment of tuberculosis (TB), microbiologists report that they have for the first time characterized a protein involved in making a glycolipid compound found in the TB cell wall, which is critical for the disease-causing Mycobacterium to become infectious.

- [**Better food choices near schools for healthier teeth**](#) [周二, 24 10月 02:09]

There's something endearing about the crooked, gapped-tooth smiles of children whose permanent teeth are coming in. While it's normal for adult teeth to show up at very different times, should we expect the same good oral health conditions for all children at all times?

- [**Herbicide's link to Parkinson's disease**](#) [周二, 24 10月 02:07]

Scientists have revealed how oxidative stress explains a common herbicide's link to risk of Parkinson's disease.

- [**'Mind-reading' brain-decoding tech**](#) [周二, 24 10月 01:20]

Researchers have demonstrated how to decode what the human brain is seeing by using artificial intelligence to interpret fMRI scans from people watching videos, representing a sort of mind-reading technology.

- [**Study links mutations in notch gene to role in B cell cancers**](#) [周二, 24 10月 01:20]

In B cell tumors, mutated overactive versions of the Notch protein directly drive the expression of the Myc gene and many other genes that participate in B cell signaling pathways, researchers have found. Myc is a critical gene in governing cell proliferation and survival.

- [**Rethinking well-being and sustainability**](#)

[measurements from local to global scales](#) [周二, 24 10月 01:20]

A new study suggests that standard ways of measuring well-being and sustainability in communities used by global organizations may be missing critical information and could lead to missteps in management actions. The article suggests alternative and complementary approaches that use indicators grounded in the values of a particular community.

• [Drug can dramatically reduce weight of people with obesity](#) [周二, 24 10月 01:19]

A drug that targets the appetite control system in the brain could bring about significant weight loss in people with clinical obesity, according to new research.

• [Support for populist ideologies linked to feelings of disadvantage and national narcissism](#) [周二, 24 10月 01:19]

People who perceive they are part of a disadvantaged group are more likely to have an unrealistic belief in the greatness of their nation and support populist ideologies, new research shows.

• [Enough vitamin D when young associated with lower risk of diabetes-related autoimmunity](#) [周二, 24 10月 01:19]

Getting enough vitamin D during infancy and childhood is associated with a reduced risk of islet autoimmunity among children at increased genetic risk for type 1 diabetes, according to a study.

• [Protein regulates vitamin A metabolic pathways, prevents inflammation](#) [周二, 24 10月 01:19]

Researchers have discovered how uncontrolled vitamin A metabolism in the gut can cause harmful inflammation. The discovery links diet to inflammatory diseases, like Crohn's disease and inflammatory bowel syndromes, and could inform nutritional interventions.

• [Antimicrobial gel could improve root canal results](#) [周二, 24 10月 01:19]

The results of root canal treatments could improve because of an

antimicrobial gel recently discovered and developed. A research team has developed an injectable antimicrobial gel that could disinfect a tooth during a root canal procedure.

- [**Scientists develop new theory of molecular evolution**](#) [周二, 24 10月 00:38]

Researchers have developed a new theory of molecular evolution, offering insights into how genes function, how the rates of evolutionary divergence can be predicted, and how harmful mutations arise at a basic level.

- [**So my brain amyloid level is elevated: What does that mean?**](#) [周二, 24 10月 00:38]

Testing drugs to prevent or delay the onset of Alzheimer's dementia and using them in the clinic will mean identifying and informing adults who have a higher risk of Alzheimer's but are still cognitively normal. A new study has shed light on how seniors cope with such information.

- [**Exploring disease predisposition to deliver personalized medicine**](#) [周二, 24 10月 00:38]

Exploring the links between diseases and tissue-specific gene activity, geneticists have been able to build a model that constitutes a first step towards the identification of specific sequences in the non-coding genome signalling their pathogenicity in the context of a specific disease. In a second study, they went even further by associating particular disease risks - including schizophrenia, cardiovascular disease and diabetes - to the variability of genome activity in various cell types.

- [**New gene linked to debilitating lung disease**](#) [周二, 24 10月 00:37]

Health scientists have heralded the discovery of a gene associated with lung fibrosis as 'a potential new avenue of treatment for further research into this terrible disease.'

- [**Patients at risk over failure to recognize important diabetes subtype**](#) [周二, 24 10月 00:37]

The health of people with diabetes is being put at risk due to the failure

of doctors to recognize which type of diabetes they have, a new study.

- [**How hospitals respond when it's uncertain if the newborn is a boy or a girl**](#) [周二, 24 10月 00:37]

When babies are born with atypical sex anatomy, the hospital's response has a major impact on a family's experience and decisions about sometimes irreversible procedures.

- [**How the brain learns to fear: New understanding**](#) [周二, 24 10月 00:35]

What happens in the brain when we learn that fire is very hot and can hurt us? It's the kind of learning that results from the association of a sensory stimulus and the perception of threat. New research in mice suggests that the accepted understanding of that critical operation is incorrect in important respects.

- [**Boost for lipid research: Researchers facilitate lipid data analysis**](#) [周二, 24 10月 00:35]

Illnesses such as cancer and multiple sclerosis may also be associated with lipids. Disorders are difficult to assess due to the diversity of lipids. Scientists now present a new tool for the analysis of lipids.

- [**Proton therapy lowers treatment side effects in pediatric head and neck cancer patients**](#) [周二, 24 10月 00:30]

Pediatric patients with head and neck cancer can be treated with proton beam therapy (PBT) instead of traditional photon radiation, and it will result in similar outcomes with less impact on quality of life.

- [**Major study of genetics of breast cancer provides clues to mechanisms behind the disease**](#) [周一, 23 10月 23:05]

Seventy-two new genetic variants that contribute to the risk of developing breast cancer have been identified by a major international collaboration involving hundreds of researchers worldwide.

- [**A step closer to a cure for adult-onset diabetes**](#) [周一, 23 10月 22:47]

In healthy people, exosomes -- tiny structures secreted by cells to allow

intercellular communication -- prevent clumping of the protein that leads to type 2 diabetes. Exosomes in patients with the disease don't have the same ability. This discovery takes us a step closer to a cure for type 2 diabetes.

- [**Immune response: Scientists identify 'first responders' to bacterial invasion**](#) [周一, 23 10月 22:47]

When bacteria enter our body, they kick-start a powerful immune response. But this chain of reactions doesn't fully account for our immediate responses. Researchers show that so-called ion channels play a key role as 'first responders'.

- [**Virus-like particle vaccine protects against RSV vaccine-enhanced respiratory disease, study finds**](#) [周一, 23 10月 22:22]

A virus-like particle vaccine can prime the body's immune response and prevent the severe respiratory disease that results when patients given an early form of a vaccine for respiratory syncytial virus (RSV) are exposed to RSV, according to a study.

- [**Consumers see 'organic' and 'non-GM' food labels as synonymous**](#) [周一, 23 10月 22:22]

What are the best ways to communicate whether a food has GM ingredients? To gauge consumers' willingness to pay for food labeled as GM vs. non-GM, researchers conducted a national survey of 1,132 respondents.

- [**Personalizing human-robot interaction may increase patient use**](#) [周一, 23 10月 22:17]

Determining the elements in the human-robot interaction that make users more motivated to continue is important in designing future robots that will interact with humans on a daily basis, say investigators looking into their use in healthcare.

- [**Psychedelic drugs may reduce criminal behavior**](#) [周一, 23 10月 22:17]

Newly published research suggests that common psychedelic drugs --

such as 'magic mushrooms', LSD and mescaline (a substance derived from the peyote cactus) -- may reduce criminal offenses. The new study found that psychedelic drugs are associated with a decreased likelihood of antisocial criminal behavior.

- [**Teams work better with a little help from your friends**](#) [周一, 23 10月 21:50]

Here's something both you and your boss can agree on: Workplace teams are better when they include your friends. Researchers analyzed the results of 26 different studies (called a meta-analysis) and found that teams composed of friends performed better on some tasks than groups of acquaintances or strangers.

- [**Depression strongly linked to higher long-term risk of early death for both women, men**](#) [周一, 23 10月 21:46]

Despite increased awareness about mental illness, depression remains strongly linked to a higher risk of early death -- and this risk has increased for women in recent years -- according to results from the 60-year Stirling County Study.

- [**Biosimilar drugs could cut US health spending by \\$54 billion over next decade**](#) [周一, 23 10月 21:46]

Biosimilar drugs have been touted as one strategy to help curb the runaway costs of biologics that have advanced the treatment of illness such as rheumatoid arthritis and many cancers. A new study finds biosimilars could cut health care spending in the United States by \$54 billion over the next decade. The savings are about 20 percent larger than a similar, widely cited analysis done three years ago by the same researchers.

- [**African-Americans live shorter lives due to heart disease and stroke**](#) [周一, 23 10月 21:46]

African-Americans carry a higher burden of cardiovascular diseases compared with white Americans. Risk factors for heart disease appear earlier in African-Americans than in whites. Social determinants of health, stress and cultural factors all play a role.

[Irregular heartbeat linked to higher thyroid hormone levels](#) [周一, 23 10月 21:46]

Individuals with higher levels of thyroid hormone (free thyroxine or FT4) circulating in the blood were more likely than individuals with lower levels to develop irregular heartbeat, even when the levels were within normal range. Blood levels of thyroid-stimulating hormone (TSH), which regulates the production of thyroid hormones and is primarily measured in clinical practice to assess thyroid function, however, were not associated with an increased risk of irregular heartbeat.

[Symptom burden may increase hospital length of stay, readmission risk in advanced cancer](#) [周一, 23 10月 21:46]

Hospitalized patients with advanced cancer who report more intense and numerous physical and psychological symptoms appear to be at risk for longer hospital stays and unplanned hospital readmissions.

[Limited data on medical cannabis use in children](#) [周一, 23 10月 21:46]

A systematic review of published studies on the use of medical cannabis in children and adolescents finds a notable lack of studies and a minimal number of the randomized, controlled trials needed to confirm the effectiveness of a treatment.

[How the microbiome is linked to autoimmune disorders](#) [周一, 23 10月 21:44]

A new study reveals a new mechanism in the gut microbiome that regulates pro- and anti-inflammatory cells.

[Key discoveries offer significant hope of reversing antibiotic resistance](#) [周一, 23 10月 21:44]

Two recent studies provide significant new hope in the fight against antibiotic resistance. By identifying what makes some bacteria resistant to the most commonly prescribed antibiotics, and how this can be reversed, the findings have demonstrated potentially life-saving

consequences and could help reverse the tide of antibiotic resistance.

• [Scientists track ovarian cancers to site of origin: Fallopian tubes](#) [周一, 23 10月 21:44]

Some scientists have suspected that the most common form of ovarian cancer may originate in the fallopian tubes, the thin fibrous tunnels that connect the ovaries to the uterus. Now, results of a study of nine women suggest that the genomic roots of many ovarian tumors may indeed arise in the fallopian tubes, potentially providing insights into the origin of ovarian cancer and suggesting new ways for prevention and intervention of this disease

• [Study finds shortcomings in Canadian regulations governing use of sugar claims](#) [周一, 23 10月 21:44]

Prepackaged food and beverages labelled with claims such as 'no added sugar' or 'reduced in sugar' can have lower sugar levels than products without sugar claims, but may not have notable reductions in calories and some can contain amounts of sugar considered in 'excess' by the World Health Organization. This is the conclusion of a recent Canadian study, report scientists.

• [After skyrocketing, opioid abuse plateaus but remains too high, national U.S. analysis shows](#) [周一, 23 10月 05:49]

While the breakneck upswing in opioid abuse has leveled off, it remains disturbingly high and does not appear to continue its decline, according to an analysis of national data.

• [Risk factors for Duchenne muscular dystrophy identified](#) [周日, 22 10月 21:29]

A new study suggests that more people with Duchenne muscular dystrophy could live longer by identifying and more aggressively treating patients with certain risk factors.

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [**Gun deaths, injuries in California spike following Nevada gun shows**](#) [周二, 24 10月 06:27]

When gun shows are held in Nevada, gun-related deaths and injuries spike across the state line in California for at least the next two weeks. A new study examined gun deaths and injuries in California before and after gun shows in California and Nevada, and their results show a nearly 70 percent increase in deaths and injuries from firearms in California communities within convenient driving distance of Nevada gun shows.

- [**Scientists discover superconductor with bounce**](#) [周二, 24 10月 02:09]

Scientists have discovered extreme 'bounce,' or super-elastic shape-memory properties in a material that could be applied for use as an actuator in the harshest of conditions, such as outer space, and might be the first in a whole new class of shape memory materials.

- [**Nanotube fiber antennas as capable as copper**](#) [周二, 24 10月 01:20]

Thin fibers made of carbon nanotubes can be formed into antennas that are just as capable as copper antennas, according to researchers.

- [**'Mind-reading' brain-decoding tech**](#) [周二, 24 10月 01:20]

Researchers have demonstrated how to decode what the human brain is seeing by using artificial intelligence to interpret fMRI scans from people watching videos, representing a sort of mind-reading technology.

- [**Scientists update four key fundamental constants**](#) [周二, 24 10月 01:20]

Paving the way for transforming the world's measurement system, an international task force has determined updated values for four fundamental constants of nature.

- [**Scheme would make new high-capacity data caches 33 to 50 percent more efficient**](#) [周二, 24 10月 01:19]

A memory management scheme would increase by 33 to 50 percent the efficiency of data caches that use the massive new memory banks known as 'in-package DRAM.'

- [**Optical communication coming to silicon chips**](#) [周二, 24 10月 00:38]

Ultrathin films of a semiconductor that emits and detects light can be stacked on top of silicon wafers, researchers report in a study that could help bring optical communication onto silicon chips.

- [**More iron in lakes is making them brown, study shows**](#) [周二, 24 10月 00:37]

The iron concentration in lakes is increasing in many parts of northern Europe. This has been shown in a study in which researchers in Sweden examined 23 years of data from 10 countries. High iron levels contribute to browner water; furthermore, iron binds environmental toxins such as lead and arsenic.

- [**Resistive memory components the computer industry can't resist**](#) [周二, 24 10月 00:36]

For years, the computer industry has sought memory technologies with higher endurance, lower cost, and better energy efficiency than commercial flash memories. Now, an international collaboration of scientists may have solved many of those challenges with the discovery of thin, molecular films that can store information.

- [**Transparent solar technology represents 'wave of the future'**](#) [周二, 24 10月 00:35]

See-through solar materials that can be applied to windows represent a massive source of untapped energy and could harvest as much power as bigger, bulkier rooftop solar units, scientists report.

- [**Experiment provides deeper look into the nature of neutrinos**](#) [周二, 24 10月 00:35]

The first glimpse of data from the full array of a deeply chilled particle detector operating beneath a mountain in Italy sets the most precise limits yet on where scientists might find a theorized process to help explain why there is more matter than antimatter in the universe.

- [**Expanding Brazilian sugarcane could dent global CO2 emissions**](#) [周一, 23 10月 23:05]

Vastly expanding sugarcane production in Brazil for conversion to ethanol could reduce current global carbon dioxide emissions by as much as 5.6 percent, researchers report. This can be accomplished without impinging on environmentally sensitive areas in Brazil and while allowing for the expansion of other agricultural crops and human needs, the researchers report.

- [**Understanding how electrons turn to glass**](#) [周一, 23 10月 22:47]

Researchers have gained new insight into the electronic processes that guide the transformation of liquids into a solid crystalline or glassy state.

- [**Personalizing human-robot interaction may increase patient use**](#) [周一, 23 10月 22:17]

Determining the elements in the human-robot interaction that make users more motivated to continue is important in designing future robots that will interact with humans on a daily basis, say investigators looking into their use in healthcare.

- [**Zircon as Earth's timekeeper: Are we reading the clock right?**](#) [周一, 23 10月 21:44]

Zircon crystals in igneous rocks must be carefully examined and not relied upon solely to predict future volcanic eruptions and other tectonic events, researchers have shown.

- [**Taming 'wild' electrons in graphene**](#) [周一, 23 10月 21:44]

Graphene -- a one-atom-thick layer of carbon -- is a better conductor than copper and is very promising for electronic devices, but with one

catch: Electrons that move through it can't be stopped. Until now, that is. Scientists have learned how to tame the unruly electrons in graphene, paving the way for the ultra-fast transport of electrons with low loss of energy in novel systems.

- [**Solution to mysterious behavior of supercooled water**](#) [周一, 23 10月 21:43]

Researchers have developed a model to explain mysterious breakdown of Stokes-Einstein relationship in supercooled water. They revealed that intermittent hydrogen bond breakage between water molecules led to non-conformity with the Stokes-Einstein relationship.

- [**Microfluidics probe 'cholesterol' of the oil industry**](#) [周六, 21 10月 00:58]

Researchers employ microfluidic devices to show how and why dispersants are able to break up deposits of asphaltene that hinder the flow of crude oil in wellheads and pipelines.

- [**Creation of coherent states in molecules by incoherent electrons**](#) [周六, 21 10月 00:57]

Coherent states of negative ion resonances in electron-molecule interaction are observed in experiments on $e^- + H_2$ and $e^- + D_2$ reactions. A forward-backward asymmetry is observed in the ejection of H⁻ ions from H₂ in this reaction, whereas the asymmetry in D⁻ from D₂ is weaker, but changes direction with electron energy. These results arise from attachment of a single electron to a molecule forming coherent superposition of odd and even parity states of negative ions.

- [**New quantum simulation protocol developed**](#) [周五, 20 10月 22:53]

Researchers are a step closer to understanding quantum mechanics after developing a new quantum simulation protocol.

- [**Innovative smart watch and smart ring**](#) [周五, 20 10月 22:17]

Researchers have developed a smart watch that takes the user to another dimension and a smart ring that provides powerful feedback.

- [**Gamma rays will reach beyond the limits of light**](#)

[周五, 20 10月 22:16]

Researchers have discovered a new way to produce high energy photon beams. The new method makes it possible to produce these gamma rays in a highly efficient way, compared with today's technique. The obtained energy is a billion times higher than the energy of photons in visible light. These high intensity gamma rays significantly exceed all known limits, and pave the way towards new fundamental studies.

• [Novel 'converter' heralds breakthrough in ultra-fast data processing at nanoscale](#) [周五, 20 10月 21:22]

Scientists have recently invented a novel 'converter' that can harness the speed and small size of plasmons for high frequency data processing and transmission in nanoelectronics.

• [Insight into a hidden order seen with high field magnet](#) [周五, 20 10月 21:22]

A specific uranium compound has puzzled researchers for thirty years. Although the crystal structure is simple, no one understands exactly what is happening once it is cooled below a certain temperature. Apparently, a 'hidden order' emerges, whose nature is completely unknown. Now physicists have characterized this hidden order state more precisely and studied it on a microscopic scale. To accomplish this, they utilized a high-field magnet that permits neutron experiments to be conducted under co...

• [Cool roofs have water saving benefits too](#) [周五, 20 10月 21:22]

The energy and climate benefits of cool roofs have been well established: By reflecting rather than absorbing the sun's energy, light-colored roofs keep buildings, cities, and even the entire planet cooler. Now a new study has found that cool roofs can also save water by reducing how much is needed for urban irrigation.

• [NASA's MAVEN mission finds Mars has a twisted magnetic tail](#) [周五, 20 10月 06:18]

Mars has an invisible magnetic 'tail' that is twisted by interaction with the solar wind, according to new research using data from NASA's

MAVEN spacecraft.

- [**New NASA study improves search for habitable worlds**](#) [周五, 20 10月 06:18]

New NASA research is helping to refine our understanding of candidate planets beyond our solar system that might support life.

- [**Be concerned about how apps collect, share health data, expert says**](#) [周五, 20 10月 05:16]

Americans should be concerned about how health and wellness apps collect, save and share their personal health data, a medical media expert says.

- [**Two-dimensional materials gets a new theory for control of properties**](#) [周五, 20 10月 05:16]

Desirable properties including increased electrical conductivity, improved mechanical properties, or magnetism for memory storage or information processing may be possible because of a theoretical method to control grain boundaries in two-dimensional materials, according to materials scientists.

- [**The microbial anatomy of an organ**](#) [周五, 20 10月 05:16]

The first 3-D spatial visualization tool has been developed for mapping 'omics' data onto whole organs. The tool helps researchers and clinicians understand the effects of chemicals, such as microbial metabolites and medications, on a diseased organ in the context of microbes that also inhabit the region. The work could advance targeted drug delivery for cystic fibrosis and other conditions where medications are unable to penetrate.

- [**Field trips of the future?**](#) [周五, 20 10月 04:42]

A biologist examines the benefits and drawbacks of virtual and augmented reality in teaching environmental science.

- [**The blob that ate the tokamak: Physicists gain understanding of bubbles at edge of plasmas**](#) [周五, 20 10月 03:05]

Scientists have completed new simulations that could provide insight into how blobs at the plasma edge behave. The simulations performed kinetic simulations of two different regions of the plasma edge simultaneously.

- [**Using optical chaos to control the momentum of light**](#) [周五, 20 10月 03:05]

Controlling and moving light poses serious challenges. One major hurdle is that light travels at different speeds and in different phases in different components of an integrated circuit. For light to couple between optical components, it needs to be moving at the same momentum. Now, a team of researchers has demonstrated a new way to control the momentum of broadband light in a widely-used optical component known as a whispering gallery microcavity (WGM).

- [**Studying insect behavior? Make yourself an ethoscope!**](#) [周五, 20 10月 02:30]

Fruit flies have surprising similarities to humans. The mysteries of a broad range of human conditions can be studied in detail in these organisms, however this often requires the use of expensive custom equipment. team of scientists now present the ethoscope -- a cheap, easy-to-use and self-made customizable piece of equipment of their invention that can be used to study flies' behavior.

- [**Liquid metal discovery ushers in new wave of chemistry and electronics**](#) [周五, 20 10月 02:30]

Researchers use liquid metal to create atom-thick 2-D never before seen in nature. The research could transform how we do chemistry and could also be applied to enhance data storage and make faster electronics.

- [**Extreme light trapping**](#) [周五, 20 10月 00:38]

Physicists have built a nanostructure whose crystal lattice bends light as it enters the material and directs it in a path parallel to the surface, known as "parallel to interface refraction."

- [**Terahertz spectroscopy goes nano**](#) [周五, 20 10月 00:18]

Researchers have improved the resolution of terahertz emission

spectroscopy -- a technique used to study a wide variety of materials -- by 1,000-fold, making the technique useful at the nanoscale.

- [**Valley polarization for electronic and optoelectronic technologies clarified**](#) [周五, 20 10月 00:18]

Many of today's technologies, such as, solid-state lighting, transistors in computer chips, and batteries in cell phones rely simply on the charge of the electron and how it moves through the material. In certain materials, such as the monolayer transition metal dichalcogenides (TMDs), electrons can be selectively placed into a chosen electronic valley using optical excitation.

- [**Nanomedicine researchers target disease at the molecular level**](#) [周四, 19 10月 23:57]

It's truly small-scale work. But researchers in nanomedicine – the study, development and application of materials under 100 nanometers in size to diagnose and treat disease – are making some big-time advances.

- [**Strange but true: Turning a material upside down can sometimes make it softer**](#) [周四, 19 10月 23:10]

Through the combined effect of flexoelectricity and piezoelectricity, researchers have found that polar materials can be made more or less resistant to dents when they are turned upside down... or when a voltage is applied to switch their polarization. This research points to the future development of 'smart mechanical materials' for use in smart coatings and ferroelectric memories.

- [**Scientists solve a magnesium mystery in rechargeable battery performance**](#) [周四, 19 10月 23:10]

Scientists have discovered a surprising set of chemical reactions involving magnesium that degrade battery performance even before the battery can be charged up. The findings could steer the design of next-gen batteries.

- [**Noxious ice cloud on Saturn's moon Titan**](#) [周四, 19 10月 22:10]

Researchers with NASA's Cassini mission found evidence of a toxic

hybrid ice in a wispy cloud high above the south pole of Saturn's largest moon, Titan.

- [**Making big data a little smaller**](#) [周四, 19 10月 22:10]

Computer scientists have found that the Johnson-Lindenstrauss lemma, a 30-year-old theorem, is the best approach to pre-process large data into a manageably low dimension for algorithmic processing.

- [**Researchers watch in real time as fat-encased drug nanoparticles invade skin cells**](#) [周四, 19 10月 22:10]

A new study describes the use of cutting-edge microscopy technology to visualize how liposomes escape from blood vessels into surrounding cells in a living mouse, offering clues that may help researchers design better drug delivery systems.

- [**Slow Internet? New technology to speed up home broadband dramatically**](#) [周四, 19 10月 22:10]

Slow internet speeds and the Internet 'rush hour' -- the peak time when data speeds drop by up to 30 percent -- could be history with new hardware that provides consistently high-speed broadband connectivity.

- [**New ways to achieve selectivity for biomarkers in bioelectronics**](#) [周四, 19 10月 22:09]

Materials science and engineering researchers have experimentally verified the electrochemical processes that control charge transfer rate from an organic polymer to a biomarker molecule. Their findings may enhance selectivity for biomarkers in bioelectronic devices.

- [**Mathematically modeling HIV drug pharmacodynamics**](#) [周四, 19 10月 22:09]

Complete elimination of Human Immunodeficiency Virus (HIV) presents a challenge due to latent viral reservoirs within the body that can help re-establish infection. In a new paper, researchers propose a mathematical model that investigates the effects of drug parameters and dosing schedules on HIV latent reservoirs and viral load dynamics.

- [**Superbug's artillery revealed: nanomachine**](#)

[**secretes toxins**](#) [周四, 19 10月 22:09]

Researchers have created the first high-resolution structure depicting a crucial part of the 'superbug' *Pseudomonas aeruginosa*, classified by the WHO as having the highest level threat to human health. The image identifies the 'nanomachine' used by the highly virulent bacteria to secrete toxins, pointing the way for drug design targeting this.

[**Impact of Amazonian hydropower 'significantly underestimated'**](#) [周四, 19 10月 22:08]

The environmental impact of hydropower generation in the Amazon may be greater than predicted, according to new research.

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [**To grasp water scarcity, researchers probe links between human and natural systems**](#) [周二, 24 10月 06:26]

Understanding the fine-level interactions between nature and people is essential in determining whether a region will suffer water scarcity in the future.

- [**Five new malaria targets that could lead to an effective vaccine**](#) [周二, 24 10月 06:26]

In the largest study of its kind, five new malaria vaccine targets have been discovered. Researchers studied the malaria parasite at its most vulnerable stage -- when invading human red blood cells -- and identified five targets that lead to a reduction in the parasite's ability to enter red blood cells.

- [**Why did the 2014 Oso, WA, landslide travel so far?**](#) [周二, 24 10月 06:25]

On Saturday, 22 March 2014, a devastating landslide roared across the North Fork of the Stillaguamish River, near Oso, Washington. The landslide killed 43 people as it plowed through the Steelhead Haven neighborhood. When it stopped, after crossing the river, the neighborhood, and State Route 530, the Oso landslide had traveled 1.4 kilometers.

- [**Florida needs more pet-friendly shelters**](#) [周二, 24 10月 06:25]

Florida needs more pet-friendly shelters, especially for older adults who represent 50 to 75 percent of deaths following disasters like hurricanes, according to a recent study.

- [**New asthma biomarkers identified from lung bacteria**](#) [周二, 24 10月 06:25]

New research suggests that the lung microbiome plays a significant role in asthma severity and response to treatment.

- [**Older Neanderthal survived with a little help from his friends**](#) [周二, 24 10月 06:15]

An older Neanderthal from about 50,000 years ago, who had suffered multiple injuries and other degenerations, became deaf and must have relied on the help of others to avoid prey and survive well into his 40s, indicates a new analysis.

- [**Archaeologists uncover cuneiform archive in Iraq's Kurdish region**](#) [周二, 24 10月 06:03]

Archaeologists have made sensational finds in the Kurdistan region of northern Iraq. The researchers found a cuneiform archive of 93 clay tablets dating from 1250 BCE -- the period of the Middle Assyrian Empire. What the tablets record remains a mystery for the time being. The researchers will have to decipher them -- a long and difficult task.

- [**Fruit-eating increases biodiversity**](#) [周二, 24 10月 03:05]

By dispersing the seeds of plants, fruit-eating animals contribute to the possibility of increased plant speciation and thus biodiversity, investigators have discovered.

- [**New magma pathways after giant lateral volcano collapses**](#) [周二, 24 10月 02:55]

Giant lateral collapses are huge landslides occurring at the flanks of a volcano. Such collapses are rather common events during the evolution of a large volcanic edifice, often with dramatic consequences such as tsunami and volcano explosions. These catastrophic events interact with the magmatic activity of the volcano, as new research suggests.

- [**Moment of impact: A journey into the Chicxulub Crater**](#) [周二, 24 10月 02:09]

When the Chicxulub asteroid slammed into Earth about 66 million years

ago, it obliterated 80 percent of Earth's species, blasted out a crater 200 kilometers across, and signaled an abrupt end to the Cretaceous Period. The impact, its catastrophic effects, and its aftermath have engrossed scientists and the public alike since it was first discovered.

- [**New Peruvian bird species discovered by its song**](#)

[周二, 24 10月 02:09]

A new species of bird from the heart of Peru remained undetected for years until researchers identified it by its unique song.

- [**Possible new anti-TB treatment path**](#)

[周二, 24 10月 02:09]

As part of the long effort to improve treatment of tuberculosis (TB), microbiologists report that they have for the first time characterized a protein involved in making a glycolipid compound found in the TB cell wall, which is critical for the disease-causing Mycobacterium to become infectious.

- [**Herbicide's link to Parkinson's disease**](#)

[周二, 24 10月 02:07]

Scientists have revealed how oxidative stress explains a common herbicide's link to risk of Parkinson's disease.

- [**Rethinking well-being and sustainability measurements from local to global scales**](#)

[周二, 24 10月 01:20]

A new study suggests that standard ways of measuring well-being and sustainability in communities used by global organizations may be missing critical information and could lead to missteps in management actions. The article suggests alternative and complementary approaches that use indicators grounded in the values of a particular community.

- [**Smart birds: Canada geese give hunters the slip by hiding out in Chicago**](#)

[周二, 24 10月 01:20]

It's open season for Canada geese in Illinois from mid-October to mid-January. Unfortunately for hunters, Canada geese are finding a new way to stay out of the line of fire. Rather than being 'sitting ducks' in a rural pond, they're setting up residence in the city. Ornithologists conducted a recent study to try to find out why there were so many Canada geese in Chicago in the winter.

- [**Rising sea levels creating first Native American climate refugees**](#) [周二, 24 10月 01:20]

Rising sea levels and human activities are fast creating a 'worst case scenario' for Native Americans of the Mississippi Delta who stand to lose not just their homes, but their irreplaceable heritage, to climate change.

- [**Scientists develop new theory of molecular evolution**](#) [周二, 24 10月 00:38]

Researchers have developed a new theory of molecular evolution, offering insights into how genes function, how the rates of evolutionary divergence can be predicted, and how harmful mutations arise at a basic level.

- [**These shrews have heads that shrink with the season**](#) [周二, 24 10月 00:36]

If any part of the body would seem ill equipped to shrink, it would probably be the head and skull. And, yet, researchers have found that the skulls of red-toothed shrews do shrink in anticipation of winter, by up to 20 percent. As spring approaches, their heads grow again to approach their previous size.

- [**Reduced impact logging still harms biodiversity in tropical rainforests**](#) [周二, 24 10月 00:35]

Even low levels of logging in the Amazon rainforest may lead to great losses in biodiversity, new research has found. The research looked at 34 different plots in the state of Pará -- a focal point for Amazon protection efforts in the last decades. They found that even low levels of logging led to negative effects on dung beetle diversity and rates of dung beetle-mediated

- [**Scientists warn that saline lakes in dire situation worldwide**](#) [周二, 24 10月 00:35]

Saline lakes around the world are shrinking in size at alarming rates. But what -- or who -- is to blame? Lakes like Utah's Great Salt Lake, Asia's

Aral Sea, the Dead Sea in Jordan and Israel, China's huge Lop Nur and Bolivia's Lake Popo are just a few that are in peril. These lakes and others like them are suffering massive environmental problems according to a group of scientists and water managers.

- [**Mongolian microfossils point to the rise of animals on Earth**](#) [周二, 24 10月 00:35]

A cache of embryo-like microfossils has been discovered in northern Mongolia that may shed light on questions about the long-ago shift from microbes to animals on Earth.

- [**Transparent solar technology represents 'wave of the future'**](#) [周二, 24 10月 00:35]

See-through solar materials that can be applied to windows represent a massive source of untapped energy and could harvest as much power as bigger, bulkier rooftop solar units, scientists report.

- [**Sumatran tigers on path to recovery in 'in danger' UNESCO World Heritage site**](#) [周二, 24 10月 00:29]

New research looks at the effectiveness of the park's protection zone and finds that the density of Sumatran tigers has increased despite the continued threat of living in an 'In Danger' World Heritage Site.

- [**Expanding Brazilian sugarcane could dent global CO2 emissions**](#) [周一, 23 10月 23:05]

Vastly expanding sugarcane production in Brazil for conversion to ethanol could reduce current global carbon dioxide emissions by as much as 5.6 percent, researchers report. This can be accomplished without impinging on environmentally sensitive areas in Brazil and while allowing for the expansion of other agricultural crops and human needs, the researchers report.

- [**Immune response: Scientists identify 'first responders' to bacterial invasion**](#) [周一, 23 10月 22:47]

When bacteria enter our body, they kick-start a powerful immune response. But this chain of reactions doesn't fully account for our

immediate responses. Researchers show that so-called ion channels play a key role as 'first responders'.

- [**Consumers see 'organic' and 'non-GM' food labels as synonymous**](#) [周一, 23 10月 22:22]

What are the best ways to communicate whether a food has GM ingredients? To gauge consumers' willingness to pay for food labeled as GM vs. non-GM, researchers conducted a national survey of 1,132 respondents.

- [**Routes out of isolation for Yellowstone grizzlies**](#) [周一, 23 10月 22:18]

An interagency team of Montana and Wyoming biologists models possible routes to a reunion of the Yellowstone and Northern Continental bear populations through adventurous male immigrants. An influx of genetic diversity through breeding with outsiders could give the Yellowstone grizzly population greater resiliency to changing environmental conditions.

- [**Western US Quake? Fifty simulations of the 'Really Big One' show how a 9.0 Cascadia earthquake could play out**](#) [周一, 23 10月 22:18]

The largest number yet of detailed simulations for how a Cascadia Subduction Zone earthquake might play out provides a clearer picture of what the region can expect when the fault unleashes a 9.0 earthquake.

- [**Genetic rescue boosts recovery of Australia's endangered mountain pygmy possums**](#) [周一, 23 10月 22:17]

For the first time, a breeding technique known as genetic rescue has been shown to increase population numbers and survival rates of the endangered mountain pygmy possum, now at their highest numbers since 1996.

- [**Crops evolving ten millennia before experts thought**](#) [周一, 23 10月 21:49]

Ancient hunter-gatherers began to systemically affect the evolution of crops up to thirty thousand years ago -- around ten millennia before

experts previously thought -- according to new research.

- [**Groundwater, tundra fires may work together to thaw permafrost**](#) [周一, 23 10月 21:46]

Groundwater may play an unrecognized role in thawing Arctic permafrost following wildfires, according to new research.

- [**Geophysicist finds teaching opportunities in movie mistakes**](#) [周一, 23 10月 21:46]

Few scientists regard the 1997 movie Volcano, in which flaming magma suddenly spews from the La Brea tar pits and incinerates much of Los Angeles, as a means to foster scientific literacy. After all, Southern California has no magma to spew. But one geophysicist sees it differently.

- [**Limited data on medical cannabis use in children**](#) [周一, 23 10月 21:46]

A systematic review of published studies on the use of medical cannabis in children and adolescents finds a notable lack of studies and a minimal number of the randomized, controlled trials needed to confirm the effectiveness of a treatment.

- [**How the microbiome is linked to autoimmune disorders**](#) [周一, 23 10月 21:44]

A new study reveals a new mechanism in the gut microbiome that regulates pro- and anti-inflammatory cells.

- [**Vaquita porpoise rescued as part of VaquitaCPR conservation project, then released**](#) [周一, 23 10月 21:44]

Scientists with the VaquitaCPR conservation project announced they succeeded in locating and rescuing a highly endangered vaquita porpoise yesterday, but in an abundance of caution the vaquita, which was a calf, was released. VaquitaCPR is trying to save the world's most endangered marine mammal. Less than 30 are left in the world.

- [**Key discoveries offer significant hope of**](#)

[reversing antibiotic resistance](#) [周一, 23 10月 21:44]

Two recent studies provide significant new hope in the fight against antibiotic resistance. By identifying what makes some bacteria resistant to the most commonly prescribed antibiotics, and how this can be reversed, the findings have demonstrated potentially life-saving consequences and could help reverse the tide of antibiotic resistance.

• [Zircon as Earth's timekeeper: Are we reading the clock right?](#) [周一, 23 10月 21:44]

Zircon crystals in igneous rocks must be carefully examined and not relied upon solely to predict future volcanic eruptions and other tectonic events, researchers have shown.

• [Birds without own brood help other birds with parenting, but not selflessly](#) [周一, 23 10月 21:44]

Birds will sometimes care for the offspring of other birds of their own species if they anticipate future benefits. Being tolerated in another bird's territory and the chance to inherit that territory later are considered rewards for which some birds are willing to postpone their own chance of reproduction.

• [Electricity from shale gas vs. coal: Lifetime toxic releases from coal much higher](#) [周一, 23 10月 21:43]

Despite widespread concern about potential human health impacts from hydraulic fracturing, the lifetime toxic chemical releases associated with coal-generated electricity are 10 to 100 times greater than those from electricity generated with natural gas obtained via fracking, according to a new study.

• [Novel transdisciplinary study uncovers microbes that may one day deter major grape disease](#) [周一, 23 10月 21:43]

Researchers have conducted a novel transdisciplinary study to characterize the microbial communities within the vascular system of grapevines and their connections with Pierce's disease, an economically significant disease of the California grape industry. Through the study,

the researchers found potentially beneficial microbes that could one day be used as a deterrent to *Xylella fastidiosa*, the pathogen that causes Pierce's disease.

- [**Exploring how herpes simplex virus changes when passed between family members**](#) [周六, 21 10月 06:25]

A new study offers a rare glimpse into the genetics of a herpes simplex virus transmission event -- information that may prove useful in future development of therapeutics and vaccines. The study reveals nearly perfect genetic transmission of the virus from a father to his son and lays the foundation for future studies exploring the genetic diversity of this virus.

- [**Pollution responsible for 16 percent of early deaths globally**](#) [周六, 21 10月 06:25]

Diseases caused by pollution were responsible in 2015 for an estimated 9 million premature deaths -- 16 percent of all deaths worldwide, according to a report.

- [**Mountain glaciers shrinking across Western U.S.**](#) [周六, 21 10月 06:25]

A technique using satellites to create twice-yearly elevation maps of US mountain glaciers provides new insight into thinning of glaciers in the lower 48 states.

- [**Prozac in ocean water a possible threat to sea life**](#) [周六, 21 10月 00:58]

Oregon shore crabs exhibit risky behavior when they're exposed to the antidepressant Prozac, making it easier for predators to catch them, according to a new study.

- [**US ocean observation critical to understanding climate change, but lacks long-term national planning**](#) [周六, 21 10月 00:57]

Ocean observing systems are important as they provide information essential for monitoring and forecasting changes in Earth's climate on

timescales ranging from days to centuries. A new report finds that continuity of ocean observations is vital to gain an accurate understanding of the climate, and calls for a decadal, national plan that is adequately resourced and implemented to ensure critical ocean information is available to understand and predict future changes.

• [Global CO2 emissions stalled for the third year in a row](#) [周五, 20 10月 22:53]

The annual assessment of global greenhouse gas (GHG) emissions by the JRC and the Netherlands Environmental Assessment Agency (PBL) confirms that CO2 emissions have stalled for the third year in a row.

• [How the smallest bacterial pathogens outwit host immune defenses by stealth mechanisms](#) [周五, 20 10月 22:16]

Despite their relatively small genome, mycoplasmas can cause persistent and difficult-to-treat infections in humans and animals. A study has shown how mycoplasmas escape the immune response. Mycoplasmas 'mask' themselves: They use their small genome in a clever way and compensate for the loss of an enzyme that is important for this process. This could be shown for the first time in vivo, thus representing a breakthrough in the research of bacterial pathogens.

• ['Antelope perfume' keeps flies away from cows](#) [周五, 20 10月 22:16]

In Africa, tsetse flies transfer the sleeping sickness also to cattle. The damage is estimated to be about 4.6 billion US dollars each year. Experts have developed an innovative way of preventing the disease. Tsetse flies avoid waterbucks, a widespread antelope species in Africa. The scientists imitated the smell of these antelopes.

• [Chromosomes may be knotted](#) [周五, 20 10月 22:16]

Little is known about the structures of our genetic material, chromosomes, which consist of long strings that -- according to our experience -- should be likely to become knotted. However, up to now it has not been possible to study this experimentally. Researchers have now found that chromosomes may indeed be knotted.

[Carbon coating gives biochar its garden-greening power](#) [周五, 20 10月 22:16]

New research has demonstrated how composting of biochar creates a very thin organic coating that significantly improves the biochar's fertilizing capabilities.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [**Gun deaths, injuries in California spike following Nevada gun shows**](#) [周二, 24 10月 06:27]

When gun shows are held in Nevada, gun-related deaths and injuries spike across the state line in California for at least the next two weeks. A new study examined gun deaths and injuries in California before and after gun shows in California and Nevada, and their results show a nearly 70 percent increase in deaths and injuries from firearms in California communities within convenient driving distance of Nevada gun shows.

- [**To grasp water scarcity, researchers probe links between human and natural systems**](#) [周二, 24 10月 06:26]

Understanding the fine-level interactions between nature and people is essential in determining whether a region will suffer water scarcity in the future.

- [**Rethinking well-being and sustainability measurements from local to global scales**](#) [周二, 24 10月 01:20]

A new study suggests that standard ways of measuring well-being and sustainability in communities used by global organizations may be missing critical information and could lead to missteps in management actions. The article suggests alternative and complementary approaches that use indicators grounded in the values of a particular community.

- [**Support for populist ideologies linked to feelings of disadvantage and national narcissism**](#) [周二, 24 10月 01:19]

People who perceive they are part of a disadvantaged group are more likely to have an unrealistic belief in the greatness of their nation and support populist ideologies, new research shows.

- [**Reduced impact logging still harms biodiversity in tropical rainforests**](#) [周二, 24 10月 00:35]

Even low levels of logging in the Amazon rainforest may lead to great losses in biodiversity, new research has found. The research looked at 34 different plots in the state of Pará -- a focal point for Amazon protection efforts in the last decades. They found that even low levels of logging led to negative effects on dung beetle diversity and rates of dung beetle-mediated

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What are the best ways to communicate whether a food has GM ingredients? To gauge consumers' willingness to pay for food labeled as GM vs. non-GM, researchers conducted a national survey of 1,132 respondents.

- [**Teams work better with a little help from your friends**](#) [周一, 23 10月 21:50]

Here's something both you and your boss can agree on: Workplace teams are better when they include your friends. Researchers analyzed the results of 26 different studies (called a meta-analysis) and found that teams composed of friends performed better on some tasks than groups of acquaintances or strangers.

- [**Geophysicist finds teaching opportunities in movie mistakes**](#) [周一, 23 10月 21:46]

Few scientists regard the 1997 movie *Volcano*, in which flaming magma suddenly spews from the La Brea tar pits and incinerates much of Los Angeles, as a means to foster scientific literacy. After all, Southern California has no magma to spew. But one geophysicist sees it differently.

• [**Biosimilar drugs could cut US health spending by \\$54 billion over next decade**](#) [周一, 23 10月 21:46]

Biosimilar drugs have been touted as one strategy to help curb the runaway costs of biologics that have advanced the treatment of illness such as rheumatoid arthritis and many cancers. A new study finds biosimilars could cut health care spending in the United States by \$54 billion over the next decade. The savings are about 20 percent larger than a similar, widely cited analysis done three years ago by the same researchers.

• [**Electricity from shale gas vs. coal: Lifetime toxic releases from coal much higher**](#) [周一, 23 10月 21:43]

Despite widespread concern about potential human health impacts from hydraulic fracturing, the lifetime toxic chemical releases associated with coal-generated electricity are 10 to 100 times greater than those from electricity generated with natural gas obtained via fracking, according to a new study.

• [**After skyrocketing, opioid abuse plateaus but remains too high, national U.S. analysis shows**](#) [周一, 23 10月 05:49]

While the breakneck upswing in opioid abuse has leveled off, it remains disturbingly high and does not appear to continue its decline, according to an analysis of national data.

• [**Pollution responsible for 16 percent of early deaths globally**](#) [周六, 21 10月 06:25]

Diseases caused by pollution were responsible in 2015 for an estimated 9 million premature deaths -- 16 percent of all deaths worldwide, according to a report.

- **[The end of pneumonia? New vaccine offers hope](#)**

[周六, 21 10月 02:38]

A new vaccine under development provoked an immune response to 72 forms of the bacteria that's responsible for pneumonia, sepsis and meningitis. That's up from the 23 forms of bacteria covered by current immunizations. The new vaccine, which represents the 'most comprehensive' coverage of pneumococcal disease to date, could greatly reduce the number of deaths from the disease.

- **[US ocean observation critical to understanding climate change, but lacks long-term national planning](#)**

[周六, 21 10月 00:57]

Ocean observing systems are important as they provide information essential for monitoring and forecasting changes in Earth's climate on timescales ranging from days to centuries. A new report finds that continuity of ocean observations is vital to gain an accurate understanding of the climate, and calls for a decadal, national plan that is adequately resourced and implemented to ensure critical ocean information is available to understand and predict future changes.

- **[Metacognition training boosts gen chem exam scores](#)**

[周六, 21 10月 00:56]

Students, and people in general, can tend to overestimate their own abilities. But new research shows that students who overcome this tendency score better on final exams. The boost is strongest for students in the lower 25 percent of the class. By thinking about their thinking, a practice called metacognition, these students raised their final exam scores by 10 percent on average -- a full letter grade.

- **[Audit uncovers concerns about the use of electroconvulsive therapy in England](#)**

[周五, 20 10月 22:53]

Electroconvulsive therapy (ECT) continues to be used in England without comprehensive national auditing.

- **[Waterside lighting drastically disrupts wildlife in the surrounding ecosystem](#)**

[周五, 20 10月 21:22]

Streetlights near waterways attract flying insects from the water and change the predator community living in the grass beneath the lights, new research has found. The findings show that artificial night-time lighting could have implications for the surrounding ecosystem and biodiversity, which should be considered when designing new lighting concepts.

- [**Be concerned about how apps collect, share health data, expert says**](#) [周五, 20 10月 05:16]

Americans should be concerned about how health and wellness apps collect, save and share their personal health data, a medical media expert says.

- [**Eye-catching labels stigmatize many healthy foods**](#) [周五, 20 10月 05:16]

Labels such as organic, fair-trade and cage free may be eye-catching but are often free of any scientific basis and stigmatize many healthy foods, a new study found.

- [**Three million Americans carry loaded handguns daily, study finds**](#) [周五, 20 10月 04:42]

An estimated 3 million adult American handgun owners carry a firearm loaded and on their person on a daily basis, and 9 million do so on a monthly basis, new research indicates. The vast majority cited protection as their primary reason for carrying a firearm. It is the first research in more than 20 years to scrutinize why, how often, and in what manner US adults carry loaded handguns.

- [**TBI laws effective at reducing rate of recurrent concussions, new study shows**](#) [周五, 20 10月 04:42]

A recent study from the Center for Injury Research and Policy at Nationwide Children's Hospital done in conjunction with researchers from Colorado School of Public Health at the University at Colorado and Temple University used data from a large, national sports injury surveillance system to determine the effect of state-level TBI laws on trends of new and recurrent concussions among US high school athletes.

- [**More permissive concealed-carry laws linked to higher homicide rates**](#) [周五, 20 10月 04:42]

Easier access to concealed firearms is associated with significantly higher rates of handgun-related homicide, according to a new study.

- [**Field trips of the future?**](#) [周五, 20 10月 04:42]

A biologist examines the benefits and drawbacks of virtual and augmented reality in teaching environmental science.

- [**Three-quarters of the total insect population lost in protected nature reserves**](#) [周五, 20 10月 00:18]

Since 1989, in 63 nature reserves in Germany the total biomass of flying insects has decreased by more than 75 percent. This decrease has long been suspected but has turned out to be more severe than previously thought.

- [**Six degrees of separation: Why it is a small world after all**](#) [周四, 19 10月 23:10]

This study examines how small-world networks occur within bigger and more complex structures.

- [**The best hedge fund managers are not psychopaths or narcissists, according to new study**](#) [周四, 19 10月 22:10]

When it comes to financial investments, hedge fund managers higher in 'dark triad' personality traits -- psychopathy, narcissism, and Machiavellianism -- perform more poorly than their peers, according to new personality psychology research. The difference is a little less than 1 percent annually compared to their peers, but with large investments over several years that slight underperformance can add up.

- [**Parents have an even greater impact on the well-being of young people than expected**](#) [周四, 19 10月 22:09]

According to a recent study, parental support for the autonomy of young people promotes the well-being of the latter in all major educational

transitions: from primary to lower secondary school, from basic education to upper secondary school, and from upper secondary school to university.

- [**Phones keeping students from concentrating during lectures**](#) [周四, 19 10月 22:08]

Daily, people spend over three hours on their phones. While ever-smarter digital devices have made many aspects of our lives more efficient, a growing body of evidence suggests that, by continuously distracting us, they are harming our ability to concentrate. Studies across the world show that students constantly use their phones when they are in class. A strong body of evidence suggests that media use during lectures is associated with lower academic performance.

- [**What characteristics do school shooters share?**](#) [周四, 19 10月 22:07]

Boys involved in school shootings often struggle to live up to what they perceive as their school's ideals surrounding masculinity. When socially shunned at school, they develop deep-set grudges against their classmates and teachers. The shooters become increasingly angry, depressed, and more violent in their gendered practice. A shooting rampage is their ultimate performance, according to experts.

- [**New light shed on early turquoise mining in Southwest**](#) [周四, 19 10月 03:18]

Researchers are blending archaeology and geochemistry to get a more complete picture of turquoise's mining and distribution in the pre-Hispanic Southwest.

- [**For \\$1000, anyone can purchase online ads to track your location and app use**](#) [周四, 19 10月 00:41]

New research finds that for a budget of roughly \$1000, it is possible for someone to track your location and app use by purchasing and targeting mobile ads. The team hopes to raise industry awareness about the potential privacy threat.

- [**Illinois sportfish recovery a result of 1972 Clean**](#)

[**Water Act, scientists report**](#) [周四, 19 10月 00:17]

Populations of largemouth bass, bluegill, catfish and other sportfish are at the highest levels recorded in more than a century in the Illinois River, according to a new report. Their dramatic recovery, from populations close to zero near Chicago throughout much of the 20th century, began just after implementation of the Clean Water Act, the researchers say.

• [**Mass killings happen randomly, yet rate has remained steady, study finds**](#) [周三, 18 10月 23:35]

Mass killings may have increasing news coverage, but the events themselves have happened at a steady rate for more than a decade, according to a new study. Furthermore, some types of mass-killing events seem to occur randomly over time, making prediction difficult and response crucial.

• [**Life in the city: Living near a forest keeps your amygdala healthier**](#) [周三, 18 10月 23:35]

A new study examined the relationship between the availability of nature near city dwellers' homes and their brain health. Its findings are relevant for urban planners among others.

• [**Reducing power plants' freshwater consumption with new silica filter**](#) [周三, 18 10月 23:35]

Power plants draw more freshwater than any other consumer in the United States, accounting for more than 50 percent of the nation's freshwater use at about 500 billion gallons daily. To help save this water, researchers have developed a new silica filter for power plant cooling waters that decreases the amount of freshwater power plants consume by increasing the number of times cooling tower water can be reused and recycled.

• [**Workers may 'choke' under pressure of non-monetary incentives**](#) [周三, 18 10月 21:16]

Competition for non-monetary awards can have adverse effects on

performance and may cause employees to “choke” under pressure, according to a new study.

- [**High risk of injury in young elite athletes**](#) [周三, 18 10月 21:09]

Every week, an average of three in every ten adolescent elite athletes suffer an injury. Worst affected are young women, and the risk of injury increases with low self-esteem, especially in combination with less sleep and higher training volume and intensity, research from in Sweden shows.

- [**Art advancing science at the nanoscale**](#) [周三, 18 10月 21:02]

Could studying molecular biology ever be as fun as watching a Star Wars movie? Two scientists decided to create their own science film to entertain viewers, and ended up making new scientific discoveries in the process. The researchers-turned-filmmakers used a novel combination of computer animation and simulation softwares to create a scientific model that is accurate down to the atomic scale, and hope that their success inspires more scientists to approach their work like artists.

- [**Arsenic in domestic well water could affect 2 million people in the US**](#) [周三, 18 10月 21:02]

Clean drinking water can be easy to take for granted if your home taps into treated water sources. But more than 44 million people in the U.S. get their water from private domestic wells, which are largely unregulated. Of those, a new report estimates that about 2 million people could be exposed to high levels of naturally occurring arsenic in their water.

- [**New Amazon threat? Deforestation from mining**](#) [周三, 18 10月 21:02]

Sprawling mining operations in Brazil have caused roughly 10 percent of all Amazon rainforest deforestation between 2005 and 2015 -- much higher than previous estimates -- says the first comprehensive study of mining deforestation in the iconic tropical rainforest. Surprisingly, the majority of mining deforestation (a full 90%) occurred outside the mining leases granted by Brazil's government, the new study finds.

- [**New simple method determines rate at which we**](#)

[burn calories walking up, down, flat](#) [周三, 18 10月 21:01]

A new way to predict the energy a person expends walking will help predict and monitor the physiological status of walkers, including foot soldiers. Researchers have developed the Army-funded method, which significantly improves on two existing standards, and relies on three readily available variables. Accurate prediction is important because the rate at which people burn calories walking can vary tenfold depending on speed, carried load and whether uphill, at-grade or downhill.

• [Chocolate production linked to increased deforestation in poor nations](#) [周三, 18 10月 04:36]

Newly published research focuses on the link between cocoa exports and deforestation in developing nations.

• [Amazonian hunters deplete wildlife but don't empty forests](#) [周三, 18 10月 03:31]

Conservationists can be 'cautiously optimistic' about the prospect of sustainable subsistence hunting by Amazonian communities, according to new research. The research team spent over a year working with 60 Amazonian communities and hiked for miles through trackless forests to deploy nearly 400 motion-activated camera traps -- in a bid to understand which species are depleted by hunting and where.

• [New examination of occupational licensing contradicts decades of research](#) [周三, 18 10月 03:30]

From doctors to engineers to carpet layers to massage therapists, more than one in three Americans is required to hold a license to work in their occupation. Broad consensus among researchers holds that licensure creates wage premiums by establishing economic monopolies, but according to research, licensure does not limit competition nor does it increase wages.

• [Preservation for the \(digital\) ages](#) [周三, 18 10月 00:43]

Researchers working with classicists and computer scientists have developed a method to preserve digital humanities databases. The preservation strategy allows scholars to re-launch a database application

in a variety of environments -- from individual computers, to virtual machines, to future web servers -- without compromising its interactive features.

• [**A new way to test body armor**](#) [周二, 17 10月 23:43]

In response to several high profile body armor failures, researchers have developed a new and extremely reliable way to test the ballistic fibers used in body armor.

• [**Nearly half of US medical care comes from emergency rooms**](#) [周二, 17 10月 21:18]

Nearly half of all US medical care is delivered by emergency departments, according to a new study. In recent years, the percentage of care delivered by emergency departments has grown. The paper highlights the major role played by emergency rooms in US health care.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- ['Mind-reading' brain-decoding tech](#) [周二, 24 10月 01:20]

Researchers have demonstrated how to decode what the human brain is seeing by using artificial intelligence to interpret fMRI scans from people watching videos, representing a sort of mind-reading technology.

- [Smart birds: Canada geese give hunters the slip by hiding out in Chicago](#) [周二, 24 10月 01:20]

It's open season for Canada geese in Illinois from mid-October to mid-January. Unfortunately for hunters, Canada geese are finding a new way to stay out of the line of fire. Rather than being 'sitting ducks' in a rural pond, they're setting up residence in the city. Ornithologists conducted a recent study to try to find out why there were so many Canada geese in Chicago in the winter.

- [These shrews have heads that shrink with the season](#) [周二, 24 10月 00:36]

If any part of the body would seem ill equipped to shrink, it would probably be the head and skull. And, yet, researchers have found that the skulls of red-toothed shrews do shrink in anticipation of winter, by up to 20 percent. As spring approaches, their heads grow again to approach their previous size.

- [Psychedelic drugs may reduce criminal behavior](#) [周一, 23 10月 22:17]

Newly published research suggests that common psychedelic drugs -- such as 'magic mushrooms', LSD and mescaline (a substance derived from the peyote cactus) -- may reduce criminal offenses. The new study found that psychedelic drugs are associated with a decreased likelihood

of antisocial criminal behavior.

- [**Prozac in ocean water a possible threat to sea life**](#) [周六, 21 10月 00:58]

Oregon shore crabs exhibit risky behavior when they're exposed to the antidepressant Prozac, making it easier for predators to catch them, according to a new study.

- [**NASA's MAVEN mission finds Mars has a twisted magnetic tail**](#) [周五, 20 10月 06:18]

Mars has an invisible magnetic 'tail' that is twisted by interaction with the solar wind, according to new research using data from NASA's MAVEN spacecraft.

- [**The blob that ate the tokamak: Physicists gain understanding of bubbles at edge of plasmas**](#) [周五, 20 10月 03:05]

Scientists have completed new simulations that could provide insight into how blobs at the plasma edge behave. The simulations performed kinetic simulations of two different regions of the plasma edge simultaneously.

- [**Using optical chaos to control the momentum of light**](#) [周五, 20 10月 03:05]

Controlling and moving light poses serious challenges. One major hurdle is that light travels at different speeds and in different phases in different components of an integrated circuit. For light to couple between optical components, it needs to be moving at the same momentum. Now, a team of researchers has demonstrated a new way to control the momentum of broadband light in a widely-used optical component known as a whispering gallery microcavity (WGM).

- [**Studying insect behavior? Make yourself an ethoscope!**](#) [周五, 20 10月 02:30]

Fruit flies have surprising similarities to humans. The mysteries of a broad range of human conditions can be studied in detail in these organisms, however this often requires the use of expensive custom

equipment. team of scientists now present the ethoscope -- a cheap, easy-to-use and self-made customizable piece of equipment of their invention that can be used to study flies' behavior.

- [**Evolution in your back garden: Great tits may be adapting their beaks to birdfeeders**](#) [周五, 20 10月 02:30]

A British enthusiasm for feeding birds may have caused UK great tits to have evolved longer beaks than their European counterparts, according to new research. The findings identify for the first time the genetic differences between UK and Dutch great tits which researchers were then able to link to longer beaks in UK birds.

- [**Liquid metal discovery ushers in new wave of chemistry and electronics**](#) [周五, 20 10月 02:30]

Researchers use liquid metal to create atom-thick 2-D never before seen in nature. The research could transform how we do chemistry and could also be applied to enhance data storage and make faster electronics.

- [**Gut bacterium indirectly causes symptoms by altering fruit fly microbiome**](#) [周五, 20 10月 02:27]

CagA, a protein produced by the bacterium *Helicobacter pylori*, can alter the population of microbes living in the fruit fly gut, leading to disease symptoms, according to new research.

- [**Extreme light trapping**](#) [周五, 20 10月 00:38]

Physicists have built a nanostructure whose crystal lattice bends light as it enters the material and directs it in a path parallel to the surface, known as "parallel to interface refraction."

- [**Strange but true: Turning a material upside down can sometimes make it softer**](#) [周四, 19 10月 23:10]

Through the combined effect of flexoelectricity and piezoelectricity, researchers have found that polar materials can be made more or less resistant to dents when they are turned upside down... or when a voltage is applied to switch their polarization. This research points to the future development of 'smart mechanical materials' for use in smart coatings

and ferroelectric memories.

- **[Six degrees of separation: Why it is a small world after all](#)** [周四, 19 10月 23:10]

This study examines how small-world networks occur within bigger and more complex structures.

- **[Itsy bitsy spider: Fear of spiders and snakes is deeply embedded in us](#)** [周四, 19 10月 23:09]

Snakes and spiders evoke fear and disgust in many people, even in developed countries where hardly anybody comes into contact with them. Until now, there has been debate about whether this aversion is innate or learnt. Scientists have recently discovered that it is hereditary: Even babies feel stressed when seeing these creatures - long before they could have learnt this reaction.

- **[A mosquito's secret weapon: a light touch and strong wings](#)** [周四, 19 10月 22:10]

How do mosquitoes land and take off without our noticing? Using high-speed video cameras, researchers have found part of the answer: mosquitoes' long legs allow them to slowly and gently push off, but their wings provide the majority of the lift, even when fully laden with a blood meal. For comparison, mosquitoes push off with forces much less than those of an escaping fruit fly.

- **[Scientists pinpoint jealousy in the monogamous mind](#)** [周四, 19 10月 22:10]

Scientists find that in male titi monkeys, jealousy is associated with heightened activity in the cingulate cortex, an area of the brain associated with social pain in humans, and the lateral septum, associated with pair bond formation in primates. A better understanding of jealousy may provide important clues on how to approach health and welfare problems such as addiction and domestic violence, as well as autism.

- **[The best hedge fund managers are not psychopaths or narcissists, according to new](#)**

[study](#) [周四, 19 10月 22:10]

When it comes to financial investments, hedge fund managers higher in 'dark triad' personality traits -- psychopathy, narcissism, and Machiavellianism -- perform more poorly than their peers, according to new personality psychology research. The difference is a little less than 1 percent annually compared to their peers, but with large investments over several years that slight underperformance can add up.

• [Salmon sex linked to geological change](#) [周四, 19 10月 22:08]

It turns out that sex can move mountains. Researchers have found that the mating habits of salmon can alter the profile of stream beds, affecting the evolution of an entire watershed. The study is one of the first to quantitatively show that salmon can influence the shape of the land.

• [Want to control your dreams? Here's how you can](#) [周四, 19 10月 22:08]

New research has found that a specific combination of techniques will increase people's chances of having lucid dreams, in which the dreamer is aware they're dreaming while it's still happening and can control the experience.

• [Scientists dig into the origin of organics on dwarf planet Ceres](#) [周四, 19 10月 03:18]

Since NASA's Dawn spacecraft detected localized organic-rich material on Ceres, scientists have been digging into the data to explore different scenarios for its origin. After considering the viability of comet or asteroid delivery, the preponderance of evidence suggests the organics are most likely native to Ceres.

• [Petals produce a 'blue halo' that helps bees find flowers](#) [周四, 19 10月 01:28]

Latest research has found that several common flower species have nanoscale ridges on the surface of their petals that meddle with light when viewed from certain angles.

- [**Solar eruptions could electrify Martian moons**](#) [周四, 19 10月 00:41]

Powerful solar eruptions could electrically charge areas of the Martian moon Phobos to hundreds of volts, presenting a complex electrical environment that could possibly affect sensitive electronics carried by future robotic explorers, according to a new NASA study. The study also considered electrical charges that could develop as astronauts transit the surface on potential human missions to Phobos.

- [**Stiff fibers spun from slime**](#) [周三, 18 10月 23:35]

Nanoparticles from the secretion of velvet worms form recyclable polymer fibers.

- [**Potential human habitat located on the moon**](#) [周三, 18 10月 22:43]

A new study confirms the existence of a large open lava tube in the Marius Hills region of the moon, which could be used to protect astronauts from hazardous conditions on the surface.

- [**When teeth grow on the body**](#) [周三, 18 10月 21:12]

Today, certain species of catfish are covered with bony plates bristling with thin teeth, like some extinct vertebrate lineages. These teeth, which regularly fall out and then grow back, are used for defense and, in males, also to seduce the females. Researchers wanted to understand how these teeth capable of regeneration can develop outside of the mouth. They discovered that the extra-oral teeth always grow on a bone, regardless of its type, even in the absence of a bony plate. This suggests a r...

- [**Flexible 'skin' can help robots, prosthetics perform everyday tasks by sensing shear force**](#) [周三, 18 10月 00:43]

Engineers have developed a flexible sensor 'skin' that can be stretched over any part of a robot's body or prosthetic to accurately convey information about shear forces and vibration, which are critical to tasks ranging from cooking an egg to dismantling a bomb.

- [**Looking for microbe 'fingerprints' on simulated Martian rocks**](#) [周二, 17 10月 23:01]

Scientists are searching for unique bio-signatures left on synthetic

extraterrestrial minerals by microbial activity. A new paper describes investigations into these signatures at a miniaturized 'Mars farm' where researchers can observe interactions between the archaeon *Metallosphaera sedula* and Mars-like rocks. These microbes are capable of oxidizing and integrating metals into their metabolism.

[Liquid metal brings soft robotics a step closer](#) [周二,

17 10月 21:19]

Scientists have invented a way to morph liquid metal into physical shapes. Researchers have applied electrical charges to manipulate liquid metal into 2-D shapes such as letters and a heart.

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ScienceDaily

周二, 31 10月 2017

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- [**9/11 WTC responders show increased physical disability due to PTSD**](#) [周二, 31 10月 03:46]

A new study of more than 1,100 WTC responders indicates a significant increase in physical disability among the responders.

- [**Less but more frequent exercise best to reduce weight? Study provides a clue**](#) [周二, 31 10月 03:45]

Low magnitude, high frequency mechanical stimulation (LMMS) reduces adipose (fat) tissue and thus may be a method of reducing weight and health risks such as diabetes. A new study takes this concept to another level.

- [**Making glass invisible: A nanoscience-based disappearing act**](#) [周二, 31 10月 03:44]

By texturing glass surfaces with nanosized features, scientists almost completely eliminated surface reflections -- an achievement that could enhance solar cell efficiency, improve consumers' experience with electronic displays, and support high-power laser applications.

- [**Examining potatoes' past could improve spuds of the future**](#) [周二, 31 10月 03:44]

Examining the ancestors of the modern, North American cultivated

potato has revealed a set of common genes and important genetic pathways that have helped spuds adapt over thousands of years. New research shows potential genetic keys that could ensure the crop will thrive in the future.

- [**The advent of 'green' cattle**](#) [周二, 31 10月 03:44]

Implications of livestock farming on climate change should not be drawn from aggregate statistics, reveals a study based on a new method of carbon footprinting for pasture-based cattle production systems that can assess the impacts of individual animals.

- [**Research aims to help renewable jet fuel take flight**](#) [周二, 31 10月 03:44]

The International Air Transport Association predicts that 7.2 billion passengers will fly in 2035, nearly doubling the 3.8 billion in 2016. So how do we make flying easier on the environment? Instead of petroleum, researchers have now developed new processes to ramp up production of bio-based fuel made from corncoobs and wood chips.

- [**Voltage-driven liquid metal fractals**](#) [周二, 31 10月 03:44]

Researchers have found that gallium indium (EGaIn), a liquid metal with one of the highest surface tensions, can be induced to spread and form patterns called fractals with the application of low voltage. The work has implications for controlling the shape of liquid metals.

- [**Right whales, already an endangered species, may face a dim future**](#) [周二, 31 10月 03:44]

Researchers show that right whales, already an endangered species, may face a dim future.

- [**It's mathematically impossible to beat aging, scientists say**](#) [周二, 31 10月 03:44]

Current understanding of the evolution of aging leaves open the possibility that aging could be stopped if only science could figure out a way to make selection between organisms perfect. However, the solution isn't that simple, researchers have found.

• [**Greenhouse gas concentrations surge to new record**](#) [周二, 31 10月 02:19]

Concentrations of carbon dioxide in the atmosphere surged at a record-breaking speed in 2016 to the highest level in 800,000 years, according to a new report. The abrupt changes in the atmosphere witnessed in the past 70 years are without precedent.

• [**Study may add to resource managers' toolbox**](#) [周二, 31 10月 02:13]

Fish 'condition' can help guide management efforts for Chesapeake Bay, suggests a new research study.

• [**For older adults with diabetes, losing weight with diet, exercise can improve circulation**](#) [周二, 31 10月 02:13]

Type 2 diabetes affects blood circulation. When blood flow in the brain is impaired, it can affect the way we think and make decisions. Recently, researchers examined information from a 10-year-long study, focusing on whether participants with type 2 diabetes who lowered calories in their diet and increased physical activity had better blood flow to the brain.

• [**Focused ultrasound shows promise for treating Parkinson's tremor**](#) [周二, 31 10月 02:13]

An initial test to determine if a scalpel-free form of brain surgery can reduce tremor caused by Parkinson's disease has produced encouraging results. Further research is warranted, the researchers conclude.

• [**Surprising monkey study: Bad times do not cause group members to change behavior**](#) [周二, 31 10月 01:56]

Researchers have observed an unexpected behavioral pattern in monkeys in Puerto Rico. As the population density in the group rises, the group as a whole produces fewer babies -- this is no surprise. But, to the surprise of researchers, it turned out that the group's individual members did not change behavior. How does this add up?

• [**Effects of Medicaid expansion focus of new**](#)

[study](#) [周二, 31 10月 01:56]

A new article examines the effects of Medicaid expansion on low-income individuals' access to health care.

• [Cobalt and tungsten key to cheaper, cleaner hydrogen](#) [周二, 31 10月 01:46]

Electrolysis, splitting the water molecule with electricity, is the cleanest way to obtain hydrogen, a clean and renewable fuel. Now, researchers have designed a new catalyst that reduces the cost of electrolytic hydrogen production. Catalysts reduce the amount of electricity needed to break the chemical bonds, speed up the reaction and minimize the energy waste.

• [Virtual reality reduces phantom pain in paraplegics](#) [周二, 31 10月 01:46]

Virtual reality reduces phantom body pain in paraplegics and creates the illusion that they can feel their paralyzed legs being touched again. The results could one day translate into therapies to reduce chronic pain in paraplegics.

• [Social media data use needs tighter research controls, experts say](#) [周二, 31 10月 01:46]

Information shared on social media is being regularly used in research projects without users' consent, a study suggests. Experts have called for tighter control of the practice, with fresh guidelines needed to ensure personal data is being used appropriately.

• [How flu shot manufacturing forces influenza to mutate](#) [周二, 31 10月 01:46]

The common practice of growing influenza vaccine components in chicken eggs disrupts the major antibody target site on the virus surface, rendering the flu vaccine less effective in humans.

• [Early age of drinking leads to neurocognitive and neuropsychological damage](#) [周二, 31 10月 01:16]

Although drinking by U.S. adolescents has decreased during the last

decade, more than 20 percent of U.S. high-school students continue to drink alcohol before the age of 14 years. This can have adverse effects on their neurodevelopment. Little is known about how the age of alcohol-use onset influences brain development. This is the first study to assess the association between age of adolescent drinking onset and neurocognitive performance, taking into account pre-existing cognitive function.

- [**Drinking during adolescence and young adulthood: Taboo, tolerated, and treasured**](#) [周二, 31 10月 01:16]

The etiology of a behavior, such as alcohol drinking, can change during adolescence and young adulthood. A new article explores factors of family and friend influences on youth and young adult drinking.

- [**Smart artificial beta cells could lead to new diabetes treatment**](#) [周二, 31 10月 01:14]

Artificial beta cells have been developed that automatically release insulin into the bloodstream when glucose levels rise. This work was done in lab experiments but could lead to a much more patient-friendly treatment than injections.

- [**New method makes bioethanol from waste -- in existing plants**](#) [周二, 31 10月 01:12]

It is possible to produce bioethanol from agricultural and industrial waste in existing plants in a socioeconomically sustainable way, according to new research from Sweden.

- [**Mystery of raging black hole beams penetrated**](#) [周二, 31 10月 01:12]

They are nature's very own Death Star beams - ultra-powerful jets of energy that shoot out from the vicinity of black holes like deadly rays from the Star Wars super-weapon.

- [**How nanoscale patterning can decrease metal fatigue**](#) [周二, 31 10月 00:35]

Fatigue due to repetitive strain is the leading cause of failure in metal components and structures, but new research shows how crystalline

structures called nanotwins can slow the accumulation of fatigue-related damage.

- [**White rot fungi's size explained by breadth of gene families involved**](#) [周二, 31 10月 00:35]

Armillaria fungi are among the most devastating fungal pathogens, causing root rot disease in more than 500 plant species found in forests, parks and vineyards. As white rot fungi, they are capable of breaking down all components of plant cell walls, a capability that interests bioenergy researchers. Biologists have now analyzed and compared four Armillaria fungal genomes with those of related fungi to better understand the evolution of Armillaria's abilities.

- [**US' power supply has capacity to adapt to climate change**](#) [周二, 31 10月 00:34]

Scientists have found that climate change ultimately will have a negative effect on the reliability of electricity generation in the United States, but today's infrastructure may be more adaptable to future climate conditions than previously thought.

- [**Jupiter's X-ray auroras pulse independently**](#) [周二, 31 10月 00:34]

Jupiter's intense northern and southern lights pulse independently of each other according to new research.

- [**Breastfeeding for two months halves risk of SIDS**](#) [周二, 31 10月 00:34]

Breastfeeding for at least two months cuts a baby's risk of Sudden Infant Death Syndrome almost in half, a sweeping new international study has found.

- [**Immigrants living in the country without authorization at risk for anxiety and depression**](#) [周二, 31 10月 00:33]

Nearly a quarter of Mexican immigrants who live near the California-Mexico border without legal authorization have a mental disorder, particularly depression or anxiety.

• [**3-D-printed device builds better nanofibers**](#) [周二, 31 10月 00:33]

Researchers describe a new device for producing nanofiber meshes, which matches the production rate and power efficiency of its best-performing predecessor --- but significantly reduces variation in the fibers' diameters, an important consideration in most applications

• [**Competitive divers face high risk of back, shoulder and other injuries**](#) [周二, 31 10月 00:33]

Competitive divers face a high risk of injuring their shoulders, back, elbows, wrists and other body parts, according to sports medicine physicians.

• [**Discovery challenges belief about brain's cellular makeup**](#) [周二, 31 10月 00:33]

A new discovery is challenging science's longstanding beliefs regarding the cellular makeup of the brain, report scientists.

• [**Studies reveal characteristics of bone, tendon injuries incurred by Olympic athletes**](#) [周一, 30 10月 23:49]

Female athletes participating in the 2016 Summer Olympics in Rio de Janeiro were more likely to experience bone stress injuries in their lower extremities while competing in track and field compared to other events. In addition, tendon abnormalities similarly were most common in track and field athletes, however they most frequently involved the shoulder, Achilles and patellar tendons.

• [**Intake of pesticide residue from fruits, vegetables and infertility treatment outcomes**](#) [周一, 30 10月 23:24]

Eating more fruits and vegetables with high-pesticide residue was associated with a lower probability of pregnancy and live birth following infertility treatment for women using assisted reproductive technologies, report researchers.

• [**New tool predicts risk of plant disease and infestation worldwide**](#) [周一, 30 10月 23:23]

Researchers have developed a technique to predict the risk of disease or infestation in plants. By considering pest-host interactions and the geographical distribution of vulnerable plants, their new algorithms can provide maps of potential disease hotspots, helping governments to identify the risk for outbreaks, before they happen.

- [**Umbilical cord blood improves motor skills in some children with cerebral palsy**](#) [周一, 30 10月 23:23]

An infusion of cells from a child's own umbilical cord blood appears to improve brain connectivity and motor function in children with spastic cerebral palsy, according to a randomized clinical trial.

- [**Quantum dots visualize tiny vibrational resonances**](#) [周一, 30 10月 23:23]

When laser light is used to drive the motion of a thin, rigid membrane, the membrane vibrates in resonance with the light. The resulting patterns can be visualized through an array of quantum dots, where these tiny structures emit light at a frequency that responds to movement.

- [**Early childhood adversities linked to health problems in tweens, teens**](#) [周一, 30 10月 23:22]

Researchers have identified a pathway in the brain that seems to connect exposure to adverse experiences during early childhood with depression and problems with physical health in teens and preteens.

- [**Work-family balance can tip wrong way for some young doctors**](#) [周一, 30 10月 23:22]

Female medical interns are more likely to suffer from symptoms of depression than their male counterparts, and the conflict between work and family responsibilities is a factor in that gender difference about a third of the time, suggests research.

- [**New fast-charging, high-energy electric-car battery technology**](#) [周一, 30 10月 23:22]

Researchers have developed a novel hydrogen isotope separation system based on a porous metal organic framework (MOF).

- **[Both the aggressor and the victim: Alarming number of teens cyberbully themselves](#)** [周一, 30 10月 23:22]

A new form of self-harm in youth has emerged and is cause for concern. The behavior: 'digital self-harm' or 'self-trolling,' where adolescents post, send or share mean things about themselves anonymously online. The concern: it is happening at alarming rates and could be a cry for help. A new study is the first to examine the extent of this behavior and is the most comprehensive investigation of this understudied problem.

- **[Nanoscale platform aims to control protein levels](#)** [周一, 30 10月 23:22]

A nanoscale antibody first found in camels combined with a protein-degrading molecule is an effective new platform to control protein levels in cells, according to scientists.

- **[Cover crops provide bed and breakfast layover for migrating birds](#)** [周一, 30 10月 23:22]

After harvesting a corn or soybean crop, farmers may plant a cover crop for a variety of reasons -- to reduce soil erosion and nutrient runoff, increase organic matter in the soil, and improve water quality. Now there's another reason. New research shows that migratory birds prefer to rest and refuel in fields with cover crops.

- **[New review looks at the effectiveness, side effects of mefloquine](#)** [周一, 30 10月 23:22]

New systematic reviews have investigated the safety of mefloquine (Lariam) for preventing malaria in travelers.

- **[Less fat, more hair and younger skin: Study in mice shows benefits from calorie-restricted diet](#)** [周一, 30 10月 23:22]

Scientists show that mice subjected to the diet presented body fat reduction and fur production increase. The research group also noted that liver, pancreas and brain cells from these mice boasted a higher performance in activities related to metabolic regulation.

• [**Willingness to take risks: A personality trait**](#) [周一, 30 10月 21:57]

People differ in their willingness to take risks. An individual's propensity for risk taking can also vary across domains. However, there is new evidence showing that there is also a general factor of individual risk preference, which remains stable over time -- akin to the general Intelligence Quotient (IQ). Researchers report these findings based on over 1500 participants in a new article.

• [**Important mechanism of epigenetic gene regulation identified**](#) [周一, 30 10月 21:57]

How can defective gene activity, which can ultimately lead to cancer, be avoided? Researchers now identified a mechanism how cells pass on the regulation of genetic information through epigenetic modifications. These insights open the door to new approaches for future cancer treatments.

• [**HPV: Vaccination and test reduce cancer risk by more than 90%**](#) [周一, 30 10月 21:56]

Every year there are around 400 new cases of cervical cancer and a total of approximately 800 cancers associated with HPV (human papilloma virus). Two measures could reverse this trend: the nonavalent HPV vaccination and HPV screening by means of smear tests as secondary prevention. This combination is able to reduce the cancer risk by more than 90%.

• [**Gradation-tint smart window**](#) [周一, 30 10月 21:56]

Scientists have developed smart glass capable of producing various shades on its surface. Unlike the conventional types, the newly developed tinting smart glass allows users to easily change the shaded area of a window. For example, a user would be able to change the shaded area of a window in accordance with the elevation of the sun. The technology may be applicable to various types of windows, including those of automobiles and buildings, enabling them to offer both shade and clear visibility s...

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9/11 WTC responders show increased physical disability due to PTSD -- ScienceDaily

A new study of more than 1,100 WTC responders cared for at the Stony Brook University WTC Wellness Program indicates a significant increase in physical disability among the responders.

The findings, published in the *Journal of Traumatic Stress*, revealed that posttraumatic stress disorder (PTSD) is associated with physical limitations (such as problems with walking, getting out of a chair, and balance). PTSD symptoms worsened among individuals with physical limitations.

Lead author Sean Clouston, PhD, Assistant Professor in the Program in Public Health, says the findings are concerning because of the relative young age of the responders (35 to 65) and are also suggestive of "a looming burden of physical disability and changes in brain functioning in the population -- two sensitive indicators of physical and/or cognitive decline."

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Making glass invisible: A nanoscience-based disappearing act -- ScienceDaily

If you have ever watched television in anything but total darkness, used a computer while sitting underneath overhead lighting or near a window, or taken a photo outside on a sunny day with your smartphone, you have experienced a major nuisance of modern display screens: glare. Most of today's electronics devices are equipped with glass or plastic covers for protection against dust, moisture, and other environmental contaminants, but light reflection from these surfaces can make information displayed on the screens difficult to see.

Now, scientists at the Center for Functional Nanomaterials (CFN) -- a U.S. Department of Energy Office of Science User Facility at Brookhaven National Laboratory -- have demonstrated a method for reducing the surface reflections from glass surfaces to nearly zero by etching tiny nanoscale features into them.

Whenever light encounters an abrupt change in refractive index (how much a ray of light bends as it

crosses from one material to another, such as between air and glass), a portion of the light is reflected. The nanoscale features have the effect of making the refractive index change gradually from that of air to that of glass, thereby avoiding reflections. The ultra-transparent nanotextured glass is antireflective over a broad wavelength range (the entire visible and near-infrared spectrum) and across a wide range of viewing angles. Reflections are reduced so much that the glass essentially becomes invisible.

This "invisible glass" could do more than improve the user experience for consumer electronic displays. It could enhance the energy-conversion efficiency of solar cells by minimizing the amount of sunlight lost to reflection. It could also be a promising alternative to the damage-prone antireflective coatings conventionally used in lasers that emit powerful pulses of light, such as those applied to the manufacture of medical devices and aerospace components.

"We're excited about the possibilities," said CFN Director Charles Black, corresponding author on the paper published online on October 30 in *Applied Physics Letters*. "Not only is the performance of these nanostructured materials extremely high, but we're also

implementing ideas from nanoscience in a manner that we believe is conducive to large-scale manufacturing."

Former Brookhaven Lab postdocs Andreas Liapis, now a research fellow at Massachusetts General Hospital's Wellman Center for Photomedicine, and Atikur Rahman, an assistant professor in the Department of Physics at the Indian Institute of Science Education and Research, Pune, are co-authors.

To texture the glass surfaces at the nanoscale, the scientists used an approach called self-assembly, which is the ability of certain materials to spontaneously form ordered arrangements on their own. In this case, the self-assembly of a block copolymer material provided a template for etching the glass surface into a "forest" of nanoscale cone-shaped structures with sharp tips -- a geometry that almost completely eliminates the surface reflections. Block copolymers are industrial polymers (repeating chains of molecules) that are found in many products, including shoe soles, adhesive tapes, and automotive interiors.

Black and CFN colleagues have previously used a similar nanotexturing technique to impart silicon, glass, and some plastic materials with water-repellent and

self-cleaning properties and anti-fogging abilities, and also to make silicon solar cells antireflective. The surface nanotextures mimic those found in nature, such as the tiny light-trapping posts that make moth eyes dark to help the insects avoid detection by predators and the waxy cones that keep cicada wings clean.

"This simple technique can be used to nanotexture almost any material with precise control over the size and shape of the nanostructures," said Rahman. "The best thing is that you don't need a separate coating layer to reduce glare, and the nanotextured surfaces outperform any coating material available today."

"We have eliminated reflections from glass windows not by coating the glass with layers of different materials but by changing the geometry of the surface at the nanoscale," added Liapis. "Because our final structure is composed entirely of glass, it is more durable than conventional antireflective coatings."

To quantify the performance of the nanotextured glass surfaces, the scientists measured the amount of light transmitted through and reflected from the surfaces. In good agreement with their own model simulations, the experimental measurements of surfaces with

nanotextures of different heights show that taller cones reflect less light. For example, glass surfaces covered with 300-nanometer-tall nanotextures reflect less than 0.2 percent of incoming red-colored light (633-nanometer wavelength). Even at the near-infrared wavelength of 2500 nanometers and viewing angles as high as 70 degrees, the amount of light passing through the nanostructured surfaces remains high -- above 95 and 90 percent, respectively.

In another experiment, they compared the performance of a commercial silicon solar cell without a cover, with a conventional glass cover, and with a nanotextured glass cover. The solar cell with the nanotextured glass cover generated the same amount of electric current as the one without a cover. They also exposed their nanotextured glass to short laser pulses to determine the intensity at which the laser light begins to damage the material. Their measurements reveal the glass can withstand three times more optical energy per unit area than commercially available antireflection coatings that operate over a broad wavelength range.

"Our role in the CFN is to demonstrate how nanoscience can facilitate the design of new materials with improved properties," said Black. "This work is a

great example of that -- we'd love to find a partner to help advance these remarkable materials toward technology."

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Examining potatoes' past could improve spuds of the future -- ScienceDaily

The old adage of looking to the past to understand the future certainly applies to improving potatoes.

Examining the ancestors of the modern, North American cultivated potato has revealed a set of common genes and important genetic pathways that have helped spuds adapt over thousands of years. Robin Buell, Michigan State University Foundation Professor of Plant Biology and senior author of the paper, shows potential genetic keys that could ensure the crop will thrive in the future.

"Worldwide, potato is the third most important crop grown for direct human consumption, yet breeders have struggled to produce new varieties that outperform those released over a century ago," Buell said. "By analyzing cultivated potato and its wild relatives using modern genomics approaches, we were able to reveal key factors that could address food

security in 21st century agriculture."

Cultivated potatoes, domesticated from wild *Solanum* species, a genetically simpler diploid (containing two complete sets of chromosomes) species, can be traced to the Andes Mountains in Peru, South America.

While the exact means of the potato migration are unknown, spuds essentially spread worldwide since their domestication some 8,000 to 10,000 years ago. As potatoes were taken from the more equatorial regions of Peru and Bolivia to the southern parts of South America, they became adapted to longer summer days in Chile and Argentina.

One aspect that is known is how Spanish conquistadors introduced potatoes upon return from their South American exploits to the European continent, where potatoes were quickly adapted as a staple crop. As the explorers ventured from Europe to North America, they also brought potatoes to the new world.

Scientific explorer Michael Hardigan, formerly at MSU and now at the University of California-Davis, led the team of MSU and Virginia Polytechnic Institute and State University scientists. Together, they studied

wild, landrace (South American potatoes that are grown by local farmers) and modern cultivars developed by plant breeders. The result, published in the current issue of *Proceedings of the National Academy of Sciences*, was the largest crop re-sequencing study to date.

Not only did it involve substantial re-sequencing of potato, but it also tackled one of the most-diverse crop genomes. The modern spuds found in today's kitchens are genetically complex tetraploid potatoes, having four times the regular number of chromosomes. Potatoes' complex genome harbors an estimated 39,000 genes. (In comparison, the human genome comprises roughly 20,000 genes.)

From the large gene pool, the researchers identified 2,622 genes that drove the crop's early improvement when first domesticated. The study appears in the current issue of *Proceedings of the National Academy of Sciences*.

Studying the gene diversity spectrum, from its wild past to its cultivated present, can provide an essential source of untapped adaptive potential, Buell said.

"We'll be able to identify and study historic introgressions and hybridization events as well as find genes targeted during domestication that control variance for agricultural traits," she said. "Many of these help focus on adapting to different climates, fending off different pathogens or improving yield, keys that we hope to better understand to improve future breeding efforts."

For example, wild potatoes reproduce through berries and seeds. Cultivated potatoes are asexual and are food and seed in one. (Anyone who's left a potato in a dark pantry too long has witnessed this trait firsthand.)

The researchers present evidence of the signatures of selection in genes controlling this change. They also shed light on a role of wild species in genetic pathways for fighting pests and processing sugars for food. Diving into somewhat obscure territory, they looked at potential genetic sources that control circadian rhythm; yes, plants also have 24-hour clocks controlling biological processes.

"We knew about their physiological traits, but we didn't know what genes were involved," Buell said.

"As potatoes were moved, they had to adapt to longer

days, more hours of sunlight. We're now starting to understand what's happening at the genetic level and how wild *Solanum* species evolved to long-day adapted tetraploid potatoes."

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The advent of 'green' cattle -- ScienceDaily

Implications of livestock farming on climate change should not be drawn from aggregate statistics, reveals a study based on a new method of carbon footprinting for pasture-based cattle production systems that can assess the impacts of individual animals.

The new method, developed by a team from the University of Bristol and Rothamsted Research, records the environmental impact of each animal separately before calculating the overall burden of a farm.

Existing methods of carbon footprinting are primarily designed to quantify total greenhouse gas (GHG) emissions of a particular farm, and are therefore unable to provide information on environmental performances of specific animals.

The ability to identify "green" cattle within a herd -- cattle that produce lower emissions per kilogram of liveweight gain -- promises more sustainable farming,

they report in the study published today in the *Journal of Cleaner Production*.

The team applied both the new and old methods to field data collected at the North Wyke Farm Platform (NWFP), a Rothamsted state-of-the-art facility that supports three experimental farms over 63 hectares in Devon.

They demonstrated that the latter approach consistently underestimates levels of GHG emissions because it fails to consider sufficiently the impacts of poorly performing animals, which are known to produce disproportionately large amounts of methane through enteric fermentation.

"The research offers two important lessons that may seem paradoxical at first sight," says Dr Taro Takahashi, Research Scientist at North Wyke and Senior Lecturer in Sustainable Livestock Systems and Food Security at Bristol Veterinary School, who led the research.

"Short-term, many carbon footprint estimates currently available are probably too low, which is clearly bad news for the industry. But long-term, this also means

that mitigation of greenhouse gas emissions originating from ruminants could be easier than traditionally thought -- if we are able to select the right animals through the right screening methods. And this is precisely what we are trying to achieve at North Wyke."

The work also marked the first comprehensive evaluation of the three production systems at North Wyke. "This study demonstrates the true value of primary data being collected by the NWFP team every day," says Paul Harris, the facility's project leader. "They can challenge our intuition and enhance our understanding of how we can make agriculture more sustainable."

The new study comes as the debate about the role of livestock in sustainable global food production intensifies. In a report published this month, the Food Climate Research Network (FCRN) reiterated that livestock production is a net contributor to global warming regardless of the species and the rearing method.

"We agree with the FCRN report that ruminants cannot reverse climate change, even if they are grass-fed,"

says Michael Lee, Head of North Wyke and Professor of Sustainable Livestock Systems at Bristol Veterinary School.

"However, as we discussed in our 2014 article in *Nature*, pasture-based livestock production systems have a multifaceted role in society -- the point acknowledged, but not actively addressed, by the FCRN report.

"At Rothamsted, not only do we aim to advance knowledge on how to minimise negative impacts of agricultural production, as exemplified by the current paper, but also on how to optimise the positive contribution grazing livestock can bring to us as part of a well-designed food supply chain."

Lee adds: "Such aspects include effective use of land unsuitable for growing crops, production of higher quality protein and more bioavailable micronutrients, improved animal welfare, prosperous rural communities and flood prevention. They all make up the bigger picture when looking for a sustainable future of food production."

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All Top News

Top science stories featured on ScienceDaily's home page.

- [**Right whales, already an endangered species, may face a dim future**](#) [周二, 31 10月 03:44]

Researchers show that right whales, already an endangered species, may face a dim future.

- [**Greenhouse gas concentrations surge to new record**](#) [周二, 31 10月 02:19]

Concentrations of carbon dioxide in the atmosphere surged at a record-breaking speed in 2016 to the highest level in 800,000 years, according to a new report. The abrupt changes in the atmosphere witnessed in the past 70 years are without precedent.

- [**Virtual reality reduces phantom pain in paraplegics**](#) [周二, 31 10月 01:46]

Virtual reality reduces phantom body pain in paraplegics and creates the illusion that they can feel their paralyzed legs being touched again. The results could one day translate into therapies to reduce chronic pain in paraplegics.

- [**How flu shot manufacturing forces influenza to mutate**](#) [周二, 31 10月 01:46]

The common practice of growing influenza vaccine components in chicken eggs disrupts the major antibody target site on the virus surface, rendering the flu vaccine less effective in humans.

- [**Mystery of raging black hole beams penetrated**](#) [周二, 31 10月 01:12]

They are nature's very own Death Star beams - ultra-powerful jets of energy that shoot out from the vicinity of black holes like deadly rays

from the Star Wars super-weapon.

- [**White rot fungi's size explained by breadth of gene families involved**](#) [周二, 31 10月 00:35]

Armillaria fungi are among the most devastating fungal pathogens, causing root rot disease in more than 500 plant species found in forests, parks and vineyards. As white rot fungi, they are capable of breaking down all components of plant cell walls, a capability that interests bioenergy researchers. Biologists have now analyzed and compared four Armillaria fungal genomes with those of related fungi to better understand the evolution of Armillaria's abilities.

- [**Jupiter's X-ray auroras pulse independently**](#) [周二, 31 10月 00:34]

Jupiter's intense northern and southern lights pulse independently of each other according to new research.

- [**Breastfeeding for two months halves risk of SIDS**](#) [周二, 31 10月 00:34]

Breastfeeding for at least two months cuts a baby's risk of Sudden Infant Death Syndrome almost in half, a sweeping new international study has found.

- [**Pumpkin genomes sequenced, revealing uncommon evolutionary history**](#) [周一, 30 10月 21:54]

For some, pumpkins conjure carved Halloween decorations, but for many people around the world, these gourds provide nutrition. Scientists have sequenced the genomes of two important pumpkin species, Cucurbita maxima and Cucurbita moschata.

- [**Bonding benefits of breastfeeding extend years beyond infancy**](#) [周一, 30 10月 21:29]

Women who breastfeed their children longer exhibit more maternal sensitivity well past the infant and toddler years, according to a 10-year longitudinal study.

- [**Oldest recorded solar eclipse helps date the**](#)

[Egyptian pharaohs](#) [周一, 30 10月 10:01]

Researchers have pinpointed the date of what could be the oldest solar eclipse yet recorded. The event, which occurred on Oct. 30, 1207 BC, is mentioned in the Bible, and could have consequences for the chronology of the ancient world.

• [Small asteroid or comet 'visits' from beyond the solar system](#) [周五, 27 10月 22:45]

A small, recently discovered asteroid -- or perhaps a comet -- appears to have originated from outside the solar system, coming from somewhere else in our galaxy. If so, it would be the first "interstellar object" to be observed and confirmed by astronomers.

• [New technique produces tunable, nanoporous materials](#) [周五, 27 10月 21:44]

A collaborative group of researchers describe a new technique for creating novel nanoporous materials with unique properties that can be used to filter molecules or light.

• [Advanced artificial limbs mapped in the brain](#) [周五, 27 10月 21:44]

Scientists have used functional MRI to show how the brain re-maps motor and sensory pathways following targeted motor and sensory reinnervation (TMSR), a neuroprosthetic approach where residual limb nerves are rerouted towards intact muscles and skin regions to control a robotic limb.

• [Water buffalo genome unveiled](#) [周五, 27 10月 21:44]

Biologists have published the full genome of the water buffalo -- opening the way for improved breeding and conservation of this economically important animal.

• [Nanomagnets levitate thanks to quantum physics](#) [周五, 27 10月 21:44]

Quantum physicists have now shown that, despite Earnshaw's theorem, nanomagnets can be stably levitated in an external static magnetic field owing to quantum mechanical principles. The quantum angular

momentum of electrons, which also causes magnetism, is accountable for this mechanism.

- **[Film research study shows how the brain reacts to difficult moral issues](#)** [周五, 27 10月 21:00]

The family relationship between film characters clearly affects the reactions in the viewers' brain, research shows. The study has also detected a significant conflict between the reactions of the brain and the person's own account.

- **[Martian landscapes formed from sand 'levitating' on a little boiling water](#)** [周五, 27 10月 20:57]

Scientists have discovered a process that could explain the long-debated mystery of how land features on Mars are formed in the absence of significant amounts of water. Experiments reveal that Mars' thin atmosphere (about 7 mbar -- compared to 1,000 mbar on Earth) combined with periods of relatively warm surface temperatures causes water flowing on the surface to violently boil. This process can then move large amounts of sand and other sediment, which effectively 'levitates' on the boiling water...

- **[Heavy metal thunder: Protein can be switched on to conduct electricity like a metal](#)** [周五, 27 10月 20:55]

When pushing the boundaries of discovery, sometimes even the most experienced of scientists can get a surprise jolt from a completely unpredictable result. About four years ago, Stuart Lindsay's research team got a lab result that even he couldn't quite believe. As with most scientific surprises, it goes against all conventional wisdom: the first evidence of a protein that could conduct electricity like a metal.

- **[Winters on Mars are shaping the Red Planet's landscape](#)** [周五, 27 10月 20:55]

Winter temperatures on the Red Planet sublimate carbon dioxide from a gas to a solid. These solid carbon dioxide blocks are then thought responsible for making gullies and furrows on Mars' landscape, based on innovative lab experiments.

- [**Learning from mussels: New way to make stronger, more stretchy polymers**](#) [周五, 27 10月 02:23]

A wide range of polymer-based materials, from tire rubber and wetsuit neoprene to Lycra clothing and silicone, are elastomers valued for their ability to flex and stretch without breaking and return to their original form.

- [**Bacteria have a sense of touch**](#) [周五, 27 10月 02:23]

Although bacteria have no sensory organs in the classical sense, they are still masters in perceiving their environment. A research group has now discovered that bacteria not only respond to chemical signals, but also possess a sense of touch. The researchers demonstrate how bacteria recognize surfaces and respond to this mechanical stimulus within seconds. This mechanism is also used by pathogens to colonize and attack their host cells.

- [**Astronomers discover sunscreen snow falling on hot exoplanet**](#) [周五, 27 10月 01:53]

Astronomers have used the Hubble Space Telescope to find a blistering-hot giant planet outside our solar system where the atmosphere 'snows' titanium dioxide -- the active ingredient in sunscreen. These observations are the first detections of this 'snow-out' process, called a 'cold trap,' on an exoplanet. The research provides insight into the complexity of weather and atmospheric composition on exoplanets, and may someday be useful for gauging the habitability of Earth-size planets.

- [**Scientists detect comets outside our solar system**](#)

[周五, 27 10月 01:53]

Scientists, working closely with amateur astronomers, have spotted the dusty tails of six exocomets -- comets outside our solar system -- orbiting a faint star 800 light years from Earth.

- [**'Bandit-masked' feathered dinosaur hid from predators using multiple types of camouflage**](#) [周五, 27 10月 01:52]

Researchers have revealed how a small feathered dinosaur used its color

patterning, including a bandit mask-like stripe across its eyes, to avoid being detected by its predators and prey.

- [**Individual with complete spinal cord injury regains voluntary motor function**](#) [周四, 26 10月 22:31]

A man with a complete spinal cord injury, who had lost motor function below the level of the injury, has regained the ability to move his legs voluntarily and stand six years after his injury.

- [**Wobbling galaxies: New evidence for dark matter makes it even more exotic**](#) [周四, 26 10月 22:31]

Astronomers have discovered that the brightest galaxies within galaxy clusters 'wobble' relative to the cluster's center of mass. This unexpected result is inconsistent with predictions made by the current standard model of dark matter. With further analysis it may provide insights into the nature of dark matter, perhaps even indicating that new physics is at work.

- [**Yellowstone spawned twin super-eruptions that altered global climate**](#) [周四, 26 10月 20:58]

A new geological record of the Yellowstone supervolcano's last catastrophic eruption is rewriting the story of what happened 630,000 years ago and how it affected Earth's climate. This eruption formed the vast Yellowstone caldera observed today, the second largest on Earth.

- [**Current climate change unparalleled over the last 100 million years?**](#) [周四, 26 10月 20:57]

A team of researchers has discovered a flaw in the way past ocean temperatures have been estimated up to now. Their findings could mean that the current period of climate change is unparalleled over the last 100 million years.

- [**'Mega-carnivore' dinosaur roamed southern Africa 200 million years ago**](#) [周四, 26 10月 03:06]

An international team of scientists has discovered the first evidence that a huge carnivorous dinosaur roamed southern Africa 200 million year

ago.

- [**6,000-year-old skull could be from the world's earliest known tsunami victim**](#) [周四, 26 10月 03:06]

Scientists have discovered what they believe is the skull of the earliest known tsunami victim, a person who lived 6,000 years ago in Papua New Guinea. The skull itself was found almost a hundred years ago, but recent analysis of the sediments found with the skull reveals that they bear distinctive hallmarks of tsunami activity.

- [**Neuroscientists improve human memory by electrically stimulating brain**](#) [周四, 26 10月 03:06]

Neuroscientists have discovered precisely where and how to electrically stimulate the human brain to enhance people's recollection of distinct memories.

- [**New property found in unusual crystalline materials**](#) [周四, 26 10月 02:11]

Researchers have discovered an unexpected property of some nanostructured metals, could lead to new ways of 'tuning' their properties.

- [**Investing in conservation pays off, study finds**](#) [周四, 26 10月 02:11]

Governments and donors have spent billions of dollars since the 1992 Rio Earth Summit attempting to slow the pace of species extinctions around the world. Now, a new article provides the first clear evidence that those efforts are working.

- [**Precise DNA editing made easy: New enzyme to rewrite the genome**](#) [周四, 26 10月 02:05]

A new type of DNA editing enzyme lets scientists directly and permanently change single base pairs of DNA from A*T to G*C. The process could one day enable precise DNA surgery to correct mutations that cause human diseases.

- [**Physicists have breakthrough on brittle smart**](#)

[phone screens](#) [周四, 26 10月 02:05]

New 'potato stamp' technique combining silver and graphene may create cheaper, more flexible and eco-friendly screens.

• [New RoboBee flies, dives, swims and explodes out the of water](#) [周四, 26 10月 02:05]

A new, hybrid RoboBee can fly, dive into water, swim, propel itself back out of water, and safely land. Floating devices allow this multipurpose air-water microrobot to stabilize on the water's surface before an internal combustion system ignites to propel it back into the air. This latest-generation RoboBee, which is 1,000 times lighter than any previous aerial-to-aquatic robot, could be used for numerous applications, from search-and-rescue operations to environmental monitoring and biological ...

• [Oysters close their shells in response to low-frequency sounds](#) [周四, 26 10月 02:05]

Oysters rapidly close their shells in response to low-frequency sounds characteristic of marine noise pollution, according to a study.

• [Alvarezsaurid dinosaur from the late Cretaceous found in Uzbekistan](#) [周四, 26 10月 02:05]

Bones from an Alvarezsaurid dinosaur were discovered in Uzbekistan and could shed light on the evolution and origin of the species, according to a new study.

• [First Jurassic ichthyosaur fossil found in India](#) [周四, 26 10月 02:05]

A new near-complete fossilized skeleton is thought to represent the first Jurassic ichthyosaur found in India.

• ['Scars' left by icebergs record West Antarctic ice retreat](#) [周四, 26 10月 02:04]

Thousands of marks on the Antarctic seafloor, caused by icebergs which broke free from glaciers more than ten thousand years ago, show how part of the Antarctic Ice Sheet retreated rapidly at the end of the last ice age as it balanced precariously on sloping ground and became unstable.

• [**Marine species threatened by deep-sea mining**](#) [周三, 25 10月 22:31]

Underwater mining poses a great danger to animals inhabiting the seafloors. A new research study describes the most abundant species, a sponge, which can now be used to regulate mining operations and help us better understand their environmental impacts.

• [**Role of gut microbiome in posttraumatic stress disorder: More than a gut feeling**](#) [周三, 25 10月 22:31]

The bacteria in your gut could hold clues to whether or not you will develop posttraumatic stress disorder (PTSD) after experiencing a traumatic event.

• [**Determining when humans started impacting the planet on a large scale**](#) [周三, 25 10月 21:05]

Humans have so profoundly altered the Earth that, some scientists argue, our current geologic epoch requires a new name: the Anthropocene. But defining the precise start of the era is tricky. Would it begin with the spread of domesticated farm animals or the appearance of radioactive elements from nuclear bomb tests? Scientists report a method to measure levels of human-made contaminants in sediments that could help pinpoint the Anthropocene's onset.

• [**Earliest known marine navigation tool revealed with scanning technology**](#) [周三, 25 10月 02:39]

Details of the earliest known marine navigation tool, discovered in a shipwreck, have been revealed thanks to state-of-the-art scanning technology.

• [**Taste, not appearance, drives corals to eat plastics**](#) [周三, 25 10月 02:17]

Scientists have long known that marine animals mistakenly eat plastic debris because tiny bits of floating plastic look like prey. But a new study of plastic ingestion by corals suggests there may be an additional reason for the potentially harmful behavior: The plastic simply tastes good. Chemical additives in the plastic may be acting as a feeding

stimulant.

- [How Neanderthals influenced human genetics at the crossroads of Asia and Europe](#) [周三, 25 10月 01:06]

A new study explores the genetic legacy of ancient trysts between Neanderthals and the ancestors of modern humans, with a focus on Western Asia, the region where the first relations may have occurred.

- [Spots on supergiant star drive spirals in stellar wind](#) [周二, 24 10月 23:56]

Astronomers have recently discovered that spots on the surface of a supergiant star are driving huge spiral structures in its stellar wind.

- [Daydreaming is good: It means you're smart](#) [周二, 24 10月 23:28]

A new study suggests that daydreaming during meetings isn't necessarily a bad thing. It might be a sign that you're really smart and creative. People with efficient brains may have too much brain capacity to stop their minds from wandering.

- [Brain region that motivates behavior change discovered](#) [周二, 24 10月 22:56]

Ever been stuck in a rut? Researchers found that stimulating a region of the brain called the posterior cingulate cortex can lead to changes in routine behavior. Neurons there ramp up their firing rates, then peak just before a pattern shifts. Knowing this could help businesses better understand how to spur employee innovation, exploration and creativity.

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Health News

Top stories featured on ScienceDaily's Health & Medicine, Mind & Brain, and Living Well sections.

- [**9/11 WTC responders show increased physical disability due to PTSD**](#) [周二, 31 10月 03:46]

A new study of more than 1,100 WTC responders indicates a significant increase in physical disability among the responders.

- [**Less but more frequent exercise best to reduce weight? Study provides a clue**](#) [周二, 31 10月 03:45]

Low magnitude, high frequency mechanical stimulation (LMMS) reduces adipose (fat) tissue and thus may be a method of reducing weight and health risks such as diabetes. A new study takes this concept to another level.

- [**It's mathematically impossible to beat aging, scientists say**](#) [周二, 31 10月 03:44]

Current understanding of the evolution of aging leaves open the possibility that aging could be stopped if only science could figure out a way to make selection between organisms perfect. However, the solution isn't that simple, researchers have found.

- [**For older adults with diabetes, losing weight with diet, exercise can improve circulation**](#) [周二, 31 10月 02:13]

Type 2 diabetes affects blood circulation. When blood flow in the brain is impaired, it can affect the way we think and make decisions. Recently, researchers examined information from a 10-year-long study, focusing on whether participants with type 2 diabetes who lowered calories in their diet and increased physical activity had better blood flow to the

brain.

- [**Focused ultrasound shows promise for treating Parkinson's tremor**](#) [周二, 31 10月 02:13]

An initial test to determine if a scalpel-free form of brain surgery can reduce tremor caused by Parkinson's disease has produced encouraging results. Further research is warranted, the researchers conclude.

- [**Surprising monkey study: Bad times do not cause group members to change behavior**](#) [周二, 31 10月 01:56]

Researchers have observed an unexpected behavioral pattern in monkeys in Puerto Rico. As the population density in the group rises, the group as a whole produces fewer babies -- this is no surprise. But, to the surprise of researchers, it turned out that the group's individual members did not change behavior. How does this add up?

- [**Effects of Medicaid expansion focus of new study**](#) [周二, 31 10月 01:56]

A new article examines the effects of Medicaid expansion on low-income individuals' access to health care.

- [**Virtual reality reduces phantom pain in paraplegics**](#) [周二, 31 10月 01:46]

Virtual reality reduces phantom body pain in paraplegics and creates the illusion that they can feel their paralyzed legs being touched again. The results could one day translate into therapies to reduce chronic pain in paraplegics.

- [**How flu shot manufacturing forces influenza to mutate**](#) [周二, 31 10月 01:46]

The common practice of growing influenza vaccine components in chicken eggs disrupts the major antibody target site on the virus surface, rendering the flu vaccine less effective in humans.

- [**Early age of drinking leads to neurocognitive and neuropsychological damage**](#) [周二, 31 10月 01:16]

Although drinking by U.S. adolescents has decreased during the last decade, more than 20 percent of U.S. high-school students continue to drink alcohol before the age of 14 years. This can have adverse effects on their neurodevelopment. Little is known about how the age of alcohol-use onset influences brain development. This is the first study to assess the association between age of adolescent drinking onset and neurocognitive performance, taking into account pre-existing cognitive function.

- [**Drinking during adolescence and young adulthood: Taboo, tolerated, and treasured**](#) [周二, 31 10月 01:16]

The etiology of a behavior, such as alcohol drinking, can change during adolescence and young adulthood. A new article explores factors of family and friend influences on youth and young adult drinking.

- [**Smart artificial beta cells could lead to new diabetes treatment**](#) [周二, 31 10月 01:14]

Artificial beta cells have been developed that automatically release insulin into the bloodstream when glucose levels rise. This work was done in lab experiments but could lead to a much more patient-friendly treatment than injections.

- [**Breastfeeding for two months halves risk of SIDS**](#) [周二, 31 10月 00:34]

Breastfeeding for at least two months cuts a baby's risk of Sudden Infant Death Syndrome almost in half, a sweeping new international study has found.

- [**Immigrants living in the country without authorization at risk for anxiety and depression**](#) [周二, 31 10月 00:33]

Nearly a quarter of Mexican immigrants who live near the California-Mexico border without legal authorization have a mental disorder, particularly depression or anxiety.

- [**Competitive divers face high risk of back,**](#)

[shoulder and other injuries](#) [周二, 31 10月 00:33]

Competitive divers face a high risk of injuring their shoulders, back, elbows, wrists and other body parts, according to sports medicine physicians.

[Discovery challenges belief about brain's cellular makeup](#) [周二, 31 10月 00:33]

A new discovery is challenging science's longstanding beliefs regarding the cellular makeup of the brain, report scientists.

[Studies reveal characteristics of bone, tendon injuries incurred by Olympic athletes](#) [周一, 30 10月 23:49]

Female athletes participating in the 2016 Summer Olympics in Rio de Janeiro were more likely to experience bone stress injuries in their lower extremities while competing in track and field compared to other events. In addition, tendon abnormalities similarly were most common in track and field athletes, however they most frequently involved the shoulder, Achilles and patellar tendons.

[Intake of pesticide residue from fruits, vegetables and infertility treatment outcomes](#) [周一, 30 10月 23:24]

Eating more fruits and vegetables with high-pesticide residue was associated with a lower probability of pregnancy and live birth following infertility treatment for women using assisted reproductive technologies, report researchers.

[Umbilical cord blood improves motor skills in some children with cerebral palsy](#) [周一, 30 10月 23:23]

An infusion of cells from a child's own umbilical cord blood appears to improve brain connectivity and motor function in children with spastic cerebral palsy, according to a randomized clinical trial.

[Early childhood adversities linked to health problems in tweens, teens](#) [周一, 30 10月 23:22]

Researchers have identified a pathway in the brain that seems to connect

exposure to adverse experiences during early childhood with depression and problems with physical health in teens and preteens.

• **[Work-family balance can tip wrong way for some young doctors](#)** [周一, 30 10月 23:22]

Female medical interns are more likely to suffer from symptoms of depression than their male counterparts, and the conflict between work and family responsibilities is a factor in that gender difference about a third of the time, suggests research.

• **[Both the aggressor and the victim: Alarming number of teens cyberbully themselves](#)** [周一, 30 10月 23:22]

A new form of self-harm in youth has emerged and is cause for concern. The behavior: 'digital self-harm' or 'self-trolling,' where adolescents post, send or share mean things about themselves anonymously online. The concern: it is happening at alarming rates and could be a cry for help. A new study is the first to examine the extent of this behavior and is the most comprehensive investigation of this understudied problem.

• **[New review looks at the effectiveness, side effects of mefloquine](#)** [周一, 30 10月 23:22]

New systematic reviews have investigated the safety of mefloquine (Lariam) for preventing malaria in travelers.

• **[Less fat, more hair and younger skin: Study in mice shows benefits from calorie-restricted diet](#)** [周一, 30 10月 23:22]

Scientists show that mice subjected to the diet presented body fat reduction and fur production increase. The research group also noted that liver, pancreas and brain cells from these mice boasted a higher performance in activities related to metabolic regulation.

• **[Willingness to take risks: A personality trait](#)** [周一, 30 10月 21:57]

People differ in their willingness to take risks. An individual's propensity for risk taking can also vary across domains. However, there is new evidence showing that there is also a general factor of individual risk preference, which remains stable over time -- akin to the general

Intelligence Quotient (IQ). Researchers report these findings based on over 1500 participants in a new article.

- **[Important mechanism of epigenetic gene regulation identified](#)** [周一, 30 10月 21:57]

How can defective gene activity, which can ultimately lead to cancer, be avoided? Researchers now identified a mechanism how cells pass on the regulation of genetic information through epigenetic modifications. These insights open the door to new approaches for future cancer treatments.

- **[HPV: Vaccination and test reduce cancer risk by more than 90%](#)** [周一, 30 10月 21:56]

Every year there are around 400 new cases of cervical cancer and a total of approximately 800 cancers associated with HPV (human papilloma virus). Two measures could reverse this trend: the nonavalent HPV vaccination and HPV screening by means of smear tests as secondary prevention. This combination is able to reduce the cancer risk by more than 90%.

- **[Research pinpoints powerful biomarker of Multiple Sclerosis](#)** [周一, 30 10月 21:54]

A breakthrough study has revealed unique molecules in the blood of people with Multiple Sclerosis (MS) that could become definitive diagnostic biomarkers of the world's most common neurologic disability in young adults. The discovery identifies tiny 'dysregulated' micro-RNA molecules that correctly diagnose MS and discriminate between patients at different disease stages -- all in a simple blood test.

- **[Wait a minute! Clamping the umbilical cord later saves preterm babies' lives](#)** [周一, 30 10月 21:54]

Thousands of preterm babies could be saved by waiting 60 seconds before clamping the umbilical cord after birth instead of clamping it immediately -- according to two international studies. The review found clear evidence that delayed clamping reduced hospital mortality by a third and is safe for mothers and pre-term infants.

• [**Effective treatment of contact allergy**](#) [周一, 30 10月 21:54]

Researchers have isolated a molecule that is suitable for the control of contact allergies. The study illuminates a central immune mechanism, which may also play a role in other inflammatory diseases such as arthritis or arteriosclerosis.

• [**Bonding benefits of breastfeeding extend years beyond infancy**](#) [周一, 30 10月 21:29]

Women who breastfeed their children longer exhibit more maternal sensitivity well past the infant and toddler years, according to a 10-year longitudinal study.

• [**Group exercise improves quality of life, reduces stress far more than individual work outs**](#) [周一, 30 10月 21:29]

Group exercise participants showed significant improvements in all three quality of life measures: mental (12.6 percent), physical (24.8 percent) and emotional (26 percent). They also reported a 26.2 percent reduction in perceived stress levels. By comparison, individual fitness participants on average worked out twice as long, and saw no significant changes in any measure, except in mental quality of life (11 percent increase).

• [**Brain's response to mid-life surge in cell aging starts or ends a path to dementia**](#) [周一, 30 10月 21:28]

Researchers have discovered a previously unknown characteristic of brain-cell aging that could help detect late-onset Alzheimer's disease decades before symptoms begin.

• [**Sulfur respiration in mammals and antioxidant activity**](#) [周一, 30 10月 21:28]

Researchers have gained new insight into the formation of a group of compounds found in almost all organisms, which are reportedly shown to be a powerful antioxidant that protects cells from damage by free radicals. They found that these compounds were also essential in supporting the mitochondrial energy metabolism, which is known as

sulfur respiration, and identified it for the first time in humans and other mammals.

- [**Montessori preschool boosts academic results and reduces income-based inequality**](#) [周一, 30 10月 20:48]

Researchers find that children in Montessori preschools show improved academic performance and social understanding, while enjoying their school work more. Strikingly, children from low-income families, who typically don't perform as well at school, show similar academic performance as children from high-income families. Children with low executive function also benefit from Montessori preschools.

- [**E-cigarette use by high school students linked to cigarette smoking**](#) [周一, 30 10月 20:47]

Use of e-cigarettes by high school students was strongly associated with later cigarette smoking, according to a new large study.

- [**Less than half of patients prescribed new cholesterol drug receive insurance approval**](#) [周一, 30 10月 20:47]

In the largest study of its kind, less than half of patients prescribed the new class of cholesterol drugs, PCSK9 inhibitors, received insurance approval even if patients had atherosclerotic cardiovascular disease (plaque build-up of the arteries) or markedly elevated bad cholesterol. The most significant factor associated with approval was insurance type, with Medicare patients more likely to be approved than those with private insurance.

- [**Review finds poor compliance with helmet use in baseball and softball**](#) [周一, 30 10月 20:47]

Despite lower rates of traumatic brain injuries in baseball and softball, there is poor compliance overall with helmet use and return-to-play guidelines following a concussion across all levels of play, according to a new systematic review.

- [**Sight unseen: Gene expression reveals 'hidden' variability in cancer cells' response to drugs**](#) [周一, 30 10月 20:47]

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A new study reveals "hidden" variability in how tumor cells are affected by anticancer drugs, offering new insights on why patients with the same form of cancer can have different responses to a drug. The results highlight strategies to better evaluate drug effectiveness and inform the development of synergistic drug combinations to overcome the ability of tumors to evade treatment.

- [**Moving neuroscience into the fast lane**](#) [周一, 30 10月 20:47]

Scientists have developed a high-throughput system to study mouse behavior and physiology. The system allows mice to train themselves for behavioral tasks, and even to self-fix their heads for recording neural activity from the brain.

- [**Driving drug resistance out of fungi**](#) [周一, 30 10月 20:47]

Scientists have developed a CRISPR-Cas9-based 'gene drive' platform to create diploid strains of the pathogen in which both gene copies could be efficiently deleted. The technique may lead the way toward a better understanding of drug resistance and biofilm-forming mechanisms, and through future research, it could help pinpoint new drug targets and combination therapies.

- [**People who value virtue show wiser reasoning**](#) [周一, 30 10月 20:47]

From romantic dramas to tensions at work, we're often better at working through other people's problems than our own -- while we may approach our friends' problems with wise, clear-eyed objectivity, we often view our own problems through a personal, flawed, emotional lens. But new research suggests that people who are motivated to develop the best in themselves and others don't show this bias -- they tend to reason just as wisely about their own problems as they do for others.

- [**Mental health clinicians need to better engage men with depression**](#) [周一, 30 10月 10:01]

The approach to treating men with depression needs to change if their increased uptake of mental health services is to be successful, researchers have found.

- [**Three new lung cancer genetic biomarkers**](#)

identified [周六, 28 10月 20:14]

SNPs (single-nucleotide polymorphisms) are variations in our DNA that determine our susceptibility to developing some diseases. Using the largest genome-wide SNP-smoking interaction analysis reported for lung cancer, a research team has identified three novel SNPs. The results from their study reinforce that gene-smoking interactions play important roles in the etiology of lung cancer and account for part of the missing heritability of this disease.

• **Recurrent brain cancer: New hope with phase 1 clinical trial results** [周六, 28 10月 04:18]

New data from a Phase I clinical trial shows more than a quarter of patients with recurrent high-grade glioma, a form of brain cancer, were alive more than three years after treatment.

• **Blocking enzyme in normal cells may impede pancreatic cancer, team shows** [周六, 28 10月 04:18]

New research findings offer a promising target for future therapies that could potentially root out even the well-hidden metastatic lesions that make pancreatic cancer so deadly.

• **New molecule shows promise in HIV vaccine design** [周六, 28 10月 02:16]

Researchers have designed a novel protein-sugar vaccine candidate that, in an animal model, stimulated an immune response against sugars that form a protective shield around HIV. The molecule could one day become part of a successful HIV vaccine.

• **Zika virus infects developing brain by first infecting cells meant to defend against it** [周六, 28 10月 02:16]

Researchers report that the Zika virus is transmitted from mother to fetus by infected cells that, ironically, will later develop into the brain's first and primary form of defense against invasive pathogens.

• **High-intensity interval training alters brain glucose metabolism in insulin resistant people** [周六,

28 10月 02:15]

Researchers have studied how high-intensity interval training (HIIT) alters the brain's glucose metabolism in physically inactive insulin resistant people. Only two weeks of HIIT training reduced glucose metabolism in all areas of the brain.

[Sleepwalkers are better at automatic walking](#) [周六,

28 10月 02:15]

Sleepwalkers who are awake may have a multi-tasking advantage over non-sleepwalkers, according to recent research that uses virtual reality.

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [**Making glass invisible: A nanoscience-based disappearing act**](#) [周二, 31 10月 03:44]

By texturing glass surfaces with nanosized features, scientists almost completely eliminated surface reflections -- an achievement that could enhance solar cell efficiency, improve consumers' experience with electronic displays, and support high-power laser applications.

- [**Research aims to help renewable jet fuel take flight**](#) [周二, 31 10月 03:44]

The International Air Transport Association predicts that 7.2 billion passengers will fly in 2035, nearly doubling the 3.8 billion in 2016. So how do we make flying easier on the environment? Instead of petroleum, researchers have now developed new processes to ramp up production of bio-based fuel made from corncoobs and wood chips.

- [**Voltage-driven liquid metal fractals**](#) [周二, 31 10月 03:44]

Researchers have found that gallium indium (EGaIn), a liquid metal with one of the highest surface tensions, can be induced to spread and form patterns called fractals with the application of low voltage. The work has implications for controlling the shape of liquid metals.

- [**It's mathematically impossible to beat aging, scientists say**](#) [周二, 31 10月 03:44]

Current understanding of the evolution of aging leaves open the possibility that aging could be stopped if only science could figure out a way to make selection between organisms perfect. However, the solution isn't that simple, researchers have found.

- [**Focused ultrasound shows promise for treating Parkinson's tremor**](#) [周二, 31 10月 02:13]

An initial test to determine if a scalpel-free form of brain surgery can reduce tremor caused by Parkinson's disease has produced encouraging results. Further research is warranted, the researchers conclude.

- [**Cobalt and tungsten key to cheaper, cleaner hydrogen**](#) [周二, 31 10月 01:46]

Electrolysis, splitting the water molecule with electricity, is the cleanest way to obtain hydrogen, a clean and renewable fuel. Now, researchers have designed a new catalyst that reduces the cost of electrolytic hydrogen production. Catalysts reduce the amount of electricity needed to break the chemical bonds, speed up the reaction and minimize the energy waste.

- [**Social media data use needs tighter research controls, experts say**](#) [周二, 31 10月 01:46]

Information shared on social media is being regularly used in research projects without users' consent, a study suggests. Experts have called for tighter control of the practice, with fresh guidelines needed to ensure personal data is being used appropriately.

- [**New method makes bioethanol from waste -- in existing plants**](#) [周二, 31 10月 01:12]

It is possible to produce bioethanol from agricultural and industrial waste in existing plants in a socioeconomically sustainable way, according to new research from Sweden.

- [**Mystery of raging black hole beams penetrated**](#) [周二, 31 10月 01:12]

They are nature's very own Death Star beams - ultra-powerful jets of energy that shoot out from the vicinity of black holes like deadly rays from the Star Wars super-weapon.

- [**How nanoscale patterning can decrease metal fatigue**](#) [周二, 31 10月 00:35]

Fatigue due to repetitive strain is the leading cause of failure in metal components and structures, but new research shows how crystalline structures called nanotwins can slow the accumulation of fatigue-related damage.

- [**US' power supply has capacity to adapt to climate change**](#) [周二, 31 10月 00:34]

Scientists have found that climate change ultimately will have a negative effect on the reliability of electricity generation in the United States, but today's infrastructure may be more adaptable to future climate conditions than previously thought.

- [**Jupiter's X-ray auroras pulse independently**](#) [周二, 31 10月 00:34]

Jupiter's intense northern and southern lights pulse independently of each other according to new research.

- [**3-D-printed device builds better nanofibers**](#) [周二, 31 10月 00:33]

Researchers describe a new device for producing nanofiber meshes, which matches the production rate and power efficiency of its best-performing predecessor --- but significantly reduces variation in the fibers' diameters, an important consideration in most applications

- [**Quantum dots visualize tiny vibrational resonances**](#) [周一, 30 10月 23:23]

When laser light is used to drive the motion of a thin, rigid membrane, the membrane vibrates in resonance with the light. The resulting patterns can be visualized through an array of quantum dots, where these tiny structures emit light at a frequency that responds to movement.

- [**New fast-charging, high-energy electric-car battery technology**](#) [周一, 30 10月 23:22]

Researchers have developed a novel hydrogen isotope separation system based on a porous metal organic framework (MOF).

- [**Both the aggressor and the victim: Alarming number of teens cyberbully themselves**](#) [周一, 30 10月 23:22]

A new form of self-harm in youth has emerged and is cause for concern. The behavior: 'digital self-harm' or 'self-trolling,' where adolescents post, send or share mean things about themselves anonymously online. The concern: it is happening at alarming rates and could be a cry for help. A new study is the first to examine the extent of this behavior and is the most comprehensive investigation of this understudied problem.

• [Nanoscale platform aims to control protein levels](#) [周一, 30 10月 23:22]

A nanoscale antibody first found in camels combined with a protein-degrading molecule is an effective new platform to control protein levels in cells, according to scientists.

• [Gradation-tint smart window](#) [周一, 30 10月 21:56]

Scientists have developed smart glass capable of producing various shades on its surface. Unlike the conventional types, the newly developed tinting smart glass allows users to easily change the shaded area of a window. For example, a user would be able to change the shaded area of a window in accordance with the elevation of the sun. The technology may be applicable to various types of windows, including those of automobiles and buildings, enabling them to offer both shade and clear visibility s...

• [Effect of nano-diamond on magnetorheological fluids](#) [周一, 30 10月 21:29]

Nano-diamond had a significant increase in MRF. The shear yield strength and settling stability of the MRF could be highly enhanced. The higher the strength of the magnetic field was, the higher the difference in the shear yield strength was. These phenomena demonstrated that the physical properties of the nano-diamond could have a higher impact on MRF, which was of high significance to the preparation of MRFs with excellent performance.

• ['Instant replay' for computer systems shows cyber attack details](#) [周一, 30 10月 21:29]

Until now, assessing the extent and impact of network or computer

system attacks has been largely a time-consuming manual process. A new software system being developed by cybersecurity researchers will largely automate that process, allowing investigators to quickly and accurately pinpoint how intruders entered the network, what data they took and which computer systems were compromised.

- [**'Combosquatting' attack hides in plain sight to trick computer users**](#) [周一, 30 10月 21:29]

To guard against unknowingly visiting malicious websites, computer users have been taught to double-check website URLs before they click on a link. But attackers are now taking advantage of that practice to trick users into visiting website domains that contain familiar trademarks -- but with additional words that change the destination to an attack site.

- [**Microscopic defects make lithium-ion batteries better**](#) [周一, 30 10月 20:47]

High-performance electrodes for lithium-ion batteries can be improved by paying closer attention to their defects -- and capitalizing on them, according to scientists.

- [**Liquids take a shine to terahertz radiation**](#) [周一, 30 10月 20:47]

In a significant breakthrough, scientists have devised a high power radiation source in the much sought after terahertz (THz) region of the electromagnetic spectrum. These powers are achieved in a compact setting on a tabletop. The energies emitted by the liquids are thousands of times larger than those from most conventional tabletop sources.

- [**Moving neuroscience into the fast lane**](#) [周一, 30 10月 20:47]

Scientists have developed a high-throughput system to study mouse behavior and physiology. The system allows mice to train themselves for behavioral tasks, and even to self-fix their heads for recording neural activity from the brain.

- [**Good vibrations: Smart access to homes and cars using fingers**](#) [周一, 30 10月 20:47]

Engineers have created VibWrite, a smart access system that senses

finger vibrations to verify users. The low-cost security system could eventually be used to gain access to homes, apartment buildings, cars, appliances -- anything with a solid surface.

- [**New studies on disordered cathodes may provide much-needed jolt to lithium batteries**](#) [周六, 28 10月 22:40]

Scientists have come up with a set of rules for making new disordered materials, a process that had previously been driven by trial-and-error. They also found a way to incorporate fluorine, which makes the material both more stable and have higher capacity.

- [**A light in the dark: NASA sounding rocket probes the dark regions of space**](#) [周六, 28 10月 04:18]

Spread out over unfathomable distances, this cold, diffuse gas between galaxies -- called the intergalactic medium, or IGM for short -- hardly emits any light, making it difficult to study.

- [**Guiding the random laser**](#) [周六, 28 10月 02:16]

At its most basic level, a random laser is precisely what its name implies; random. It's random in the spectrum of light it produces and in the way that light is emitted. So, how do you control some of the randomness to make useful devices? It's a question that's led a team of researchers to a discovery that's taking laser technology to the next level.

- [**Safer and more powerful lithium-ion batteries**](#) [周六, 28 10月 02:15]

Researchers are working to improve conductivity and safety in the batteries, which are used to power many electronic devices around the world, including laptops, artificial hearts and cell phones.

- [**From Cellulose to 3-D Objects**](#) [周六, 28 10月 00:27]

In our modern world, eliminating plastics is inconceivable. Unfortunately, they do have disadvantages, including the formation of CO(2) in both production and combustion, depletion of fossil feedstocks, and growth of landfills. Researchers have now introduced a new way forward, a polymer made entirely from biomass that can easily and inexpensively be used in 3-D printing. Objects produced in this way are of high quality, easily recyclable, and highly solvent-resistant.

- [Relief of chronic neuropathic pain](#) [周五, 27 10月 22:48]

Researchers have patented an innovative formulation based on nanotechnology, which is designed to relieve chronic neuropathic pain.

- [Small asteroid or comet 'visits' from beyond the solar system](#) [周五, 27 10月 22:45]

A small, recently discovered asteroid -- or perhaps a comet -- appears to have originated from outside the solar system, coming from somewhere else in our galaxy. If so, it would be the first "interstellar object" to be observed and confirmed by astronomers.

- [New technique produces tunable, nanoporous materials](#) [周五, 27 10月 21:44]

A collaborative group of researchers describe a new technique for creating novel nanoporous materials with unique properties that can be used to filter molecules or light.

- [Advanced artificial limbs mapped in the brain](#) [周五, 27 10月 21:44]

Scientists have used functional MRI to show how the brain re-maps motor and sensory pathways following targeted motor and sensory reinnervation (TMSR), a neuroprosthetic approach where residual limb nerves are rerouted towards intact muscles and skin regions to control a robotic limb.

- [Nanomagnets levitate thanks to quantum physics](#) [周五, 27 10月 21:44]

Quantum physicists have now shown that, despite Earnshaw's theorem, nanomagnets can be stably levitated in an external static magnetic field owing to quantum mechanical principles. The quantum angular momentum of electrons, which also causes magnetism, is accountable for this mechanism.

- [Virtual coasts improve understanding of possible coastal planning outcomes](#) [周五, 27 10月 21:01]

Newly developed immersive geographic visualization tool is the first of its kind to use audio and visual animations and an underwater

perspective. This enables people to assess the aesthetic aspects of potential management scenarios through a first-person perspective and leads to a greater appreciation for environmental protection.

- [**New sensor system ensures a safe harvest**](#) [周五, 27 10月 21:00]

Tractors and combine harvesters are frequently operated on difficult terrain. Crops such as canola and corn grow at different densities; the field is sometimes muddy and is rocky at other times; and plants often obscure the view of potential impediments. In order to enable harvesting machinery to efficiently and safely harvest crops despite changing conditions, a new system for environment detection has been developed.

- [**Artificial intelligence to evaluate brain maturity of preterm infants**](#) [周五, 27 10月 21:00]

Artificial intelligence software can now evaluate the maturity of a preterm infant's brain directly from an EEG.

- [**Martian landscapes formed from sand 'levitating' on a little boiling water**](#) [周五, 27 10月 20:57]

Scientists have discovered a process that could explain the long-debated mystery of how land features on Mars are formed in the absence of significant amounts of water. Experiments reveal that Mars' thin atmosphere (about 7 mbar -- compared to 1,000 mbar on Earth) combined with periods of relatively warm surface temperatures causes water flowing on the surface to violently boil. This process can then move large amounts of sand and other sediment, which effectively 'levitates' on the boiling water...

- [**Heavy metal thunder: Protein can be switched on to conduct electricity like a metal**](#) [周五, 27 10月 20:55]

When pushing the boundaries of discovery, sometimes even the most experienced of scientists can get a surprise jolt from a completely unpredictable result. About four years ago, Stuart Lindsay's research team got a lab result that even he couldn't quite believe. As with most scientific surprises, it goes against all conventional wisdom: the first evidence of a protein that could conduct electricity like a metal.

- [**Winters on Mars are shaping the Red Planet's landscape**](#) [周五, 27 10月 20:55]

Winter temperatures on the Red Planet sublimate carbon dioxide from a gas to a solid. These solid carbon dioxide blocks are then thought responsible for making gullies and furrows on Mars' landscape, based on innovative lab experiments.

- [**Efforts to revive coal industry unlikely to work, may slow job growth**](#) [周五, 27 10月 20:55]

Current federal efforts to revive the coal industry will likely do more harm than good to fragile Appalachian communities transitioning from coal as a major source of employment, according to a new study.

- [**Envisioning a new engineering field: Understanding atomic-scale patterns**](#) [周五, 27 10月 03:22]

The phenomenon that forms interference patterns on television displays when a camera focuses on a pattern like a person wearing stripes has inspired a new way to conceptualize electronic devices. Researchers are showing how the atomic-scale version of this phenomenon may hold the secrets to help advance electronics design to the limits of size and speed.

- [**You can't tell a gerrymandered district by its shape**](#) [周五, 27 10月 02:25]

When it comes to judging the fairness of electoral districts, we can't believe our eyes.

- [**Learning from mussels: New way to make stronger, more stretchy polymers**](#) [周五, 27 10月 02:23]

A wide range of polymer-based materials, from tire rubber and wetsuit neoprene to Lycra clothing and silicone, are elastomers valued for their ability to flex and stretch without breaking and return to their original form.

- [**Global road-building explosion could be disastrous for people and nature, say scientists**](#) [周五, 27 10月 02:23]

The global explosion of new roads is rife with economic, social, and environmental dangers, according to a new study.

• [**First close-ups of finger-like growths that trigger battery fires**](#) [周五, 27 10月 02:23]

Scientists have captured the first atomic-level images of finger-like growths called dendrites that can pierce the barrier between battery compartments and trigger short circuits or fires. Dendrites and the problems they cause have been a stumbling block on the road to developing new types of batteries that store more energy so electric cars, cell phones, laptops and other devices can go longer between charges.

• [**Astronomers discover sunscreen snow falling on hot exoplanet**](#) [周五, 27 10月 01:53]

Astronomers have used the Hubble Space Telescope to find a blistering-hot giant planet outside our solar system where the atmosphere 'snows' titanium dioxide -- the active ingredient in sunscreen. These observations are the first detections of this 'snow-out' process, called a 'cold trap,' on an exoplanet. The research provides insight into the complexity of weather and atmospheric composition on exoplanets, and may someday be useful for gauging the habitability of Earth-size planets.

• [**Scientists detect comets outside our solar system**](#) [周五, 27 10月 01:53]

Scientists, working closely with amateur astronomers, have spotted the dusty tails of six exocomets -- comets outside our solar system -- orbiting a faint star 800 light years from Earth.

• [**The Bakhshali manuscript: The world's oldest zero?**](#) [周五, 27 10月 01:53]

Last month, the Bodleian Library at Oxford University announced that a Sanskrit manuscript housed in the library for the last century contains the oldest known written zero, although not a 'true' zero. An international group of historians of Indian mathematics has now challenged those findings.

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [**Examining potatoes' past could improve spuds of the future**](#) [周二, 31 10月 03:44]

Examining the ancestors of the modern, North American cultivated potato has revealed a set of common genes and important genetic pathways that have helped spuds adapt over thousands of years. New research shows potential genetic keys that could ensure the crop will thrive in the future.

- [**The advent of 'green' cattle**](#) [周二, 31 10月 03:44]

Implications of livestock farming on climate change should not be drawn from aggregate statistics, reveals a study based on a new method of carbon footprinting for pasture-based cattle production systems that can assess the impacts of individual animals.

- [**Research aims to help renewable jet fuel take flight**](#) [周二, 31 10月 03:44]

The International Air Transport Association predicts that 7.2 billion passengers will fly in 2035, nearly doubling the 3.8 billion in 2016. So how do we make flying easier on the environment? Instead of petroleum, researchers have now developed new processes to ramp up production of bio-based fuel made from corncoobs and wood chips.

- [**Right whales, already an endangered species, may face a dim future**](#) [周二, 31 10月 03:44]

Researchers show that right whales, already an endangered species, may face a dim future.

- [**Greenhouse gas concentrations surge to new record**](#) [周二, 31 10月 02:19]

Concentrations of carbon dioxide in the atmosphere surged at a record-breaking speed in 2016 to the highest level in 800,000 years, according to a new report. The abrupt changes in the atmosphere witnessed in the past 70 years are without precedent.

- [**Study may add to resource managers' toolbox**](#) [周二, 31 10月 02:13]

Fish 'condition' can help guide management efforts for Chesapeake Bay, suggests a new research study.

- [**Surprising monkey study: Bad times do not cause group members to change behavior**](#) [周二, 31 10月 01:56]

Researchers have observed an unexpected behavioral pattern in monkeys in Puerto Rico. As the population density in the group rises, the group as a whole produces fewer babies -- this is no surprise. But, to the surprise of researchers, it turned out that the group's individual members did not change behavior. How does this add up?

- [**Cobalt and tungsten key to cheaper, cleaner hydrogen**](#) [周二, 31 10月 01:46]

Electrolysis, splitting the water molecule with electricity, is the cleanest way to obtain hydrogen, a clean and renewable fuel. Now, researchers have designed a new catalyst that reduces the cost of electrolytic hydrogen production. Catalysts reduce the amount of electricity needed to break the chemical bonds, speed up the reaction and minimize the energy waste.

- [**How flu shot manufacturing forces influenza to mutate**](#) [周二, 31 10月 01:46]

The common practice of growing influenza vaccine components in chicken eggs disrupts the major antibody target site on the virus surface, rendering the flu vaccine less effective in humans.

- [**New method makes bioethanol from waste -- in**](#)

[existing plants](#) [周二, 31 10月 01:12]

It is possible to produce bioethanol from agricultural and industrial waste in existing plants in a socioeconomically sustainable way, according to new research from Sweden.

• [White rot fungi's size explained by breadth of gene families involved](#) [周二, 31 10月 00:35]

Armillaria fungi are among the most devastating fungal pathogens, causing root rot disease in more than 500 plant species found in forests, parks and vineyards. As white rot fungi, they are capable of breaking down all components of plant cell walls, a capability that interests bioenergy researchers. Biologists have now analyzed and compared four Armillaria fungal genomes with those of related fungi to better understand the evolution of Armillaria's abilities.

• [US' power supply has capacity to adapt to climate change](#) [周二, 31 10月 00:34]

Scientists have found that climate change ultimately will have a negative effect on the reliability of electricity generation in the United States, but today's infrastructure may be more adaptable to future climate conditions than previously thought.

• [New tool predicts risk of plant disease and infestation worldwide](#) [周一, 30 10月 23:23]

Researchers have developed a technique to predict the risk of disease or infestation in plants. By considering pest-host interactions and the geographical distribution of vulnerable plants, their new algorithms can provide maps of potential disease hotspots, helping governments to identify the risk for outbreaks, before they happen.

• [Nanoscale platform aims to control protein levels](#) [周一, 30 10月 23:22]

A nanoscale antibody first found in camels combined with a protein-degrading molecule is an effective new platform to control protein levels in cells, according to scientists.

- [**Cover crops provide bed and breakfast layover for migrating birds**](#) [周一, 30 10月 23:22]

After harvesting a corn or soybean crop, farmers may plant a cover crop for a variety of reasons -- to reduce soil erosion and nutrient runoff, increase organic matter in the soil, and improve water quality. Now there's another reason. New research shows that migratory birds prefer to rest and refuel in fields with cover crops.

- [**Less fat, more hair and younger skin: Study in mice shows benefits from calorie-restricted diet**](#) [周一, 30 10月 23:22]

Scientists show that mice subjected to the diet presented body fat reduction and fur production increase. The research group also noted that liver, pancreas and brain cells from these mice boasted a higher performance in activities related to metabolic regulation.

- [**Pumpkin genomes sequenced, revealing uncommon evolutionary history**](#) [周一, 30 10月 21:54]

For some, pumpkins conjure carved Halloween decorations, but for many people around the world, these gourds provide nutrition. Scientists have sequenced the genomes of two important pumpkin species, *Cucurbita maxima* and *Cucurbita moschata*.

- [**Sulfur respiration in mammals and antioxidant activity**](#) [周一, 30 10月 21:28]

Researchers have gained new insight into the formation of a group of compounds found in almost all organisms, which are reportedly shown to be a powerful antioxidant that protects cells from damage by free radicals. They found that these compounds were also essential in supporting the mitochondrial energy metabolism, which is known as sulfur respiration, and identified it for the first time in humans and other mammals.

- [**Bears not bothered by diet high in saturated fats**](#) [周一, 30 10月 20:47]

Campgrounds and cottages are getaways for humans. They are also locations where grizzly bears are acquiring appetites for human foods

that are high in saturated fats. Diets high in saturated fats are associated with many diseases in humans. Does the health of a bear suffer too?

- [**How environment plays key role in changing movement behavior of animals**](#) [周一, 30 10月 20:47]

Mathematicians have developed a theory which helps to unravel long-standing mysteries of animal movement.

- [**Moving neuroscience into the fast lane**](#) [周一, 30 10月 20:47]

Scientists have developed a high-throughput system to study mouse behavior and physiology. The system allows mice to train themselves for behavioral tasks, and even to self-fix their heads for recording neural activity from the brain.

- [**Driving drug resistance out of fungi**](#) [周一, 30 10月 20:47]

Scientists have developed a CRISPR-Cas9-based 'gene drive' platform to create diploid strains of the pathogen in which both gene copies could be efficiently deleted. The technique may lead the way toward a better understanding of drug resistance and biofilm-forming mechanisms, and through future research, it could help pinpoint new drug targets and combination therapies.

- [**Caribbean's largest concentration of indigenous pre-Columbian rock art**](#) [周一, 30 10月 10:01]

New research reveals key discoveries including first direct rock art dates in the Caribbean, how pre-Columbian rock-art was made and paint recipes.

- [**Oldest recorded solar eclipse helps date the Egyptian pharaohs**](#) [周一, 30 10月 10:01]

Researchers have pinpointed the date of what could be the oldest solar eclipse yet recorded. The event, which occurred on Oct. 30, 1207 BC, is mentioned in the Bible, and could have consequences for the chronology of the ancient world.

- [**How beetles bounce back from forest fires**](#) [周六, 28 10月 22:42]

Research has illuminated the piecemeal patterns of recolonization

among a hardy species of beetle regularly affected by managed burns.

- [**New molecule shows promise in HIV vaccine design**](#) [周六, 28 10月 02:16]

Researchers have designed a novel protein-sugar vaccine candidate that, in an animal model, stimulated an immune response against sugars that form a protective shield around HIV. The molecule could one day become part of a successful HIV vaccine.

- [**Zika virus infects developing brain by first infecting cells meant to defend against it**](#) [周六, 28 10月 02:16]

Researchers report that the Zika virus is transmitted from mother to fetus by infected cells that, ironically, will later develop into the brain's first and primary form of defense against invasive pathogens.

- [**Using networks to understand tissue-specific gene regulation**](#) [周六, 28 10月 02:15]

Researchers have discerned that different tissue functions arise from a core biological machinery that is largely shared across tissues, rather than from their own individual regulators.

- [**Malaria parasite in the Americas is more genetically diverse than previously thought**](#) [周六, 28 10月 00:28]

Researchers discover that populations of Plasmodium vivax on the continent are as genetically diverse as in Southeast Asia, where malaria transmission is more frequent. Vivax's greater genetic diversity in the Americas in comparison with Falciparum species might be explained by a wider range of migratory routes.

- [**Hand surgeons provide update on wild animal bites**](#) [周六, 28 10月 00:27]

Injuries from wild animals are relatively uncommon, with a risk of unusual infections and other potentially severe complications.

- [**From Cellulose to 3-D Objects**](#) [周六, 28 10月 00:27]

In our modern world, eliminating plastics is inconceivable.

Unfortunately, they do have disadvantages, including the formation of CO₂ in both production and combustion, depletion of fossil feedstocks, and growth of landfills. Researchers have now introduced a new way forward, a polymer made entirely from biomass that can easily and inexpensively be used in 3-D printing. Objects produced in this way are of high quality, easily recyclable, and highly solvent-resistant.

- [**Cell Biology: Cellular power outage**](#) [周五, 27 10月 23:18]

Protein aggregation is a hallmark of many neurodegenerative diseases. Even in normal cells, such deposits can accumulate in mitochondria, blocking energy production, but a newly described quality control system can mitigate the problem.

- [**'Sink' or swim for salt marshes**](#) [周五, 27 10月 22:49]

Salt marshes have the potential to store large amounts of carbon, but unfortunately these ecosystems face serious threats, from sea level rise, land use change, nutrient runoff and more. Using multiple sensors, ecologists are working to better understand the processes (and time scales) that control the flow of carbon in marshes. Changes in such processes could ultimately dictate whether marshes will serve as net 'sources' or 'sinks' of carbon.

- [**Tropical forest reserves slow down global warming**](#) [周五, 27 10月 21:44]

National parks and nature reserves in South America, Africa and Asia, created to protect wildlife, heritage sites and the territory of indigenous people, are reducing carbon emissions from tropical deforestation by a third, and so are slowing the rate of global warming, a new study shows.

- [**Water buffalo genome unveiled**](#) [周五, 27 10月 21:44]

Biologists have published the full genome of the water buffalo -- opening the way for improved breeding and conservation of this economically important animal.

- [**Virtual coasts improve understanding of possible coastal planning outcomes**](#) [周五, 27 10月 21:01]

Newly developed immersive geographic visualization tool is the first of

its kind to use audio and visual animations and an underwater perspective. This enables people to assess the aesthetic aspects of potential management scenarios through a first-person perspective and leads to a greater appreciation for environmental protection.

- [**New sensor system ensures a safe harvest**](#) [周五, 27 10月 21:00]

Tractors and combine harvesters are frequently operated on difficult terrain. Crops such as canola and corn grow at different densities; the field is sometimes muddy and is rocky at other times; and plants often obscure the view of potential impediments. In order to enable harvesting machinery to efficiently and safely harvest crops despite changing conditions, a new system for environment detection has been developed.

- [**Distant relatives: TOR protein regulates cell growth in plants and animals**](#) [周五, 27 10月 20:59]

Plant researchers are studying a gene which, if out of control, can contribute to cancer spread.

- [**How plants decide on a pattern for a new leaf**](#) [周五, 27 10月 20:59]

When a multicellular organism develops, each cell needs to know its place in relation to all other cells. This means cells need to communicate amongst themselves to create the patterns from which different tissue and cell types arise. In the case of animals, we know about the signals and mechanisms which drive these patterning processes.

- [**Dogs may protect against childhood eczema and asthma**](#) [周五, 27 10月 20:55]

Two new studies show there may be even more reason to love your dog as they may provide a protective effect against eczema and asthma.

- [**Habitat restoration can maximize the benefits of marine protected areas**](#) [周五, 27 10月 20:55]

Marine Protected Areas can potentially subsidize harvested oyster populations via larval spillover -- however, these benefits can only be realized if harvested areas contain suitable habitat for larval settlement and survival. The study is one of the first to document the contribution

of different habitat restoration strategies to an overall marine population.

- [**Almost half of food allergies in adults appear in adulthood**](#) [周五, 27 10月 20:55]

A new study shows that almost half of all food-allergic adults surveyed reported one or more adult-onset food allergies.

- [**21 percent increase in childhood peanut allergy since 2010**](#) [周五, 27 10月 20:55]

New research suggests that peanut allergy in children has increased 21 percent since 2010, and that nearly 2.5 percent of US children may have an allergy to peanuts.

- [**Regular marijuana use linked to more sex, study finds**](#) [周五, 27 10月 20:55]

Despite concerns among physicians and scientists that frequent marijuana use may impair sexual desire or performance, the opposite appears more likely to be the case, new research indicates.

- [**Peatland plants adapting well to climate change**](#) [周五, 27 10月 20:55]

They account for just three per cent of the Earth's surface but play a major role in offsetting carbon dioxide emissions -- and now a team of scientists has discovered that the plants that make up peat bogs adapt exceptionally well to climate change.

- [**Efforts to revive coal industry unlikely to work, may slow job growth**](#) [周五, 27 10月 20:55]

Current federal efforts to revive the coal industry will likely do more harm than good to fragile Appalachian communities transitioning from coal as a major source of employment, according to a new study.

- [**Hush little virus, don't say a word: How scientists investigate sleeping viruses**](#) [周五, 27 10月 02:23]

Four in five adults are infected with herpes simplex virus, say researchers, but most don't show symptoms like cold sores because the virus infection is 'latent' -- sleeping -- within the nervous system. While

many virus researchers are interested in understanding what causes these sleeping viruses to wake up, or reactivate, scientists are now trying to understand what prevents the infection from going to sleep in the first place.

· [**Learning from mussels: New way to make stronger, more stretchy polymers**](#) [周五, 27 10月 02:23]

A wide range of polymer-based materials, from tire rubber and wetsuit neoprene to Lycra clothing and silicone, are elastomers valued for their ability to flex and stretch without breaking and return to their original form.

· [**Global road-building explosion could be disastrous for people and nature, say scientists**](#) [周

五, 27 10月 02:23]

The global explosion of new roads is rife with economic, social, and environmental dangers, according to a new study.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

• [**Study may add to resource managers' toolbox**](#) [周二, 31 10月 02:13]

Fish 'condition' can help guide management efforts for Chesapeake Bay, suggests a new research study.

• [**Effects of Medicaid expansion focus of new study**](#) [周二, 31 10月 01:56]

A new article examines the effects of Medicaid expansion on low-income individuals' access to health care.

• [**Social media data use needs tighter research controls, experts say**](#) [周二, 31 10月 01:46]

Information shared on social media is being regularly used in research projects without users' consent, a study suggests. Experts have called for tighter control of the practice, with fresh guidelines needed to ensure personal data is being used appropriately.

• [**Immigrants living in the country without authorization at risk for anxiety and depression**](#) [周二, 31 10月 00:33]

Nearly a quarter of Mexican immigrants who live near the California-Mexico border without legal authorization have a mental disorder, particularly depression or anxiety.

• [**'Combosquatting' attack hides in plain sight to trick computer users**](#) [周一, 30 10月 21:29]

To guard against unknowingly visiting malicious websites, computer users have been taught to double-check website URLs before they click

on a link. But attackers are now taking advantage of that practice to trick users into visiting website domains that contain familiar trademarks -- but with additional words that change the destination to an attack site.

- [**Montessori preschool boosts academic results and reduces income-based inequality**](#) [周一, 30 10月 20:48]

Researchers find that children in Montessori preschools show improved academic performance and social understanding, while enjoying their school work more. Strikingly, children from low-income families, who typically don't perform as well at school, show similar academic performance as children from high-income families. Children with low executive function also benefit from Montessori preschools.

- [**Modern civilization doesn't diminish violence, study shows**](#) [周五, 27 10月 22:48]

Modern civilization may not have dulled humankind's bloodlust, but living in a large, organized society may increase the likelihood of surviving a war, an anthropology professor reports.

- [**Efforts to revive coal industry unlikely to work, may slow job growth**](#) [周五, 27 10月 20:55]

Current federal efforts to revive the coal industry will likely do more harm than good to fragile Appalachian communities transitioning from coal as a major source of employment, according to a new study.

- [**Global trade entrenches poverty traps**](#) [周五, 27 10月 05:13]

A new theorem suggests that greater engagement in the international exchange can actually reinforce productivity-impeding practices that keep countries in poverty.

- [**Does population size affect rates of violence?**](#) [周五, 27 10月 04:45]

A new article argues small-scale societies are likely to be victims, rather than perpetrators, of violence.

- [**You can't tell a gerrymandered district by its shape**](#) [周五, 27 10月 02:25]

When it comes to judging the fairness of electoral districts, we can't believe our eyes.

- [**Global road-building explosion could be disastrous for people and nature, say scientists**](#) [周五, 27 10月 02:23]

The global explosion of new roads is rife with economic, social, and environmental dangers, according to a new study.

- [**How cities can best fight climate change**](#) [周五, 27 10月 01:53]

It will be easier for cities to reduce emissions coming from residential energy use rather than from local transportation, say researchers -- and this reduction will happen mostly thanks to better building practices, not greater housing density.

- [**Dynamic catalytic converters for clean air in the city**](#) [周四, 26 10月 22:31]

Reducing pollutant emission of vehicles and meeting stricter exhaust gas standards are major challenges when developing catalytic converters. A new concept might help to efficiently treat exhaust gases after the cold start of engines and in urban traffic and to reduce the consumption of expensive noble metal.

- [**Britain's marginalized youth show a 'sense of purpose' in greater numbers than youngsters in mainstream schools, research reveals**](#) [周四, 26 10月 21:08]

Greater numbers of marginalized young people report having a 'sense of purpose' in their lives, compared with those in mainstream education.

- [**Can open and honest scientists win public trust?**](#) [周四, 26 10月 03:06]

With the increased politicization of science, more and more people continue to be skeptical of research, especially when it comes to hot-button topics such as climate change and vaccines. Now researchers wondered whether it would be better for scientists to acknowledge some of their personal or social values up front when reporting on their studies in order to gain trust.

• [**Philly's tax on soda made prices bubble up**](#) [周四, 26 10月 02:26]

An economist was at a research conference in Philadelphia when he happened upon a sweet natural experiment in the making. An expert in risky health behaviors linked to obesity, he read a newspaper article about how an upcoming city tax on sugar-sweetened drinks would be challenging to implement in the Philadelphia International Airport, which straddles the city border: soda would be taxed in some terminals but not others.

• [**Immigrant parents, refugees face greater mental health challenges; Kids' learning at risk**](#) [周四, 26 10月 02:11]

Canadian immigrant parents, refugees, women and minorities are at greater risk of mental health issues and socioeconomic challenges, with their children more likely to suffer learning setbacks before kindergarten, a pair of studies have shown.

• [**Investing in conservation pays off, study finds**](#) [周四, 26 10月 02:11]

Governments and donors have spent billions of dollars since the 1992 Rio Earth Summit attempting to slow the pace of species extinctions around the world. Now, a new article provides the first clear evidence that those efforts are working.

• [**Flu forecasting tool uses evolution to make earlier predictions**](#) [周四, 26 10月 02:05]

A new flu forecasting tool aims to make better predictions by combining data about how the virus spreads with an estimate of how much the current virus evolved compared to recent years. The new model accurately predicted the total number of cases for each season in the US from 2002 to 2016, and produced an accurate, real-time prediction for the 2016-17 season before it started last year.

• [**New fractal-like concentrating solar power receivers are better at absorbing sunlight**](#) [周四, 26 10月 00:24]

Engineers have developed new fractal-like, concentrating solar power receivers for small- to medium-scale use that are up to 20 percent more

effective at absorbing sunlight than current technology.

- [**Among 'green' energy, hydropower is the most dangerous**](#) [周三, 25 10月 22:31]

Many governments are promoting a move away from fossil fuels towards renewable energy sources. However, in a new study, scientists highlight some of the ecological dangers this wave of 'green' energy poses.

- [**Marine species threatened by deep-sea mining**](#) [周三, 25 10月 22:31]

Underwater mining poses a great danger to animals inhabiting the seafloors. A new research study describes the most abundant species, a sponge, which can now be used to regulate mining operations and help us better understand their environmental impacts.

- [**Living close to green spaces is associated with better attention in children**](#) [周三, 25 10月 22:31]

How do green spaces affect cognitive development in children? A new study concludes that children with more greenness around their homes may develop better attention capacities.

- [**Non-native species do not make native fish more vulnerable to pollution in Mediterranean rivers**](#) [周三, 25 10月 22:06]

The presence of exotic fish in rivers does not alter the native fish response to the environmental pollution, according to an article.

- [**Large declines seen in teen substance abuse, delinquency**](#) [周三, 25 10月 21:05]

In recent years, teens have become far less likely to abuse alcohol, nicotine and illicit drugs, according to researchers. Teens also are less likely to engage in behaviors like fighting and stealing, and the researchers believe the declines in substance use and delinquency are connected.

- [**Determining when humans started impacting the planet on a large scale**](#) [周三, 25 10月 21:05]

Humans have so profoundly altered the Earth that, some scientists argue, our current geologic epoch requires a new name: the Anthropocene. But defining the precise start of the era is tricky. Would it begin with the spread of domesticated farm animals or the appearance of radioactive elements from nuclear bomb tests? Scientists report a method to measure levels of human-made contaminants in sediments that could help pinpoint the Anthropocene's onset.

- [**Energy firm branding not deals influences customer switching**](#) [周三, 25 10月 11:32]

Energy companies in the UK are using specific branding approaches instead of product innovation to keep customers, according to new research.

- [**National security implications of gene editing**](#) [周三, 25 10月 11:28]

A trio of scientists have participated in an international think tank this month on the intersection of genome editing technology and national security.

- [**Universities should actively support open scholarship, expert urges**](#) [周三, 25 10月 02:17]

Universities should take action to support the sharing of educational resources, argues author Erin McKiernan. Open scholarship not only benefits society at large, but also fulfills universities' core missions of knowledge dissemination, community engagement, and public good. It may also increase institutions' visibility, funding, and recruitment power, and lead to better learning outcomes.

- [**Raton Basin earthquakes linked to oil and gas fluid injections**](#) [周三, 25 10月 02:17]

A rash of earthquakes in southern Colorado and northern New Mexico recorded between 2008 and 2010 was likely due to fluids pumped deep underground during oil and gas wastewater disposal, suggests a new study.

- [**The problem with being pretty**](#) [周三, 25 10月 01:06]

While good-looking people are generally believed to receive more favorable treatment in the hiring process, when it comes to applying for less desirable jobs, such as those with low pay or uninteresting work, attractiveness may be a liability, according to research.

• [**Daydreaming is good: It means you're smart**](#) [周二, 24 10月 23:28]

A new study suggests that daydreaming during meetings isn't necessarily a bad thing. It might be a sign that you're really smart and creative. People with efficient brains may have too much brain capacity to stop their minds from wandering.

• [**How to predict high school dropouts**](#) [周二, 24 10月 22:57]

Teenagers who do not access healthcare when needed are at greater risk of dropping out of high school. Dropouts are more likely to have combinations of the following traits: low conscientiousness, neuroticism and introversion. The study examined data from the US National Longitudinal Study of Adolescents to Adult Health, a nationally representative sample of 90,000 students in grades 7 to 12 at 132 schools.

• [**Brain region that motivates behavior change discovered**](#) [周二, 24 10月 22:56]

Ever been stuck in a rut? Researchers found that stimulating a region of the brain called the posterior cingulate cortex can lead to changes in routine behavior. Neurons there ramp up their firing rates, then peak just before a pattern shifts. Knowing this could help businesses better understand how to spur employee innovation, exploration and creativity.

• [**Disaster makes people with depression less healthy**](#) [周二, 24 10月 22:33]

People who exhibit even a few depressive symptoms before a major life stressor, such as a disaster, may experience an increase in inflammation -- a major risk factor for heart disease and other negative health conditions -- after the event.

• [**Value of acknowledging adolescents'**](#)

perspectives [周二, 24 10月 22:33]

Across very different cultures -- Ghana and the United States -- when parents acknowledge the perspectives of their adolescent children and encourage them to express themselves, the youths have a stronger sense of self-worth, intrinsic motivation, and engagement, and also have less depression. Yet having the latitude to make decisions appears to function differently in the two cultures, with positive outcomes for youths in the United States but not in Ghana.

- **Starting at age 6, children spontaneously practice skills to prepare for the future** [周二, 24 10月 22:33]

Deliberate practice is essential for improving a wide range of skills important for everyday life, from tying shoelaces to reading and writing. Yet despite its importance for developing basic skills, academic success, and expertise, we know little about the development of deliberate practice. A new study from Australia found that children spontaneously practice skills to prepare for the future starting at the age of 6.

- **Self-esteem mapped in the human brain** [周二, 24 10月 22:33]

A team of researchers has devised a mathematical equation that can explain how our self-esteem is shaped by what other people think of us.

- **'Choosing Wisely' movement: Off to a good start, but change needed for continued success** [周二, 24 10月 22:33]

Five years ago, a group of medical organizations did something they'd never done before: give doctors a list of things they shouldn't do for their patients. The momentum behind this campaign, called 'Choosing Wisely,' has snowballed, but it needs to evolve in order to eliminate unnecessary care.

- **Sacrificing one life to save others: Psychopaths' force for 'greater good'** [周二, 24 10月 22:33]

New research shows that people would sacrifice one person to save a larger group of people -- and in addition, the force with which they carry out these actions could be predicted by psychopathic traits.

• [**What we call postdoctoral researchers matters, scientists say**](#) [周二, 24 10月 22:33]

Eight scientists and science policy experts make the case for standardizing how postdoctoral researchers are categorized by human resources offices and provide a framework that institutions can follow.

• [**New research highlights worldwide risk of HIV, Hepatitis C epidemics**](#) [周二, 24 10月 22:33]

Two reviews studied the global prevalence of injecting drug use and of interventions to prevent the spread of blood borne viruses among people who inject drugs.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- [Mystery of raging black hole beams penetrated](#) [周二, 31 10月 01:12]

They are nature's very own Death Star beams - ultra-powerful jets of energy that shoot out from the vicinity of black holes like deadly rays from the Star Wars super-weapon.

- [Both the aggressor and the victim: Alarming number of teens cyberbully themselves](#) [周一, 30 10月 23:22]

A new form of self-harm in youth has emerged and is cause for concern. The behavior: 'digital self-harm' or 'self-trolling,' where adolescents post, send or share mean things about themselves anonymously online. The concern: it is happening at alarming rates and could be a cry for help. A new study is the first to examine the extent of this behavior and is the most comprehensive investigation of this understudied problem.

- [Good vibrations: Smart access to homes and cars using fingers](#) [周一, 30 10月 20:47]

Engineers have created VibWrite, a smart access system that senses finger vibrations to verify users. The low-cost security system could eventually be used to gain access to homes, apartment buildings, cars, appliances -- anything with a solid surface.

- [Sleepwalkers are better at automatic walking](#) [周六, 28 10月 02:15]

Sleepwalkers who are awake may have a multi-tasking advantage over non-sleepwalkers, according to recent research that uses virtual reality.

- [From Cellulose to 3-D Objects](#) [周六, 28 10月 00:27]

In our modern world, eliminating plastics is inconceivable.

Unfortunately, they do have disadvantages, including the formation of CO₂ in both production and combustion, depletion of fossil feedstocks, and growth of landfills. Researchers have now introduced a new way forward, a polymer made entirely from biomass that can easily and inexpensively be used in 3-D printing. Objects produced in this way are of high quality, easily recyclable, and highly solvent-resistant.

- [**New technique produces tunable, nanoporous materials**](#) [周五, 27 10月 21:44]

A collaborative group of researchers describe a new technique for creating novel nanoporous materials with unique properties that can be used to filter molecules or light.

- [**Advanced artificial limbs mapped in the brain**](#) [周五, 27 10月 21:44]

Scientists have used functional MRI to show how the brain re-maps motor and sensory pathways following targeted motor and sensory reinnervation (TMSR), a neuroprosthetic approach where residual limb nerves are rerouted towards intact muscles and skin regions to control a robotic limb.

- [**Nanomagnets levitate thanks to quantum physics**](#) [周五, 27 10月 21:44]

Quantum physicists have now shown that, despite Earnshaw's theorem, nanomagnets can be stably levitated in an external static magnetic field owing to quantum mechanical principles. The quantum angular momentum of electrons, which also causes magnetism, is accountable for this mechanism.

- [**Martian landscapes formed from sand 'levitating' on a little boiling water**](#) [周五, 27 10月 20:57]

Scientists have discovered a process that could explain the long-debated mystery of how land features on Mars are formed in the absence of significant amounts of water. Experiments reveal that Mars' thin atmosphere (about 7 mbar -- compared to 1,000 mbar on Earth) combined with periods of relatively warm surface temperatures causes water flowing on the surface to violently boil. This process can then

move large amounts of sand and other sediment, which effectively 'levitates' on the boiling water...

- [**Heavy metal thunder: Protein can be switched on to conduct electricity like a metal**](#) [周五, 27 10月 20:55]

When pushing the boundaries of discovery, sometimes even the most experienced of scientists can get a surprise jolt from a completely unpredictable result. About four years ago, Stuart Lindsay's research team got a lab result that even he couldn't quite believe. As with most scientific surprises, it goes against all conventional wisdom: the first evidence of a protein that could conduct electricity like a metal.

- [**Winters on Mars are shaping the Red Planet's landscape**](#) [周五, 27 10月 20:55]

Winter temperatures on the Red Planet sublime carbon dioxide from a gas to a solid. These solid carbon dioxide blocks are then thought responsible for making gullies and furrows on Mars' landscape, based on innovative lab experiments.

- [**Bat feces: A reliable source of climate change**](#) [周五, 27 10月 01:53]

Isotopes found in bat guano over the last 1,200 years provide scientists with information on how the climate was and is changing.

- [**Astronomers discover sunscreen snow falling on hot exoplanet**](#) [周五, 27 10月 01:53]

Astronomers have used the Hubble Space Telescope to find a blistering-hot giant planet outside our solar system where the atmosphere 'snows' titanium dioxide -- the active ingredient in sunscreen. These observations are the first detections of this 'snow-out' process, called a 'cold trap,' on an exoplanet. The research provides insight into the complexity of weather and atmospheric composition on exoplanets, and may someday be useful for gauging the habitability of Earth-size planets.

- [**'Bandit-masked' feathered dinosaur hid from predators using multiple types of camouflage**](#) [周五, 27 10月 01:52]

Researchers have revealed how a small feathered dinosaur used its color patterning, including a bandit mask-like stripe across its eyes, to avoid being detected by its predators and prey.

- [**Wobbling galaxies: New evidence for dark matter makes it even more exotic**](#) [周四, 26 10月 22:31]

Astronomers have discovered that the brightest galaxies within galaxy clusters 'wobble' relative to the cluster's center of mass. This unexpected result is inconsistent with predictions made by the current standard model of dark matter. With further analysis it may provide insights into the nature of dark matter, perhaps even indicating that new physics is at work.

- [**'Mega-carnivore' dinosaur roamed southern Africa 200 million years ago**](#) [周四, 26 10月 03:06]

An international team of scientists has discovered the first evidence that a huge carnivorous dinosaur roamed southern Africa 200 million year ago.

- [**6,000-year-old skull could be from the world's earliest known tsunami victim**](#) [周四, 26 10月 03:06]

Scientists have discovered what they believe is the skull of the earliest known tsunami victim, a person who lived 6,000 years ago in Papua New Guinea. The skull itself was found almost a hundred years ago, but recent analysis of the sediments found with the skull reveals that they bear distinctive hallmarks of tsunami activity.

- [**New property found in unusual crystalline materials**](#) [周四, 26 10月 02:11]

Researchers have discovered an unexpected property of some nanostructured metals, could lead to new ways of 'tuning' their properties.

- [**New RoboBee flies, dives, swims and explodes out the of water**](#) [周四, 26 10月 02:05]

A new, hybrid RoboBee can fly, dive into water, swim, propel itself

back out of water, and safely land. Floating devices allow this multipurpose air-water microrobot to stabilize on the water's surface before an internal combustion system ignites to propel it back into the air. This latest-generation RoboBee, which is 1,000 times lighter than any previous aerial-to-aquatic robot, could be used for numerous applications, from search-and-rescue operations to environmental monitoring and biological ...

- [**Could squirrel fur trade have contributed to England's medieval leprosy outbreak?**](#) [周三, 25 10月 22:31]

Genetic analysis of a pre-Norman skull unearthed in a garden in Suffolk has added to a growing body of evidence that East Anglia may have been the epicentre of an epidemic of leprosy that spread through medieval England. The authors of the new study suggest that an explanation for the prevalence of leprosy in medieval East Anglia may possibly be found in the sustained Scandinavian trade in squirrel fur -- an animal known to carry the disease.

- [**Why arched backs are attractive**](#) [周三, 25 10月 22:31]

Researchers have provided scientific evidence for what lap dancers and those who twerk probably have known all along -- men are captivated by the arched back of a woman. A team used 3-D models and eye-tracking technology to show how the subsequent slight thrusting out of a woman's hips can hold a man's gaze.

- [**Skin found to play a role in controlling blood pressure**](#) [周三, 25 10月 22:31]

Skin plays a surprising role in helping regulate blood pressure and heart rate, according to scientists. While this discovery was made in mice, the researchers believe it is likely to be true also in humans.

- [**Taste, not appearance, drives corals to eat plastics**](#) [周三, 25 10月 02:17]

Scientists have long known that marine animals mistakenly eat plastic debris because tiny bits of floating plastic look like prey. But a new study of plastic ingestion by corals suggests there may be an additional

reason for the potentially harmful behavior: The plastic simply tastes good. Chemical additives in the plastic may be acting as a feeding stimulant.

- [**'Wing prints' may identify individual bats as effectively as fingerprints identify people**](#) [周三, 25 10月 01:06]

For decades, bats have defied scientists' best ideas for keeping track of individuals, a critical element in wildlife research. Biologists have now discovered a means of identifying individual bats that may be as universal, distinctive, permanent and collectable as fingerprints: bats' wings.

- [**Spots on supergiant star drive spirals in stellar wind**](#) [周二, 24 10月 23:56]

Astronomers have recently discovered that spots on the surface of a supergiant star are driving huge spiral structures in its stellar wind.

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ScienceDaily

周六, 07 10月 2017

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- [Mars study yields clues to possible cradle of life](#) [周

六, 07 10月 03:49]

The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth. The research offers evidence that these deposits were formed by heated water from a volcanically active part of the planet's crust entering the bottom of a large sea long ago.

- [Asymmetric sound absorption lets in the light](#) [周六,

07 10月 02:22]

Many asymmetric absorbers are currently based on a single-port system, where sound enters one side and is absorbed before a rigid wall. In this design, however, light and air are unable to pass through the system. But new research shows that asymmetric absorption can be realized within a straight transparent waveguide.

- [Predicting insect feeding preferences after deforestation](#) [周五, 06 10月 22:18]

Understanding how parasitoids and hosts interact, and how their interactions change with human influence, is critically important to understanding ecosystems. New research finds mathematical models can predict complex insect behavioral changes using a simple description of insect preferences.

• [**Segregation-induced ordered superstructures at general grain boundaries in a Ni-Bi alloy**](#) [周五, 06 10月 22:18]

Randomly selected, high-angle, general grain boundaries in a nickel-bismuth (Ni-Bi) polycrystalline alloy can undergo interfacial reconstruction to form ordered superstructures, a discovery that enriches the theories and fundamental understandings of both grain boundary segregation and liquid metal embrittlement in physical metallurgy.

• [**New study analyzes volcanic fatalities in more detail than ever before**](#) [周五, 06 10月 22:18]

Building on existing information and databases relating to volcanic fatalities, scientists have, for the first time, been able to classify victims by activity or occupation and look at the distance of their death from the volcano.

• [**Exotic quantum particle observed in bilayer graphene**](#) [周五, 06 10月 21:22]

Physicists have definitively observed an intensely studied anomaly in condensed matter physics -- the even-denominator fractional quantum Hall state -- via transport measurement in bilayer graphene.

• [**Beyond bullying: Study shows damaging affects of multiple forms of victimization on school climate**](#) [周五, 06 10月 21:04]

School officials focused exclusively on bullying prevention efforts might want to consider the findings of a new study showing the highly damaging effects of multiple forms of victimization on school climate.

• [**Microbes dictate regime shifts causing anoxia in lakes and seas**](#) [周五, 06 10月 21:03]

Gradual environmental changes due to eutrophication and global warming can cause a rapid depletion of oxygen levels in lakes and coastal waters. A new study shows that microorganisms play a key role in these disastrous regime shifts.

- **[Electron behavior under extreme conditions described for the first time](#)** [周五, 06 10月 21:02]

Researchers have modeled the actions of electrons under extreme temperatures and densities, such as those found within planets and stars.

- **[Social acceptance more important than economic factors in fertility treatment availability](#)** [周五, 06 10月 20:59]

A new British study has shed light on some of the reasons why Assisted Reproductive Technologies (ART) usage varies across Europe -- pinpointing moral and social acceptance of the treatment and religion as key. Scientists have, for the first time, assessed the relative importance of the role that economic, demographic and cultural normative factors play in the process.

- **[Is your partner's hearing loss driving you mad?](#)** [周五, 06 10月 20:59]

The impact of a person's hearing loss on their nearest and dearest should be considered when personalizing rehabilitation plans for patients with deafness, suggest researchers.

- **[How seemingly acute viral infections can persist](#)** [周五, 06 10月 20:59]

Scientists have resolved a paradox of viral infection. They've identified how a viral product can both trigger an immune response aimed at eliminating the virus or, conversely, allow the virus to survive and persist.

- **[Engineers invent breakthrough millimeter-wave circulator IC](#)** [周五, 06 10月 20:59]

Researchers continue to break new ground in developing magnet-free non-reciprocal components in modern semiconductor processes. They have built the first magnet-free non-reciprocal circulator on a silicon chip that operates at millimeter-wave frequencies, enabling circulators to be built in conventional semiconductor chips and operate at millimeter-wave frequencies, enabling full-duplex or two-way wireless.

- [**Pushy or laid back? Economic factors influence parenting style**](#) [周五, 06 10月 07:03]

A new study argues that parenting styles are shaped by economic factors that incentivize one strategy over others.

- [**'Transformative' research unrealistic to predict, scientists tell granting agencies**](#) [周五, 06 10月 07:03]

Research-funding agencies that require scientists to declare at the proposal stage how their projects will be 'transformative' may actually be hindering discovery.

- [**How to decrease the discard rate of donated organs**](#) [周五, 06 10月 07:02]

From 2008-2015, the number of kidneys donated after circulatory death that were obtained by the country's 58 donor service areas varied substantially. The outcomes associated with these organs were generally excellent. The use of these organs could be increased if 'cold ischemia times' are limited.

- [**Women who get frequent UTIs may reduce risk by drinking plenty of water**](#) [周五, 06 10月 07:02]

Women who suffer from recurrent urinary tract infections may reduce their risk by drinking more water, according to a new study.

- [**Screen children with reading difficulties for hearing problems**](#) [周五, 06 10月 07:02]

A new study found 25 percent of its young participants who had reading difficulties showed mild or moderate hearing impairment, of which their parents and teachers were unaware.

- [**Old Faithful's geological heart revealed**](#) [周五, 06 10月 07:02]

Scientists have mapped the near-surface geology around Old Faithful, revealing the reservoir of heated water that feeds the geyser's surface vent and how the ground shaking behaves in between eruptions.

- [**New research to combat pancreatic cancer**](#) [周五, 06 10月

04:11]

New research is underway that could help scientists combat the most lethal of cancers: pancreatic cancer. In a recent study, scientists demonstrated that bacteria in pancreatic tumors degrade a chemotherapy drug -- Gemcitabine -- most commonly used to treat patients who have pancreatic cancer.

- [**Bariatric surgery lowers cancer risk for severely obese patients**](#) [周五, 06 10月 04:11]

Bariatric surgery lowers the risk of cancer for severely obese patients. The risks drop most for postmenopausal breast cancer, endometrial cancer, pancreatic cancer and colon cancer.

- [**Smartphone-controlled smart bandage for better, faster healing**](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [**Multiple research approaches are key to pandemic preparedness**](#) [周五, 06 10月 03:11]

Preparedness in the face of major disease outbreaks can save thousands of lives. A new article examines the multifaceted nature of effective preparedness and the role that biomedical research plays. Specifically, the article examines three approaches to pandemic preparedness: pathogen-specific work, platform-based technologies, and prototype-pathogen efforts.

- [**Interpreting hurricane forecast displays can be difficult for general public**](#) [周五, 06 10月 03:11]

The 2017 hurricane season has highlighted the critical need to communicate a storm's impact path and intensity accurately, but new research shows significant misunderstandings of the two most commonly used storm forecast visualization methods.

- [**Low serum calcium may increase risk of sudden**](#)

[cardiac arrest](#) [周五, 06 10月 02:18]

In a new study, researchers found that individuals with lower levels of calcium in the blood, which is easily monitored, are more likely to experience SCA than those with higher calcium levels.

• [Molecule created that could 'kick and kill' HIV](#) [周五, 06 10月 02:18]

Researchers have been looking for ways to eliminate the 'reservoirs' where the virus hides, and researchers may have developed a solution. Their approach involves sending an agent to 'wake up' the dormant virus, which causes it to begin replicating so that either the immune system or the virus itself would kill the cell harboring HIV.

• [Cost-effectiveness of guinea worm disease eradication](#) [周五, 06 10月 02:18]

Eradication of guinea worm disease (dracunculiasis), targeted by the World Health Organization (WHO) for the year 2015, is finally within reach, with only 25 reported human transmissions in 2016. Now, researchers have re-asserted the cost-effectiveness of the global Guinea Worm Eradication Programme (GWEP), some 30 years after it started.

• [Simulating a brain-cooling treatment that could one day ease epilepsy](#) [周五, 06 10月 02:18]

Using computer simulation techniques, scientists have gained new insights into the mechanism by which lowering the temperature of specific brain regions could potentially treat epileptic seizures.

• [3-D quantum gas atomic clock offers new dimensions in measurement](#) [周五, 06 10月 02:18]

Physicists have created an entirely new design for an atomic clock, in which strontium atoms are packed into a tiny three-dimensional cube at 1,000 times the density of previous one-dimensional clocks. In doing so, they are the first to harness the ultra-controlled behavior of a so-called 'quantum gas' to make a practical measurement device.

• [Carbon feedback from forest soils to accelerate global warming](#) [周五, 06 10月 02:18]

After 26 years, the world's longest-running experiment to discover how warming temperatures affect forest soils has revealed a surprising, cyclical response: Soil warming stimulates periods of abundant carbon release from the soil to the atmosphere alternating with periods of no detectable loss in soil carbon stores. The study indicates that in a warming world, a self-reinforcing and perhaps uncontrollable carbon feedback will occur between forest soils and the climate system, accelerating global...

- [**Decision to rescind Waters of the United States rule \(WOTUS\) based on flawed analysis**](#) [周五, 06 10月 02:18]

New evidence suggests that the Trump Administration's proposal to rescind the 2015 Waters of the United States (WOTUS) rule that would limit the scope of the Clean Water Act inappropriately overlooks wetlands-related values.

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [**First cell-type census of mouse brains: Surprises about structure, male-female differences**](#) [周五, 06 10月 02:18]

Neuroscientists have mobilized advanced imaging and computational methods to comprehensively map -- 'count' -- the total populations of specific types of cells throughout the mouse brain. In a new study, they report two highly surprising findings regarding distribution of cell types across the brain as well as male-female brain differences.

- [**Prehistoric humans are likely to have formed mating networks to avoid inbreeding**](#) [周五, 06 10月 02:17]

Early humans seem to have recognized the dangers of inbreeding at least 34,000 years ago, and developed surprisingly sophisticated social and mating networks to avoid it, new research has found.

- [**Scientists solve 3-D structure of key defense protein against Parkinson's disease**](#) [周五, 06 10月 02:17]

Scientists have identified the structure of a key enzyme that protects the brain against Parkinson's disease. The result of a decade of work, the research team said that solving the 3-D structure and inner workings of the PINK1 enzyme represented a major breakthrough.

- [**Better genetic decoding of neurodevelopmental disorders**](#) [周五, 06 10月 02:17]

New research into improving the genetic decoding of neurodevelopmental disorders promises to help future diagnosis of children with such conditions, including intellectual disability, autism or schizophrenia.

- [**Middle managers may turn to unethical behavior to face unrealistic expectations**](#) [周五, 06 10月 02:17]

While unethical behavior in organizations is often portrayed as flowing down from top management, or creeping up from low-level positions, a team of researchers suggest that middle management also can play a key role in promoting wide-spread unethical behavior among their subordinates.

- [**Why lab researchers should talk with industry counterparts**](#) [周五, 06 10月 02:17]

A research team has found both obstacles and lessons from the process of getting a novel membrane for chemical processing out of the lab into the commercial world.

- [**Delivering bad news? Don't beat around the bush**](#) [周五, 06 10月 02:17]

New research shows that when it comes to receiving bad news, most people prefer directness, candor and very little -- if any -- buffer.

- [**Predicting when a sound will occur relies on the brain's motor system**](#) [周五, 06 10月 02:17]

Whether it is dancing or just tapping one foot to the beat, we all experience how auditory signals like music can induce movement. Now new research suggests that motor signals in the brain actually sharpen sound perception, and this effect is increased when we move in rhythm with the sound.

- [**Road pricing most effective in reducing vehicle emissions**](#) [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

- [**New research on sperm stem cells has implications for male infertility and cancer**](#) [周五, 06 10月 02:17]

Scientists have shed light on the complex process that occurs in the development of human sperm stem cells.

- [**Identifying ways to minimize the harm of energy drinks**](#) [周五, 06 10月 02:17]

Because many countries allow the sale of energy drinks to young people, identifying ways to minimize potential harm from energy drinks is critical. A new study provided unique insights into intervention strategies suggested by young people themselves to reduce consumption. In addition to more research and education, these strategies included policy changes targeting energy drink sales, packaging, price, and visibility.

- [**New test opens path for better 2-D catalysts**](#) [周五, 06 10月 02:17]

Scientists have developed technology for rapid screening of two-dimensional materials for electrocatalysis of hydrogen. The method could accelerate the development of 2-D materials for energy

applications.

- [**Faster Salmonella test boosts food safety for humans and animals**](#) [周五, 06 10月 02:17]

A new test allows accurate, rapid testing for Salmonella, a bacteria that is one of the leading causes of food-borne illness across all regions of the world.

- [**Something universal occurs in the brain when it processes stories, regardless of language**](#) [周五, 06 10月 02:17]

New brain research shows that reading stories generates activity in the same regions of the brain for speakers of three different languages.

- [**Key plant species may be important for supporting wildflower pollinators**](#) [周五, 06 10月 02:17]

Increased agricultural production has likely led to loss, fragmentation, and degradation of flower-rich habitats for pollinators. To counteract these negative effects of modern agricultural practices, efforts to maintain and restore diverse plants in agricultural landscapes -- called agri-environmental schemes -- have been implemented in numerous European countries.

- [**Heart: No evidence for piezoelectricity or ferroelectricity in the aorta**](#) [周五, 06 10月 02:17]

While some studies have supported the idea that the walls of the aorta are piezoelectric or ferroelectric, the most recent research finds no evidence of these properties. Researchers investigated by testing samples of pig aorta using a traditional setup, known as Sawyer-Tower, to detect ferroelectricity. Their experiments suggest the aorta has no special properties, and instead acts as a standard dielectric material that does not conduct current.

- [**12,000 years ago, Florida hurricanes heated up despite chilly seas**](#) [周五, 06 10月 00:50]

Category 5 hurricanes may have slammed Florida repeatedly during the chilly Younger Dryas, 12,000 years ago. The cause? Hurricane-

suppressing effects of cooler sea surface were out-weighed by side effects of slowed ocean circulation.

• [**Brain study reveals how insects make beeline for home**](#) [周五, 06 10月 00:50]

Scientists have discovered how the wiring of bees' brains helps them plot the most direct route back to their hive.

Mars study yields clues to possible cradle of life -- ScienceDaily

The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth.

A recent international report examines observations by NASA's Mars Reconnaissance Orbiter (MRO) of massive deposits in a basin on southern Mars. The authors interpret the data as evidence that these deposits were formed by heated water from a volcanically active part of the planet's crust entering the bottom of a large sea long ago.

"Even if we never find evidence that there's been life on Mars, this site can tell us about the type of environment where life may have begun on Earth," said Paul Niles of NASA's Johnson Space Center, Houston. "Volcanic activity combined with standing water provided conditions that were likely similar to conditions that existed on Earth at about the same time -- when early life was evolving here."

Mars today has neither standing water nor volcanic activity. Researchers estimate an age of about 3.7 billion years for the Martian deposits attributed to seafloor hydrothermal activity. Undersea hydrothermal conditions on Earth at about that same time are a strong candidate for where and when life on Earth began. Earth still has such conditions, where many forms of life thrive on chemical energy extracted from rocks, without sunlight. But due to Earth's active crust, our planet holds little direct geological evidence preserved from the time when life began. The possibility of undersea hydrothermal activity inside icy moons such as Europa at Jupiter and Enceladus at Saturn feeds interest in them as destinations in the quest to find extraterrestrial life.

Observations by MRO's Compact Reconnaissance Spectrometer for Mars (CRISM) provided the data for identifying minerals in massive deposits within Mars' Eridania basin, which lies in a region with some of the Red Planet's most ancient exposed crust.

"This site gives us a compelling story for a deep, long-lived sea and a deep-sea hydrothermal environment," Niles said. "It is evocative of the deep-sea hydrothermal environments on Earth, similar to

environments where life might be found on other worlds -- life that doesn't need a nice atmosphere or temperate surface, but just rocks, heat and water."

Niles co-authored the recent report in the journal *Nature Communications* with lead author Joseph Michalski, who began the analysis while at the Natural History Museum, London, and co-authors at the Planetary Science Institute in Tucson, Arizona, and the Natural History Museum.

The researchers estimate the ancient Eridania sea held about 50,000 cubic miles (210,000 cubic kilometers) of water. That is as much as all other lakes and seas on ancient Mars combined and about nine times more than the combined volume of all of North America's Great Lakes. The mix of minerals identified from the spectrometer data, including serpentine, talc and carbonate, and the shape and texture of the thick bedrock layers, led to identifying possible seafloor hydrothermal deposits. The area has lava flows that post-date the disappearance of the sea. The researchers cite these as evidence that this is an area of Mars' crust with a volcanic susceptibility that also could have produced effects earlier, when the sea was present.

The new work adds to the diversity of types of wet environments for which evidence exists on Mars, including rivers, lakes, deltas, seas, hot springs, groundwater, and volcanic eruptions beneath ice.

"Ancient, deep-water hydrothermal deposits in Eridania basin represent a new category of astrobiological target on Mars," the report states. It also says, "Eridania seafloor deposits are not only of interest for Mars exploration, they represent a window into early Earth." That is because the earliest evidence of life on Earth comes from seafloor deposits of similar origin and age, but the geological record of those early-Earth environments is poorly preserved.

The Johns Hopkins University Applied Physics Laboratory, Laurel, Maryland, built and operates CRISM, one of six instruments with which MRO has been examining Mars since 2006. NASA's Jet Propulsion Laboratory, a division of Caltech in Pasadena, California, manages the project for the NASA Science Mission Directorate in Washington. Lockheed Martin Space Systems of Denver built the orbiter and supports its operations. For more about MRO, visit: <https://mars.nasa.gov/mro>

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Asymmetric sound absorption lets in the light: A new acoustic design with a two-port system enables simple asymmetric absorption while letting air and light pass through, offering new applications for sound-absorbing devices -- ScienceDaily

If you've ever lived in an apartment building or stayed in a hotel room, you are probably familiar with the inconvenience of inadequate sound absorption.

Acoustic absorption refers to the absorption of sound energy by a material. Whether it's to improve acoustics or to prevent noisy neighbors, sound absorption has multiple applications in engineering and architecture, which can be improved by asymmetric acoustics.

Many asymmetric absorbers, those that only absorb sound coming in from one direction, are currently based on a single-port system, where sound enters one side and is absorbed before a rigid wall. In this design, however, light and air are unable to pass through the

system. But a combined research effort from Nanjing University and the Chinese Academy of Sciences shows that asymmetric absorption can be realized within a straight transparent waveguide. The waveguide allows light transmission and air flow through the absorber and is described this week in *Applied Physics Letters*, from AIP Publishing.

Ying Cheng, associate professor of physics at Nanjing University, and his colleagues developed a methodology to induce non-reciprocal absorption and reflectance for both multiband and broadband sound. They discovered that sound was almost completely absorbed, more than 96 percent, when using the multiband absorber in an asymmetric Helmholtz resonance (HR) fashion.

"Therefore, we were curious about whether there are artificial structures with the effect of 'blocking' sound waves which act as the rigid wall, but [are] transparent to light and wind," Cheng said.

Within a tube with both ends open they constructed an asymmetric sound absorber. "[T]he system can almost totally absorb the sound energy impinging on one port, but largely reflects the sound energy entering the other

port," he said. "In the system, one of [the] Helmholtz resonators (located on branches to the main tube and acting as shunts) functions as an artificial soft wall which can block sound waves as if they were a rigid solid wall."

Asymmetric absorbers use a more complicated method of absorption than, say, porous metamaterials that absorb from both directions. Often, nonlinear effects or highly complex structures are required to break reciprocity and allow reflection from one direction.

Here, however, the clever design of the shunted HR pairs takes advantage of natural loss mechanisms to achieve the effect. These systems could find a number of applications in architectural design, specifically in the design of acoustically isolated rooms where light and air flow is still desired.

"The researchers may [have] found an almost 100 percent absorption of the noise from outside of a room for acoustic isolation as well as high reflection of the sound waves inside the room to enhance the reverberation. And most importantly, the design allows free interchange of air between the outside and the room, which they were unable to do in previous

prototypes [with only one end of the tube being open]," Cheng said.

Using the newly developed model, "we may extend asymmetric sound absorption into a two-dimensional planar system by using other types of acoustic resonators to make the asymmetric absorption more widely used," said Cheng.

Story Source:

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Predicting insect feeding preferences after deforestation -- ScienceDaily

Like a scene from the movie *Alien*, insect parasitoids inject their eggs into unsuspecting hosts, their offspring grow and eat from within, eventually bursting out leaving dead, empty host vessels. These tiny predators, many of them wasps, can have major ecological and economic impacts. For example, wasps in the genus *Melittobia* attack pollinating bumblebees. Parasitoid wasp larvae feed on the pupae of nesting bees, and their fast reproduction can destroy entire colonies with barely a trace of the preceding carnage.

Understanding how parasitoids and hosts interact, and how their interactions change with human influence, is critically important to understanding ecosystems. New research by an international team of researchers finds mathematical models can predict complex insect behavioural changes using a simple description of insect preferences. The research, published in the journal *Nature Communications* on October 6, was able to predict parasitism rates after deforestation

without the need for extensive field data.

"Collecting field data is necessary but expensive, so it's great to show we can use mathematical models to help focus efforts and make data collection more efficient," Phillip Staniczenko, Ph.D., lead author and research fellow at the National Socio-Environmental Synthesis Center (SESYNC). "Faced with all the complicated relationships among species, and between species and the environment, it's amazing we can identify simple patterns that, although not perfect, describe how humans might be affecting parasitism in the same way at different places all over the world."

Staniczenko set out to see if recorded changes in a particular type of parasitic interaction, between parasitoids and their hosts, shared similarities between data sets from different countries, and, therefore, might be predictable. Staniczenko and colleagues analysed data on bees, wasps and their parasitoids collected using trap nests. Joining this research effort were Staniczenko's former adviser, Felix Reed-Tsochas, Ph.D., at the CABDyN Complexity Centre at the University of Oxford's Saïd Business School, Owen Lewis, Ph.D., professor of ecology at the University of Oxford, Jason Tylianakis, Ph.D., professor of ecology

at the University of Canterbury in New Zealand, Matthias Albrecht, Ph.D., researcher at the Institute for Sustainability Sciences in Switzerland, Valérie Coudrain, Ph.D., researcher at the Mediterranean Institute of Marine and Terrestrial Biodiversity and Ecology in France, and Alexandra-Maria Klein, professor of ecology at the University of Freiburg in Germany.

They based their findings on host-parasitoid interaction data collected in Ecuador, Indonesia, and Switzerland, at field sites located in a diverse range of ecosystems, including tropical forest and agroforest, temperate meadows and plains, as well as human-modified habitats, such as pasture land and rice paddies. Because parasitoids can attack multiple hosts, interaction data can be combined to build networks that describe, in one mathematical object, the relative rates of parasitism among multiple species at a field site. Given these data, the researchers first designed a way of extracting parasitoid preferences for each host from ecological networks.

"A lot of information about behaviour and species' responses to the environment is contained in ecological networks, but the question is how to make this

information useful for prediction," Staniczenko said. "Eventually, we realised the answer was interaction preferences, which quantify how much more or less parasitoids attack their hosts compared to a baseline expectation that they attack every time a parasitoid randomly encounters one of its possible hosts."

Co-author Lewis added, "It would be very difficult and time consuming to study the feeding behaviour of all these species in the field -- particularly in high diversity ecosystems like tropical rainforests. Fortunately, it turns out that using interaction preferences might allow us to skip that step."

Staniczenko continued, "We found that when interaction preferences changed, they did so in the same way in each country. This meant we could design models that captured systematic shifts in interaction preferences to make predictions at new locations, without needing to collect lots of new interaction data."

"Adding preference data to interaction networks is a big step forward because it allows refinement of the interaction map from a simple list of who-eats-whom to measures that actually provide information on the relative intensity of those interactions. Preference data

are clearly a great boon to prediction and an important target for inclusion in future studies," commented Bill Fagan, Professor and Chair of Biology at the University of Maryland, who was not involved in the project.

Staniczenko and colleagues focused on deforestation, but their new mathematical approach will be valuable for understanding the consequences of many types of human-driven environmental changes. "Interactions among species are the gears that keep the engine of ecosystems working to provide us with resources for our survival. Changes to the environment caused by human activities have disrupted these interactions, and it has previously been difficult to predict changes before it's too late," co-author Tyliankis said.

"We're a long way from predicting the consequences of every human activity," Staniczenko concluded, "but at least now we know it's possible."

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Segregation-induced ordered superstructures at general grain boundaries in a Ni-Bi alloy: The discovery of ordered, segregation-induced superstructures at general grain boundaries challenges a traditional view in physical metallurgy -- ScienceDaily

The discovery of ordered, segregation-induced superstructures at general grain boundaries challenges a traditional view in physical metallurgy

A team of researchers found that randomly selected, high-angle, general grain boundaries in a nickel-bismuth (Ni-Bi) polycrystalline alloy can undergo interfacial reconstruction to form ordered superstructures, a discovery that enriches the theories and fundamental understandings of both grain boundary segregation and liquid metal embrittlement in physical metallurgy.

This discovery shows that segregation-induced ordered superstructures are not limited to special grain boundaries that are inherently periodic, but may exist at a variety of general grain boundaries that were thought to be lacking any long-range order; hence, they can affect the performance of polycrystalline engineering alloys.

The team, including nanoengineering professor Jian Luo here at the University of California San Diego as a co-corresponding author together with Professor Martin Harmer at Lehigh University, lays out their findings in the Oct. 6, 2017 issue of *Science*.

Researchers observed and investigated segregation-induced superstructures at randomly-selected general grain boundaries of a Ni-Bi polycrystalline alloy via aberration-corrected scanning transmission electron microscopy (AC STEM), in conjunction with first-principles density functional theory calculations.

Grain boundaries are internal interfaces in polycrystalline materials that often control the materials' properties. The segregation of alloying elements or impurities at grain boundaries can significantly alter, often severely degrade, the

mechanical and physical properties of engineered alloys.

Prior studies of atomic-level grain boundary and segregation structures have been mostly focused on small-angle or special symmetrical tilt and twist boundaries with high symmetries and well-defined periodicities in artificial bicrystals. However, most grain boundaries in polycrystalline materials are so-called "general" grain boundaries of mixed tilt and twist character, which are not well understood due to the difficulties in characterizing and modeling them. Yet, such general grain boundaries are often significantly weaker mechanically and chemically than the well-studied special grain boundaries, thereby limiting properties and performance of engineered materials. Here, a traditional view is that these high-angle general grain boundaries may not undergo interfacial reconstructions to form ordered superstructures because a lattice match between the two abutting grains is lacking. This traditional belief is challenged by this new report in *Science*.

More specifically, interfacial reconstructions that change the 2-D translational symmetries, which are known to occur frequently at crystalline surfaces, were

thought impossible to be realized at general grain boundaries that should be lacking long-range translational symmetries. But researchers showed that it is enabled by faceting, as well as the formation of atomic-level steps at the grain boundaries, which allows separate interfacial reconstructions to occur at both terminating grain surface planes in a unique "bilayer" interfacial phase (wherein an "interfacial phase" refers to a thermodynamically 2-D phase spontaneously-formed at an interface, which is also called a "complexion").

Specific to this nickel-bismuth system, such interfacial superstructures are the root cause of a mysterious phenomenon called "liquid metal embrittlement," wherein a normally ductile nickel metal or nickel-based alloy can fail catastrophically in an extremely brittle manner in contact with a bismuth-based liquid metal.

This work is a further, significant advancement of Luo's earlier collaborative research with Lehigh University published six years ago [Luo et al., *Science* 333: 1730-1733 (2011)].

In that earlier work, researchers discovered this bilayer interfacial phase that is responsible for the mysterious

liquid metal embrittlement in nickel-bismuth, but the exact atomic structures of the bilayers had not been determined at that time. Specifically, it was unclear whether the segregated bismuth atoms can form reconstructed superstructures, the existence of which was not expected at the general grain boundaries, but have been revealed in this new study. Another scientifically interesting observation of the current study is that the interfacial reconstruction is driven and dictated by the orientation of the terminating grain surface, rather than by lattice mis-orientation between the two abutting grains as commonly believed in classical physical metallurgy.

Researchers believe that these new and somewhat surprising discoveries are scientifically important and enrich our fundamental understanding of the general grain boundaries that often control the performance properties of various polycrystalline engineered materials.

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New study analyzes volcanic fatalities in more detail than ever before -- ScienceDaily

A tenth of the world's population lives within the potential footprint of volcanic hazards with more than 800 million people living within 100 km of active volcanoes.

Between 1500 and 2017 more than 278,000 people met their fate as a result of volcanic hazards -- on average that's about 540 people a year.

Volcanoes produce numerous hazards which affect different distances, in both times of eruption and when the volcano is quiet.

During this research Dr Sarah Brown from the University of Bristol's School of Earth Sciences and colleagues, updated previous databases of volcanic fatalities by correcting data, adding events and, crucially, now including information on the location of the fatalities in terms of distance from the volcano.

The location of fatal incidents was identified from official reports, volcano activity bulletins, scientific reports and media stories.

Nearly half of all fatal incidents were recorded within 10 km of volcanoes but fatalities are recorded as far away as 170 km.

Close to volcanoes (within 5 km) ballistics or volcanic bombs dominate the fatality record.

Pyroclastic density currents, fast-moving avalanches of hot rock, ash and gas are the dominant cause of death at more medial distances (5-15 km).

Lahars -- volcanic mudflows, tsunamis and tephra (ashfall) -- are the main cause of death at greater distances.

As well as the distances, Dr Brown and her team were also able to classify the victims in more detail than any previous studies.

Whilst most victims were people who live on or near the volcano, several groups were identified as common victims. These were namely tourists, media, emergency response personnel and scientists (mostly

volcanologists).

561 tourist fatalities were recorded, mostly during small eruptions or in times of quiescence when the volcano was not actively erupting. Most of these fatalities occurred close to the volcano (within 5 km), with ballistics being the most common cause of death in eruptions.

A recent example of tourist fatalities was the 2014 Ontake eruption in Japan when hikers on the volcano were caught out by a sudden eruption which tragically killed 57 people.

And, just a few weeks ago, a child and his parents died in Campi Flegri in Italy, likely overcome by deadly gases when the ground collapsed beneath them in a restricted area.

The fatalities of 67 scientists (mostly volcanologists and those supporting their work) were recorded with more than 70 per cent of these within 1 km of the volcano summit, highlighting the danger to field scientists visiting the summit of active volcanoes.

Disaster prevention and response personnel, military

and emergency services working to evacuate, rescue or recover victims of volcanic eruptions have unfortunately also lost their lives, with 57 fatalities of emergency response personnel.

The deaths of 30 media employees are also recorded -- these were reporting on eruptions and were often within the declared danger zones.

Dr Brown, who is also a member of the University of Bristol's Cabot Institute, said: "The identification of these groups of victims is key for improving safety and reducing deaths and injuries in these groups.

"While volcanologists and emergency response personnel might have valid reasons for their approach into hazardous zones, the benefits and risks must be carefully weighed.

"The media and tourists should observe exclusion zones and follow direction from the authorities and volcano observatories.

"Tourist fatalities could be reduced with appropriate access restrictions, warnings and education."

The location data allows the characterisation of

volcanic threat with distance, as a function of eruption size and the hazard type. It contributes to risk reduction by providing an empirical dataset on which to forecast impacts and support evidence-based eruption planning and preparedness.

The data and analysis support assessment of volcanic threat, population exposure and vulnerabilities, and is a good step towards systematic fatality data collection which supports the priority target of the Sendai Framework for Disaster Risk Reduction in reducing mortality from disasters.

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The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth. The research offers evidence that these deposits were formed by heated water from a volcanically active part of the planet's crust entering the bottom of a large sea long ago.

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Physicists have definitively observed an intensely studied anomaly in condensed matter physics -- the even-denominator fractional quantum Hall state -- via transport measurement in bilayer graphene.

- [Old Faithful's geological heart revealed](#) [周五, 06 10月 07:02]

Scientists have mapped the near-surface geology around Old Faithful, revealing the reservoir of heated water that feeds the geyser's surface vent and how the ground shaking behaves in between eruptions.

- [3-D quantum gas atomic clock offers new dimensions in measurement](#) [周五, 06 10月 02:18]

Physicists have created an entirely new design for an atomic clock, in which strontium atoms are packed into a tiny three-dimensional cube at 1,000 times the density of previous one-dimensional clocks. In doing so, they are the first to harness the ultra-controlled behavior of a so-called 'quantum gas' to make a practical measurement device.

- [Carbon feedback from forest soils to accelerate global warming](#) [周五, 06 10月 02:18]

After 26 years, the world's longest-running experiment to discover how warming temperatures affect forest soils has revealed a surprising, cyclical response: Soil warming stimulates periods of abundant carbon release from the soil to the atmosphere alternating with periods of no detectable loss in soil carbon stores. The study indicates that in a warming world, a self-reinforcing and perhaps uncontrollable carbon feedback will occur between forest soils and the climate system, accelerating global...

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [**Prehistoric humans are likely to have formed mating networks to avoid inbreeding**](#) [周五, 06 10月 02:17]

Early humans seem to have recognized the dangers of inbreeding at least 34,000 years ago, and developed surprisingly sophisticated social and mating networks to avoid it, new research has found.

- [**12,000 years ago, Florida hurricanes heated up despite chilly seas**](#) [周五, 06 10月 00:50]

Category 5 hurricanes may have slammed Florida repeatedly during the chilly Younger Dryas, 12,000 years ago. The cause? Hurricane-suppressing effects of cooler sea surface were out-weighed by side effects of slowed ocean circulation.

- [**Brain study reveals how insects make beeline for home**](#) [周五, 06 10月 00:50]

Scientists have discovered how the wiring of bees' brains helps them plot the most direct route back to their hive.

- [**Once declared extinct, Lord Howe Island stick insects really do live**](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny

crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead Lord Howe Island stick insects have some good news: those rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

- [**More traits associated with your Neanderthal DNA**](#) [周五, 06 10月 00:11]

After humans and Neanderthals met many thousands of years ago, the two species began interbreeding. Recent studies have shown that some of those Neanderthal genes have contributed to human immunity and modern diseases. Now researchers have found that our Neanderthal inheritance has contributed to other characteristics, too, including skin tone, hair color, sleep patterns, mood, and even a person's smoking status.

- [**Violent helium reaction on white dwarf surface triggers supernova explosion**](#) [周四, 05 10月 23:11]

Astronomers have found solid evidence about what triggered a star to explode, which will contribute to a further understanding of supernova history and behavior.

- [**'Squirtable' elastic surgical glue seals wounds in 60 seconds**](#) [周四, 05 10月 22:27]

A highly elastic and adhesive surgical glue that quickly seals wounds without the need for common staples or sutures could transform how surgeries are performed.

- [**Who fatally undermined Scott's Antarctic expedition?**](#) [周四, 05 10月 22:26]

What doomed Captain Robert Falcon Scott's British Antarctic Expedition in 1912? Scientists have uncovered documents and diary entries that suggest a team member stole food Scott needed, failed to pass on orders that would have sent out a dog team to meet the men and then changed his story over time to cover up his role in their deaths.

- [**Too much sugar? Even 'healthy people' are at risk of developing heart disease**](#) [周四, 05 10月 08:20]

Healthy people who consume high levels of sugar are at an increased risk of developing cardiovascular disease.

- [**Milky Way's 'most-mysterious star' continues to confound**](#) [周四, 05 10月 07:05]

In 2015, a star called KIC 8462852 caused quite a stir in and beyond the astronomy community due to a series of rapid, unexplained dimming events. The latest findings from astronomers take a longer look at the star, going back to 2006 -- before its strange behavior was detected by Kepler.

- [**No clear evidence that most new cancer drugs extend or improve life**](#) [周四, 05 10月 07:04]

The majority of cancer drugs approved in Europe between 2009 and 2013 entered the market without clear evidence that they improved survival or quality of life for patients, finds a study.

- [**Sunlight and 'right' microbes convert Arctic carbon into carbon dioxide**](#) [周四, 05 10月 04:38]

A new study outlines the mechanisms and points to the importance of both sunlight and the right microbial community as keys to converting permafrost carbon to CO₂.

- [**New nanomaterial can extract hydrogen fuel from seawater**](#) [周四, 05 10月 04:20]

A new hybrid nanomaterial harvests solar energy and uses it to extract hydrogen from seawater, cheaply and efficiently. Future commercialization could mean a new source of environmentally friendly fuel and less dependence on fossil fuels.

- [**Ancient humans left Africa to escape drying climate**](#) [周四, 05 10月 03:12]

Humans migrated out of Africa as the climate shifted from wet to dry

about 60,000 years ago, according to new paleoclimate research. What the northeast Africa climate was like when people migrated from Africa into Eurasia between 70,000 and 55,000 years ago is still uncertain. The new research shows around 70,000 years ago, the Horn of Africa climate shifted from a wet phase called 'Green Sahara' to even drier than the region is now.

- [**Why does divorce run in families? The answer may be genetics**](#) [周四, 05 10月 03:12]

Children of divorced parents are more likely to get divorced when compared to those who grew up in two-parent families -- and genetic factors are the primary explanation, according to a new study.

- [**The super-Earth that came home for dinner**](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire solar system to one side. It is a possible "Planet Nine" -- a world perhaps 10 times the mass of Earth and 20 times farther from the sun than Neptune.

- [**Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

- [**Bumblebees shed light on why some individuals are smarter than others**](#) [周四, 05 10月 01:28]

By examining the brains of bees trained to different tasks, the researchers found that the number of connections between nerve cells may hold the answer to questions about individual cognitive differences. Bees with a greater density of nerve connections (known as synaptic

complexes) in a specific part of their brains had better memories and learned faster than bees with fewer connections in these areas.

- [**In Iceland stream, possible glimpse of warming future**](#) [周四, 05 10月 01:26]

When a normally cold stream in Iceland was warmed, the make-up of life inside changed as larger organisms thrived while smaller ones struggled. The findings carry implications for life in a warming climate.

- [**Anxiety and depression caused by childhood bullying decline over time**](#) [周四, 05 10月 00:05]

A new study has provided the strongest evidence to date that exposure to bullying causes mental health issues such as anxiety years later.

- [**Flights worldwide face increased risk of severe turbulence due to climate change**](#) [周四, 05 10月 00:04]

Flights all around the world could be encountering lots more turbulence in the future, according to the first ever global projections of in-flight bumpiness.

- [**Hurricane exposes and washes away thousands of sea turtle nests**](#) [周四, 05 10月 00:04]

Marine biologists have released estimates of sea turtle nests lost to Hurricane Irma, finding that 56 percent of green turtle nests and 24 percent of loggerhead nests were lost within Archie Carr National Wildlife Refuge. Both are endangered species. The losses put a damper on what had been a record year for green turtle nesting.

- [**Nobel Prize in Chemistry 2017: Cryo-electron microscopy**](#) [周三, 04 10月 21:02]

The Nobel Prize in Chemistry 2017 goes to Jacques Dubochet, Joachim Frank, and Richard Henderson "for developing cryo-electron microscopy for the high-resolution structure determination of biomolecules in solution."

- [**'CRISPR-Gold' fixes Duchenne muscular**](#)

[**dystrophy mutation in mice**](#) [周三, 04 10月 08:29]

Scientists have engineered a new way to deliver CRISPR-Cas9 gene-editing technology inside cells and have demonstrated in mice that the technology can repair the mutation that causes Duchenne muscular dystrophy, a severe muscle-wasting disease.

[**Livestock grazing harming giant panda habitat**](#) [周三, 04 10月 00:54]

One third of the giant panda habitat in China's Wanglang National Nature Reserve has been degraded and lost to livestock grazing, a new study finds. Livestock numbers in the park have increased ninefold in the last 15 years.

[**First evidence of the body's waste system in the human brain discovered**](#) [周二, 03 10月 23:11]

By scanning the brains of healthy volunteers, researchers saw the first, long-sought evidence that our brains may drain some waste out through lymphatic vessels, the body's sewer system. The results further suggest the vessels could act as a pipeline between the brain and the immune system.

[**Large volcanic eruptions in Tropics can trigger El Niño events**](#) [周二, 03 10月 23:11]

Explosive volcanic eruptions in the tropics can lead to El Niño events, those notorious warming periods in the Pacific Ocean with dramatic global impacts on the climate, according to a new study.

[**House sparrow decline linked to air pollution and poor diet**](#) [周二, 03 10月 23:10]

House sparrows are well-adapted to living in urban areas, so it is surprising their numbers have fallen significantly over the past decades. An investigation into this worrying trend finds that sparrows living in urban areas are adversely affected by pollution and poor nutrition. The study also finds the birds suffer more during the breeding season, when resources are needed to produce healthy eggs.

[**To breed or not to breed? Migratory female**](#)

[**butterflies face a monsoonal dilemma**](#) [周二, 03 10月 23:10]

Female butterflies make smart investments, finds a new study.

• [**Astronomers reveal evidence of dynamical dark energy**](#) [周二, 03 10月 23:10]

Astronomers found that the nature of dark energy may not be the cosmological constant introduced by Albert Einstein 100 years ago. This is crucial for the study of dark energy.

• [**Nobel Prize in Physics 2017: Gravitational waves**](#) [周二, 03 10月 21:58]

The Nobel Prize in Physics 2017 goes to Rainer Weiss, Barry C. Barish, and Kip S. Thorne "for decisive contributions to the LIGO detector and the observation of gravitational waves."

• [**Earth's tectonic plates are weaker than once thought**](#) [周二, 03 10月 21:40]

A long-standing question regarding the strength of olivine, the primary component of Earth's mantle, has now been answered. This study has implications for how we understand now tectonic plates form and move.

• [**An algorithm that explains how ants create and repair trail networks**](#) [周二, 03 10月 21:40]

Observing ants in the trees of a tropical forest, researchers recorded how, without a plan, the ants make and maintain their networks -- and how they repair the network when it is ruptured.

• [**Prehistoric squid was last meal of newborn ichthyosaur 200 million years ago**](#) [周二, 03 10月 21:39]

Scientists have identified the smallest and youngest specimen of Ichthyosaurus communis on record and found an additional surprise preserved in its stomach.

• [**Ancient petrified salamander reveals its last meal**](#) [周二, 03 10月 21:39]

A new study on an exceptionally preserved salamander from the Eocene

of France reveals that its soft organs are conserved under its skin and bones. Organs preserved in three dimensions include the lung, nerves, gut, and within it, the last meal of the animal, according to a new study.

• [**Monstrous crocodile fossil points to early rise of ancient reptiles**](#) [周二, 03 10月 08:22]

A newly identified prehistoric marine predator has shed light on the origins of the distant relatives of modern crocodiles.

• [**New source of radioactivity from Fukushima disaster**](#) [周二, 03 10月 04:12]

Scientists have found a previously unsuspected place where radioactive material from the Fukushima Dai-ichi nuclear power plant disaster has accumulated -- in sands and brackish groundwater beneath beaches up to 60 miles away. The sands took up and retained radioactive cesium originating from the disaster in 2011 and have been slowly releasing it back to the ocean.

• [**Did life on Earth start due to meteorites splashing into warm little ponds?**](#) [周二, 03 10月 04:12]

Life on Earth began somewhere between 3.7 and 4.5 billion years ago, after meteorites splashed down and leached essential elements into warm little ponds, say scientists. Their calculations suggest that wet and dry cycles bonded basic molecular building blocks in the ponds' nutrient-rich broth into self-replicating RNA molecules that constituted the first genetic code for life on the planet.

• [**Meteorite tells us that Mars had a dense atmosphere 4 billion years ago**](#) [周一, 02 10月 23:42]

Exploration missions have suggested that Mars once had a warm climate, which sustained oceans on its surface. To keep Mars warm requires a dense atmosphere with a sufficient greenhouse effect, while the present-day Mars has a thin atmosphere whose surface pressure is only 0.006 bar, resulting in the cold climate it has today. It has been a big mystery as to when and how Mars lost its dense atmosphere.

• [**ALMA and Rosetta detect Freon-40 in space dashing hopes that molecule may be marker of life**](#) [周一, 02 10月 23:28]

Observations made with the Atacama Large Millimeter/submillimeter Array (ALMA) and ESA's Rosetta mission, have revealed the presence of the organohalogen Freon-40 in gas around both an infant star and a comet. Organohalogens are formed by organic processes on Earth, but this is the first ever detection of them in interstellar space. This discovery suggests that organohalogens may not be as good markers of life as had been hoped, but that they may be significant components of the material from whi...

• [**First look at electrons escaping atoms**](#) [周一, 02 10月 23:27]

Researchers have taken a first step toward controlling electrons' behavior inside matter -- and thus the first step down a long and complicated road that could eventually lead to the ability to create new states of matter at will.

• [**Mini-kidneys grown in lab reveal renal disease secrets**](#) [周一, 02 10月 23:27]

By creating and manipulating mini-kidney organoids that contain a realistic micro-anatomy, researchers can now track the early stages of polycystic kidney disease. The organoids are grown from human stem cells.

• [**Siberian volcanic eruptions caused extinction 250 million years ago, new evidence shows**](#) [周一, 02 10月 22:52]

The Great Permian Extinction, which occurred approximately 250 million years ago, was caused by massive volcanic eruptions that led to significant environmental changes, new evidence shows.

• [**DNA: The next hot material in photonics?**](#) [周一, 02 10月 22:52]

Using DNA from salmon, researchers in South Korea hope to make better biomedical and other photonic devices based on organic thin films.

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Health News

Top stories featured on ScienceDaily's Health & Medicine, Mind & Brain, and Living Well sections.

- [**Asymmetric sound absorption lets in the light**](#) [周六, 07 10月 02:22]

Many asymmetric absorbers are currently based on a single-port system, where sound enters one side and is absorbed before a rigid wall. In this design, however, light and air are unable to pass through the system. But new research shows that asymmetric absorption can be realized within a straight transparent waveguide.

- [**Beyond bullying: Study shows damaging affects of multiple forms of victimization on school climate**](#) [周五, 06 10月 21:04]

School officials focused exclusively on bullying prevention efforts might want to consider the findings of a new study showing the highly damaging effects of multiple forms of victimization on school climate.

- [**Social acceptance more important than economic factors in fertility treatment availability**](#) [周五, 06 10月 20:59]

A new British study has shed light on some of the reasons why Assisted Reproductive Technologies (ART) usage varies across Europe -- pinpointing moral and social acceptance of the treatment and religion as key. Scientists have, for the first time, assessed the relative importance of the role that economic, demographic and cultural normative factors play in the process.

- [**Is your partner's hearing loss driving you mad?**](#) [周五, 06 10月 20:59]

The impact of a person's hearing loss on their nearest and dearest should

be considered when personalizing rehabilitation plans for patients with deafness, suggest researchers.

- [**How seemingly acute viral infections can persist**](#)

[周五, 06 10月 20:59]

Scientists have resolved a paradox of viral infection. They've identified how a viral product can both trigger an immune response aimed at eliminating the virus or, conversely, allow the virus to survive and persist.

- [**Pushy or laid back? Economic factors influence parenting style**](#)

[周五, 06 10月 07:03]

A new study argues that parenting styles are shaped by economic factors that incentivize one strategy over others.

- [**How to decrease the discard rate of donated organs**](#)

[周五, 06 10月 07:02]

From 2008-2015, the number of kidneys donated after circulatory death that were obtained by the country's 58 donor service areas varied substantially. The outcomes associated with these organs were generally excellent. The use of these organs could be increased if 'cold ischemia times' are limited.

- [**Women who get frequent UTIs may reduce risk by drinking plenty of water**](#)

[周五, 06 10月 07:02]

Women who suffer from recurrent urinary tract infections may reduce their risk by drinking more water, according to a new study.

- [**Screen children with reading difficulties for hearing problems**](#)

[周五, 06 10月 07:02]

A new study found 25 percent of its young participants who had reading difficulties showed mild or moderate hearing impairment, of which their parents and teachers were unaware.

- [**New research to combat pancreatic cancer**](#)

[周五, 06 10月 04:11]

New research is underway that could help scientists combat the most lethal of cancers: pancreatic cancer. In a recent study, scientists

demonstrated that bacteria in pancreatic tumors degrade a chemotherapy drug -- Gemcitabine -- most commonly used to treat patients who have pancreatic cancer.

- [**Bariatric surgery lowers cancer risk for severely obese patients**](#) [周五, 06 10月 04:11]

Bariatric surgery lowers the risk of cancer for severely obese patients. The risks drop most for postmenopausal breast cancer, endometrial cancer, pancreatic cancer and colon cancer.

- [**Smartphone-controlled smart bandage for better, faster healing**](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [**Multiple research approaches are key to pandemic preparedness**](#) [周五, 06 10月 03:11]

Preparedness in the face of major disease outbreaks can save thousands of lives. A new article examines the multifaceted nature of effective preparedness and the role that biomedical research plays. Specifically, the article examines three approaches to pandemic preparedness: pathogen-specific work, platform-based technologies, and prototype-pathogen efforts.

- [**Low serum calcium may increase risk of sudden cardiac arrest**](#) [周五, 06 10月 02:18]

In a new study, researchers found that individuals with lower levels of calcium in the blood, which is easily monitored, are more likely to experience SCA than those with higher calcium levels.

- [**Molecule created that could 'kick and kill' HIV**](#) [周五, 06 10月 02:18]

Researchers have been looking for ways to eliminate the 'reservoirs' where the virus hides, and researchers may have developed a solution. Their approach involves sending an agent to 'wake up' the dormant

virus, which causes it to begin replicating so that either the immune system or the virus itself would kill the cell harboring HIV.

- [**Cost-effectiveness of guinea worm disease eradication**](#) [周五, 06 10月 02:18]

Eradication of guinea worm disease (dracunculiasis), targeted by the World Health Organization (WHO) for the year 2015, is finally within reach, with only 25 reported human transmissions in 2016. Now, researchers have re-asserted the cost-effectiveness of the global Guinea Worm Eradication Programme (GWEP), some 30 years after it started.

- [**Simulating a brain-cooling treatment that could one day ease epilepsy**](#) [周五, 06 10月 02:18]

Using computer simulation techniques, scientists have gained new insights into the mechanism by which lowering the temperature of specific brain regions could potentially treat epileptic seizures.

- [**First cell-type census of mouse brains: Surprises about structure, male-female differences**](#) [周五, 06 10月 02:18]

Neuroscientists have mobilized advanced imaging and computational methods to comprehensively map -- 'count' -- the total populations of specific types of cells throughout the mouse brain. In a new study, they report two highly surprising findings regarding distribution of cell types across the brain as well as male-female brain differences.

- [**Prehistoric humans are likely to have formed mating networks to avoid inbreeding**](#) [周五, 06 10月 02:17]

Early humans seem to have recognized the dangers of inbreeding at least 34,000 years ago, and developed surprisingly sophisticated social and mating networks to avoid it, new research has found.

- [**Scientists solve 3-D structure of key defense protein against Parkinson's disease**](#) [周五, 06 10月 02:17]

Scientists have identified the structure of a key enzyme that protects the brain against Parkinson's disease. The result of a decade of work, the research team said that solving the 3-D structure and inner workings of

the PINK1 enzyme represented a major breakthrough.

- [**Better genetic decoding of neurodevelopmental disorders**](#) [周五, 06 10月 02:17]

New research into improving the genetic decoding of neurodevelopmental disorders promises to help future diagnosis of children with such conditions, including intellectual disability, autism or schizophrenia.

- [**Middle managers may turn to unethical behavior to face unrealistic expectations**](#) [周五, 06 10月 02:17]

While unethical behavior in organizations is often portrayed as flowing down from top management, or creeping up from low-level positions, a team of researchers suggest that middle management also can play a key role in promoting wide-spread unethical behavior among their subordinates.

- [**Delivering bad news? Don't beat around the bush**](#) [周五, 06 10月 02:17]

New research shows that when it comes to receiving bad news, most people prefer directness, candor and very little -- if any -- buffer.

- [**Predicting when a sound will occur relies on the brain's motor system**](#) [周五, 06 10月 02:17]

Whether it is dancing or just tapping one foot to the beat, we all experience how auditory signals like music can induce movement. Now new research suggests that motor signals in the brain actually sharpen sound perception, and this effect is increased when we move in rhythm with the sound.

- [**New research on sperm stem cells has implications for male infertility and cancer**](#) [周五, 06 10月 02:17]

Scientists have shed light on the complex process that occurs in the development of human sperm stem cells.

- [**Identifying ways to minimize the harm of energy**](#)

[drinks](#) [周五, 06 10月 02:17]

Because many countries allow the sale of energy drinks to young people, identifying ways to minimize potential harm from energy drinks is critical. A new study provided unique insights into intervention strategies suggested by young people themselves to reduce consumption. In addition to more research and education, these strategies included policy changes targeting energy drink sales, packaging, price, and visibility.

. [Faster Salmonella test boosts food safety for humans and animals](#) [周五, 06 10月 02:17]

A new test allows accurate, rapid testing for Salmonella, a bacteria that is one of the leading causes of food-borne illness across all regions of the world.

. [Something universal occurs in the brain when it processes stories, regardless of language](#) [周五, 06 10月 02:17]

New brain research shows that reading stories generates activity in the same regions of the brain for speakers of three different languages.

. [Heart: No evidence for piezoelectricity or ferroelectricity in the aorta](#) [周五, 06 10月 02:17]

While some studies have supported the idea that the walls of the aorta are piezoelectric or ferroelectric, the most recent research finds no evidence of these properties. Researchers investigated by testing samples of pig aorta using a traditional setup, known as Sawyer-Tower, to detect ferroelectricity. Their experiments suggest the aorta has no special properties, and instead acts as a standard dielectric material that does not conduct current.

. [Air pollution exposure on home-to-school routes reduces the growth of working memory](#) [周五, 06 10月 00:50]

A new study has demonstrated that exposure to air pollution on the way to school can have damaging effects on children's cognitive development. The study found an association between a reduction in

working memory and exposure to fine particulate matter (PM2.5) and black carbon during the walking commute to and from school.

- [**Genetic drivers of most common form of lymphoma identified**](#) [周五, 06 10月 00:50]

An international research effort has been working to better understand the genetic underpinnings of the most prevalent form of lymphoma -- diffuse large B cell lymphoma -- and how those genes might play a role in patients' responses to therapies.

- [**A new CRISPR-engineered cancer model to test therapeutics**](#) [周五, 06 10月 00:11]

Using multiplex CRISPR-Cas9 editing of human hematopoietic, or blood-forming, stem cells followed by transplantation in mice, researchers designed customized mouse models for the progression of leukemia. In a number of different experiments, the animal models successfully reflected human responses to a therapeutic agent commonly used to treat blood cancers.

- [**Germs in the kitchen: Salmonella better known than Campylobacter**](#) [周五, 06 10月 00:11]

What health risks are consumers aware of? What are they concerned about?

- [**More traits associated with your Neanderthal DNA**](#) [周五, 06 10月 00:11]

After humans and Neanderthals met many thousands of years ago, the two species began interbreeding. Recent studies have shown that some of those Neanderthal genes have contributed to human immunity and modern diseases. Now researchers have found that our Neanderthal inheritance has contributed to other characteristics, too, including skin tone, hair color, sleep patterns, mood, and even a person's smoking status.

- [**A candidate genetic factor for effects of prenatal alcohol exposure has been found**](#) [周五, 06 10月 00:10]

Researchers have found a genetic variation, which associates with the damage caused by maternal alcohol consumption. This genetic variation clarifies the role of genetic factors in the alcohol-induced developmental disorders and could be useful in future diagnostics.

- ['Body-on- a-chip' system to accelerate testing of new drugs](#) [周五, 06 10月 00:10]

Being able to test new drugs in a 3-D model of the body has the potential to speed up drug discovery, reduce the use of animal testing and advance personalized medicine.

- [Appetizing imagery puts visual perception on fast forward](#) [周五, 06 10月 00:10]

People rated images containing positive content as fading more smoothly compared with neutral and negative images, even when they faded at the same rate, according to new findings.

- [Novel PET tracer identifies most bacterial infections](#) [周四, 05 10月 23:11]

Medical scientists have developed a novel imaging agent that could be used to identify most bacterial infections.

- [Understanding how gastric bypass works: Finding drug targets for obesity and diabetes](#) [周四, 05 10月 23:11]

Medical researchers have made a technological advancement toward accelerating the discovery of drug targets for obesity, type II diabetes and other metabolic diseases.

- [Fingerprints lack scientific basis for legal certainty](#) [周四, 05 10月 23:11]

A new report on the quality of latent fingerprint analysis says that courtroom testimony and reports stating or even implying that fingerprints collected from a crime scene belong to a single person are indefensible and lack scientific foundation.

- ['Khamisiyah Plume' linked to brain and](#)

[memory effects in Gulf War vets](#) [周四, 05 10月 22:40]

Gulf War veterans with low-level exposure to chemical weapons show lasting adverse effects on brain structure and memory function, reports a study.

• [Athletes and health aficionados: The lupine protein beverage](#) [周四, 05 10月 22:39]

With its intensive colors and many blossoms, the lupine looks like an ornamental plant. Yet, the tall lupine is far too good to be used decoratively as the plant's seeds contain nutritious proteins. However, it is rather complicated to make lupines edible for humans.

• [Spray drying: Perfect dosing thanks to drug capsules](#) [周四, 05 10月 22:38]

Instant coffee and powdered milk are produced by spray drying. Researchers have adapted this technique to the tricky question of incorporating insoluble substances in core-shell particles. The new method helps reduce the concentration of active ingredients in therapeutic medications.

• [Predatory bacteria that engineer 'portholes' and paint 'frescoes' in harmful bacteria](#) [周四, 05 10月 22:34]

A microbiological mystery of how one bacterium could invade another and grow inside it without breaking the other bacterium instantly has been illuminated by scientists.

• [Largest twin study pins nearly 80% of schizophrenia risk on heritability](#) [周四, 05 10月 22:33]

In the largest study of twins in schizophrenia research to date, researchers have estimated that as much as 79% of schizophrenia risk may be explained by genetic factors. The estimate indicates that genetics have a substantial influence on risk for the disorder.

• [Key component of respiratory center identified](#) [周四, 05 10月 22:33]

Star-shaped cells called astrocytes are much more than simple support cells in the brain. In a new study on mice, researchers demonstrate that

they also play a key part in the respiratory center of the brainstem and release inflammatory molecules that regulate breathing. The results can provide important clues as to the causes of respiratory disease and the sudden unexpected postnatal collapse of newborn infants (SUPC).

- [**Beer brands popular among youth violate code with youth-appealing ads**](#) [周四, 05 10月 22:27]

Alcohol brands popular among underage drinkers are more likely to air television advertisements that violate the industry's voluntary code by including youth-appealing content, according to a new study.

- [**'Squirtable' elastic surgical glue seals wounds in 60 seconds**](#) [周四, 05 10月 22:27]

A highly elastic and adhesive surgical glue that quickly seals wounds without the need for common staples or sutures could transform how surgeries are performed.

- [**Completing the drug design jigsaw**](#) [周四, 05 10月 22:27]

A powerful new way of analysing how drugs interact with molecules in the body could aid the design of better treatments with fewer side-effects.

- [**Newborns with congenital heart disease show signs of brain impairment even before cardiac surgery**](#) [周四, 05 10月 22:27]

Using a novel imaging technique, researchers demonstrate for the first time that the brains of high-risk infants with congenital heart disease already show signs of functional impairment even before they undergo corrective open heart surgery.

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [Mars study yields clues to possible cradle of life](#) [周六, 07 10月 03:49]

The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth. The research offers evidence that these deposits were formed by heated water from a volcanically active part of the planet's crust entering the bottom of a large sea long ago.

- [Predicting insect feeding preferences after deforestation](#) [周五, 06 10月 22:18]

Understanding how parasitoids and hosts interact, and how their interactions change with human influence, is critically important to understanding ecosystems. New research finds mathematical models can predict complex insect behavioral changes using a simple description of insect preferences.

- [Segregation-induced ordered superstructures at general grain boundaries in a Ni-Bi alloy](#) [周五, 06 10月 22:18]

Randomly selected, high-angle, general grain boundaries in a nickel-bismuth (Ni-Bi) polycrystalline alloy can undergo interfacial reconstruction to form ordered superstructures, a discovery that enriches the theories and fundamental understandings of both grain boundary segregation and liquid metal embrittlement in physical metallurgy.

- [Exotic quantum particle observed in bilayer graphene](#) [周五, 06 10月 21:22]

Physicists have definitively observed an intensely studied anomaly in

condensed matter physics -- the even-denominator fractional quantum Hall state -- via transport measurement in bilayer graphene.

- [**Electron behavior under extreme conditions described for the first time**](#) [周五, 06 10月 21:02]

Researchers have modeled the actions of electrons under extreme temperatures and densities, such as those found within planets and stars.

- [**Engineers invent breakthrough millimeter-wave circulator IC**](#) [周五, 06 10月 20:59]

Researchers continue to break new ground in developing magnet-free non-reciprocal components in modern semiconductor processes. They have built the first magnet-free non-reciprocal circulator on a silicon chip that operates at millimeter-wave frequencies, enabling circulators to be built in conventional semiconductor chips and operate at millimeter-wave frequencies, enabling full-duplex or two-way wireless.

- [**'Transformative' research unrealistic to predict, scientists tell granting agencies**](#) [周五, 06 10月 07:03]

Research-funding agencies that require scientists to declare at the proposal stage how their projects will be 'transformative' may actually be hindering discovery.

- [**Smartphone-controlled smart bandage for better, faster healing**](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [**Simulating a brain-cooling treatment that could one day ease epilepsy**](#) [周五, 06 10月 02:18]

Using computer simulation techniques, scientists have gained new insights into the mechanism by which lowering the temperature of specific brain regions could potentially treat epileptic seizures.

- [**3-D quantum gas atomic clock offers new dimensions in measurement**](#) [周五, 06 10月 02:18]

Physicists have created an entirely new design for an atomic clock, in which strontium atoms are packed into a tiny three-dimensional cube at 1,000 times the density of previous one-dimensional clocks. In doing so, they are the first to harness the ultra-controlled behavior of a so-called 'quantum gas' to make a practical measurement device.

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [**Why lab researchers should talk with industry counterparts**](#) [周五, 06 10月 02:17]

A research team has found both obstacles and lessons from the process of getting a novel membrane for chemical processing out of the lab into the commercial world.

- [**Road pricing most effective in reducing vehicle emissions**](#) [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

- [**New test opens path for better 2-D catalysts**](#) [周五, 06 10月 02:17]

Scientists have developed technology for rapid screening of two-dimensional materials for electrocatalysis of hydrogen. The method could accelerate the development of 2-D materials for energy applications.

- [**Heart: No evidence for piezoelectricity or ferroelectricity in the aorta**](#) [周五, 06 10月 02:17]

While some studies have supported the idea that the walls of the aorta are piezoelectric or ferroelectric, the most recent research finds no evidence of these properties. Researchers investigated by testing samples of pig aorta using a traditional setup, known as Sawyer-Tower, to detect ferroelectricity. Their experiments suggest the aorta has no special properties, and instead acts as a standard dielectric material that does not conduct current.

- [**'Body-on-a-chip' system to accelerate testing of new drugs**](#) [周五, 06 10月 00:10]

Being able to test new drugs in a 3-D model of the body has the potential to speed up drug discovery, reduce the use of animal testing and advance personalized medicine.

- [**Paper-based supercapacitor uses metal nanoparticles to boost energy density**](#) [周五, 06 10月 00:10]

Using a simple layer-by-layer coating technique, researchers have developed a paper-based flexible supercapacitor that could be used to help power wearable devices. The device uses metallic nanoparticles to coat cellulose fibers in the paper, creating supercapacitor electrodes with high energy and power densities -- and the best performance so far in a textile-based supercapacitor.

- [**Violent helium reaction on white dwarf surface triggers supernova explosion**](#) [周四, 05 10月 23:11]

Astronomers have found solid evidence about what triggered a star to explode, which will contribute to a further understanding of supernova history and behavior.

- [**Fingerprints lack scientific basis for legal certainty**](#) [周四, 05 10月 23:11]

A new report on the quality of latent fingerprint analysis says that courtroom testimony and reports stating or even implying that

fingerprints collected from a crime scene belong to a single person are indefensible and lack scientific foundation.

- [**New 'molecular trap' cleans more radioactive waste from nuclear fuel rods**](#) [周四, 05 10月 23:10]

A new method for capturing radioactive waste from nuclear power plants is cheaper and more effective than current methods, a potential boon for the energy industry, according to new research.

- [**Machinery that repairs itself**](#) [周四, 05 10月 22:38]

Scientists are developing maintenance technology capable of forecasting machine downtimes in production before they occur. This allows plant managers to rectify faults before the machine breaks down. The system even corrects some defects automatically.

- [**Safety assistance system warns of dirty bombs**](#) [周四, 05 10月 22:38]

The threat of terrorism has been on the rise in recent years, with experts and politicians particularly worried that terrorists might make use of dirty bombs. Researchers have developed a new system that will be able to detect possible carriers of radioactive substances, even in large crowds of people.

- [**Spray drying: Perfect dosing thanks to drug capsules**](#) [周四, 05 10月 22:38]

Instant coffee and powdered milk are produced by spray drying. Researchers have adapted this technique to the tricky question of incorporating insoluble substances in core-shell particles. The new method helps reduce the concentration of active ingredients in therapeutic medications.

- [**Tracking debris in the Earth's orbit with centimeter precision using efficient laser technology**](#) [周四, 05 10月 22:38]

Uncontrollable flying objects in orbit are a massive risk for modern space travel, and, due to our dependence on satellites today, it is also a risk to global economy. Scientists have now developed a fiber laser that

reliably determines the position and direction of the space debris' movement to mitigate these risks.

- [**Mitigating the unpleasant scent of adhesives**](#) [周四, 05 10月 22:38]

It is a known fact that adhesives may smell unpleasant. However, as researchers have recently discovered, this doesn't need to be the case. Through extensive research on acrylic adhesives they were able to identify the substances responsible for the offensive odors. So far, very little research has been conducted on the subject, but now manufacturers finally have the opportunity to optimize their production process.

- [**Using elastomer films to generate electricity**](#) [周四, 05 10月 22:35]

Water is still the most important source of renewable energy in Bavaria, Germany, accounting for some 33 percent of all renewable energy produced in the region, as showed by the Bavarian Energy Map. But conventional hydroelectric plants, especially micro hydro generators, are a subject of controversy due to their low output volumes and their interference with the ecosystem. Researchers are working on an environmentally friendly alternative: in the future, innovative elastomer materials are set to...

- [**New nanoplatelets improve the brightness of LEDs, lasers and LCD screens, researchers show**](#) [周四, 05 10月 22:35]

New semiconductor nanoplatelets synthesized in laboratories can improve the brightness of LEDs, lasers and LCD screens of computers or televisions because they allow to minimize energy losses compared to current semiconductor materials.

- [**'Squirtable' elastic surgical glue seals wounds in 60 seconds**](#) [周四, 05 10月 22:27]

A highly elastic and adhesive surgical glue that quickly seals wounds without the need for common staples or sutures could transform how surgeries are performed.

- [**Completing the drug design jigsaw**](#) [周四, 05 10月 22:27]

A powerful new way of analysing how drugs interact with molecules in

the body could aid the design of better treatments with fewer side-effects.

- [**Computer model unravels knotty problems in DNA**](#) [周四, 05 10月 22:27]

If you've ever tried to untangle a pair of earbuds, you'll understand how loops and cords can get twisted up. DNA can get tangled in the same way, and in some cases, has to be cut and reconnected to resolve the knots. Now a team of mathematicians, biologists and computer scientists has unraveled how E. coli bacteria can unlink tangled DNA by a local reconnection process. The math behind the research could have implications far beyond biology.

- [**Mars' moon Phobos examined in a different light**](#) [周四, 05 10月 22:27]

NASA's longest-lived mission to Mars has gained its first look at the Martian moon Phobos, pursuing a deeper understanding by examining it in infrared wavelengths.

- [**How much can watching hockey stress your heart?**](#) [周四, 05 10月 22:27]

A new study suggests that both the thrill of victory and the agony of defeat can have a substantial effect on the cardiovascular system. Investigators took the pulse of fans during a hockey game and found that on average, their heart rate increased by 75 percent when watching on TV, and by a whopping 110 percent (more than doubled, equivalent to the cardiac stress with vigorous exercise) when watching in person.

- [**Caution ahead: The growing challenge for drivers' attention**](#) [周四, 05 10月 22:27]

Many of the infotainment features in most 2017 vehicles are so distracting they should not be enabled while a vehicle is in motion, according to a new study. The study found In-Vehicle Information Systems take drivers' attention off the road for too long to be safe.

- [**A novel textile material that keeps itself germ-**](#)

[**free**](#) [周四, 05 10月 22:27]

Scientists have developed a novel weapon in the battle against deadly hospital-acquired infections -- a textile that disinfects itself. And independent tests show it can reduce bacteria levels by more than 90 per cent. By incorporating the specially-engineered textile in a device designed to be used on hospital doors instead of the traditional aluminum door plate, that part of the door that people push to open it -- they aim to bolster hand hygiene.

. [**Vertigo and understanding the body's balance system**](#) [周四, 05 10月 22:26]

Finding out what's happening in the brains of people with balance disorders, such as vertigo, might be one step closer following new research on the vestibular system, which controls balance and movement. An interdisciplinary team of optical physicists and biologists has found a novel way, using optical tweezers, or focused beams of light, to understand the vestibular system while animals are still, not moving.

. [**Milky Way's 'most-mysterious star' continues to confound**](#) [周四, 05 10月 07:05]

In 2015, a star called KIC 8462852 caused quite a stir in and beyond the astronomy community due to a series of rapid, unexplained dimming events. The latest findings from astronomers take a longer look at the star, going back to 2006 -- before its strange behavior was detected by Kepler.

. [**Impacts of ride-hailing on crashes differ from city to city**](#) [周四, 05 10月 07:05]

Ride-hailing services reduce drunk-driving crashes in some cities, reports a new study. The research is the first to look at the specific effects of ride-hailing, or 'ride-sharing,' within specific cities, rather than averaging data across multiple cities.

. [**New nanomaterial can extract hydrogen fuel**](#)

[from seawater](#) [周四, 05 10月 04:20]

A new hybrid nanomaterial harvests solar energy and uses it to extract hydrogen from seawater, cheaply and efficiently. Future commercialization could mean a new source of environmentally friendly fuel and less dependence on fossil fuels.

• [The super-Earth that came home for dinner](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire solar system to one side. It is a possible "Planet Nine" -- a world perhaps 10 times the mass of Earth and 20 times farther from the sun than Neptune.

• [Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

• [Light-activated nanoparticles can supercharge current antibiotics](#) [周四, 05 10月 02:26]

Light-activated nanoparticles, also known as quantum dots, can provide a crucial boost in effectiveness for antibiotic treatments used to combat drug-resistant superbugs such as E. coli and Salmonella, new research shows.

• [A new way to produce clean hydrogen fuel from water using sunlight](#) [周四, 05 10月 02:01]

Researchers combined graphitic carbon nitride and black phosphorous to make a new metal-free composite photocatalyst capable of producing hydrogen from water. The photocatalyst featured good photocatalytic production of hydrogen, even when powered by low-energy near

infrared light.

- [**Surface helium detonation spells end for white dwarf**](#) [周四, 05 10月 02:01]

Researchers have found evidence that the brightest stellar explosions in our Universe could be triggered by helium nuclear detonation near the surface of a white dwarf star.

- [**Nanoscale islands dot light-driven catalyst**](#) [周四, 05 10月 00:22]

Scientists have combined aluminum nanoparticles and smaller metal particles to create a versatile nanostructure that could lead to new applications for plasmonics. The technique allows for customizable surface chemistry and reactivity in one material.

- [**NASA's Webb Telescope to witness galactic infancy**](#) [周四, 05 10月 00:04]

Scientists will use NASA's James Webb Space Telescope to study sections of the sky previously observed by NASA's Great Observatories, including the Hubble Space Telescope and the Spitzer Space Telescope, to understand the creation of the universe's first galaxies and stars.

- [**Flights worldwide face increased risk of severe turbulence due to climate change**](#) [周四, 05 10月 00:04]

Flights all around the world could be encountering lots more turbulence in the future, according to the first ever global projections of in-flight bumpiness.

- [**Tungsten offers nano-interconnects a path of least resistance**](#) [周三, 04 10月 22:14]

As microchips become smaller, the shrinking size of their copper interconnects leads to increased electrical resistivity at the nanoscale. Finding a solution to this technical bottleneck is a problem for the semiconductor industry; one possibility involves reducing the resistivity size effect by altering the crystalline orientation of interconnect materials. Researchers conducted electron transport measurements in epitaxial single-crystal layers of tungsten as one potential solution.

- [**Smart pump: small but powerful**](#) [周三, 04 10月 21:53]

Particulate matter harms the heart and lungs. In the future, a smartphone with an inbuilt gas sensor could be used to warn of heavy exposure. To help the sensor respond quickly and provide accurate measurements, researchers have developed a powerful micro diaphragm pump for delivering ambient air to the sensor.

- [**What is STEM education?**](#) [周三, 04 10月 21:51]

Everyone needs a good teacher -- including teachers. Two new studies show how digging deeper into what STEM education means and strategically designing online classrooms can enhance teaching science, technology, engineering, and math.

- [**Nobel Prize in Chemistry 2017: Cryo-electron microscopy**](#) [周三, 04 10月 21:02]

The Nobel Prize in Chemistry 2017 goes to Jacques Dubochet, Joachim Frank, and Richard Henderson "for developing cryo-electron microscopy for the high-resolution structure determination of biomolecules in solution."

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [**Mars study yields clues to possible cradle of life**](#) [周六, 07 10月 03:49]

The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth. The research offers evidence that these deposits were formed by heated water from a volcanically active part of the planet's crust entering the bottom of a large sea long ago.

- [**Predicting insect feeding preferences after deforestation**](#) [周五, 06 10月 22:18]

Understanding how parasitoids and hosts interact, and how their interactions change with human influence, is critically important to understanding ecosystems. New research finds mathematical models can predict complex insect behavioral changes using a simple description of insect preferences.

- [**New study analyzes volcanic fatalities in more detail than ever before**](#) [周五, 06 10月 22:18]

Building on existing information and databases relating to volcanic fatalities, scientists have, for the first time, been able to classify victims by activity or occupation and look at the distance of their death from the volcano.

- [**Microbes dictate regime shifts causing anoxia in lakes and seas**](#) [周五, 06 10月 21:03]

Gradual environmental changes due to eutrophication and global warming can cause a rapid depletion of oxygen levels in lakes and

coastal waters. A new study shows that microorganisms play a key role in these disastrous regime shifts.

- [**How seemingly acute viral infections can persist**](#)

[周五, 06 10月 20:59]

Scientists have resolved a paradox of viral infection. They've identified how a viral product can both trigger an immune response aimed at eliminating the virus or, conversely, allow the virus to survive and persist.

- [**Old Faithful's geological heart revealed**](#)

[周五, 06 10月 07:02]

Scientists have mapped the near-surface geology around Old Faithful, revealing the reservoir of heated water that feeds the geyser's surface vent and how the ground shaking behaves in between eruptions.

- [**Interpreting hurricane forecast displays can be difficult for general public**](#)

[周五, 06 10月 03:11]

The 2017 hurricane season has highlighted the critical need to communicate a storm's impact path and intensity accurately, but new research shows significant misunderstandings of the two most commonly used storm forecast visualization methods.

- [**Cost-effectiveness of guinea worm disease eradication**](#)

[周五, 06 10月 02:18]

Eradication of guinea worm disease (dracunculiasis), targeted by the World Health Organization (WHO) for the year 2015, is finally within reach, with only 25 reported human transmissions in 2016. Now, researchers have re-asserted the cost-effectiveness of the global Guinea Worm Eradication Programme (GWEP), some 30 years after it started.

- [**Carbon feedback from forest soils to accelerate global warming**](#)

[周五, 06 10月 02:18]

After 26 years, the world's longest-running experiment to discover how warming temperatures affect forest soils has revealed a surprising, cyclical response: Soil warming stimulates periods of abundant carbon release from the soil to the atmosphere alternating with periods of no detectable loss in soil carbon stores. The study indicates that in a

warming world, a self-reinforcing and perhaps uncontrollable carbon feedback will occur between forest soils and the climate system, accelerating global...

- [**Decision to rescind Waters of the United States rule \(WOTUS\) based on flawed analysis**](#) [周五, 06 10月 02:18]

New evidence suggests that the Trump Administration's proposal to rescind the 2015 Waters of the United States (WOTUS) rule that would limit the scope of the Clean Water Act inappropriately overlooks wetlands-related values.

- [**Prehistoric humans are likely to have formed mating networks to avoid inbreeding**](#) [周五, 06 10月 02:17]

Early humans seem to have recognized the dangers of inbreeding at least 34,000 years ago, and developed surprisingly sophisticated social and mating networks to avoid it, new research has found.

- [**Road pricing most effective in reducing vehicle emissions**](#) [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

- [**Faster Salmonella test boosts food safety for humans and animals**](#) [周五, 06 10月 02:17]

A new test allows accurate, rapid testing for Salmonella, a bacteria that is one of the leading causes of food-borne illness across all regions of the world.

- [**Key plant species may be important for supporting wildflower pollinators**](#) [周五, 06 10月 02:17]

Increased agricultural production has likely led to loss, fragmentation,

and degradation of flower-rich habitats for pollinators. To counteract these negative effects of modern agricultural practices, efforts to maintain and restore diverse plants in agricultural landscapes -- called agri-environmental schemes -- have been implemented in numerous European countries.

• [**12,000 years ago, Florida hurricanes heated up despite chilly seas**](#) [周五, 06 10月 00:50]

Category 5 hurricanes may have slammed Florida repeatedly during the chilly Younger Dryas, 12,000 years ago. The cause? Hurricane-suppressing effects of cooler sea surface were out-weighed by side effects of slowed ocean circulation.

• [**Brain study reveals how insects make beeline for home**](#) [周五, 06 10月 00:50]

Scientists have discovered how the wiring of bees' brains helps them plot the most direct route back to their hive.

• [**Air pollution exposure on home-to-school routes reduces the growth of working memory**](#) [周五, 06 10月 00:50]

A new study has demonstrated that exposure to air pollution on the way to school can have damaging effects on children's cognitive development. The study found an association between a reduction in working memory and exposure to fine particulate matter (PM2.5) and black carbon during the walking commute to and from school.

• [**Liverwort genes and land plant evolution**](#) [周五, 06 10月 00:11]

The common liverwort is a living link to the transition from marine algae to land plants. Biologists have analyzed the genome sequence of the common liverwort (*Marchantia polymorpha*) to identify genes and gene families that were deemed crucial to plant evolution and have been conserved over millions of years and across plant lineages.

• [**Germs in the kitchen: Salmonella better known than Campylobacter**](#) [周五, 06 10月 00:11]

What health risks are consumers aware of? What are they concerned

about?

• [**How yellow and blue make green in parrots**](#) [周五, 06 10月 00:11]

Many brightly colored birds get their pigments from the foods that they eat, but that's not true of parrots. Now, researchers reporting a study of familiar pet store parakeets -- also known as budgies -- have new evidence to explain how the birds produce their characteristic yellow, blue, and green feathers.

• [**Once declared extinct, Lord Howe Island stick insects really do live**](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead Lord Howe Island stick insects have some good news: those rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

• [**Novel PET tracer identifies most bacterial infections**](#) [周四, 05 10月 23:11]

Medical scientists have developed a novel imaging agent that could be used to identify most bacterial infections.

• [**New 'molecular trap' cleans more radioactive waste from nuclear fuel rods**](#) [周四, 05 10月 23:10]

A new method for capturing radioactive waste from nuclear power plants is cheaper and more effective than current methods, a potential boon for the energy industry, according to new research.

• [**Athletes and health aficionados: The lupine protein beverage**](#) [周四, 05 10月 22:39]

With its intensive colors and many blossoms, the lupine looks like an ornamental plant. Yet, the tall lupine is far too good to be used decoratively as the plant's seeds contain nutritious proteins. However, it is rather complicated to make lupines edible for humans.

- [**Tracking debris in the Earth's orbit with centimeter precision using efficient laser technology**](#) [周四, 05 10月 22:38]

Uncontrollable flying objects in orbit are a massive risk for modern space travel, and, due to our dependence on satellites today, it is also a risk to global economy. Scientists have now developed a fiber laser that reliably determines the position and direction of the space debris' movement to mitigate these risks.

- [**Predatory bacteria that engineer 'portholes' and paint 'frescoes' in harmful bacteria**](#) [周四, 05 10月 22:34]

A microbiological mystery of how one bacterium could invade another and grow inside it without breaking the other bacterium instantly has been illuminated by scientists.

- [**Lake water mixing: The might of the microorganism?**](#) [周四, 05 10月 22:32]

Can microorganisms cause lake water to be mixed? The answer given by previous studies is no, since the movement of small, slow-swimming bacteria is not sufficient to disturb the stratification of lake water induced by differences in, for example, temperature or salinity.

- [**Modified peptides could boost plant growth and development**](#) [周四, 05 10月 22:27]

A new study of peptide hormones critical for plant development could result in wide-ranging benefits for agriculture, tissue culture, and related industries, and even improve knowledge of peptides in humans. The study synthesized and examined the function of CLE peptides, a relatively new class of the peptide hormone family in plants.

- [**A need for bananas? Dietary potassium regulates calcification of arteries**](#) [周四, 05 10月 22:27]

Researchers have shown, for the first time, that reduced dietary potassium promotes elevated aortic stiffness in a mouse model. Such arterial stiffness in humans is predictive of heart disease and death from

heart disease, and it represents an important health problem for the nation. The researchers also found that increased dietary potassium levels lessened vascular calcification and aortic stiffness. Furthermore, they unraveled the molecular mechanism underlying the effects of low or high dietary potassium.

- [**Climate solution in soil?**](#) [周四, 05 10月 22:26]

The land under our feet and the plant matter it contains could offset a significant amount of carbon emissions if managed properly. More research is needed to unlock soil's potential to mitigate global warming, improve crop yields and increase resilience, say researchers.

- [**Who fatally undermined Scott's Antarctic expedition?**](#) [周四, 05 10月 22:26]

What doomed Captain Robert Falcon Scott's British Antarctic Expedition in 1912? Scientists have uncovered documents and diary entries that suggest a team member stole food Scott needed, failed to pass on orders that would have sent out a dog team to meet the men and then changed his story over time to cover up his role in their deaths.

- [**Vertigo and understanding the body's balance system**](#) [周四, 05 10月 22:26]

Finding out what's happening in the brains of people with balance disorders, such as vertigo, might be one step closer following new research on the vestibular system, which controls balance and movement. An interdisciplinary team of optical physicists and biologists has found a novel way, using optical tweezers, or focused beams of light, to understand the vestibular system while animals are still, not moving.

- [**How cells adapt to help repair damage**](#) [周四, 05 10月 22:26]

Genetic processes that allow cells to transform so they can mend damaged nerves have been identified by scientists.

- [**Supervolcanoes: Magma chambers have a sponge-like structure**](#) [周四, 05 10月 22:26]

Researchers show that magma chambers under supervolcanoes are more

like soggy sponges than reservoirs of molten rock. Before a volcano of this kind erupts, such mush must slowly be reactivated by heat input following deep magma recharge ultimately derived from the Earth's mantle.

- [**Sunlight and 'right' microbes convert Arctic carbon into carbon dioxide**](#) [周四, 05 10月 04:38]

A new study outlines the mechanisms and points to the importance of both sunlight and the right microbial community as keys to converting permafrost carbon to CO₂.

- [**Climate change, population growth may lead to open ocean aquaculture**](#) [周四, 05 10月 04:37]

A new analysis suggests that open-ocean aquaculture for three species of finfish is a viable option for industry expansion under most climate change scenarios -- an option that may provide a new source of protein for the world's growing population.

- [**Are we at a tipping point with weed control?**](#) [周四, 05 10月 04:20]

Imagine walking the cereal aisle at your favorite grocery store. Are you reading labels? Scanning prices? Thinking about weeds? If you're like most American consumers, weeds probably aren't at the forefront of your mind when buying food. But if farmers could no longer control weeds with existing herbicides, Americans would take notice pretty quickly.

- [**New nanomaterial can extract hydrogen fuel from seawater**](#) [周四, 05 10月 04:20]

A new hybrid nanomaterial harvests solar energy and uses it to extract hydrogen from seawater, cheaply and efficiently. Future commercialization could mean a new source of environmentally friendly fuel and less dependence on fossil fuels.

- [**Ancient humans left Africa to escape drying climate**](#) [周四, 05 10月 03:12]

Humans migrated out of Africa as the climate shifted from wet to dry

about 60,000 years ago, according to new paleoclimate research. What the northeast Africa climate was like when people migrated from Africa into Eurasia between 70,000 and 55,000 years ago is still uncertain. The new research shows around 70,000 years ago, the Horn of Africa climate shifted from a wet phase called 'Green Sahara' to even drier than the region is now.

- [**Test reveals antibiotic-resistant bacteria in a half hour**](#) [周四, 05 10月 02:26]

A new test can identify whether bacteria are resistant to antibiotics in a mere half hour, giving medical professionals a new tool for fighting infections and superbug bacteria.

- [**Ornamented artifact may indicate long-distance exchange between Mesolithic communities**](#) [周四, 05 10月 02:26]

An ornamented bâton percé found in Central Poland may provide evidence of exchange between Mesolithic communities, according to a study.

- [**Light-activated nanoparticles can supercharge current antibiotics**](#) [周四, 05 10月 02:26]

Light-activated nanoparticles, also known as quantum dots, can provide a crucial boost in effectiveness for antibiotic treatments used to combat drug-resistant superbugs such as E. coli and Salmonella, new research shows.

- [**Meet Madagascar's oldest animal lineage, a whirligig beetle with 206-million-year-old origins**](#) [周四, 05 10月 02:01]

A new study suggests the Malagasy striped whirligig beetle *Heterogyrus milloti* boasts a genetic pedigree stretching back to the late Triassic period.

- [**Win-win for spotted owls and forest management**](#) [周四, 05 10月 02:01]

Remote sensing technology has detected what could be a win for both spotted owls and forestry management, according to a study.

• [**A new way to produce clean hydrogen fuel from water using sunlight**](#) [周四, 05 10月 02:01]

Researchers combined graphitic carbon nitride and black phosphorous to make a new metal-free composite photocatalyst capable of producing hydrogen from water. The photocatalyst featured good photocatalytic production of hydrogen, even when powered by low-energy near infrared light.

• [**Accurately transcribing DNA overrides DNA repair, researchers find**](#) [周四, 05 10月 01:36]

Researchers found that in the model organism E. coli, the fidelity of transcribing DNA comes at the expense of DNA repair.

• [**Cell stress response sheds light on treating inflammation-related cancer, aging**](#) [周四, 05 10月 01:35]

Stress -- defined broadly -- can have a profoundly deleterious effect on the human body. Even individual cells have their own way of dealing with environmental strains such as ultraviolet radiation from the sun or germs. One response to stress -- called senescence -- can trigger cells to stop dividing in cases of cancer and aging. This may hold promise for treating inflammation-related disorders.

• [**In warmer climates, Greenlandic deltas have grown**](#) [周四, 05 10月 01:35]

Unlike most other deltas worldwide, Greenland's are growing -- a trend with major consequences for both fishing and tourism.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [**New study analyzes volcanic fatalities in more detail than ever before**](#) [周五, 06 10月 22:18]

Building on existing information and databases relating to volcanic fatalities, scientists have, for the first time, been able to classify victims by activity or occupation and look at the distance of their death from the volcano.

- [**Social acceptance more important than economic factors in fertility treatment availability**](#) [周五, 06 10月 20:59]

A new British study has shed light on some of the reasons why Assisted Reproductive Technologies (ART) usage varies across Europe -- pinpointing moral and social acceptance of the treatment and religion as key. Scientists have, for the first time, assessed the relative importance of the role that economic, demographic and cultural normative factors play in the process.

- [**Pushy or laid back? Economic factors influence parenting style**](#) [周五, 06 10月 07:03]

A new study argues that parenting styles are shaped by economic factors that incentivize one strategy over others.

- [**'Transformative' research unrealistic to predict, scientists tell granting agencies**](#) [周五, 06 10月 07:03]

Research-funding agencies that require scientists to declare at the proposal stage how their projects will be 'transformative' may actually

be hindering discovery.

- [**Screen children with reading difficulties for hearing problems**](#) [周五, 06 10月 07:02]

A new study found 25 percent of its young participants who had reading difficulties showed mild or moderate hearing impairment, of which their parents and teachers were unaware.

- [**Multiple research approaches are key to pandemic preparedness**](#) [周五, 06 10月 03:11]

Preparedness in the face of major disease outbreaks can save thousands of lives. A new article examines the multifaceted nature of effective preparedness and the role that biomedical research plays. Specifically, the article examines three approaches to pandemic preparedness: pathogen-specific work, platform-based technologies, and prototype-pathogen efforts.

- [**Interpreting hurricane forecast displays can be difficult for general public**](#) [周五, 06 10月 03:11]

The 2017 hurricane season has highlighted the critical need to communicate a storm's impact path and intensity accurately, but new research shows significant misunderstandings of the two most commonly used storm forecast visualization methods.

- [**Decision to rescind Waters of the United States rule \(WOTUS\) based on flawed analysis**](#) [周五, 06 10月 02:18]

New evidence suggests that the Trump Administration's proposal to rescind the 2015 Waters of the United States (WOTUS) rule that would limit the scope of the Clean Water Act inappropriately overlooks wetlands-related values.

- [**Middle managers may turn to unethical behavior to face unrealistic expectations**](#) [周五, 06 10月 02:17]

While unethical behavior in organizations is often portrayed as flowing down from top management, or creeping up from low-level positions, a team of researchers suggest that middle management also can play a key

role in promoting wide-spread unethical behavior among their subordinates.

- [**Why lab researchers should talk with industry counterparts**](#) [周五, 06 10月 02:17]

A research team has found both obstacles and lessons from the process of getting a novel membrane for chemical processing out of the lab into the commercial world.

- [**Delivering bad news? Don't beat around the bush**](#) [周五, 06 10月 02:17]

New research shows that when it comes to receiving bad news, most people prefer directness, candor and very little -- if any -- buffer.

- [**Road pricing most effective in reducing vehicle emissions**](#) [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

- [**Identifying ways to minimize the harm of energy drinks**](#) [周五, 06 10月 02:17]

Because many countries allow the sale of energy drinks to young people, identifying ways to minimize potential harm from energy drinks is critical. A new study provided unique insights into intervention strategies suggested by young people themselves to reduce consumption. In addition to more research and education, these strategies included policy changes targeting energy drink sales, packaging, price, and visibility.

- [**Something universal occurs in the brain when it processes stories, regardless of language**](#) [周五, 06 10月 02:17]

New brain research shows that reading stories generates activity in the same regions of the brain for speakers of three different languages.

- [**Air pollution exposure on home-to-school routes reduces the growth of working memory**](#) [周五, 06 10月 00:50]

A new study has demonstrated that exposure to air pollution on the way to school can have damaging effects on children's cognitive development. The study found an association between a reduction in working memory and exposure to fine particulate matter (PM2.5) and black carbon during the walking commute to and from school.

- [**Fingerprints lack scientific basis for legal certainty**](#) [周四, 05 10月 23:11]

A new report on the quality of latent fingerprint analysis says that courtroom testimony and reports stating or even implying that fingerprints collected from a crime scene belong to a single person are indefensible and lack scientific foundation.

- [**Beer brands popular among youth violate code with youth-appealing ads**](#) [周四, 05 10月 22:27]

Alcohol brands popular among underage drinkers are more likely to air television advertisements that violate the industry's voluntary code by including youth-appealing content, according to a new study.

- [**Low-cost, high-volume services make up big portion of spending on unneeded health care**](#) [周四, 05 10月 22:27]

Low-cost, high-volume health services account for a high percentage of unnecessary health spending, adding strain to the health care system.

- [**Caution ahead: The growing challenge for drivers' attention**](#) [周四, 05 10月 22:27]

Many of the infotainment features in most 2017 vehicles are so distracting they should not be enabled while a vehicle is in motion, according to a new study. The study found In-Vehicle Information Systems take drivers' attention off the road for too long to be safe.

- [**DNA-based Zika vaccine is safe and effective at inducing immune response**](#) [周四, 05 10月 07:05]

A new generation DNA-based Zika vaccine demonstrated both safety and ability to elicit an immune response against Zika in humans in a phase 1 clinical trial.

- [**Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

- [**Parole violations, not new crimes, help drive prison's revolving door**](#) [周四, 05 10月 02:27]

Failing a drug test, associating with felons and other technical parole violations are among the key drivers of prison's 'revolving door,' according to new American research.

- [**Win-win for spotted owls and forest management**](#) [周四, 05 10月 02:01]

Remote sensing technology has detected what could be a win for both spotted owls and forestry management, according to a study.

- [**In warmer climates, Greenlandic deltas have grown**](#) [周四, 05 10月 01:35]

Unlike most other deltas worldwide, Greenland's are growing -- a trend with major consequences for both fishing and tourism.

- [**Assessing regional earthquake risk and hazards in the age of exascale**](#) [周四, 05 10月 00:05]

Researchers are building the first-ever end-to-end simulation code to precisely capture the geology and physics of regional earthquakes, and how the shaking impacts buildings.

- [**Albatross feces show diet of fishery discards**](#) [周四, 05 10月 00:04]

The first-ever analysis of fish DNA in albatross scat indicates a high level of interaction between seabirds and commercial fisheries. This non-invasive method could be used to assess whether fisheries are complying with discard policies. Extending the analysis to other marine predators could help monitor marine biodiversity and broader marine ecosystem changes.

- [**Safe motherhood campaign associated with more prenatal visits, birth planning, study finds**](#) [周四, 05 10月 00:04]

In Tanzania, pregnant women who were exposed to a national safe motherhood campaign designed to get them to visit health facilities for prenatal care and delivery were more likely to create birth plans and to attend more prenatal appointments.

- [**Rampant consumption of hippo teeth**](#) [周三, 04 10月 22:14]

Investigators have examined the case of hippo teeth and revealed discordance in trade volumes declared between importers and exporters -- a scenario that could threaten the survival of the species.

- [**Doing homework is associated with change in students' personality**](#) [周三, 04 10月 22:07]

Homework may have a positive influence on students' conscientiousness. Students who do more homework than their peers show positive changes in conscientiousness, according to new research. Thus, schools may be doing more than contributing to students' learning, but they may also be effecting changes of their students' personality.

- [**What is STEM education?**](#) [周三, 04 10月 21:51]

Everyone needs a good teacher -- including teachers. Two new studies show how digging deeper into what STEM education means and strategically designing online classrooms can enhance teaching science, technology, engineering, and math.

- [**Too little is known about wildfire smoke**](#) [周三, 04 10月 21:29]

How do fire-suppression chemicals and pesticides affect wildfire smoke and the health of those who breathe it? New research has discovered that this question cannot be answered based on current scientific evidence, say investigators.

- [**Neighborhood affluence linked to positive birth outcomes**](#) [周三, 04 10月 02:48]

It's not uncommon for new parents to relocate in search of neighborhoods with better schools, safer streets and healthier, more kid-friendly activities. But a new study has found that living in such neighborhoods before a baby is born protects against the risks of poor birth outcomes.

- [**Women firefighters can improve safety, but department culture must change**](#) [周三, 04 10月 02:45]

A new study has discerned that gender may be a unique contributor to safety, but hypermasculine fire service culture creates barriers.

- [**Twitter a hotbed of anti-vaccine sentiment**](#) [周二, 03 10月 23:11]

Anti-vaccine sentiment is alive and growing on social media, with California, Connecticut, Massachusetts, New York and Pennsylvania showing the most negative tweets, according to a new 5-year study.

- [**Social action may give youth a career edge, education faculty research suggests**](#) [周二, 03 10月 23:11]

When disadvantaged youth engage in social activism, they tend to have high-status occupations in adulthood, according to researchers. The findings also suggest there's a place for more discussion of social issues in our educational systems.

- [**New method to quantify life cycle land use of natural gas**](#) [周二, 03 10月 23:10]

A case study of the Barnett Shale region in Texas, where hydraulic fracturing was first implemented, for the first time provides quantifiable information on the life cycle land use of generating electricity from natural gas based on physical measurements instead of using

assumptions and averages that were previously used for evaluation.

- [**U.S. breast cancer death rates dropped 39 percent between 1989 and 2015**](#) [周二, 03 10月 23:10]

Breast cancer death rates dropped 39 percent between 1989 and 2015, averting 322,600 breast cancer deaths during those 26 years. Death rates in several states are now statistically equivalent, perhaps reflecting an elimination of disparities in those states.

- [**Incidence of measles in the United States**](#) [周二, 03 10月 23:10]

From 2001 to 2015, the overall annual incidence of measles in the United States remained extremely low (less than 1 case/million population) compared with incidence worldwide (40 cases/million population). Relative increases in measles rates were observed over the period, and the findings suggest that failure to vaccinate may be the main driver of measles transmission, according to a study.

- [**European sea bass show chronic impairment after exposure to crude oil**](#) [周二, 03 10月 21:46]

We may be underestimating the long-term impact of oil spills on fish, particularly their ability to tolerate low oxygen environments, according to research.

- [**New method could help disrupt opioid crisis**](#) [周二, 03 10月 21:40]

Researchers have zeroed in on a unique component of heroin that could help zero in on the locations of origin for individual batches.

- [**Program for parents improves ADHD behaviors in young children**](#) [周二, 03 10月 21:39]

Effective early intervention is crucial for young children with ADHD, due to the unfavorable short-term and long-term outcomes associated with the disorder.

- [**Cutting absenteeism in primary schools**](#) [周二, 03 10月 08:23]

A pilot program reduced absenteeism in elementary schools by an average of 10 percent, according to a new study.

- **[Breakthrough cancer treatment brings hope and challenges](#)** [周二, 03 10月 08:23]

The first gene therapy for cancer will transform approaches to cancer treatments, but it poses ethical challenges for policy-makers.

- **[New source of radioactivity from Fukushima disaster](#)** [周二, 03 10月 04:12]

Scientists have found a previously unsuspected place where radioactive material from the Fukushima Dai-ichi nuclear power plant disaster has accumulated -- in sands and brackish groundwater beneath beaches up to 60 miles away. The sands took up and retained radioactive cesium originating from the disaster in 2011 and have been slowly releasing it back to the ocean.

- **[Firearm-related injuries account for \\$2.8 billion on emergency room and inpatient charges each year](#)** [周二, 03 10月 04:12]

A new study of more than 704,000 people who arrived alive at a United States emergency room for treatment of a firearm-related injury between 2006 and 2014 finds decreasing incidence of such injury in some age groups, increasing trends in others, and affirmation of the persistently high cost of gunshot wounds in dollars and human suffering.

- **[Most Americans want the government to combat climate change, some willing to pay a high amount](#)** [周二, 03 10月 02:49]

Sixty-one percent of Americans think climate change is a problem that the government needs to address, including 43 percent of Republicans and 80 percent of Democrats, according to a new survey.

- **[Win-win strategies for climate and food security](#)** [周一, 02 10月 20:48]

Efforts to reduce greenhouse gas emissions from the agriculture and forestry sectors could lead to increased food prices -- but new research identifies strategies that could help mitigate climate change while

avoiding steep hikes in food prices.

[Adulteration of proprietary Chinese medicines and health products poses severe health risks](#) [周一, 02

10月 20:48]

Traditional Chinese medicine is widely used as a form of complementary medicine all over the world for various indications and for improving general health. Various reports have documented the adulteration of pCMs and health products with undeclared agents, including prescription drugs, drug analogues, and banned drugs. Such adulteration can have serious and even fatal consequences.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- [Smartphone-controlled smart bandage for better, faster healing](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [What Earth's climate system and topological insulators have in common](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [How yellow and blue make green in parrots](#) [周五, 06 10月 00:11]

Many brightly colored birds get their pigments from the foods that they eat, but that's not true of parrots. Now, researchers reporting a study of familiar pet store parakeets -- also known as budgies -- have new evidence to explain how the birds produce their characteristic yellow, blue, and green feathers.

- [Once declared extinct, Lord Howe Island stick insects really do live](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead Lord Howe Island stick insects have some good news: those

rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

[More traits associated with your Neanderthal DNA](#) [周五, 06 10月 00:11]

After humans and Neanderthals met many thousands of years ago, the two species began interbreeding. Recent studies have shown that some of those Neanderthal genes have contributed to human immunity and modern diseases. Now researchers have found that our Neanderthal inheritance has contributed to other characteristics, too, including skin tone, hair color, sleep patterns, mood, and even a person's smoking status.

[How much can watching hockey stress your heart?](#) [周四, 05 10月 22:27]

A new study suggests that both the thrill of victory and the agony of defeat can have a substantial effect on the cardiovascular system. Investigators took the pulse of fans during a hockey game and found that on average, their heart rate increased by 75 percent when watching on TV, and by a whopping 110 percent (more than doubled, equivalent to the cardiac stress with vigorous exercise) when watching in person.

[Milky Way's 'most-mysterious star' continues to confound](#) [周四, 05 10月 07:05]

In 2015, a star called KIC 8462852 caused quite a stir in and beyond the astronomy community due to a series of rapid, unexplained dimming events. The latest findings from astronomers take a longer look at the star, going back to 2006 -- before its strange behavior was detected by Kepler.

[The super-Earth that came home for dinner](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire solar system to one side. It is a possible "Planet Nine" -- a world perhaps

10 times the mass of Earth and 20 times farther from the sun than Neptune.

- [**Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

- [**Female fish like males who sing**](#) [周四, 05 10月 00:05]

Noisier seas seem to hamper fish reproduction. New research shows that noise pollution impedes reproduction in sand and common gobies, both of which are important food sources for juvenile cod.

- [**Prehistoric squid was last meal of newborn ichthyosaur 200 million years ago**](#) [周二, 03 10月 21:39]

Scientists have identified the smallest and youngest specimen of *Ichthyosaurus communis* on record and found an additional surprise preserved in its stomach.

- [**Ancient petrified salamander reveals its last meal**](#) [周二, 03 10月 21:39]

A new study on an exceptionally preserved salamander from the Eocene of France reveals that its soft organs are conserved under its skin and bones. Organs preserved in three dimensions include the lung, nerves, gut, and within it, the last meal of the animal, according to a new study.

- [**Monstrous crocodile fossil points to early rise of ancient reptiles**](#) [周二, 03 10月 08:22]

A newly identified prehistoric marine predator has shed light on the origins of the distant relatives of modern crocodiles.

- [**Immature flies in Central Park subsist on duck droppings**](#) [周二, 03 10月 04:12]

Introducing Themira lohmanus, a fly like no other, and the most recently discovered species in the popular Manhattan urban oasis of Central Park. The immature insects subsist on duck droppings.

- [**Meteorite tells us that Mars had a dense atmosphere 4 billion years ago**](#) [周一, 02 10月 23:42]

Exploration missions have suggested that Mars once had a warm climate, which sustained oceans on its surface. To keep Mars warm requires a dense atmosphere with a sufficient greenhouse effect, while the present-day Mars has a thin atmosphere whose surface pressure is only 0.006 bar, resulting in the cold climate it has today. It has been a big mystery as to when and how Mars lost its dense atmosphere.

- [**First look at electrons escaping atoms**](#) [周一, 02 10月 23:27]

Researchers have taken a first step toward controlling electrons' behavior inside matter -- and thus the first step down a long and complicated road that could eventually lead to the ability to create new states of matter at will.

- [**Asphalt helps lithium batteries charge faster**](#) [周一, 02 10月 22:52]

A touch of asphalt may be the secret to high-capacity lithium batteries that charge up to 20 times faster than commercial lithium-ion batteries, according to scientists.

- [**DNA: The next hot material in photonics?**](#) [周一, 02 10月 22:52]

Using DNA from salmon, researchers in South Korea hope to make better biomedical and other photonic devices based on organic thin films.

- [**Animals that play with objects learn how to use them as tools**](#) [周一, 02 10月 22:52]

New Caledonian crows and kea parrots can learn about the usefulness of objects by playing with them -- similar to human baby behavior.

- [**Electricity produced from tears**](#) [周一, 02 10月 22:51]

A team of scientists has discovered that applying pressure to a protein found in egg whites and tears can generate electricity. The researchers

observed that crystals of lysozyme, a model protein that is abundant in egg whites of birds as well as in the tears, saliva and milk of mammals can generate electricity when pressed.

- [**Body energy as a power source**](#) [周一, 02 10月 20:56]

Smartphones, MP3 players, sports electronics devices such as pulse meters or trackers, medical equipment such as tonometers, pacemakers of the heart, or insulin pumps: An increasing number of electronic companions make daily life easier for us. But as useful these smart helpers may be: Their constant hunger for electricity is a problem. The solution: power supply by means of energy produced by body movements.

- [**A sea of spinning electrons**](#) [周一, 02 10月 20:48]

Picture two schools of fish swimming in clockwise and counterclockwise circles. It's enough to make your head spin, and now scientists have discovered the 'chiral spin mode' -- a sea of electrons spinning in opposing circles.

- [**'Revolutionary' new gesture control tech turns any object into a TV remote**](#) [周一, 02 10月 10:53]

Imagine changing the channel of your TV simply by moving your cup of tea, adjusting the volume on a music player by rolling a toy car, or rotating a spatula to pause a cookery video on your tablet. New gesture control technology that can turn everyday objects into remote controls could revolutionize how we interact with televisions, and other screens - ending frustrating searches for remotes that have slipped down the side of sofa cushions.

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ScienceDaily

周日, 08 10月 2017

ScienceDaily

[周日, 08 10月 2017]

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- [**US Olympians at 2016 Rio Games were infected with West Nile virus, not Zika**](#) [周日, 08 10月 05:29]

US Olympic and Paralympic athletes and staff who traveled to Rio de Janeiro, Brazil, for the 2016 Summer Games did not become infected with Zika virus but did test positive for other tropical, mosquito-borne viral infections, including West Nile Virus, Dengue Fever and Chikungunya.

- [**New electro-organic synthesis allows sustainable and green production of fine chemicals**](#) [周六, 07 10月 04:49]

Scientists have succeeded in developing a state-of-the-art and innovative electro-organic synthesis.

- [**Cannabis consumption increases violent behavior in young people in psychiatric care**](#) [周六, 07 10月 04:48]

A new study on cannabis use that involved 1,136 patients (from 18 to 40 years of age) with mental illnesses who had been seen five times during the year after discharge from a psychiatric hospital demonstrates that sustained use of cannabis is associated with an increase in violent behavior in young people. Moreover, the association between persistent cannabis use and violence is stronger than that associated with alcohol or cocaine.

- [**Antibiotics for dental procedures linked to superbug infection**](#) [周六, 07 10月 04:48]

Dental procedures are an overlooked source of antibiotic prescribing, which is a concern as these medications increase the risk of developing *C. difficile*.

- [**DNA barcoding technology helping monitor health of all-important boreal forest**](#) [周六, 07 10月 04:48]

The Boreal forest is essential to Canada and the world, storing carbon, purifying water and air and regulating climate. But keeping tabs on the health of this vulnerable biome has proven to be a painstaking and time-consuming undertaking - until now. Cutting-edge DNA metabarcoding technology can help speed up and improve the monitoring process, according to a new study.

- [**Genetic body/brain connection identified in genomic region linked to autism**](#) [周六, 07 10月 04:48]

For the first time, scientists have documented a direct link between deletions in two genes--*fam57ba* and *doc2a*--in zebrafish and certain brain and body traits, such as seizures, hyperactivity, large head size, and increased fat content. Both genes reside in the 16p11.2 region of the genome, which has been linked to multiple brain and body disorders in humans, including autism spectrum disorder, developmental delays, seizures, and obesity.

- [**Mars study yields clues to possible cradle of life**](#) [周六, 07 10月 03:49]

The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth. The research offers evidence that these deposits were formed by heated water from a volcanically active part of the planet's crust entering the bottom of a large sea long ago.

- [**A dash of gold improves microlasers**](#) [周六, 07 10月 02:22]

By attaching gold nanoparticles to the surface of a microlaser, researchers demonstrated a frequency comb that takes up less space and

requires 1000 times less power than current comb technology.

- [**DNA damage caused by cancer treatment reversed by ZATT protein**](#) [周六, 07 10月 02:22]

An international team has discovered a new way that cells fix an important and dangerous type of DNA damage known as a DNA-protein cross-link (DPC). The researchers found that a protein named ZATT can eliminate DPCs with the help of another protein, TDP2.

- [**Preeclampsia triggered by an overdose of gene activity**](#) [周六, 07 10月 02:22]

Preeclampsia, the most dangerous form of hypertension during a pregnancy, is known to originate in the placenta. But the root causes remain largely a mystery. Findings reveal that it is not a single disease caused solely by genetic factors: Epigenetically regulated genes play an important role. The research team also developed an in vitro model of the disorder which demonstrates the dysregulation of an important transcription factor.

- [**New telescope attachment allows ground-based observations of new worlds**](#) [周六, 07 10月 02:22]

A new, low-cost attachment to telescopes allows previously unachievable precision in ground-based observations of planets beyond our solar system. With it, ground-based telescopes can produce measurements of light intensity that rival the highest quality photometric observations from space.

- [**Asymmetric sound absorption lets in the light**](#) [周六, 07 10月 02:22]

Many asymmetric absorbers are currently based on a single-port system, where sound enters one side and is absorbed before a rigid wall. In this design, however, light and air are unable to pass through the system. But new research shows that asymmetric absorption can be realized within a straight transparent waveguide.

- [**Deer prefer native plants leaving lasting damage on forests**](#) [周六, 07 10月 02:21]

When rampant white-tailed deer graze in forests, they prefer to eat native plants over certain unpalatable invasive plants, such as garlic mustard and Japanese stiltgrass. These eating habits lower native plant diversity and abundance, while increasing the proportion of plant communities made up of non-native species, according to a new study.

• [Breakthrough in direct activation of CO₂ and CH₄ into liquid fuels and chemicals](#) [周六, 07 10月 00:40]

Researchers have made a significant breakthrough in the direct conversion of carbon dioxide (CO₂) and methane (CH₄) into liquid fuels and chemicals which could help industry to reduce greenhouse gas emissions whilst producing valuable chemical feedstocks.

• [Gluten intolerance appears largely undiagnosed in Canada](#) [周六, 07 10月 00:40]

Research on a large sample of Canadians suggests that most people with celiac disease don't know they have it.

• [Breast cancer linked to bacterial imbalances](#) [周六, 07 10月 00:40]

Researchers have uncovered differences in the bacterial composition of breast tissue of healthy women vs. women with breast cancer. The research team has discovered for the first time that healthy breast tissue contains more of the bacterial species *Methylobacterium*, a finding which could offer a new perspective in the battle against breast cancer.

• [Energy against the current on a quantum scale, without contradicting the laws of physics](#) [周五, 06 10月 23:23]

In a classical thermodynamic system, the heat current flows from the hotter body to the colder one, or electricity from the higher voltage to the lower one. The same thing happens in quantum systems, but this state can be changed, and the flow of energy and particles can be reversed if a quantum observer is inserted into the system.

• [Sensitivity to time improves performance at remotely controlling devices](#) [周五, 06 10月 23:23]

A new study finds that people who are more sensitive to the passage of

time are better at accounting for the latency -- or time lag -- inherent in remotely controlling robots or other tools.

- [**'Lost chapel' of Westminster Palace revealed in new 3-D model**](#) [周五, 06 10月 23:23]

The first dedicated House of Commons chamber, destroyed in the 1834 Palace of Westminster fire, has been reconstructed with the help of 3-D visualization technology.

- [**Predicting insect feeding preferences after deforestation**](#) [周五, 06 10月 22:18]

Understanding how parasitoids and hosts interact, and how their interactions change with human influence, is critically important to understanding ecosystems. New research finds mathematical models can predict complex insect behavioral changes using a simple description of insect preferences.

- [**Segregation-induced ordered superstructures at general grain boundaries in a Ni-Bi alloy**](#) [周五, 06 10月 22:18]

Randomly selected, high-angle, general grain boundaries in a nickel-bismuth (Ni-Bi) polycrystalline alloy can undergo interfacial reconstruction to form ordered superstructures, a discovery that enriches the theories and fundamental understandings of both grain boundary segregation and liquid metal embrittlement in physical metallurgy.

- [**Plant cells survive but stop dividing upon DNA damage**](#) [周五, 06 10月 22:18]

The cell cycle is how a cell passes its DNA but ceases if the DNA is damaged, as otherwise it risks passing this damage to daughter cells. Scientists report a new molecular mechanism that explains how this cessation occurs. The study shows that the transcription factor family MYB3R is normally degraded, but accumulates upon DNA damage to prevent cell cycle progression.

- [**New antifungal drug**](#) [周五, 06 10月 22:18]

Medical researchers have developed a new antifungal drug to help in the

treatment of life threatening invasive fungal infections such as invasive aspergillosis.

- [**New study analyzes volcanic fatalities in more detail than ever before**](#) [周五, 06 10月 22:18]

Building on existing information and databases relating to volcanic fatalities, scientists have, for the first time, been able to classify victims by activity or occupation and look at the distance of their death from the volcano.

- [**Exotic quantum particle observed in bilayer graphene**](#) [周五, 06 10月 21:22]

Physicists have definitively observed an intensely studied anomaly in condensed matter physics -- the even-denominator fractional quantum Hall state -- via transport measurement in bilayer graphene.

- [**Beyond bullying: Study shows damaging affects of multiple forms of victimization on school climate**](#) [周五, 06 10月 21:04]

School officials focused exclusively on bullying prevention efforts might want to consider the findings of a new study showing the highly damaging effects of multiple forms of victimization on school climate.

- [**Microbes dictate regime shifts causing anoxia in lakes and seas**](#) [周五, 06 10月 21:03]

Gradual environmental changes due to eutrophication and global warming can cause a rapid depletion of oxygen levels in lakes and coastal waters. A new study shows that microorganisms play a key role in these disastrous regime shifts.

- [**Electron behavior under extreme conditions described for the first time**](#) [周五, 06 10月 21:02]

Researchers have modeled the actions of electrons under extreme temperatures and densities, such as those found within planets and stars.

- [**Social acceptance more important than**](#)

[**economic factors in fertility treatment availability**](#) [周五, 06 10月 20:59]

A new British study has shed light on some of the reasons why Assisted Reproductive Technologies (ART) usage varies across Europe -- pinpointing moral and social acceptance of the treatment and religion as key. Scientists have, for the first time, assessed the relative importance of the role that economic, demographic and cultural normative factors play in the process.

• [**Is your partner's hearing loss driving you mad?**](#)

[周五, 06 10月 20:59]

The impact of a person's hearing loss on their nearest and dearest should be considered when personalizing rehabilitation plans for patients with deafness, suggest researchers.

• [**How seemingly acute viral infections can persist**](#)

[周五, 06 10月 20:59]

Scientists have resolved a paradox of viral infection. They've identified how a viral product can both trigger an immune response aimed at eliminating the virus or, conversely, allow the virus to survive and persist.

• [**Engineers invent breakthrough millimeter-wave circulator IC**](#) [周五, 06 10月 20:59]

Researchers continue to break new ground in developing magnet-free non-reciprocal components in modern semiconductor processes. They have built the first magnet-free non-reciprocal circulator on a silicon chip that operates at millimeter-wave frequencies, enabling circulators to be built in conventional semiconductor chips and operate at millimeter-wave frequencies, enabling full-duplex or two-way wireless.

• [**Discovery advances understanding of inflammatory bowel disease**](#) [周五, 06 10月 07:06]

New findings could help guide doctors to determine how best to treat patients with Crohn's disease, outlines a new report.

• [**Shrinking the proton again**](#) [周五, 06 10月 07:04]

Scientists, using high precision laser spectroscopy of atomic hydrogen,

confirm the surprisingly small value of the proton radius determined from muonic hydrogen.

- [**Pushy or laid back? Economic factors influence parenting style**](#) [周五, 06 10月 07:03]

A new study argues that parenting styles are shaped by economic factors that incentivize one strategy over others.

- [**'Transformative' research unrealistic to predict, scientists tell granting agencies**](#) [周五, 06 10月 07:03]

Research-funding agencies that require scientists to declare at the proposal stage how their projects will be 'transformative' may actually be hindering discovery.

- [**How to decrease the discard rate of donated organs**](#) [周五, 06 10月 07:02]

From 2008-2015, the number of kidneys donated after circulatory death that were obtained by the country's 58 donor service areas varied substantially. The outcomes associated with these organs were generally excellent. The use of these organs could be increased if 'cold ischemia times' are limited.

- [**Women who get frequent UTIs may reduce risk by drinking plenty of water**](#) [周五, 06 10月 07:02]

Women who suffer from recurrent urinary tract infections may reduce their risk by drinking more water, according to a new study.

- [**Screen children with reading difficulties for hearing problems**](#) [周五, 06 10月 07:02]

A new study found 25 percent of its young participants who had reading difficulties showed mild or moderate hearing impairment, of which their parents and teachers were unaware.

- [**Old Faithful's geological heart revealed**](#) [周五, 06 10月 07:02]

Scientists have mapped the near-surface geology around Old Faithful, revealing the reservoir of heated water that feeds the geyser's surface

vent and how the ground shaking behaves in between eruptions.

- [**Study challenges long-standing concept in cancer metabolism**](#) [周五, 06 10月 04:11]

Scientists have discovered that lactate provides a fuel for growing tumors, challenging a nearly century-old observation known as the Warburg effect.

- [**New research to combat pancreatic cancer**](#) [周五, 06 10月 04:11]

New research is underway that could help scientists combat the most lethal of cancers: pancreatic cancer. In a recent study, scientists demonstrated that bacteria in pancreatic tumors degrade a chemotherapy drug -- Gemcitabine -- most commonly used to treat patients who have pancreatic cancer.

- [**Bariatric surgery lowers cancer risk for severely obese patients**](#) [周五, 06 10月 04:11]

Bariatric surgery lowers the risk of cancer for severely obese patients. The risks drop most for postmenopausal breast cancer, endometrial cancer, pancreatic cancer and colon cancer.

- [**Smartphone-controlled smart bandage for better, faster healing**](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [**Multiple research approaches are key to pandemic preparedness**](#) [周五, 06 10月 03:11]

Preparedness in the face of major disease outbreaks can save thousands of lives. A new article examines the multifaceted nature of effective preparedness and the role that biomedical research plays. Specifically, the article examines three approaches to pandemic preparedness: pathogen-specific work, platform-based technologies, and prototype-pathogen efforts.

- **[Interpreting hurricane forecast displays can be difficult for general public](#)** [周五, 06 10月 03:11]

The 2017 hurricane season has highlighted the critical need to communicate a storm's impact path and intensity accurately, but new research shows significant misunderstandings of the two most commonly used storm forecast visualization methods.

- **[Do earthquakes have a 'tell'?](#)** [周五, 06 10月 03:11]

Data scientists and seismologists could potentially forecast strong earthquakes through algorithms designed to detect and monitor 'deep tremor.'

- **[Good-guy bacteria may help cancer immunotherapies do their job](#)** [周五, 06 10月 02:42]

Individuals with certain types of bacteria in their gut may be more likely to respond well to cancer immunotherapy, researchers found in a study of patients with metastatic melanoma.

- **[Low serum calcium may increase risk of sudden cardiac arrest](#)** [周五, 06 10月 02:18]

In a new study, researchers found that individuals with lower levels of calcium in the blood, which is easily monitored, are more likely to experience SCA than those with higher calcium levels.

US Olympians at 2016 Rio Games were infected with West Nile virus, not Zika -- ScienceDaily

U.S. Olympic and Paralympic athletes and staff who traveled to Rio de Janeiro, Brazil, for the 2016 Summer Games did not become infected with Zika virus but did test positive for other tropical, mosquito-borne viral infections, including West Nile Virus, Dengue Fever and Chikungunya. Results from the University of Utah Health-led study will be reported at IDWeek, a national infectious disease conference being held in San Diego.

None of the infected travelers became seriously ill, say the study's investigators. But the findings are a reminder that amidst the frenzy over Zika, travelers were also susceptible to other, long-standing public health risks that did not receive the same level of scrutiny.

"Everyone was concentrating on Zika and ignoring that there could be other infections caused by mosquito bites. We did not expect to find so many with these

other infections," says U of U Health infectious disease specialist Krow Ampofo, MBChB., who will be presenting the study's results on Oct. 7. "That is one of the reasons why we think that being vigilant about monitoring for infectious diseases after travel to at-risk areas is so important."

Other sources have indicated that there were no Zika cases reported during the Rio Olympics. But the U of U Health investigation is the first to examine a large cohort for viruses that cause other tropical infectious diseases.

Of the 457 athletes and staff who provided blood samples after returning from Brazil, testing found that 32 (7%) had become infected with mosquito-borne viruses while abroad. Twenty-seven had West Nile Virus, three had Chikungunya, and two had Dengue. None had signs of Zika.

Twelve of the individuals who tested positive filled out post-travel surveys. From those, only three -- two with Chikungunya and one with West Nile Virus -- reported having symptoms that can include body aches and rash. Symptoms emerged within two weeks after travel and resolved shortly thereafter.

"We were thrilled that there were no cases of Zika," says lead investigator Carrie Byington, M.D., who began the study while at U of U Health and is now at Texas A&M; Health Science Center. "One of the reasons we think that post travel diagnostics is really important is because multiple things can cause a similar picture and it's important to know what you had."

In general, most people infected with one of the other three viruses tested in the study -- West Nile Virus, Chikangunya or Dengue -- either had no symptoms or, when ill, had mild symptoms. In rare cases, these infections can be severely disabling or lethal.

At the time the study began, organizers were particularly concerned about Zika, which can also spread through sexual transmission and cause debilitating birth defects in unborn babies.

The 2016 Olympic and Paralympic Summer Games were held not long after the height of the Zika epidemic. The U of U Health study was mounted as a rapid response to monitor the health of U.S. athletes and staff traveling to Brazil, the epicenter of the outbreak. Of the estimated 2,000 travelers, 950

enrolled in the study, and just under half submitted samples for testing upon return. Participants who tested positive were sent letters explaining their results and recommending they consult with their health care provider.

"We all had our Hollywood sunglasses on, and they blinded us to other possibilities," says Marc Couturier, Ph.D., a medical director at ARUP Laboratories who led the testing. "We can't forget that West Nile Virus has been around for a while, and is still here."

Story Source:

Materials provided by [University of Utah Health](#).

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New electro-organic synthesis allows sustainable and green production of fine chemicals: Innovative contribution to the energy transition -- ScienceDaily

In the cooperative EPSYLON research project funded by the German Federal Ministry of Education and Research, scientists from Johannes Gutenberg University Mainz (JGU) and Evonik Performance Materials GmbH have succeeded in developing a state-of-the-art and innovative electro-organic synthesis. The results of their research, presented in last week's issue of *Science Advances*, allow the use of electrosynthesis as a trend-setting and sustainable green chemistry for technical applications. The method developed allows the operator to react flexibly to the available supply of electricity. Moreover, the operator no longer has to rely on customized electrolysis apparatuses and can use a wide variety of different equipment.

The method of carrying out chemical reactions using electricity was developed more than 160 years ago by German chemist Hermann Kolbe. Although

electrochemical syntheses are used in the chemical industry, this has so far been a niche technology. One reason is that the electrolysis conditions must be very finely controlled and uniform current input is essential. Due to the sophisticated technical infrastructure, the option of electrosynthesis remained unknown to most chemists. Now, in the 21st century, the green potential of electrochemistry has been rediscovered. It makes sustainable and eco-friendly chemistry possible with very simple means, particularly with the use of surplus power from renewable sources, such as wind or solar energy.

Electrochemistry is a versatile and powerful method that can be used to produce various chemical compounds or to effect chemical changes in molecules. To put it simply, electrons replace costly and toxic reagents. Unnecessary wastes can be avoided and the reaction can be halted at any time by simply switching off the power. Another advantage over classical synthesis is that many individual steps are more easily implemented by electrochemistry. In some cases, this can shorten a synthesis by several steps. However, electrolyses often require a narrow current-density window and long reaction times. In addition, selectivity and scalability are more difficult or even

impossible.

The key to the success of the research group headed by Professor Siegfried Waldvogel of the Institute of Organic Chemistry at Johannes Gutenberg University Mainz is the use of a unique electrolyte system. The electrolyses here have extremely high stability to variation in current density, allowing operation in a current-density window with a width extending over more than two orders of magnitude, with no loss of productivity or selectivity. If the supply of current permits, the electrolysis may be carried out in a short time with very high current density.

Story Source:

Materials provided by [**Johannes Gutenberg Universitaet Mainz**](#). *Note: Content may be edited for style and length.*

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Cannabis consumption increases violent behavior in young people in psychiatric care -- ScienceDaily

A new study by researchers at the Institut en santé mentale de Montréal demonstrates that sustained use of cannabis is associated with an increase in violent behaviour in young people after discharge from a psychiatric hospital.

The research by Dr. Alexandre Dumais (MD, PhD, FRCPC, psychiatrist at the Institut Philippe Pinel) and Dr. Stéphane Potvin (PhD, professor at the Université de Montréal), which studied 1,136 patients (from 18 to 40 years of age) with mental illnesses who had been seen five times during the year after discharge, took into account substance use and the onset of violent behaviour.

Previous research has already shown that a cannabis use disorder is associated with violent behaviour. According to this new study published in *Frontiers in Psychiatry*, users who reported at each follow-up visit

that they continued to smoke cannabis presented an increased risk (+144%) of violent behaviour.

These results also confirm the detrimental role of chronic cannabis use in patients with mental illness. According to the principal researcher Alexandre Dumais (MD, PhD, FRCPC): "an interesting feature of our results is that the association between persistent cannabis use and violence is stronger than that associated with alcohol or cocaine."

Indicator for external follow-up

Persistent cannabis use should therefore be considered as an indicator of future violent behaviour in patients who leave a psychiatric hospital for follow-up in an outpatient clinic, although the researcher points out that this behaviour tends to fade with time.

"This decrease could be explained by better adherence to treatment (the patient becomes more involved in their treatment over time) and by better support from their entourage. Even though we observed that violent behaviour tended to decrease during follow-up periods, the association remained statistically significant," noted Dr. Dumais.

The research results also suggest that there is no reciprocal relationship, that is, the use of cannabis resulted in future violent behaviour and not the reverse (for example, a violent person might use cannabis following an episode of violent behaviour to reduce their tension), as was suggested by previous studies.

The effects of cannabis on the brain

A recent meta-analysis of neuroimaging studies demonstrated that chronic cannabis users have deficits in the prefrontal cortex, a part of the brain that inhibits impulsive behaviour.

These results are important because they offer additional information to young adults, who can evaluate the risks of cannabis before deciding whether or not to use it. They will also serve as a tool to develop strategies to prevent the risk of violence associated with cannabis, since these risks have important consequences, both socially and for the health of young adults and for society in general.

This study was funded by the Fonds de la recherche du Québec-Santé.

Story Source:

[Materials](#) provided by [University of Montreal](#). *Note: Content may be edited for style and length.*

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Antibiotics for dental procedures linked to superbug infection -- ScienceDaily

Taking antibiotics can put patients at risk for developing *C. diff* and illustrates the importance of using the medications only when needed. The Minnesota Department of Health (MDH) tracked community-associated *C. diff* infections -- meaning those in patients who did not have an overnight stay in a hospital or nursing home -- in five counties in the state. During the six-year period, researchers determined 15 percent of those with the infection who had taken antibiotics had them prescribed for dental procedures.

But one-third of those patients' medical charts included no mention of receiving dental procedure-related antibiotics, researchers determined. An earlier survey conducted by the MDH found 36 percent of dentists prescribed antibiotics in situations that are generally not recommended by the American Dental Association (ADA) and reported challenges to making appropriate

antibiotic prescribing decisions, including confusion about or perceived conflicts among prescribing guidelines.

"Dentists have been overlooked as a source of antibiotic prescribing, which can potentially delay treatment when doctors are trying to determine what is causing a patient's illness," said Stacy Holzbauer, DVM, MPH, lead author of the study and career epidemiology field officer for the CDC and MDH. "It's important to educate dentists about the potential complications of antibiotic prescribing, including *C. diff*. Dentists write more than 24.5 million prescriptions for antibiotics a year. It is essential that they be included in efforts to improve antibiotic prescribing."

Dentists appropriately prescribe antibiotics in certain situations, such as to treat infections stemming from a tooth abscess. However, some dentists prescribe antibiotics prophylactically before a dental procedure to prevent a heart infection in patients with heart conditions, or to prevent an infection of an artificial joint, such as a hip or knee replacement. The ADA no longer recommends preventive antibiotics in most of those cases, as it once did. "It is possible some dentists aren't aware of the updated recommendations or are

being asked by other healthcare providers to continue preventive antibiotics despite the change," said Dr. Holzbauer. Current recommendations note the risk of taking antibiotics -- such as developing *C. diff* -- is greater than the risk of an infection in those cases. Further, the inappropriate use of antibiotics helps fuel the creation of drug-resistant bacteria, which are very difficult to treat and are an increasing public health threat.

In the study, MDH researchers interviewed 1,626 people with community-associated *C. diff* between 2009 and 2015. Of those, 926 (57 percent) reported they had been prescribed antibiotics, 136 (15 percent) of those for dental procedures. The study found patients who were prescribed antibiotics for dental procedures tended to be older and more likely to receive clindamycin, an antibiotic that is associated with *C. diff* infection. Of those who had received antibiotics for a dental procedure, 34 percent had no mention of antibiotics in their medical charts, illustrating the disconnect between dental and medical care. During routine medical appointments, patients should bring up dental visits and medications, including antibiotics -- they have taken. In addition, healthcare providers should ask patients about dental

visits and medications taken for dental reasons.

Antibiotics kill bad and good bacteria in the gastrointestinal (GI) system. Wiping out the protective bacteria can allow the growth of *C. diff* bacteria, leading to severe and potentially deadly diarrhea. *C. diff* can occur after just one dose of antibiotics and is one of the top three most urgent antibiotic-resistant threats identified by the CDC. It caused almost half a million infections and led to 15,000 deaths in a single year, according to CDC estimates.

"Research has shown that reducing outpatient antibiotic prescribing by 10 percent could decrease *C. diff* rates outside of hospitals by 17 percent," said Dr. Holzbauer. "Limiting the use of inappropriate antibiotics in dentistry could also have a profound impact."

While the ADA has expressed a commitment to and is an active partner in antibiotic stewardship, a 2015 MDH survey of dentists found fewer than half were concerned about adverse drug effects, antibiotic resistance or *C. diff* as factors that influenced their prescribing decisions. That's likely because they are unaware when their patients develop *C. diff*, Dr. Holzbauer said. Better communication between dental

and medical communities and improved history taking by all prescribers would help, she said.

Story Source:

Materials provided by [Infectious Diseases Society of America](#). *Note: Content may be edited for style and length.*

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DNA barcoding technology helping monitor health of all-important boreal forest -- ScienceDaily

The Boreal forest is essential to Canada and the world, storing carbon, purifying water and air and regulating climate. But keeping tabs on the health of this vulnerable biome has proven to be a painstaking and time-consuming undertaking -- until now.

Cutting-edge DNA metabarcoding technology developed by the University of Guelph can help speed up and improve the monitoring process, according to a new study published today in *Scientific Reports*.

"We get a lot more information out of DNA, and we were able to reproduce the data and the interpretations of the data that the standard morphology approach provided," said study co-author Mehrdad Hajibabaei, a professor in U of G's Department of Integrative Biology.

In the study, researchers compared use of advanced

DNA meta-barcoding technology -- identifying DNA from many aquatic organisms at once -- with hands-on identification of invertebrate specimens, used for decades to assess ecosystem biodiversity.

Accurate and timely information about the boreal ecosystem has never been more urgently needed, according to forest scientists. Rising temperatures in the boreal region are leading to degradation of permafrost, as well as more intense droughts and wildfires. Climate change is causing wildfires to burn more fiercely, pumping more greenhouse gases into the atmosphere.

However, federal scientists have been challenged by the sheer volume of bio-monitoring needed for Canada's forest integrity program, Hajibabaei said.

"They need to assess the health of this forest, and one way to do that is to look at the presence of invertebrates in the streams."

Stream health is an indicator of overall forest health and biodiversity. The time-tested but time-consuming approach was to manually collect specimens by hand and then identify indicator organisms.

"Natural Resources Canada wanted to get into using the approach -- DNA metabarcoding -- that my lab has been researching for quite some time," Hajibabaei said.

"They approached us and we initiated this collaboration. The importance of this work is both in terms of taking this approach into a real-world scenario and helping to address the needs of Canadian Forest Service for timely monitoring."

Metabarcoding is quick and highly effective at detecting many different aquatic organisms in water, Hajibabaei said.

Identifying invertebrates manually takes time and requires experts, whose results may not always be consistent, he added.

Another important aspect of the work is that it can be applied to an environmental gradient, measuring fluctuations in conditions based on various stressors and processes, Hajibabaei said.

The study involved scientists from U of G's Centre for Biodiversity Genomics and Natural Resources Canada's Great Lakes Forestry Centre in Sault Ste.

Marie.

The study calls metabarcoding "a potentially transformative approach to biomonitoring, biodiversity discovery and ecosystem health assessments."

The findings give Natural Resources Canada more confidence in DNA monitoring, Hajibabaei said. "Obviously if they want to mitigate any type of impact, faster and more high throughput approaches are always in demand."

Story Source:

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All Top News

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• [Mars study yields clues to possible cradle of life](#) [周六, 07 10月 03:49]

The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth. The research offers evidence that these deposits were formed by heated water from a volcanically active part of the planet's crust entering the bottom of a large sea long ago.

• [New telescope attachment allows ground-based observations of new worlds](#) [周六, 07 10月 02:22]

A new, low-cost attachment to telescopes allows previously unachievable precision in ground-based observations of planets beyond our solar system. With it, ground-based telescopes can produce measurements of light intensity that rival the highest quality photometric observations from space.

• [Breast cancer linked to bacterial imbalances](#) [周六, 07 10月 00:40]

Researchers have uncovered differences in the bacterial composition of breast tissue of healthy women vs. women with breast cancer. The research team has discovered for the first time that healthy breast tissue contains more of the bacterial species *Methylobacterium*, a finding which could offer a new perspective in the battle against breast cancer.

• [Exotic quantum particle observed in bilayer graphene](#) [周五, 06 10月 21:22]

Physicists have definitively observed an intensely studied anomaly in condensed matter physics -- the even-denominator fractional quantum Hall state -- via transport measurement in bilayer graphene.

. [**Old Faithful's geological heart revealed**](#) [周五, 06 10月 07:02]

Scientists have mapped the near-surface geology around Old Faithful, revealing the reservoir of heated water that feeds the geyser's surface vent and how the ground shaking behaves in between eruptions.

. [**3-D quantum gas atomic clock offers new dimensions in measurement**](#) [周五, 06 10月 02:18]

Physicists have created an entirely new design for an atomic clock, in which strontium atoms are packed into a tiny three-dimensional cube at 1,000 times the density of previous one-dimensional clocks. In doing so, they are the first to harness the ultra-controlled behavior of a so-called 'quantum gas' to make a practical measurement device.

. [**Carbon feedback from forest soils to accelerate global warming**](#) [周五, 06 10月 02:18]

After 26 years, the world's longest-running experiment to discover how warming temperatures affect forest soils has revealed a surprising, cyclical response: Soil warming stimulates periods of abundant carbon release from the soil to the atmosphere alternating with periods of no detectable loss in soil carbon stores. The study indicates that in a warming world, a self-reinforcing and perhaps uncontrollable carbon feedback will occur between forest soils and the climate system, accelerating global...

. [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

. [**Prehistoric humans are likely to have formed mating networks to avoid inbreeding**](#) [周五, 06 10月 02:17]

Early humans seem to have recognized the dangers of inbreeding at least 34,000 years ago, and developed surprisingly sophisticated social and mating networks to avoid it, new research has found.

- [**12,000 years ago, Florida hurricanes heated up despite chilly seas**](#) [周五, 06 10月 00:50]

Category 5 hurricanes may have slammed Florida repeatedly during the chilly Younger Dryas, 12,000 years ago. The cause? Hurricane-suppressing effects of cooler sea surface were out-weighed by side effects of slowed ocean circulation.

- [**Brain study reveals how insects make beeline for home**](#) [周五, 06 10月 00:50]

Scientists have discovered how the wiring of bees' brains helps them plot the most direct route back to their hive.

- [**Once declared extinct, Lord Howe Island stick insects really do live**](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead Lord Howe Island stick insects have some good news: those rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

- [**Violent helium reaction on white dwarf surface triggers supernova explosion**](#) [周四, 05 10月 23:11]

Astronomers have found solid evidence about what triggered a star to explode, which will contribute to a further understanding of supernova history and behavior.

- [**'Squirtable' elastic surgical glue seals wounds in 60 seconds**](#) [周四, 05 10月 22:27]

A highly elastic and adhesive surgical glue that quickly seals wounds without the need for common staples or sutures could transform how surgeries are performed.

- [**Who fatally undermined Scott's Antarctic**](#)

[expedition?](#) [周四, 05 10月 22:26]

What doomed Captain Robert Falcon Scott's British Antarctic Expedition in 1912? Scientists have uncovered documents and diary entries that suggest a team member stole food Scott needed, failed to pass on orders that would have sent out a dog team to meet the men and then changed his story over time to cover up his role in their deaths.

• [Too much sugar? Even 'healthy people' are at risk of developing heart disease](#) [周四, 05 10月 08:20]

Healthy people who consume high levels of sugar are at an increased risk of developing cardiovascular disease.

• [Milky Way's 'most-mysterious star' continues to confound](#) [周四, 05 10月 07:05]

In 2015, a star called KIC 8462852 caused quite a stir in and beyond the astronomy community due to a series of rapid, unexplained dimming events. The latest findings from astronomers take a longer look at the star, going back to 2006 -- before its strange behavior was detected by Kepler.

• [No clear evidence that most new cancer drugs extend or improve life](#) [周四, 05 10月 07:04]

The majority of cancer drugs approved in Europe between 2009 and 2013 entered the market without clear evidence that they improved survival or quality of life for patients, finds a study.

• [Sunlight and 'right' microbes convert Arctic carbon into carbon dioxide](#) [周四, 05 10月 04:38]

A new study outlines the mechanisms and points to the importance of both sunlight and the right microbial community as keys to converting permafrost carbon to CO₂.

• [New nanomaterial can extract hydrogen fuel from seawater](#) [周四, 05 10月 04:20]

A new hybrid nanomaterial harvests solar energy and uses it to extract hydrogen from seawater, cheaply and efficiently. Future

commercialization could mean a new source of environmentally friendly fuel and less dependence on fossil fuels.

- [**Ancient humans left Africa to escape drying climate**](#) [周四, 05 10月 03:12]

Humans migrated out of Africa as the climate shifted from wet to dry about 60,000 years ago, according to new paleoclimate research. What the northeast Africa climate was like when people migrated from Africa into Eurasia between 70,000 and 55,000 years ago is still uncertain. The new research shows around 70,000 years ago, the Horn of Africa climate shifted from a wet phase called 'Green Sahara' to even drier than the region is now.

- [**Why does divorce run in families? The answer may be genetics**](#) [周四, 05 10月 03:12]

Children of divorced parents are more likely to get divorced when compared to those who grew up in two-parent families -- and genetic factors are the primary explanation, according to a new study.

- [**The super-Earth that came home for dinner**](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire solar system to one side. It is a possible "Planet Nine" -- a world perhaps 10 times the mass of Earth and 20 times farther from the sun than Neptune.

- [**Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

- [**Bumblebees shed light on why some individuals**](#)

[are smarter than others](#) [周四, 05 10月 01:28]

By examining the brains of bees trained to different tasks, the researchers found that the number of connections between nerve cells may hold the answer to questions about individual cognitive differences. Bees with a greater density of nerve connections (known as synaptic complexes) in a specific part of their brains had better memories and learned faster than bees with fewer connections in these areas.

• [In Iceland stream, possible glimpse of warming future](#) [周四, 05 10月 01:26]

When a normally cold stream in Iceland was warmed, the make-up of life inside changed as larger organisms thrived while smaller ones struggled. The findings carry implications for life in a warming climate.

• [Anxiety and depression caused by childhood bullying decline over time](#) [周四, 05 10月 00:05]

A new study has provided the strongest evidence to date that exposure to bullying causes mental health issues such as anxiety years later.

• [Flights worldwide face increased risk of severe turbulence due to climate change](#) [周四, 05 10月 00:04]

Flights all around the world could be encountering lots more turbulence in the future, according to the first ever global projections of in-flight bumpiness.

• [Hurricane exposes and washes away thousands of sea turtle nests](#) [周四, 05 10月 00:04]

Marine biologists have released estimates of sea turtle nests lost to Hurricane Irma, finding that 56 percent of green turtle nests and 24 percent of loggerhead nests were lost within Archie Carr National Wildlife Refuge. Both are endangered species. The losses put a damper on what had been a record year for green turtle nesting.

• [Nobel Prize in Chemistry 2017: Cryo-electron microscopy](#) [周三, 04 10月 21:02]

The Nobel Prize in Chemistry 2017 goes to Jacques Dubochet, Joachim

Frank, and Richard Henderson "for developing cryo-electron microscopy for the high-resolution structure determination of biomolecules in solution."

- ['CRISPR-Gold' fixes Duchenne muscular dystrophy mutation in mice](#) [周三, 04 10月 08:29]

Scientists have engineered a new way to deliver CRISPR-Cas9 gene-editing technology inside cells and have demonstrated in mice that the technology can repair the mutation that causes Duchenne muscular dystrophy, a severe muscle-wasting disease.

- [Livestock grazing harming giant panda habitat](#) [周三, 04 10月 00:54]

One third of the giant panda habitat in China's Wanglang National Nature Reserve has been degraded and lost to livestock grazing, a new study finds. Livestock numbers in the park have increased ninefold in the last 15 years.

- [First evidence of the body's waste system in the human brain discovered](#) [周二, 03 10月 23:11]

By scanning the brains of healthy volunteers, researchers saw the first, long-sought evidence that our brains may drain some waste out through lymphatic vessels, the body's sewer system. The results further suggest the vessels could act as a pipeline between the brain and the immune system.

- [Large volcanic eruptions in Tropics can trigger El Niño events](#) [周二, 03 10月 23:11]

Explosive volcanic eruptions in the tropics can lead to El Niño events, those notorious warming periods in the Pacific Ocean with dramatic global impacts on the climate, according to a new study.

- [House sparrow decline linked to air pollution and poor diet](#) [周二, 03 10月 23:10]

House sparrows are well-adapted to living in urban areas, so it is surprising their numbers have fallen significantly over the past decades. An investigation into this worrying trend finds that sparrows living in

urban areas are adversely affected by pollution and poor nutrition. The study also finds the birds suffer more during the breeding season, when resources are needed to produce healthy eggs.

- [**To breed or not to breed? Migratory female butterflies face a monsoonal dilemma**](#) [周二, 03 10月 23:10]

Female butterflies make smart investments, finds a new study.

- [**Astronomers reveal evidence of dynamical dark energy**](#) [周二, 03 10月 23:10]

Astronomers found that the nature of dark energy may not be the cosmological constant introduced by Albert Einstein 100 years ago. This is crucial for the study of dark energy.

- [**Nobel Prize in Physics 2017: Gravitational waves**](#) [周二, 03 10月 21:58]

The Nobel Prize in Physics 2017 goes to Rainer Weiss, Barry C. Barish, and Kip S. Thorne "for decisive contributions to the LIGO detector and the observation of gravitational waves."

- [**Earth's tectonic plates are weaker than once thought**](#) [周二, 03 10月 21:40]

A long-standing question regarding the strength of olivine, the primary component of Earth's mantle, has now been answered. This study has implications for how we understand now tectonic plates form and move.

- [**An algorithm that explains how ants create and repair trail networks**](#) [周二, 03 10月 21:40]

Observing ants in the trees of a tropical forest, researchers recorded how, without a plan, the ants make and maintain their networks -- and how they repair the network when it is ruptured.

- [**Prehistoric squid was last meal of newborn ichthyosaur 200 million years ago**](#) [周二, 03 10月 21:39]

Scientists have identified the smallest and youngest specimen of *Ichthyosaurus communis* on record and found an additional surprise

preserved in its stomach.

- [**Ancient petrified salamander reveals its last meal**](#) [周二, 03 10月 21:39]

A new study on an exceptionally preserved salamander from the Eocene of France reveals that its soft organs are conserved under its skin and bones. Organs preserved in three dimensions include the lung, nerves, gut, and within it, the last meal of the animal, according to a new study.

- [**Monstrous crocodile fossil points to early rise of ancient reptiles**](#) [周二, 03 10月 08:22]

A newly identified prehistoric marine predator has shed light on the origins of the distant relatives of modern crocodiles.

- [**New source of radioactivity from Fukushima disaster**](#) [周二, 03 10月 04:12]

Scientists have found a previously unsuspected place where radioactive material from the Fukushima Dai-ichi nuclear power plant disaster has accumulated -- in sands and brackish groundwater beneath beaches up to 60 miles away. The sands took up and retained radioactive cesium originating from the disaster in 2011 and have been slowly releasing it back to the ocean.

- [**Did life on Earth start due to meteorites splashing into warm little ponds?**](#) [周二, 03 10月 04:12]

Life on Earth began somewhere between 3.7 and 4.5 billion years ago, after meteorites splashed down and leached essential elements into warm little ponds, say scientists. Their calculations suggest that wet and dry cycles bonded basic molecular building blocks in the ponds' nutrient-rich broth into self-replicating RNA molecules that constituted the first genetic code for life on the planet.

- [**Meteorite tells us that Mars had a dense atmosphere 4 billion years ago**](#) [周一, 02 10月 23:42]

Exploration missions have suggested that Mars once had a warm climate, which sustained oceans on its surface. To keep Mars warm

requires a dense atmosphere with a sufficient greenhouse effect, while the present-day Mars has a thin atmosphere whose surface pressure is only 0.006 bar, resulting in the cold climate it has today. It has been a big mystery as to when and how Mars lost its dense atmosphere.

- [**ALMA and Rosetta detect Freon-40 in space dashing hopes that molecule may be marker of life**](#) [周一, 02 10月 23:28]

Observations made with the Atacama Large Millimeter/submillimeter Array (ALMA) and ESA's Rosetta mission, have revealed the presence of the organohalogen Freon-40 in gas around both an infant star and a comet. Organohalogens are formed by organic processes on Earth, but this is the first ever detection of them in interstellar space. This discovery suggests that organohalogens may not be as good markers of life as had been hoped, but that they may be significant components of the material from whi...

- [**First look at electrons escaping atoms**](#) [周一, 02 10月 23:27]

Researchers have taken a first step toward controlling electrons' behavior inside matter -- and thus the first step down a long and complicated road that could eventually lead to the ability to create new states of matter at will.

- [**Mini-kidneys grown in lab reveal renal disease secrets**](#) [周一, 02 10月 23:27]

By creating and manipulating mini-kidney organoids that contain a realistic micro-anatomy, researchers can now track the early stages of polycystic kidney disease. The organoids are grown from human stem cells.

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Health News

Top stories featured on ScienceDaily's Health & Medicine, Mind & Brain, and Living Well sections.

- [**US Olympians at 2016 Rio Games were infected with West Nile virus, not Zika**](#) [周日, 08 10月 05:29]

US Olympic and Paralympic athletes and staff who traveled to Rio de Janeiro, Brazil, for the 2016 Summer Games did not become infected with Zika virus but did test positive for other tropical, mosquito-borne viral infections, including West Nile Virus, Dengue Fever and Chikungunya.

- [**Cannabis consumption increases violent behavior in young people in psychiatric care**](#) [周六, 07 10月 04:48]

A new study on cannabis use that involved 1,136 patients (from 18 to 40 years of age) with mental illnesses who had been seen five times during the year after discharge from a psychiatric hospital demonstrates that sustained use of cannabis is associated with an increase in violent behavior in young people. Moreover, the association between persistent cannabis use and violence is stronger than that associated with alcohol or cocaine.

- [**Antibiotics for dental procedures linked to superbug infection**](#) [周六, 07 10月 04:48]

Dental procedures are an overlooked source of antibiotic prescribing, which is a concern as these medications increase the risk of developing *C. difficile*.

- [**Genetic body/brain connection identified in genomic region linked to autism**](#) [周六, 07 10月 04:48]

For the first time, scientists have documented a direct link between deletions in two genes--*fam57ba* and *doc2a*--in zebrafish and certain brain and body traits, such as seizures, hyperactivity, large head size, and increased fat content. Both genes reside in the 16p11.2 region of the genome, which has been linked to multiple brain and body disorders in humans, including autism spectrum disorder, developmental delays, seizures, and obesity.

[DNA damage caused by cancer treatment reversed by ZATT protein](#) [周六, 07 10月 02:22]

An international team has discovered a new way that cells fix an important and dangerous type of DNA damage known as a DNA-protein cross-link (DPC). The researchers found that a protein named ZATT can eliminate DPCs with the help of another protein, TDP2.

[Preeclampsia triggered by an overdose of gene activity](#) [周六, 07 10月 02:22]

Preeclampsia, the most dangerous form of hypertension during a pregnancy, is known to originate in the placenta. But the root causes remain largely a mystery. Findings reveal that it is not a single disease caused solely by genetic factors: Epigenetically regulated genes play an important role. The research team also developed an in vitro model of the disorder which demonstrates the dysregulation of an important transcription factor.

[Asymmetric sound absorption lets in the light](#) [周六, 07 10月 02:22]

Many asymmetric absorbers are currently based on a single-port system, where sound enters one side and is absorbed before a rigid wall. In this design, however, light and air are unable to pass through the system. But new research shows that asymmetric absorption can be realized within a straight transparent waveguide.

[Gluten intolerance appears largely undiagnosed in Canada](#) [周六, 07 10月 00:40]

Research on a large sample of Canadians suggests that most people with celiac disease don't know they have it.

• **[Breast cancer linked to bacterial imbalances](#)** [周六, 07 10月 00:40]

Researchers have uncovered differences in the bacterial composition of breast tissue of healthy women vs. women with breast cancer. The research team has discovered for the first time that healthy breast tissue contains more of the bacterial species *Methylobacterium*, a finding which could offer a new perspective in the battle against breast cancer.

• **[Sensitivity to time improves performance at remotely controlling devices](#)** [周五, 06 10月 23:23]

A new study finds that people who are more sensitive to the passage of time are better at accounting for the latency -- or time lag -- inherent in remotely controlling robots or other tools.

• **[New antifungal drug](#)** [周五, 06 10月 22:18]

Medical researchers have developed a new antifungal drug to help in the treatment of life threatening invasive fungal infections such as invasive aspergillosis.

• **[Beyond bullying: Study shows damaging affects of multiple forms of victimization on school climate](#)** [周五, 06 10月 21:04]

School officials focused exclusively on bullying prevention efforts might want to consider the findings of a new study showing the highly damaging effects of multiple forms of victimization on school climate.

• **[Social acceptance more important than economic factors in fertility treatment availability](#)** [周五, 06 10月 20:59]

A new British study has shed light on some of the reasons why Assisted Reproductive Technologies (ART) usage varies across Europe -- pinpointing moral and social acceptance of the treatment and religion as key. Scientists have, for the first time, assessed the relative importance of the role that economic, demographic and cultural normative factors play in the process.

- [**Is your partner's hearing loss driving you mad?**](#)

[周五, 06 10月 20:59]

The impact of a person's hearing loss on their nearest and dearest should be considered when personalizing rehabilitation plans for patients with deafness, suggest researchers.

- [**How seemingly acute viral infections can persist**](#)

[周五, 06 10月 20:59]

Scientists have resolved a paradox of viral infection. They've identified how a viral product can both trigger an immune response aimed at eliminating the virus or, conversely, allow the virus to survive and persist.

- [**Discovery advances understanding of inflammatory bowel disease**](#)

[周五, 06 10月 07:06]

New findings could help guide doctors to determine how best to treat patients with Crohn's disease, outlines a new report.

- [**Pushy or laid back? Economic factors influence parenting style**](#)

[周五, 06 10月 07:03]

A new study argues that parenting styles are shaped by economic factors that incentivize one strategy over others.

- [**How to decrease the discard rate of donated organs**](#)

[周五, 06 10月 07:02]

From 2008-2015, the number of kidneys donated after circulatory death that were obtained by the country's 58 donor service areas varied substantially. The outcomes associated with these organs were generally excellent. The use of these organs could be increased if 'cold ischemia times' are limited.

- [**Women who get frequent UTIs may reduce risk by drinking plenty of water**](#)

[周五, 06 10月 07:02]

Women who suffer from recurrent urinary tract infections may reduce their risk by drinking more water, according to a new study.

- [**Screen children with reading difficulties for**](#)

[hearing problems](#) [周五, 06 10月 07:02]

A new study found 25 percent of its young participants who had reading difficulties showed mild or moderate hearing impairment, of which their parents and teachers were unaware.

• [Study challenges long-standing concept in cancer metabolism](#) [周五, 06 10月 04:11]

Scientists have discovered that lactate provides a fuel for growing tumors, challenging a nearly century-old observation known as the Warburg effect.

• [New research to combat pancreatic cancer](#) [周五, 06 10月 04:11]

New research is underway that could help scientists combat the most lethal of cancers: pancreatic cancer. In a recent study, scientists demonstrated that bacteria in pancreatic tumors degrade a chemotherapy drug -- Gemcitabine -- most commonly used to treat patients who have pancreatic cancer.

• [Bariatric surgery lowers cancer risk for severely obese patients](#) [周五, 06 10月 04:11]

Bariatric surgery lowers the risk of cancer for severely obese patients. The risks drop most for postmenopausal breast cancer, endometrial cancer, pancreatic cancer and colon cancer.

• [Smartphone-controlled smart bandage for better, faster healing](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

• [Multiple research approaches are key to pandemic preparedness](#) [周五, 06 10月 03:11]

Preparedness in the face of major disease outbreaks can save thousands of lives. A new article examines the multifaceted nature of effective preparedness and the role that biomedical research plays. Specifically,

the article examines three approaches to pandemic preparedness: pathogen-specific work, platform-based technologies, and prototype-pathogen efforts.

- [**Good-guy bacteria may help cancer immunotherapies do their job**](#) [周五, 06 10月 02:42]

Individuals with certain types of bacteria in their gut may be more likely to respond well to cancer immunotherapy, researchers found in a study of patients with metastatic melanoma.

- [**Low serum calcium may increase risk of sudden cardiac arrest**](#) [周五, 06 10月 02:18]

In a new study, researchers found that individuals with lower levels of calcium in the blood, which is easily monitored, are more likely to experience SCA than those with higher calcium levels.

- [**Cost-effectiveness of guinea worm disease eradication**](#) [周五, 06 10月 02:18]

Eradication of guinea worm disease (dracunculiasis), targeted by the World Health Organization (WHO) for the year 2015, is finally within reach, with only 25 reported human transmissions in 2016. Now, researchers have re-asserted the cost-effectiveness of the global Guinea Worm Eradication Programme (GWEP), some 30 years after it started.

- [**Simulating a brain-cooling treatment that could one day ease epilepsy**](#) [周五, 06 10月 02:18]

Using computer simulation techniques, scientists have gained new insights into the mechanism by which lowering the temperature of specific brain regions could potentially treat epileptic seizures.

- [**First cell-type census of mouse brains: Surprises about structure, male-female differences**](#) [周五, 06 10月 02:18]

Neuroscientists have mobilized advanced imaging and computational methods to comprehensively map -- 'count' -- the total populations of specific types of cells throughout the mouse brain. In a new study, they report two highly surprising findings regarding distribution of cell types

across the brain as well as male-female brain differences.

- [**Prehistoric humans are likely to have formed mating networks to avoid inbreeding**](#) [周五, 06 10月 02:17]

Early humans seem to have recognized the dangers of inbreeding at least 34,000 years ago, and developed surprisingly sophisticated social and mating networks to avoid it, new research has found.

- [**Scientists solve 3-D structure of key defense protein against Parkinson's disease**](#) [周五, 06 10月 02:17]

Scientists have identified the structure of a key enzyme that protects the brain against Parkinson's disease. The result of a decade of work, the research team said that solving the 3-D structure and inner workings of the PINK1 enzyme represented a major breakthrough.

- [**Better genetic decoding of neurodevelopmental disorders**](#) [周五, 06 10月 02:17]

New research into improving the genetic decoding of neurodevelopmental disorders promises to help future diagnosis of children with such conditions, including intellectual disability, autism or schizophrenia.

- [**Middle managers may turn to unethical behavior to face unrealistic expectations**](#) [周五, 06 10月 02:17]

While unethical behavior in organizations is often portrayed as flowing down from top management, or creeping up from low-level positions, a team of researchers suggest that middle management also can play a key role in promoting wide-spread unethical behavior among their subordinates.

- [**Delivering bad news? Don't beat around the bush**](#) [周五, 06 10月 02:17]

New research shows that when it comes to receiving bad news, most people prefer directness, candor and very little -- if any -- buffer.

- [**Predicting when a sound will occur relies on the**](#)

brain's motor system [周五, 06 10月 02:17]

Whether it is dancing or just tapping one foot to the beat, we all experience how auditory signals like music can induce movement. Now new research suggests that motor signals in the brain actually sharpen sound perception, and this effect is increased when we move in rhythm with the sound.

New research on sperm stem cells has implications for male infertility and cancer [周五, 06 10月 02:17]

Scientists have shed light on the complex process that occurs in the development of human sperm stem cells.

Identifying ways to minimize the harm of energy drinks [周五, 06 10月 02:17]

Because many countries allow the sale of energy drinks to young people, identifying ways to minimize potential harm from energy drinks is critical. A new study provided unique insights into intervention strategies suggested by young people themselves to reduce consumption. In addition to more research and education, these strategies included policy changes targeting energy drink sales, packaging, price, and visibility.

Faster Salmonella test boosts food safety for humans and animals [周五, 06 10月 02:17]

A new test allows accurate, rapid testing for Salmonella, a bacteria that is one of the leading causes of food-borne illness across all regions of the world.

Planning for the future [周五, 06 10月 02:17]

Over the past decade, increasing temperatures across much of Africa and decreasing rainfall across East Africa have come to represent an alarming climate trend. Chief among concerns is the impact such conditions have on human health.

Something universal occurs in the brain when it processes stories, regardless of language [周五, 06 10月 02:17]

New brain research shows that reading stories generates activity in the same regions of the brain for speakers of three different languages.

- [**Heart: No evidence for piezoelectricity or ferroelectricity in the aorta**](#) [周五, 06 10月 02:17]

While some studies have supported the idea that the walls of the aorta are piezoelectric or ferroelectric, the most recent research finds no evidence of these properties. Researchers investigated by testing samples of pig aorta using a traditional setup, known as Sawyer-Tower, to detect ferroelectricity. Their experiments suggest the aorta has no special properties, and instead acts as a standard dielectric material that does not conduct current.

- [**Why can't mTOR inhibitors kill cancer? Study explains**](#) [周五, 06 10月 00:50]

Anti-cancer drugs called mTOR inhibitors slow the growth of cancer cells but show limited ability to cause cancer cell death. A new studies explain why.

- [**Air pollution exposure on home-to-school routes reduces the growth of working memory**](#) [周五, 06 10月 00:50]

A new study has demonstrated that exposure to air pollution on the way to school can have damaging effects on children's cognitive development. The study found an association between a reduction in working memory and exposure to fine particulate matter (PM2.5) and black carbon during the walking commute to and from school.

- [**Genetic drivers of most common form of lymphoma identified**](#) [周五, 06 10月 00:50]

An international research effort has been working to better understand the genetic underpinnings of the most prevalent form of lymphoma -- diffuse large B cell lymphoma -- and how those genes might play a role in patients' responses to therapies.

- [**New findings on mechanisms for body temperature regulation by fat tissue**](#) [周五, 06 10月 00:11]

New discoveries about the mechanism responsible for heat generation in the body related to fat tissue oppose classical views in the field and could lead to new ways to fight metabolic disorders associated with obesity, according to a study.

- [**A new CRISPR-engineered cancer model to test therapeutics**](#) [周五, 06 10月 00:11]

Using multiplex CRISPR-Cas9 editing of human hematopoietic, or blood-forming, stem cells followed by transplantation in mice, researchers designed customized mouse models for the progression of leukemia. In a number of different experiments, the animal models successfully reflected human responses to a therapeutic agent commonly used to treat blood cancers.

- [**Germs in the kitchen: Salmonella better known than Campylobacter**](#) [周五, 06 10月 00:11]

What health risks are consumers aware of? What are they concerned about?

- [**More traits associated with your Neanderthal DNA**](#) [周五, 06 10月 00:11]

After humans and Neanderthals met many thousands of years ago, the two species began interbreeding. Recent studies have shown that some of those Neanderthal genes have contributed to human immunity and modern diseases. Now researchers have found that our Neanderthal inheritance has contributed to other characteristics, too, including skin tone, hair color, sleep patterns, mood, and even a person's smoking status.

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [**New electro-organic synthesis allows sustainable and green production of fine chemicals**](#) [周六, 07 10月 04:49]

Scientists have succeeded in developing a state-of-the-art and innovative electro-organic synthesis.

- [**Mars study yields clues to possible cradle of life**](#) [周六, 07 10月 03:49]

The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth. The research offers evidence that these deposits were formed by heated water from a volcanically active part of the planet's crust entering the bottom of a large sea long ago.

- [**A dash of gold improves microlasers**](#) [周六, 07 10月 02:22]

By attaching gold nanoparticles to the surface of a microlaser, researchers demonstrated a frequency comb that takes up less space and requires 1000 times less power than current comb technology.

- [**New telescope attachment allows ground-based observations of new worlds**](#) [周六, 07 10月 02:22]

A new, low-cost attachment to telescopes allows previously unachievable precision in ground-based observations of planets beyond our solar system. With it, ground-based telescopes can produce measurements of light intensity that rival the highest quality photometric observations from space.

- [**Breakthrough in direct activation of CO₂ and CH₄ into liquid fuels and chemicals**](#) [周六, 07 10月 00:40]

Researchers have made a significant breakthrough in the direct conversion of carbon dioxide (CO₂) and methane (CH₄) into liquid fuels and chemicals which could help industry to reduce greenhouse gas emissions whilst producing valuable chemical feedstocks.

- [**Energy against the current on a quantum scale, without contradicting the laws of physics**](#) [周五, 06 10月 23:23]

In a classical thermodynamic system, the heat current flows from the hotter body to the colder one, or electricity from the higher voltage to the lower one. The same thing happens in quantum systems, but this state can be changed, and the flow of energy and particles can be reversed if a quantum observer is inserted into the system.

- [**Sensitivity to time improves performance at remotely controlling devices**](#) [周五, 06 10月 23:23]

A new study finds that people who are more sensitive to the passage of time are better at accounting for the latency -- or time lag -- inherent in remotely controlling robots or other tools.

- [**Predicting insect feeding preferences after deforestation**](#) [周五, 06 10月 22:18]

Understanding how parasitoids and hosts interact, and how their interactions change with human influence, is critically important to understanding ecosystems. New research finds mathematical models can predict complex insect behavioral changes using a simple description of insect preferences.

- [**Segregation-induced ordered superstructures at general grain boundaries in a Ni-Bi alloy**](#) [周五, 06 10月 22:18]

Randomly selected, high-angle, general grain boundaries in a nickel-bismuth (Ni-Bi) polycrystalline alloy can undergo interfacial reconstruction to form ordered superstructures, a discovery that enriches the theories and fundamental understandings of both grain boundary segregation and liquid metal embrittlement in physical metallurgy.

- [**Exotic quantum particle observed in bilayer**](#)

[**graphene**](#) [周五, 06 10月 21:22]

Physicists have definitively observed an intensely studied anomaly in condensed matter physics -- the even-denominator fractional quantum Hall state -- via transport measurement in bilayer graphene.

• [**Electron behavior under extreme conditions described for the first time**](#) [周五, 06 10月 21:02]

Researchers have modeled the actions of electrons under extreme temperatures and densities, such as those found within planets and stars.

• [**Engineers invent breakthrough millimeter-wave circulator IC**](#) [周五, 06 10月 20:59]

Researchers continue to break new ground in developing magnet-free non-reciprocal components in modern semiconductor processes. They have built the first magnet-free non-reciprocal circulator on a silicon chip that operates at millimeter-wave frequencies, enabling circulators to be built in conventional semiconductor chips and operate at millimeter-wave frequencies, enabling full-duplex or two-way wireless.

• [**Shrinking the proton again**](#) [周五, 06 10月 07:04]

Scientists, using high precision laser spectroscopy of atomic hydrogen, confirm the surprisingly small value of the proton radius determined from muonic hydrogen.

• [**'Transformative' research unrealistic to predict, scientists tell granting agencies**](#) [周五, 06 10月 07:03]

Research-funding agencies that require scientists to declare at the proposal stage how their projects will be 'transformative' may actually be hindering discovery.

• [**Smartphone-controlled smart bandage for better, faster healing**](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [**Simulating a brain-cooling treatment that could one day ease epilepsy**](#) [周五, 06 10月 02:18]

Using computer simulation techniques, scientists have gained new insights into the mechanism by which lowering the temperature of specific brain regions could potentially treat epileptic seizures.

- [**3-D quantum gas atomic clock offers new dimensions in measurement**](#) [周五, 06 10月 02:18]

Physicists have created an entirely new design for an atomic clock, in which strontium atoms are packed into a tiny three-dimensional cube at 1,000 times the density of previous one-dimensional clocks. In doing so, they are the first to harness the ultra-controlled behavior of a so-called 'quantum gas' to make a practical measurement device.

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [**Why lab researchers should talk with industry counterparts**](#) [周五, 06 10月 02:17]

A research team has found both obstacles and lessons from the process of getting a novel membrane for chemical processing out of the lab into the commercial world.

- [**Road pricing most effective in reducing vehicle emissions**](#) [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

• [**New test opens path for better 2-D catalysts**](#) [周五, 06 10月 02:17]

Scientists have developed technology for rapid screening of two-dimensional materials for electrocatalysis of hydrogen. The method could accelerate the development of 2-D materials for energy applications.

• [**Heart: No evidence for piezoelectricity or ferroelectricity in the aorta**](#) [周五, 06 10月 02:17]

While some studies have supported the idea that the walls of the aorta are piezoelectric or ferroelectric, the most recent research finds no evidence of these properties. Researchers investigated by testing samples of pig aorta using a traditional setup, known as Sawyer-Tower, to detect ferroelectricity. Their experiments suggest the aorta has no special properties, and instead acts as a standard dielectric material that does not conduct current.

• [**'Body-on-a-chip' system to accelerate testing of new drugs**](#) [周五, 06 10月 00:10]

Being able to test new drugs in a 3-D model of the body has the potential to speed up drug discovery, reduce the use of animal testing and advance personalized medicine.

• [**Paper-based supercapacitor uses metal nanoparticles to boost energy density**](#) [周五, 06 10月 00:10]

Using a simple layer-by-layer coating technique, researchers have developed a paper-based flexible supercapacitor that could be used to help power wearable devices. The device uses metallic nanoparticles to coat cellulose fibers in the paper, creating supercapacitor electrodes with high energy and power densities -- and the best performance so far in a textile-based supercapacitor.

• [**Violent helium reaction on white dwarf surface triggers supernova explosion**](#) [周四, 05 10月 23:11]

Astronomers have found solid evidence about what triggered a star to explode, which will contribute to a further understanding of supernova

history and behavior.

- [**Fingerprints lack scientific basis for legal certainty**](#) [周四, 05 10月 23:11]

A new report on the quality of latent fingerprint analysis says that courtroom testimony and reports stating or even implying that fingerprints collected from a crime scene belong to a single person are indefensible and lack scientific foundation.

- [**New 'molecular trap' cleans more radioactive waste from nuclear fuel rods**](#) [周四, 05 10月 23:10]

A new method for capturing radioactive waste from nuclear power plants is cheaper and more effective than current methods, a potential boon for the energy industry, according to new research.

- [**Machinery that repairs itself**](#) [周四, 05 10月 22:38]

Scientists are developing maintenance technology capable of forecasting machine downtimes in production before they occur. This allows plant managers to rectify faults before the machine breaks down. The system even corrects some defects automatically.

- [**Safety assistance system warns of dirty bombs**](#) [周四, 05 10月 22:38]

The threat of terrorism has been on the rise in recent years, with experts and politicians particularly worried that terrorists might make use of dirty bombs. Researchers have developed a new system that will be able to detect possible carriers of radioactive substances, even in large crowds of people.

- [**Spray drying: Perfect dosing thanks to drug capsules**](#) [周四, 05 10月 22:38]

Instant coffee and powdered milk are produced by spray drying. Researchers have adapted this technique to the tricky question of incorporating insoluble substances in core-shell particles. The new method helps reduce the concentration of active ingredients in therapeutic medications.

- [**Tracking debris in the Earth's orbit with**](#)

[centimeter precision using efficient laser technology](#) [周四, 05 10月 22:38]

Uncontrollable flying objects in orbit are a massive risk for modern space travel, and, due to our dependence on satellites today, it is also a risk to global economy. Scientists have now developed a fiber laser that reliably determines the position and direction of the space debris' movement to mitigate these risks.

• [Mitigating the unpleasant scent of adhesives](#) [周四, 05 10月 22:38]

It is a known fact that adhesives may smell unpleasant. However, as researchers have recently discovered, this doesn't need to be the case. Through extensive research on acrylic adhesives they were able to identify the substances responsible for the offensive odors. So far, very little research has been conducted on the subject, but now manufacturers finally have the opportunity to optimize their production process.

• [Using elastomer films to generate electricity](#) [周四, 05 10月 22:35]

Water is still the most important source of renewable energy in Bavaria, Germany, accounting for some 33 percent of all renewable energy produced in the region, as showed by the Bavarian Energy Map. But conventional hydroelectric plants, especially micro hydro generators, are a subject of controversy due to their low output volumes and their interference with the ecosystem. Researchers are working on an environmentally friendly alternative: in the future, innovative elastomer materials are set to...

• [New nanoplatelets improve the brightness of LEDs, lasers and LCD screens, researchers show](#) [周四, 05 10月 22:35]

New semiconductor nanoplatelets synthesized in laboratories can improve the brightness of LEDs, lasers and LCD screens of computers or televisions because they allow to minimize energy losses compared to current semiconductor materials.

• ['Squirtable' elastic surgical glue seals wounds in 60 seconds](#) [周四, 05 10月 22:27]

A highly elastic and adhesive surgical glue that quickly seals wounds without the need for common staples or sutures could transform how surgeries are performed.

- [Completing the drug design jigsaw](#) [周四, 05 10月 22:27]

A powerful new way of analysing how drugs interact with molecules in the body could aid the design of better treatments with fewer side-effects.

- [Computer model unravels knotty problems in DNA](#) [周四, 05 10月 22:27]

If you've ever tried to untangle a pair of earbuds, you'll understand how loops and cords can get twisted up. DNA can get tangled in the same way, and in some cases, has to be cut and reconnected to resolve the knots. Now a team of mathematicians, biologists and computer scientists has unraveled how E. coli bacteria can unlink tangled DNA by a local reconnection process. The math behind the research could have implications far beyond biology.

- [Mars' moon Phobos examined in a different light](#) [周四, 05 10月 22:27]

NASA's longest-lived mission to Mars has gained its first look at the Martian moon Phobos, pursuing a deeper understanding by examining it in infrared wavelengths.

- [How much can watching hockey stress your heart?](#) [周四, 05 10月 22:27]

A new study suggests that both the thrill of victory and the agony of defeat can have a substantial effect on the cardiovascular system. Investigators took the pulse of fans during a hockey game and found that on average, their heart rate increased by 75 percent when watching on TV, and by a whopping 110 percent (more than doubled, equivalent to the cardiac stress with vigorous exercise) when watching in person.

- [Caution ahead: The growing challenge for drivers' attention](#) [周四, 05 10月 22:27]

Many of the infotainment features in most 2017 vehicles are so distracting they should not be enabled while a vehicle is in motion, according to a new study. The study found In-Vehicle Information Systems take drivers' attention off the road for too long to be safe.

[A novel textile material that keeps itself germ-free](#) [周四, 05 10月 22:27]

Scientists have developed a novel weapon in the battle against deadly hospital-acquired infections -- a textile that disinfects itself. And independent tests show it can reduce bacteria levels by more than 90 per cent. By incorporating the specially-engineered textile in a device designed to be used on hospital doors instead of the traditional aluminum door plate, that part of the door that people push to open it -- they aim to bolster hand hygiene.

[Vertigo and understanding the body's balance system](#) [周四, 05 10月 22:26]

Finding out what's happening in the brains of people with balance disorders, such as vertigo, might be one step closer following new research on the vestibular system, which controls balance and movement. An interdisciplinary team of optical physicists and biologists has found a novel way, using optical tweezers, or focused beams of light, to understand the vestibular system while animals are still, not moving.

[Milky Way's 'most-mysterious star' continues to confound](#) [周四, 05 10月 07:05]

In 2015, a star called KIC 8462852 caused quite a stir in and beyond the astronomy community due to a series of rapid, unexplained dimming events. The latest findings from astronomers take a longer look at the star, going back to 2006 -- before its strange behavior was detected by Kepler.

[Impacts of ride-hailing on crashes differ from city to city](#) [周四, 05 10月 07:05]

Ride-hailing services reduce drunk-driving crashes in some cities,

reports a new study. The research is the first to look at the specific effects of ride-hailing, or 'ride-sharing,' within specific cities, rather than averaging data across multiple cities.

- [**New nanomaterial can extract hydrogen fuel from seawater**](#) [周四, 05 10月 04:20]

A new hybrid nanomaterial harvests solar energy and uses it to extract hydrogen from seawater, cheaply and efficiently. Future commercialization could mean a new source of environmentally friendly fuel and less dependence on fossil fuels.

- [**The super-Earth that came home for dinner**](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire solar system to one side. It is a possible "Planet Nine" -- a world perhaps 10 times the mass of Earth and 20 times farther from the sun than Neptune.

- [**Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

- [**Light-activated nanoparticles can supercharge current antibiotics**](#) [周四, 05 10月 02:26]

Light-activated nanoparticles, also known as quantum dots, can provide a crucial boost in effectiveness for antibiotic treatments used to combat drug-resistant superbugs such as E. coli and Salmonella, new research shows.

- [**A new way to produce clean hydrogen fuel from water using sunlight**](#) [周四, 05 10月 02:01]

Researchers combined graphitic carbon nitride and black phosphorous to make a new metal-free composite photocatalyst capable of producing hydrogen from water. The photocatalyst featured good photocatalytic production of hydrogen, even when powered by low-energy near infrared light.

[Surface helium detonation spells end for white dwarf](#) [周四, 05 10月 02:01]

Researchers have found evidence that the brightest stellar explosions in our Universe could be triggered by helium nuclear detonation near the surface of a white dwarf star.

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [**US Olympians at 2016 Rio Games were infected with West Nile virus, not Zika**](#) [周日, 08 10月 05:29]

US Olympic and Paralympic athletes and staff who traveled to Rio de Janeiro, Brazil, for the 2016 Summer Games did not become infected with Zika virus but did test positive for other tropical, mosquito-borne viral infections, including West Nile Virus, Dengue Fever and Chikungunya.

- [**DNA barcoding technology helping monitor health of all-important boreal forest**](#) [周六, 07 10月 04:48]

The Boreal forest is essential to Canada and the world, storing carbon, purifying water and air and regulating climate. But keeping tabs on the health of this vulnerable biome has proven to be a painstaking and time-consuming undertaking - until now. Cutting-edge DNA metabarcoding technology can help speed up and improve the monitoring process, according to a new study.

- [**Mars study yields clues to possible cradle of life**](#) [周六, 07 10月 03:49]

The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth. The research offers evidence that these deposits were formed by heated water from a volcanically active part of the planet's crust entering the bottom of a large sea long ago.

- [**Deer prefer native plants leaving lasting damage on forests**](#) [周六, 07 10月 02:21]

When rampant white-tailed deer graze in forests, they prefer to eat native plants over certain unpalatable invasive plants, such as garlic mustard and Japanese stiltgrass. These eating habits lower native plant diversity and abundance, while increasing the proportion of plant communities made up of non-native species, according to a new study.

- [**Breakthrough in direct activation of CO₂ and CH₄ into liquid fuels and chemicals**](#) [周六, 07 10月 00:40]

Researchers have made a significant breakthrough in the direct conversion of carbon dioxide (CO₂) and methane (CH₄) into liquid fuels and chemicals which could help industry to reduce greenhouse gas emissions whilst producing valuable chemical feedstocks.

- [**Breast cancer linked to bacterial imbalances**](#) [周六, 07 10月 00:40]

Researchers have uncovered differences in the bacterial composition of breast tissue of healthy women vs. women with breast cancer. The research team has discovered for the first time that healthy breast tissue contains more of the bacterial species *Methylobacterium*, a finding which could offer a new perspective in the battle against breast cancer.

- [**'Lost chapel' of Westminster Palace revealed in new 3-D model**](#) [周五, 06 10月 23:23]

The first dedicated House of Commons chamber, destroyed in the 1834 Palace of Westminster fire, has been reconstructed with the help of 3-D visualization technology.

- [**Predicting insect feeding preferences after deforestation**](#) [周五, 06 10月 22:18]

Understanding how parasitoids and hosts interact, and how their interactions change with human influence, is critically important to understanding ecosystems. New research finds mathematical models can predict complex insect behavioral changes using a simple description of insect preferences.

- [**Plant cells survive but stop dividing upon DNA damage**](#) [周五, 06 10月 22:18]

The cell cycle is how a cell passes its DNA but ceases if the DNA is damaged, as otherwise it risks passing this damage to daughter cells. Scientists report a new molecular mechanism that explains how this cessation occurs. The study shows that the transcription factor family MYB3R is normally degraded, but accumulates upon DNA damage to prevent cell cycle progression.

- [**New study analyzes volcanic fatalities in more detail than ever before**](#) [周五, 06 10月 22:18]

Building on existing information and databases relating to volcanic fatalities, scientists have, for the first time, been able to classify victims by activity or occupation and look at the distance of their death from the volcano.

- [**Microbes dictate regime shifts causing anoxia in lakes and seas**](#) [周五, 06 10月 21:03]

Gradual environmental changes due to eutrophication and global warming can cause a rapid depletion of oxygen levels in lakes and coastal waters. A new study shows that microorganisms play a key role in these disastrous regime shifts.

- [**How seemingly acute viral infections can persist**](#) [周五, 06 10月 20:59]

Scientists have resolved a paradox of viral infection. They've identified how a viral product can both trigger an immune response aimed at eliminating the virus or, conversely, allow the virus to survive and persist.

- [**Old Faithful's geological heart revealed**](#) [周五, 06 10月 07:02]

Scientists have mapped the near-surface geology around Old Faithful, revealing the reservoir of heated water that feeds the geyser's surface vent and how the ground shaking behaves in between eruptions.

- [**Interpreting hurricane forecast displays can be difficult for general public**](#) [周五, 06 10月 03:11]

The 2017 hurricane season has highlighted the critical need to communicate a storm's impact path and intensity accurately, but new

research shows significant misunderstandings of the two most commonly used storm forecast visualization methods.

- [**Do earthquakes have a 'tell'?**](#) [周五, 06 10月 03:11]

Data scientists and seismologists could potentially forecast strong earthquakes through algorithms designed to detect and monitor 'deep tremor.'

- [**Cost-effectiveness of guinea worm disease eradication**](#) [周五, 06 10月 02:18]

Eradication of guinea worm disease (dracunculiasis), targeted by the World Health Organization (WHO) for the year 2015, is finally within reach, with only 25 reported human transmissions in 2016. Now, researchers have re-asserted the cost-effectiveness of the global Guinea Worm Eradication Programme (GWEP), some 30 years after it started.

- [**Carbon feedback from forest soils to accelerate global warming**](#) [周五, 06 10月 02:18]

After 26 years, the world's longest-running experiment to discover how warming temperatures affect forest soils has revealed a surprising, cyclical response: Soil warming stimulates periods of abundant carbon release from the soil to the atmosphere alternating with periods of no detectable loss in soil carbon stores. The study indicates that in a warming world, a self-reinforcing and perhaps uncontrollable carbon feedback will occur between forest soils and the climate system, accelerating global...

- [**Decision to rescind Waters of the United States rule \(WOTUS\) based on flawed analysis**](#) [周五, 06 10月 02:18]

New evidence suggests that the Trump Administration's proposal to rescind the 2015 Waters of the United States (WOTUS) rule that would limit the scope of the Clean Water Act inappropriately overlooks wetlands-related values.

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- **[Prehistoric humans are likely to have formed mating networks to avoid inbreeding](#)** [周五, 06 10月 02:17]

Early humans seem to have recognized the dangers of inbreeding at least 34,000 years ago, and developed surprisingly sophisticated social and mating networks to avoid it, new research has found.

- **[Road pricing most effective in reducing vehicle emissions](#)** [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

- **[New 'movie' technique reveals bacterial signalling in sharper resolution](#)** [周五, 06 10月 02:17]

Researchers used a study of the plant-growth promoting bacterium *Pseudomonas fluorescens* to develop an advanced analysis method which, they hope, will increase our capacity to understand plant and human diseases.

- **[Faster Salmonella test boosts food safety for humans and animals](#)** [周五, 06 10月 02:17]

A new test allows accurate, rapid testing for Salmonella, a bacteria that is one of the leading causes of food-borne illness across all regions of the world.

- **[Planning for the future](#)** [周五, 06 10月 02:17]

Over the past decade, increasing temperatures across much of Africa and decreasing rainfall across East Africa have come to represent an

alarming climate trend. Chief among concerns is the impact such conditions have on human health.

- [**Key plant species may be important for supporting wildflower pollinators**](#) [周五, 06 10月 02:17]

Increased agricultural production has likely led to loss, fragmentation, and degradation of flower-rich habitats for pollinators. To counteract these negative effects of modern agricultural practices, efforts to maintain and restore diverse plants in agricultural landscapes -- called agri-environmental schemes -- have been implemented in numerous European countries.

- [**12,000 years ago, Florida hurricanes heated up despite chilly seas**](#) [周五, 06 10月 00:50]

Category 5 hurricanes may have slammed Florida repeatedly during the chilly Younger Dryas, 12,000 years ago. The cause? Hurricane-suppressing effects of cooler sea surface were out-weighted by side effects of slowed ocean circulation.

- [**Brain study reveals how insects make beeline for home**](#) [周五, 06 10月 00:50]

Scientists have discovered how the wiring of bees' brains helps them plot the most direct route back to their hive.

- [**Air pollution exposure on home-to-school routes reduces the growth of working memory**](#) [周五, 06 10月 00:50]

A new study has demonstrated that exposure to air pollution on the way to school can have damaging effects on children's cognitive development. The study found an association between a reduction in working memory and exposure to fine particulate matter (PM2.5) and black carbon during the walking commute to and from school.

- [**Liverwort genes and land plant evolution**](#) [周五, 06 10月 00:11]

The common liverwort is a living link to the transition from marine algae to land plants. Biologists have analyzed the genome sequence of the common liverwort (*Marchantia polymorpha*) to identify genes and

gene families that were deemed crucial to plant evolution and have been conserved over millions of years and across plant lineages.

- [**Germs in the kitchen: Salmonella better known than Campylobacter**](#) [周五, 06 10月 00:11]

What health risks are consumers aware of? What are they concerned about?

- [**How yellow and blue make green in parrots**](#) [周五, 06 10月 00:11]

Many brightly colored birds get their pigments from the foods that they eat, but that's not true of parrots. Now, researchers reporting a study of familiar pet store parakeets -- also known as budgies -- have new evidence to explain how the birds produce their characteristic yellow, blue, and green feathers.

- [**Once declared extinct, Lord Howe Island stick insects really do live**](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead Lord Howe Island stick insects have some good news: those rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

- [**Novel PET tracer identifies most bacterial infections**](#) [周四, 05 10月 23:11]

Medical scientists have developed a novel imaging agent that could be used to identify most bacterial infections.

- [**New 'molecular trap' cleans more radioactive waste from nuclear fuel rods**](#) [周四, 05 10月 23:10]

A new method for capturing radioactive waste from nuclear power plants is cheaper and more effective than current methods, a potential boon for the energy industry, according to new research.

- [**Athletes and health aficionados: The lupine protein beverage**](#) [周四, 05 10月 22:39]

With its intensive colors and many blossoms, the lupine looks like an ornamental plant. Yet, the tall lupine is far too good to be used decoratively as the plant's seeds contain nutritious proteins. However, it is rather complicated to make lupines edible for humans.

- [**Tracking debris in the Earth's orbit with centimeter precision using efficient laser technology**](#) [周四, 05 10月 22:38]

Uncontrollable flying objects in orbit are a massive risk for modern space travel, and, due to our dependence on satellites today, it is also a risk to global economy. Scientists have now developed a fiber laser that reliably determines the position and direction of the space debris' movement to mitigate these risks.

- [**Predatory bacteria that engineer 'portholes' and paint 'frescoes' in harmful bacteria**](#) [周四, 05 10月 22:34]

A microbiological mystery of how one bacterium could invade another and grow inside it without breaking the other bacterium instantly has been illuminated by scientists.

- [**Lake water mixing: The might of the microorganism?**](#) [周四, 05 10月 22:32]

Can microorganisms cause lake water to be mixed? The answer given by previous studies is no, since the movement of small, slow-swimming bacteria is not sufficient to disturb the stratification of lake water induced by differences in, for example, temperature or salinity.

- [**Computer model unravels knotty problems in DNA**](#) [周四, 05 10月 22:27]

If you've ever tried to untangle a pair of earbuds, you'll understand how loops and cords can get twisted up. DNA can get tangled in the same way, and in some cases, has to be cut and reconnected to resolve the knots. Now a team of mathematicians, biologists and computer scientists

has unraveled how E. coli bacteria can unlink tangled DNA by a local reconnection process. The math behind the research could have implications far beyond biology.

• [Modified peptides could boost plant growth and development](#) [周四, 05 10月 22:27]

A new study of peptide hormones critical for plant development could result in wide-ranging benefits for agriculture, tissue culture, and related industries, and even improve knowledge of peptides in humans. The study synthesized and examined the function of CLE peptides, a relatively new class of the peptide hormone family in plants.

• [A need for bananas? Dietary potassium regulates calcification of arteries](#) [周四, 05 10月 22:27]

Researchers have shown, for the first time, that reduced dietary potassium promotes elevated aortic stiffness in a mouse model. Such arterial stiffness in humans is predictive of heart disease and death from heart disease, and it represents an important health problem for the nation. The researchers also found that increased dietary potassium levels lessened vascular calcification and aortic stiffness. Furthermore, they unraveled the molecular mechanism underlying the effects of low or high dietary potassium.

• [Climate solution in soil?](#) [周四, 05 10月 22:26]

The land under our feet and the plant matter it contains could offset a significant amount of carbon emissions if managed properly. More research is needed to unlock soil's potential to mitigate global warming, improve crop yields and increase resilience, say researchers.

• [Who fatally undermined Scott's Antarctic expedition?](#) [周四, 05 10月 22:26]

What doomed Captain Robert Falcon Scott's British Antarctic Expedition in 1912? Scientists have uncovered documents and diary entries that suggest a team member stole food Scott needed, failed to pass on orders that would have sent out a dog team to meet the men and then changed his story over time to cover up his role in their deaths.

[**Vertigo and understanding the body's balance system**](#) [周四, 05 10月 22:26]

Finding out what's happening in the brains of people with balance disorders, such as vertigo, might be one step closer following new research on the vestibular system, which controls balance and movement. An interdisciplinary team of optical physicists and biologists has found a novel way, using optical tweezers, or focused beams of light, to understand the vestibular system while animals are still, not moving.

[**How cells adapt to help repair damage**](#) [周四, 05 10月 22:26]

Genetic processes that allow cells to transform so they can mend damaged nerves have been identified by scientists.

[**Supervolcanoes: Magma chambers have a sponge-like structure**](#) [周四, 05 10月 22:26]

Researchers show that magma chambers under supervolcanoes are more like soggy sponges than reservoirs of molten rock. Before a volcano of this kind erupts, such mush must slowly be reactivated by heat input following deep magma recharge ultimately derived from the Earth's mantle.

[**Sunlight and 'right' microbes convert Arctic carbon into carbon dioxide**](#) [周四, 05 10月 04:38]

A new study outlines the mechanisms and points to the importance of both sunlight and the right microbial community as keys to converting permafrost carbon to CO₂.

[**Climate change, population growth may lead to open ocean aquaculture**](#) [周四, 05 10月 04:37]

A new analysis suggests that open-ocean aquaculture for three species of finfish is a viable option for industry expansion under most climate change scenarios -- an option that may provide a new source of protein for the world's growing population.

[**Are we at a tipping point with weed control?**](#) [周四, 05 10月 04:20]

Imagine walking the cereal aisle at your favorite grocery store. Are you reading labels? Scanning prices? Thinking about weeds? If you're like most American consumers, weeds probably aren't at the forefront of your mind when buying food. But if farmers could no longer control weeds with existing herbicides, Americans would take notice pretty quickly.

• [**New nanomaterial can extract hydrogen fuel from seawater**](#) [周四, 05 10月 04:20]

A new hybrid nanomaterial harvests solar energy and uses it to extract hydrogen from seawater, cheaply and efficiently. Future commercialization could mean a new source of environmentally friendly fuel and less dependence on fossil fuels.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [**New study analyzes volcanic fatalities in more detail than ever before**](#) [周五, 06 10月 22:18]

Building on existing information and databases relating to volcanic fatalities, scientists have, for the first time, been able to classify victims by activity or occupation and look at the distance of their death from the volcano.

- [**Social acceptance more important than economic factors in fertility treatment availability**](#) [周五, 06 10月 20:59]

A new British study has shed light on some of the reasons why Assisted Reproductive Technologies (ART) usage varies across Europe -- pinpointing moral and social acceptance of the treatment and religion as key. Scientists have, for the first time, assessed the relative importance of the role that economic, demographic and cultural normative factors play in the process.

- [**Pushy or laid back? Economic factors influence parenting style**](#) [周五, 06 10月 07:03]

A new study argues that parenting styles are shaped by economic factors that incentivize one strategy over others.

- [**'Transformative' research unrealistic to predict, scientists tell granting agencies**](#) [周五, 06 10月 07:03]

Research-funding agencies that require scientists to declare at the proposal stage how their projects will be 'transformative' may actually

be hindering discovery.

- [**Screen children with reading difficulties for hearing problems**](#) [周五, 06 10月 07:02]

A new study found 25 percent of its young participants who had reading difficulties showed mild or moderate hearing impairment, of which their parents and teachers were unaware.

- [**Multiple research approaches are key to pandemic preparedness**](#) [周五, 06 10月 03:11]

Preparedness in the face of major disease outbreaks can save thousands of lives. A new article examines the multifaceted nature of effective preparedness and the role that biomedical research plays. Specifically, the article examines three approaches to pandemic preparedness: pathogen-specific work, platform-based technologies, and prototype-pathogen efforts.

- [**Interpreting hurricane forecast displays can be difficult for general public**](#) [周五, 06 10月 03:11]

The 2017 hurricane season has highlighted the critical need to communicate a storm's impact path and intensity accurately, but new research shows significant misunderstandings of the two most commonly used storm forecast visualization methods.

- [**Do earthquakes have a 'tell'?**](#) [周五, 06 10月 03:11]

Data scientists and seismologists could potentially forecast strong earthquakes through algorithms designed to detect and monitor 'deep tremor.'

- [**Decision to rescind Waters of the United States rule \(WOTUS\) based on flawed analysis**](#) [周五, 06 10月 02:18]

New evidence suggests that the Trump Administration's proposal to rescind the 2015 Waters of the United States (WOTUS) rule that would limit the scope of the Clean Water Act inappropriately overlooks wetlands-related values.

- [**Middle managers may turn to unethical**](#)

behavior to face unrealistic expectations [周五, 06 10月 02:17]

While unethical behavior in organizations is often portrayed as flowing down from top management, or creeping up from low-level positions, a team of researchers suggest that middle management also can play a key role in promoting wide-spread unethical behavior among their subordinates.

Why lab researchers should talk with industry counterparts [周五, 06 10月 02:17]

A research team has found both obstacles and lessons from the process of getting a novel membrane for chemical processing out of the lab into the commercial world.

Delivering bad news? Don't beat around the bush [周五, 06 10月 02:17]

New research shows that when it comes to receiving bad news, most people prefer directness, candor and very little -- if any -- buffer.

Road pricing most effective in reducing vehicle emissions [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

Identifying ways to minimize the harm of energy drinks [周五, 06 10月 02:17]

Because many countries allow the sale of energy drinks to young people, identifying ways to minimize potential harm from energy drinks is critical. A new study provided unique insights into intervention strategies suggested by young people themselves to reduce consumption. In addition to more research and education, these strategies included

policy changes targeting energy drink sales, packaging, price, and visibility.

- **[Planning for the future](#)** [周五, 06 10月 02:17]

Over the past decade, increasing temperatures across much of Africa and decreasing rainfall across East Africa have come to represent an alarming climate trend. Chief among concerns is the impact such conditions have on human health.

- **[Something universal occurs in the brain when it processes stories, regardless of language](#)** [周五, 06 10月 02:17]

New brain research shows that reading stories generates activity in the same regions of the brain for speakers of three different languages.

- **[Air pollution exposure on home-to-school routes reduces the growth of working memory](#)** [周五, 06 10月 00:50]

A new study has demonstrated that exposure to air pollution on the way to school can have damaging effects on children's cognitive development. The study found an association between a reduction in working memory and exposure to fine particulate matter (PM2.5) and black carbon during the walking commute to and from school.

- **[Fingerprints lack scientific basis for legal certainty](#)** [周四, 05 10月 23:11]

A new report on the quality of latent fingerprint analysis says that courtroom testimony and reports stating or even implying that fingerprints collected from a crime scene belong to a single person are indefensible and lack scientific foundation.

- **[Beer brands popular among youth violate code with youth-appealing ads](#)** [周四, 05 10月 22:27]

Alcohol brands popular among underage drinkers are more likely to air television advertisements that violate the industry's voluntary code by including youth-appealing content, according to a new study.

- **[Low-cost, high-volume services make up big](#)**

[portion of spending on unneeded health care](#) [周四, 05 10月 22:27]

Low-cost, high-volume health services account for a high percentage of unnecessary health spending, adding strain to the health care system.

• [Caution ahead: The growing challenge for drivers' attention](#) [周四, 05 10月 22:27]

Many of the infotainment features in most 2017 vehicles are so distracting they should not be enabled while a vehicle is in motion, according to a new study. The study found In-Vehicle Information Systems take drivers' attention off the road for too long to be safe.

• [DNA-based Zika vaccine is safe and effective at inducing immune response](#) [周四, 05 10月 07:05]

A new generation DNA-based Zika vaccine demonstrated both safety and ability to elicit an immune response against Zika in humans in a phase 1 clinical trial.

• [Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

• [Parole violations, not new crimes, help drive prison's revolving door](#) [周四, 05 10月 02:27]

Failing a drug test, associating with felons and other technical parole violations are among the key drivers of prison's 'revolving door,' according to new American research.

• [Win-win for spotted owls and forest management](#) [周四, 05 10月 02:01]

Remote sensing technology has detected what could be a win for both spotted owls and forestry management, according to a study.

• [**In warmer climates, Greenlandic deltas have grown**](#) [周四, 05 10月 01:35]

Unlike most other deltas worldwide, Greenland's are growing -- a trend with major consequences for both fishing and tourism.

• [**Assessing regional earthquake risk and hazards in the age of exascale**](#) [周四, 05 10月 00:05]

Researchers are building the first-ever end-to-end simulation code to precisely capture the geology and physics of regional earthquakes, and how the shaking impacts buildings.

• [**Albatross feces show diet of fishery discards**](#) [周四, 05 10月 00:04]

The first-ever analysis of fish DNA in albatross scat indicates a high level of interaction between seabirds and commercial fisheries. This non-invasive method could be used to assess whether fisheries are complying with discard policies. Extending the analysis to other marine predators could help monitor marine biodiversity and broader marine ecosystem changes.

• [**Safe motherhood campaign associated with more prenatal visits, birth planning, study finds**](#) [周四, 05 10月 00:04]

In Tanzania, pregnant women who were exposed to a national safe motherhood campaign designed to get them to visit health facilities for prenatal care and delivery were more likely to create birth plans and to attend more prenatal appointments.

• [**Rampant consumption of hippo teeth**](#) [周三, 04 10月 22:14]

Investigators have examined the case of hippo teeth and revealed discordance in trade volumes declared between importers and exporters -- a scenario that could threaten the survival of the species.

• [**Doing homework is associated with change in students' personality**](#) [周三, 04 10月 22:07]

Homework may have a positive influence on students' conscientiousness. Students who do more homework than their peers

show positive changes in conscientiousness, according to new research. Thus, schools may be doing more than contributing to students' learning, but they may also be effecting changes of their students' personality.

- **[What is STEM education?](#)** [周三, 04 10月 21:51]

Everyone needs a good teacher -- including teachers. Two new studies show how digging deeper into what STEM education means and strategically designing online classrooms can enhance teaching science, technology, engineering, and math.

- **[Too little is known about wildfire smoke](#)** [周三, 04 10月 21:29]

How do fire-suppression chemicals and pesticides affect wildfire smoke and the health of those who breathe it? New research has discovered that this question cannot be answered based on current scientific evidence, say investigators.

- **[Neighborhood affluence linked to positive birth outcomes](#)** [周三, 04 10月 02:48]

It's not uncommon for new parents to relocate in search of neighborhoods with better schools, safer streets and healthier, more kid-friendly activities. But a new study has found that living in such neighborhoods before a baby is born protects against the risks of poor birth outcomes.

- **[Women firefighters can improve safety, but department culture must change](#)** [周三, 04 10月 02:45]

A new study has discerned that gender may be a unique contributor to safety, but hypermasculine fire service culture creates barriers.

- **[Twitter a hotbed of anti-vaccine sentiment](#)** [周二, 03 10月 23:11]

Anti-vaccine sentiment is alive and growing on social media, with California, Connecticut, Massachusetts, New York and Pennsylvania showing the most negative tweets, according to a new 5-year study.

- **[Social action may give youth a career edge, education faculty research suggests](#)** [周二, 03 10月 23:11]

When disadvantaged youth engage in social activism, they tend to have high-status occupations in adulthood, according to researchers. The findings also suggest there's a place for more discussion of social issues in our educational systems.

- [**New method to quantify life cycle land use of natural gas**](#) [周二, 03 10月 23:10]

A case study of the Barnett Shale region in Texas, where hydraulic fracturing was first implemented, for the first time provides quantifiable information on the life cycle land use of generating electricity from natural gas based on physical measurements instead of using assumptions and averages that were previously used for evaluation.

- [**U.S. breast cancer death rates dropped 39 percent between 1989 and 2015**](#) [周二, 03 10月 23:10]

Breast cancer death rates dropped 39 percent between 1989 and 2015, averting 322,600 breast cancer deaths during those 26 years. Death rates in several states are now statistically equivalent, perhaps reflecting an elimination of disparities in those states.

- [**Incidence of measles in the United States**](#) [周二, 03 10月 23:10]

From 2001 to 2015, the overall annual incidence of measles in the United States remained extremely low (less than 1 case/million population) compared with incidence worldwide (40 cases/million population). Relative increases in measles rates were observed over the period, and the findings suggest that failure to vaccinate may be the main driver of measles transmission, according to a study.

- [**European sea bass show chronic impairment after exposure to crude oil**](#) [周二, 03 10月 21:46]

We may be underestimating the long-term impact of oil spills on fish, particularly their ability to tolerate low oxygen environments, according to research.

- [**New method could help disrupt opioid crisis**](#) [周二, 03 10月 21:40]

Researchers have zeroed in on a unique component of heroin that could

help zero in on the locations of origin for individual batches.

- **[Program for parents improves ADHD behaviors in young children](#)** [周二, 03 10月 21:39]

Effective early intervention is crucial for young children with ADHD, due to the unfavorable short-term and long-term outcomes associated with the disorder.

- **[Cutting absenteeism in primary schools](#)** [周二, 03 10月 08:23]

A pilot program reduced absenteeism in elementary schools by an average of 10 percent, according to a new study.

- **[Breakthrough cancer treatment brings hope and challenges](#)** [周二, 03 10月 08:23]

The first gene therapy for cancer will transform approaches to cancer treatments, but it poses ethical challenges for policy-makers.

- **[New source of radioactivity from Fukushima disaster](#)** [周二, 03 10月 04:12]

Scientists have found a previously unsuspected place where radioactive material from the Fukushima Dai-ichi nuclear power plant disaster has accumulated -- in sands and brackish groundwater beneath beaches up to 60 miles away. The sands took up and retained radioactive cesium originating from the disaster in 2011 and have been slowly releasing it back to the ocean.

- **[Firearm-related injuries account for \\$2.8 billion on emergency room and inpatient charges each year](#)** [周二, 03 10月 04:12]

A new study of more than 704,000 people who arrived alive at a United States emergency room for treatment of a firearm-related injury between 2006 and 2014 finds decreasing incidence of such injury in some age groups, increasing trends in others, and affirmation of the persistently high cost of gunshot wounds in dollars and human suffering.

- **[Most Americans want the government to combat](#)**

[climate change, some willing to pay a high amount](#) [周二, 03 10月 02:49]

Sixty-one percent of Americans think climate change is a problem that the government needs to address, including 43 percent of Republicans and 80 percent of Democrats, according to a new survey.

· [Win-win strategies for climate and food security](#)

[周一, 02 10月 20:48]

Efforts to reduce greenhouse gas emissions from the agriculture and forestry sectors could lead to increased food prices -- but new research identifies strategies that could help mitigate climate change while avoiding steep hikes in food prices.

· [Adulteration of proprietary Chinese medicines and health products poses severe health risks](#) [周一, 02 10月 20:48]

10月 20:48]

Traditional Chinese medicine is widely used as a form of complementary medicine all over the world for various indications and for improving general health. Various reports have documented the adulteration of pCMs and health products with undeclared agents, including prescription drugs, drug analogues, and banned drugs. Such adulteration can have serious and even fatal consequences.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- [Smartphone-controlled smart bandage for better, faster healing](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [What Earth's climate system and topological insulators have in common](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [How yellow and blue make green in parrots](#) [周五, 06 10月 00:11]

Many brightly colored birds get their pigments from the foods that they eat, but that's not true of parrots. Now, researchers reporting a study of familiar pet store parakeets -- also known as budgies -- have new evidence to explain how the birds produce their characteristic yellow, blue, and green feathers.

- [Once declared extinct, Lord Howe Island stick insects really do live](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead Lord Howe Island stick insects have some good news: those

rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

• [More traits associated with your Neanderthal DNA](#) [周五, 06 10月 00:11]

After humans and Neanderthals met many thousands of years ago, the two species began interbreeding. Recent studies have shown that some of those Neanderthal genes have contributed to human immunity and modern diseases. Now researchers have found that our Neanderthal inheritance has contributed to other characteristics, too, including skin tone, hair color, sleep patterns, mood, and even a person's smoking status.

• [Milky Way's 'most-mysterious star' continues to confound](#) [周四, 05 10月 07:05]

In 2015, a star called KIC 8462852 caused quite a stir in and beyond the astronomy community due to a series of rapid, unexplained dimming events. The latest findings from astronomers take a longer look at the star, going back to 2006 -- before its strange behavior was detected by Kepler.

• [The super-Earth that came home for dinner](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire solar system to one side. It is a possible "Planet Nine" -- a world perhaps 10 times the mass of Earth and 20 times farther from the sun than Neptune.

• [Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers

have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

- [**Female fish like males who sing**](#) [周四, 05 10月 00:05]

Noisier seas seem to hamper fish reproduction. New research shows that noise pollution impedes reproduction in sand and common gobies, both of which are important food sources for juvenile cod.

- [**Burmese python's hungry escapades may have consequences for human health**](#) [周三, 04 10月 22:12]

As the large, invasive Burmese python eats its way through south Florida's mammals, the mosquitoes in the area have fewer types of animals to bite. Now, more mosquitoes are drawing blood from a rat that carries a virus dangerous to humans.

- [**Prehistoric squid was last meal of newborn ichthyosaur 200 million years ago**](#) [周二, 03 10月 21:39]

Scientists have identified the smallest and youngest specimen of *Ichthyosaurus communis* on record and found an additional surprise preserved in its stomach.

- [**Ancient petrified salamander reveals its last meal**](#) [周二, 03 10月 21:39]

A new study on an exceptionally preserved salamander from the Eocene of France reveals that its soft organs are conserved under its skin and bones. Organs preserved in three dimensions include the lung, nerves, gut, and within it, the last meal of the animal, according to a new study.

- [**Monstrous crocodile fossil points to early rise of ancient reptiles**](#) [周二, 03 10月 08:22]

A newly identified prehistoric marine predator has shed light on the origins of the distant relatives of modern crocodiles.

- [**Immature flies in Central Park subsist on duck droppings**](#) [周二, 03 10月 04:12]

Introducing *Themira lohmanus*, a fly like no other, and the most recently

discovered species in the popular Manhattan urban oasis of Central Park. The immature insects subsist on duck droppings.

- [**Meteorite tells us that Mars had a dense atmosphere 4 billion years ago**](#) [周一, 02 10月 23:42]

Exploration missions have suggested that Mars once had a warm climate, which sustained oceans on its surface. To keep Mars warm requires a dense atmosphere with a sufficient greenhouse effect, while the present-day Mars has a thin atmosphere whose surface pressure is only 0.006 bar, resulting in the cold climate it has today. It has been a big mystery as to when and how Mars lost its dense atmosphere.

- [**First look at electrons escaping atoms**](#) [周一, 02 10月 23:27]

Researchers have taken a first step toward controlling electrons' behavior inside matter -- and thus the first step down a long and complicated road that could eventually lead to the ability to create new states of matter at will.

- [**Asphalt helps lithium batteries charge faster**](#) [周一, 02 10月 22:52]

A touch of asphalt may be the secret to high-capacity lithium batteries that charge up to 20 times faster than commercial lithium-ion batteries, according to scientists.

- [**DNA: The next hot material in photonics?**](#) [周一, 02 10月 22:52]

Using DNA from salmon, researchers in South Korea hope to make better biomedical and other photonic devices based on organic thin films.

- [**Animals that play with objects learn how to use them as tools**](#) [周一, 02 10月 22:52]

New Caledonian crows and kea parrots can learn about the usefulness of objects by playing with them -- similar to human baby behavior.

- [**Electricity produced from tears**](#) [周一, 02 10月 22:51]

A team of scientists has discovered that applying pressure to a protein found in egg whites and tears can generate electricity. The researchers observed that crystals of lysozyme, a model protein that is abundant in

egg whites of birds as well as in the tears, saliva and milk of mammals can generate electricity when pressed.

- **[Body energy as a power source](#)** [周一, 02 10月 20:56]

Smartphones, MP3 players, sports electronics devices such as pulse meters or trackers, medical equipment such as tonometers, pacemakers of the heart, or insulin pumps: An increasing number of electronic companions make daily life easier for us. But as useful these smart helpers may be: Their constant hunger for electricity is a problem. The solution: power supply by means of energy produced by body movements.

- **[A sea of spinning electrons](#)** [周一, 02 10月 20:48]

Picture two schools of fish swimming in clockwise and counterclockwise circles. It's enough to make your head spin, and now scientists have discovered the 'chiral spin mode' -- a sea of electrons spinning in opposing circles.

- **['Revolutionary' new gesture control tech turns any object into a TV remote](#)** [周一, 02 10月 10:53]

Imagine changing the channel of your TV simply by moving your cup of tea, adjusting the volume on a music player by rolling a toy car, or rotating a spatula to pause a cookery video on your tablet. New gesture control technology that can turn everyday objects into remote controls could revolutionize how we interact with televisions, and other screens - - ending frustrating searches for remotes that have slipped down the side of sofa cushions.

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- [**The skinny on lipid immunology**](#) [周六, 21 10月 02:38]

Scientists reveal new insights into the basis for T cell receptor (TCR) autoreactivity to self-phospholipids, with implications for autoimmune diseases.

- [**The end of pneumonia? New vaccine offers hope**](#)

[周六, 21 10月 02:38]

A new vaccine under development provoked an immune response to 72 forms of the bacteria that's responsible for pneumonia, sepsis and meningitis. That's up from the 23 forms of bacteria covered by current immunizations. The new vaccine, which represents the 'most comprehensive' coverage of pneumococcal disease to date, could greatly reduce the number of deaths from the disease.

- [**Prozac in ocean water a possible threat to sea life**](#) [周六, 21 10月 00:58]

Oregon shore crabs exhibit risky behavior when they're exposed to the antidepressant Prozac, making it easier for predators to catch them, according to a new study.

- [**Parents' alcohol use can set the stage for teenage dating violence, study finds**](#) [周六, 21 10月 00:58]

Having a parent with an alcohol use disorder increases the risk for

dating violence among teenagers, according to a study.

• [**Microfluidics probe 'cholesterol' of the oil industry**](#) [周六, 21 10月 00:58]

Researchers employ microfluidic devices to show how and why dispersants are able to break up deposits of asphaltene that hinder the flow of crude oil in wellheads and pipelines.

• [**US ocean observation critical to understanding climate change, but lacks long-term national planning**](#) [周六, 21 10月 00:57]

Ocean observing systems are important as they provide information essential for monitoring and forecasting changes in Earth's climate on timescales ranging from days to centuries. A new report finds that continuity of ocean observations is vital to gain an accurate understanding of the climate, and calls for a decadal, national plan that is adequately resourced and implemented to ensure critical ocean information is available to understand and predict future changes.

• [**To vape or not to vape? Probably: Not to vape**](#) [周五, 20 10月 22:53]

E-cigarettes appear to trigger unique immune responses as well as the same ones triggered by regular cigarettes, according to new research.

• [**New quantum simulation protocol developed**](#) [周五, 20 10月 22:53]

Researchers are a step closer to understanding quantum mechanics after developing a new quantum simulation protocol.

• [**Innovative smart watch and smart ring**](#) [周五, 20 10月 22:17]

Researchers have developed a smart watch that takes the user to another dimension and a smart ring that provides powerful feedback.

• [**Researchers use novel imaging to predict spinal degeneration**](#) [周五, 20 10月 22:17]

A main cause for spinal disc degeneration is thought to be a change in the water content in the intervertebral disk. A research team used a novel magnetic resonance imaging technique, called apparent diffusion

coefficient (ADC) maps, which directly assessed the movements and dynamics of the water in the intervertebral disk and other spinal structures. The ADC maps provided precise assessments and correlations with degeneration.

• [**Gamma rays will reach beyond the limits of light**](#)

[周五, 20 10月 22:16]

Researchers have discovered a new way to produce high energy photon beams. The new method makes it possible to produce these gamma rays in a highly efficient way, compared with today's technique. The obtained energy is a billion times higher than the energy of photons in visible light. These high intensity gamma rays significantly exceed all known limits, and pave the way towards new fundamental studies.

• [**How obesity promotes breast cancer**](#)

[周五, 20 10月 22:16]

Obesity leads to the release of cytokines into the bloodstream which impact the metabolism of breast cancer cells, making them more aggressive as a result. The research team has already been able to halt this mechanism with an antibody treatment.

• [**How the smallest bacterial pathogens outwit host immune defenses by stealth mechanisms**](#)

[周五, 20 10月 22:16]

Despite their relatively small genome, mycoplasmas can cause persistent and difficult-to-treat infections in humans and animals. A study has shown how mycoplasmas escape the immune response. Mycoplasmas 'mask' themselves: They use their small genome in a clever way and compensate for the loss of an enzyme that is important for this process. This could be shown for the first time in vivo, thus representing a breakthrough in the research of bacterial pathogens.

• [**'Antelope perfume' keeps flies away from cows**](#)

[周五, 20 10月 22:16]

In Africa, tsetse flies transfer the sleeping sickness also to cattle. The damage is estimated to be about 4.6 billion US dollars each year. Experts have developed an innovative way of preventing the disease. Tsetse flies avoid waterbucks, a widespread antelope species in Africa. The scientists imitated the smell of these antelopes.

• [**Chromosomes may be knotted**](#) [周五, 20 10月 22:16]

Little is known about the structures of our genetic material, chromosomes, which consist of long strings that -- according to our experience -- should be likely to become knotted. However, up to now it has not been possible to study this experimentally. Researchers have now found that chromosomes may indeed be knotted.

• [**Carbon coating gives biochar its garden-greening power**](#) [周五, 20 10月 22:16]

New research has demonstrated how composting of biochar creates a very thin organic coating that significantly improves the biochar's fertilizing capabilities.

• [**Can an aspirin a day keep liver cancer away?**](#) [周五, 20 10月 21:30]

A new study found that daily aspirin therapy was significantly associated with a reduced risk in hepatitis B related liver cancer.

• [**Logged tropical rainforests still support biodiversity even when the heat is on**](#) [周五, 20 10月 21:22]

Tropical rainforests continue to buffer wildlife from extreme temperatures even after logging, a new study has revealed.

• [**Physical inactivity and restless sleep exacerbate genetic risk of obesity**](#) [周五, 20 10月 21:22]

Low levels of physical activity and inefficient sleep patterns intensify the effects of genetic risk factors for obesity, according to new results.

• [**Novel 'converter' heralds breakthrough in ultra-fast data processing at nanoscale**](#) [周五, 20 10月 21:22]

Scientists have recently invented a novel 'converter' that can harness the speed and small size of plasmons for high frequency data processing and transmission in nanoelectronics.

• [**Insight into a hidden order seen with high field magnet**](#) [周五, 20 10月 21:22]

A specific uranium compound has puzzled researchers for thirty years.

Although the crystal structure is simple, no one understands exactly what is happening once it is cooled below a certain temperature. Apparently, a 'hidden order' emerges, whose nature is completely unknown. Now physicists have characterized this hidden order state more precisely and studied it on a microscopic scale. To accomplish this, they utilized a high-field magnet that permits neutron experiments to be conducted under co...

- [**'Y' a protein unicorn might matter in glaucoma**](#)

[周五, 20 10月 21:22]

A protein shaped like a 'Y' makes scientists do a double-take and may change the way they think about a protein sometimes implicated in glaucoma. The Y is a centerpiece in myocilin, binding four other components nicknamed propellers together like balloons on strings.

- [**Waterside lighting drastically disrupts wildlife in the surrounding ecosystem**](#)

[周五, 20 10月 21:22]

Streetlights near waterways attract flying insects from the water and change the predator community living in the grass beneath the lights, new research has found. The findings show that artificial night-time lighting could have implications for the surrounding ecosystem and biodiversity, which should be considered when designing new lighting concepts.

- [**Life goes on for marine ecosystems after cataclysmic mass extinction**](#)

[周五, 20 10月 21:22]

One of the largest global mass extinctions did not fundamentally change marine ecosystems, scientists have found.

- [**Delayed word processing could predict patients' potential to develop Alzheimer's disease**](#)

[周五, 20 10月 21:22]

A delayed neurological response to processing the written word could be an indicator that a patient with mild memory problems is at an increased risk of developing Alzheimer's disease, research has discovered.

- [**'Selfish brain' wins out when competing with muscle power, study finds**](#)

[周五, 20 10月 21:22]

New research on our internal trade-off when physical and mental performance are put in direct competition has found that cognition takes less of a hit, suggesting more energy is diverted to the brain than body muscle. Researchers say the findings support the 'selfish brain' theory of human evolution.

• [**Cool roofs have water saving benefits too**](#) [周五, 20 10月 21:22]

The energy and climate benefits of cool roofs have been well established: By reflecting rather than absorbing the sun's energy, light-colored roofs keep buildings, cities, and even the entire planet cooler. Now a new study has found that cool roofs can also save water by reducing how much is needed for urban irrigation.

• [**Experts recommend fewer lab tests for hospitalized patients**](#) [周五, 20 10月 21:22]

Experts have compiled published evidence and crafted an experience-based quality improvement blueprint to reduce repetitive lab testing for hospitalized patients.

• [**New function in gene-regulatory protein discovered**](#) [周五, 20 10月 21:22]

Researchers show how the protein CBP affects the expression of genes through its interaction with the basal machinery that reads the instructions in our DNA.

• [**NASA's MAVEN mission finds Mars has a twisted magnetic tail**](#) [周五, 20 10月 06:18]

Mars has an invisible magnetic 'tail' that is twisted by interaction with the solar wind, according to new research using data from NASA's MAVEN spacecraft.

• [**New NASA study improves search for habitable worlds**](#) [周五, 20 10月 06:18]

New NASA research is helping to refine our understanding of candidate planets beyond our solar system that might support life.

• [**Maternal diet may program child for disease risk, but better nutrition later can change that**](#) [周五, 20 10月 06:18]

A mother's diet during pregnancy, particularly one that is high-fat, may program her baby for future risk of certain diseases such as diabetes, new research shows. The new study shows that switching the offspring to a new diet -- a low-fat diet, in this case -- can reverse that programming.

• [**The birth of a new protein**](#) [周五, 20 10月 05:16]

A yeast protein that evolved from scratch can fold into a compact three-dimensional shape -- contrary to the general understanding of young proteins. Recent evidence suggests new genes can arise from the non-coding sections, or 'junk,' DNA and that those new genes could code for brand-new proteins. Scientists thought such newly evolved proteins were works-in-progress that could not fold into complex shapes the way more ancient proteins do.

• [**Be concerned about how apps collect, share health data, expert says**](#) [周五, 20 10月 05:16]

Americans should be concerned about how health and wellness apps collect, save and share their personal health data, a medical media expert says.

• [**Eye-catching labels stigmatize many healthy foods**](#) [周五, 20 10月 05:16]

Labels such as organic, fair-trade and cage free may be eye-catching but are often free of any scientific basis and stigmatize many healthy foods, a new study found.

• [**Two-dimensional materials gets a new theory for control of properties**](#) [周五, 20 10月 05:16]

Desirable properties including increased electrical conductivity, improved mechanical properties, or magnetism for memory storage or information processing may be possible because of a theoretical method to control grain boundaries in two-dimensional materials, according to

materials scientists.

- [**Climate shifts shorten marine food chain off California**](#) [周五, 20 10月 05:16]

Environmental disturbances such as El Niño shake up the marine food web off Southern California, new research shows, countering conventional thinking that the hierarchy of who-eats-who in the ocean remains largely constant over time.

- [**The microbial anatomy of an organ**](#) [周五, 20 10月 05:16]

The first 3-D spatial visualization tool has been developed for mapping 'omics' data onto whole organs. The tool helps researchers and clinicians understand the effects of chemicals, such as microbial metabolites and medications, on a diseased organ in the context of microbes that also inhabit the region. The work could advance targeted drug delivery for cystic fibrosis and other conditions where medications are unable to penetrate.

- [**Research yields test to predict bitter pit disorder in Honeycrisp apples**](#) [周五, 20 10月 04:43]

A test to determine whether bitter pit -- a disorder that blindsides apple growers by showing up weeks or months after picking -- will develop in stored Honeycrisp apples was developed by a team of researchers, promising to potentially save millions of dollars annually in wasted fruit.

- [**Three million Americans carry loaded handguns daily, study finds**](#) [周五, 20 10月 04:42]

An estimated 3 million adult American handgun owners carry a firearm loaded and on their person on a daily basis, and 9 million do so on a monthly basis, new research indicates. The vast majority cited protection as their primary reason for carrying a firearm. It is the first research in more than 20 years to scrutinize why, how often, and in what manner US adults carry loaded handguns.

- [**TBI laws effective at reducing rate of recurrent concussions, new study shows**](#) [周五, 20 10月 04:42]

A recent study from the Center for Injury Research and Policy at Nationwide Children's Hospital done in conjunction with researchers from Colorado School of Public Health at the University at Colorado and Temple University used data from a large, national sports injury surveillance system to determine the effect of state-level TBI laws on trends of new and recurrent concussions among US high school athletes.

• [**More permissive concealed-carry laws linked to higher homicide rates**](#) [周五, 20 10月 04:42]

Easier access to concealed firearms is associated with significantly higher rates of handgun-related homicide, according to a new study.

• [**Field trips of the future?**](#) [周五, 20 10月 04:42]

A biologist examines the benefits and drawbacks of virtual and augmented reality in teaching environmental science.

• [**Newly discovered viral marker could help predict flu severity in infected patients**](#) [周五, 20 10月 04:42]

Flu viruses contain defective genetic material that may activate the immune system in infected patients, and new research published in PLOS Pathogens suggests that lower levels of these molecules could increase flu severity.

• [**DNA damage found in veterans with Gulf War illness**](#) [周五, 20 10月 04:41]

Researchers say they have found the 'first direct biological evidence' of damage in veterans with Gulf War illness to DNA within cellular structures that produce energy in the body.

• [**The blob that ate the tokamak: Physicists gain understanding of bubbles at edge of plasmas**](#) [周五, 20 10月 03:05]

Scientists have completed new simulations that could provide insight into how blobs at the plasma edge behave. The simulations performed kinetic simulations of two different regions of the plasma edge simultaneously.

- [**Using optical chaos to control the momentum of light**](#) [周五, 20 10月 03:05]

Controlling and moving light poses serious challenges. One major hurdle is that light travels at different speeds and in different phases in different components of an integrated circuit. For light to couple between optical components, it needs to be moving at the same momentum. Now, a team of researchers has demonstrated a new way to control the momentum of broadband light in a widely-used optical component known as a whispering gallery microcavity (WGM).

- [**New tyrannosaur fossil is most complete found in Southwestern US**](#) [周五, 20 10月 02:30]

A fossilized skeleton of a tyrannosaur discovered in Utah's Grand Staircase-Escalante National Monument was airlifted by helicopter Oct 15, and delivered to the Natural History Museum of Utah where it will be uncovered, prepared, and studied. The fossil is approximately 76 million years old and is likely an individual of the species *Teratophoneus curriei*.

- [**Studying insect behavior? Make yourself an ethoscope!**](#) [周五, 20 10月 02:30]

Fruit flies have surprising similarities to humans. The mysteries of a broad range of human conditions can be studied in detail in these organisms, however this often requires the use of expensive custom equipment. team of scientists now present the ethoscope -- a cheap, easy-to-use and self-made customizable piece of equipment of their invention that can be used to study flies' behavior.

- [**Researchers drill down into gene behind frontotemporal lobar degeneration**](#) [周五, 20 10月 02:30]

Mutations in the TMEM106B gene significantly increases a person's risk of frontotemporal lobar degeneration (FTLD), the second most common cause of dementia in those under 65, researchers have demonstrated. While the data confirmed the gene's clinical relevance, it didn't tell researchers how it caused the disease -- which is vital to developing new

therapeutics.

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The skinny on lipid immunology -- ScienceDaily

Phospholipids -- fat molecules that form the membranes found around cells -- make up almost half of the dry weight of cells, but when it comes to autoimmune diseases, their role has largely been overlooked. Recent research has pointed to a role for them in numerous diseases, including psoriasis, contact hypersensitivities and allergies. In a new study published in *Science Immunology*, researchers from Brigham and Women's Hospital and Monash University in Australia reveal new insights into the basis for T cell receptor (TCR) autoreactivity to self-phospholipids, with implications for autoimmune diseases.

"Lipids have been under appreciated in immunology," said co-corresponding author D. Branch Moody, MD, a principal investigator in the Division of Rheumatology, Immunology and Allergy. "We've been interested in autoimmune diseases for decades, and it's thought that in certain autoimmune diseases like psoriasis, multiple

sclerosis and type 1 diabetes are driven by particular tissues. The search for the particular molecules, known as antigens, that trigger autoimmune diseases has focused on proteins and peptides, but we should also be thinking about lipids as candidate antigens for autoimmune disease."

For 30 years, researchers have known that T cells play an important role in autoimmune disorders, but it was thought that T cells could only respond to proteins. Previous studies conducted by investigators at the Brigham provided the first hint that a T cell could also respond to lipids. The newly published study suggests that many T cells can respond lipids, and illuminates the physical structures that make this recognition of lipids possible.

T cells are activated when another key part of the immune system, dendritic cells, present them with an antigen. Moody and his colleagues, Ildiko Van Rhijn and Tan-yun Cheng, set out to detect what molecules were being captured and presented, stimulating a T cell response. Using structural biology, Jamie Rossjohn and Adam Shahine of the Australian Research Council Centre of Excellence in Advanced Molecular Imaging at Monash University in Australia showed how a

protein on the surface of dendritic cells -- known as CD1b -- binds to lipids. This complex of CD1b and a lipid then binds to a T cell receptor, activating an immune response.

"The advanced imaging facilities of the Australian Synchrotron have allowed us to generate three-dimensional models of T-cell receptor interaction against CD1b and lipid antigens," said Shahine. "These results highlight the role of CD1b in a phospholipid-mediated immune response, and grant us a deeper understanding of the mechanisms of lipid-based autoimmune disease."

The work may have implications for specific forms of autoimmune disease, including systemic lupus erythematosus. Previous studies have found that patients with lupus have antibodies that bind to phospholipids, which cause clotting and strokes. The new study shows that T cells also recognize phospholipids, opening up new perspectives on T cell and antibody cooperation in this disease.

"We now have these beautiful, three-dimensional images of how three different molecules can interact, which explains some detail about which part of the

lipid matters. Knowing the precise structure of the complexes involved in this process could be useful for designing new kinds of lipids that could turn on or off the immune response," said Moody.

Story Source:

Materials provided by [Brigham and Women's Hospital](#). *Note: Content may be edited for style and length.*

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The end of pneumonia? New vaccine offers hope: Vaccine under development provides the 'most comprehensive coverage' to date and alleviates antimicrobial concerns, new study finds -- ScienceDaily

In 2004, pneumonia killed more than 2 million children worldwide, according to the World Health Organization. By 2015, the number was less than 1 million.

Better access to antibiotics and improved nutrition account for part of the decline. But scientists say it's mostly due to vaccines introduced in the early 2000s that target up to 23 of the most deadly forms of the bacterium that causes pneumonia, *Streptococcus pneumoniae*.

Now, a new vaccine under development could deal another blow to the disease, lowering the number of deaths even further by targeting dozens of additional

strains of *S. pneumoniae*, and anticipating future versions of the bacteria responsible for pneumococcal disease, which includes sepsis and meningitis.

The vaccine provoked an immune response to 72 forms of *S. pneumoniae* -- including the 23 mentioned above -- in lab tests on animals, according to new research published in the journal *Science Advances*. The study represents the "most comprehensive" coverage of pneumococcal disease to date, researchers say.

"We've made tremendous progress fighting the spread of pneumonia, especially among children. But if we're ever going to rid ourselves of the disease, we need to create smarter and more cost-effective vaccines," says Blaine Pfeifer, PhD, associate professor of chemical and biological engineering at the University at Buffalo's School of Engineering and Applied Sciences, and the study's co-lead author.

The limitation of existing vaccines

Each strain of *S. pneumoniae* contains unique polysaccharides. Vaccines such as Prevnar 13 and Synflorix connect these sugars -- by the sharing of an electron -- to a protein called CRM197. The process,

known as a covalent bond, creates a potent vaccine that prompts the body to find and destroy bacteria before they colonize the body.

While effective, creating covalent bonds for each strain of *S. pneumoniae* is time-consuming and expensive. Plus, this type of immunization, known as a conjugate vaccine, prompts the body to eliminate each of the targeted bacteria types -- regardless of whether the bacteria is idle or attacking the body.

Another vaccine, Pneumovax 23, contains sugars of 23 of the most common types of *S. pneumoniae*. However, the immune response it provokes is not as strong as Prevnar because the sugars are not covalently linked.

"Traditional vaccines completely remove bacteria from the body. But we now know that bacteria -- and in a larger sense, the microbiome -- are beneficial to maintaining good health," says Charles H. Jones, the study's other co-lead author. "What's really exciting is that we now have the ability -- with the vaccine we're developing -- to watch over bacteria and attack it only if it breaks away from the colony to cause an illness. That's important because if we leave the harmless

bacteria in place, it prevents other harmful bacteria from filling that space."

Jones, who earned a PhD while working in Pfeifer's lab, has formed a company, Abcombi Biosciences, to bring the vaccine and other pharmaceutical products to market.

Co-authors of the study from UB's engineering school include Guojian Zhang, Roozbeh Nayerhoda, Marie Beitelshes (also of Abcombi), Andrew Hill (also of Abcombi) and Yi Li; Bruce A. Davidson and Paul Knight III, both faculty members from the Jacobs School of Medicine and Biomedical Sciences at UB; and Pooya Rostami of New York University's Langone Medical Center.

How the new vaccine works

Varieties of *S. pneumoniae* not covered by current immunizations are responsible for a small portion -- for example, 7 to 10 percent among U.S. children -- of pneumonia, meningitis and other cases of pneumococcal disease.

But officials worry that will change, as these less

common forms -- and, potentially, yet-to-be discovered antimicrobial resistant strains -- replace the 23 more common types targeted by current immunizations.

According to results from the study, the new vaccine provokes a strong immune response (comparable to Prevnar) and is engineered in a way that makes it easy to add sugars (like Pneumovax) for a broad immune response.

Key to the technology is a liposome -- a tiny liquid-filled bubble made of fat -- that acts as a storage tank for the sugars. Because the sugars are not covalently bonded, it's possible that the liposome could host all of the sugars that identify individual strains of *S. pneumoniae*.

The research team added proteins at the surface of the liposome (also non-covalently) which, together with the sugars, provoke immunotherapy. According to tests performed on mice and rabbits, the new vaccine stimulated an immune response to 72 of the more than 90 known strains of *S. pneumoniae*. In many cases, it outperformed Prevnar and Pneumovax.

"The advantage of our approach is that we don't have

to apply the more complex covalent chemistry that is required for Prevnar," Pfeifer says. "As a result, we can extend beyond the 13 types of sugars, potentially providing universal coverage against bacteria that cause pneumonia, meningitis, sepsis and other types of pneumococcal disease. It holds the promise of saving hundreds of thousands of lives each year."

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Prozac in ocean water a possible threat to sea life -- ScienceDaily

Oregon shore crabs exhibit risky behavior when they're exposed to the antidepressant Prozac, making it easier for predators to catch them, according to a new study from Portland State University (PSU).

The study, published in the journal *Ecology and Evolution*, illustrates how concentrations of pharmaceuticals found in the environment could pose a risk to animal survival.

For years, tests of seawater near areas of human habitation have shown trace levels of everything from caffeine to prescription medicines. The chemicals are flushed from homes or medical facilities, go into the sewage system, and eventually make their way to the ocean.

In a laboratory, the PSU team exposed Oregon shore crabs to traces of fluoxetine, the active ingredient in Prozac. They found that the crabs increased their foraging behavior, showing less concern for predators

than they normally would. They even did so during the day, when they would normally be in hiding.

They also fought more with members of their own species, often either killing their foe or getting killed in the process.

"The changes we observed in their behaviors may mean that crabs living in harbors and estuaries contaminated with fluoxetine are at greater risk of predation and mortality," said researcher Elise Granek, a professor in PSU's department of Environmental Sciences and Management.

The team received funding from Oregon Sea Grant.

Story Source:

[Materials](#) provided by [Portland State University](#).

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Parents' alcohol use can set the stage for teenage dating violence, study finds -- ScienceDaily

Having a parent with an alcohol use disorder increases the risk for dating violence among teenagers, according to a study from the University at Buffalo Research Institute on Addictions.

In addition, researchers found that the root causes of teen dating violence can be seen as early as infancy.

"Although teen dating violence is typically viewed as a problem related specifically to adolescent development, our findings indicate that the risk for aggressive behavior and involvement in dating violence are related to stressors experienced much earlier in life," says Jennifer A. Livingston, PhD, senior research scientist at RIA and lead author of the study.

Livingston evaluated 144 teenagers who had fathers with an alcohol use disorder and who had been initially recruited for study at 12 months of age. By analyzing

data that was collected regularly over the course of their lifespan, Livingston was able to identify factors that led to some of the teenagers to be involved in abusive dating relationships.

"It appears that family dynamics occurring in the preschool years and in middle childhood are critical in the development of aggression and dating violence in the teenage years," she says.

Mothers living with partners who have alcohol use disorder tended to be more depressed and, as a result, were less warm and sensitive in their interactions with their children, beginning in infancy. "This is significant because children with warm and sensitive mothers are better able to regulate their emotions and behavior," Livingston says. "In addition, there is more marital conflict when there is alcohol addiction."

These conditions can interfere with children's abilities to control their own behavior, resulting in higher levels of aggression in early and middle childhood. Children who are more aggressive in childhood, particularly with their siblings, are more likely to be aggressive with their romantic partners during their teen years.

"Our findings underscore the critical need for early intervention and prevention with families who are at-risk due to alcohol problems. Mothers with alcoholic partners are especially in need of support," Livingston says. "Our research suggests the risk for violence can be lessened when parents are able to be more warm and sensitive in their interactions with their children during the toddler years. This in turn can reduce marital conflict and increase the children's self-control, and ultimately reduce involvement in aggressive behavior."

Story Source:

[Materials](#) provided by [University at Buffalo](#). Original written by Cathy Wilde. *Note: Content may be edited for style and length.*

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Microfluidics probe 'cholesterol' of the oil industry: How dispersants modify asphaltene to keep pipes open -- ScienceDaily

It sounds cliché, but things do get worse before they get better when oil and gas lines are being cleared of contaminants, according to Rice University researchers. Until now, nobody knew exactly why.

Asphaltene is a complex of hydrocarbon molecules found in crude oil. It is the source of valuable asphalt and can also be made into waterproofing and roofing materials, corrosion inhibitors and other products, but when it builds up in a pipeline, it's trouble. Asphaltenes are often called the "cholesterol" of the oil industry since they are known to coagulate and slow or even stop the flow of oil and gas in reservoir rock.

Rice engineer Sibani Lisa Biswal and her colleagues used their unique microfluidic devices, instruments that use a small amount of fluid on a microchip to perform a test, to examine four commercial chemical

dispersants that curtail the buildup of asphaltene in wells and pipelines. The devices allowed them to watch how the dispersants react with asphaltenes.

The Rice-led study appears in the American Chemical Society journal *Energy and Fuels*.

Ensuring flow through pipelines is paramount in oil and gas production, so advances that help keep lines clear are important to the industry. To date, chemical companies have generally performed static bulk tests on anti-asphaltene products, Biswal said.

The Rice lab makes microfluidic devices with microscopic channels through which researchers can watch the dynamics of asphaltene deposition in real time, with or without dispersants and at a variety of flow rates.

"Everything in our system is transparent," Biswal said. "Crude oil hasn't been very compatible with the microfluidic devices others are using (because the channels and pillars are too wide), and the type of devices we're making have only been possible with recent materials. We're one of the early groups to push the idea that we can use these systems to visualize oil

flow processes

The devices allow oil to flow around pillars that are only 125 microns wide and leave channels that are roughly the size of those in oil-bearing formations. Through a microscope, Biswal and lead author and Rice graduate student Yu-Jiun Lin watched as asphaltene formed delta-shaped clumps in front of and behind the pillars, eventually filling in the channels.

When chemical dispersants were added to the crude, the researchers saw something they didn't expect: The deposits appeared even sooner, but then began to break down and fall away in the flow.

Dispersants are designed to make asphaltene particles smaller, and the experiments proved they do. "The idea is, if you make the crude oil nanoparticles smaller, it's less likely that they're going to be able to deposit inside a pipeline or plug porous media," Biswal said.

"But almost all tests up to now have been done on a bulk scale and very few under flowing conditions. Companies were just seeing if their chemicals make particles smaller. And they do. What they didn't understand is that the smaller the particle is, the less

likely it's going to follow the fluid stream. In the presence of dispersants, deposits can actually get worse."

The saving grace, she said, is that dispersants appear to chemically alter asphaltene by increasing repulsion between the aggregates. That makes it more difficult for particles to stick together. "We refer to them as softer asphaltenes," Biswal said. "It doesn't take much force to break up large aggregates."

Lin said dispersant manufacturers typically use liters of crude oil in each test. "We just need a milliliter of crude, and we get better resolution than they do," he said. "When the asphaltene content is very low, traditional methods fail to see a difference in chemicals, or even a deposit."

Co-authors of the paper are postdoctoral researcher Peng He, lecturer Mohammad Tavakkoli and Francisco Vargas, an assistant professor of chemical and biomolecular engineering, all from Rice; Nevin Thunduvila Mathew, Yap Yit Fatt and Afshin Goharzadeh of the Petroleum Institute, Abu Dhabi, United Arab Emirates; and John Chai, a professor of engineering and technology at the University of

Huddersfield, United Kingdom. Biswal is an associate professor of chemical and biomolecular engineering and of materials science and nanoengineering.

The Abu Dhabi National Oil Co., the Abu Dhabi Oil research and development subcommittee and the Petroleum Institute supported the research.

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All Top News

Top science stories featured on ScienceDaily's home page.

- [**Life goes on for marine ecosystems after cataclysmic mass extinction**](#) [周五, 20 10月 21:22]

One of the largest global mass extinctions did not fundamentally change marine ecosystems, scientists have found.

- [**NASA's MAVEN mission finds Mars has a twisted magnetic tail**](#) [周五, 20 10月 06:18]

Mars has an invisible magnetic 'tail' that is twisted by interaction with the solar wind, according to new research using data from NASA's MAVEN spacecraft.

- [**New NASA study improves search for habitable worlds**](#) [周五, 20 10月 06:18]

New NASA research is helping to refine our understanding of candidate planets beyond our solar system that might support life.

- [**Climate shifts shorten marine food chain off California**](#) [周五, 20 10月 05:16]

Environmental disturbances such as El Niño shake up the marine food web off Southern California, new research shows, countering conventional thinking that the hierarchy of who-eats-who in the ocean remains largely constant over time.

- [**Field trips of the future?**](#) [周五, 20 10月 04:42]

A biologist examines the benefits and drawbacks of virtual and augmented reality in teaching environmental science.

- [**DNA damage found in veterans with Gulf War**](#)

[**illness**](#) [周五, 20 10月 04:41]

Researchers say they have found the 'first direct biological evidence' of damage in veterans with Gulf War illness to DNA within cellular structures that produce energy in the body.

. [**New tyrannosaur fossil is most complete found in Southwestern US**](#) [周五, 20 10月 02:30]

A fossilized skeleton of a tyrannosaur discovered in Utah's Grand Staircase-Escalante National Monument was airlifted by helicopter Oct 15, and delivered to the Natural History Museum of Utah where it will be uncovered, prepared, and studied. The fossil is approximately 76 million years old and is likely an individual of the species *Teratophoneus curriei*.

. [**Ancient DNA offers new view on saber-toothed cats' past**](#) [周五, 20 10月 02:30]

Researchers who've analyzed the complete mitochondrial genomes from ancient samples representing two species of saber-toothed cats have a new take on the animals' history over the last 50,000 years. The data suggest that the saber-toothed cats shared a common ancestor with all living cat-like species about 20 million years ago. The two saber-toothed cat species under study diverged from each other about 18 million years ago.

. [**Evolution in your back garden: Great tits may be adapting their beaks to birdfeeders**](#) [周五, 20 10月 02:30]

A British enthusiasm for feeding birds may have caused UK great tits to have evolved longer beaks than their European counterparts, according to new research. The findings identify for the first time the genetic differences between UK and Dutch great tits which researchers were then able to link to longer beaks in UK birds.

. [**H7N9 influenza is both lethal and transmissible in animal model for flu**](#) [周五, 20 10月 02:30]

In 2013, an influenza virus began circulating among poultry in China. It

caused several waves of human infection and as of late July 2017, nearly 1,600 people had tested positive for avian H7N9. Nearly 40 percent of those infected had died. In 2017, a medical researcher received a sample of H7N9 virus isolated from a patient in China who had died of the flu. He and his research team subsequently began work to characterize and understand it.

- [**Liquid metal discovery ushers in new wave of chemistry and electronics**](#) [周五, 20 10月 02:30]

Researchers use liquid metal to create atom-thick 2-D never before seen in nature. The research could transform how we do chemistry and could also be applied to enhance data storage and make faster electronics.

- [**Six degrees of separation: Why it is a small world after all**](#) [周四, 19 10月 23:10]

This study examines how small-world networks occur within bigger and more complex structures.

- [**Itsy bitsy spider: Fear of spiders and snakes is deeply embedded in us**](#) [周四, 19 10月 23:09]

Snakes and spiders evoke fear and disgust in many people, even in developed countries where hardly anybody comes into contact with them. Until now, there has been debate about whether this aversion is innate or learnt. Scientists have recently discovered that it is hereditary: Even babies feel stressed when seeing these creatures - long before they could have learnt this reaction.

- [**A mosquito's secret weapon: a light touch and strong wings**](#) [周四, 19 10月 22:10]

How do mosquitoes land and take off without our noticing? Using high-speed video cameras, researchers have found part of the answer: mosquitoes' long legs allow them to slowly and gently push off, but their wings provide the majority of the lift, even when fully laden with a blood meal. For comparison, mosquitoes push off with forces much less than those of an escaping fruit fly.

• [**Noxious ice cloud on Saturn's moon Titan**](#) [周四, 19 10月 22:10]

Researchers with NASA's Cassini mission found evidence of a toxic hybrid ice in a wispy cloud high above the south pole of Saturn's largest moon, Titan.

• [**Scientists pinpoint jealousy in the monogamous mind**](#) [周四, 19 10月 22:10]

Scientists find that in male titi monkeys, jealousy is associated with heightened activity in the cingulate cortex, an area of the brain associated with social pain in humans, and the lateral septum, associated with pair bond formation in primates. A better understanding of jealousy may provide important clues on how to approach health and welfare problems such as addiction and domestic violence, as well as autism.

• [**Slow Internet? New technology to speed up home broadband dramatically**](#) [周四, 19 10月 22:10]

Slow internet speeds and the Internet 'rush hour' -- the peak time when data speeds drop by up to 30 percent -- could be history with new hardware that provides consistently high-speed broadband connectivity.

• [**Fossil coral reefs show sea level rose in bursts during last warming**](#) [周四, 19 10月 22:09]

Scientists have discovered that Earth's sea level did not rise steadily when the planet's glaciers last melted during a period of global warming; rather, sea level rose sharply in punctuated bursts.

• [**Dogs are more expressive when someone is looking**](#) [周四, 19 10月 22:09]

Dogs produce more facial expressions when humans are looking at them, according to new research.

• [**More than 75 percent decrease in total flying insect biomass over 27 years across Germany**](#) [周四, 19 10月 22:09]

The total flying insect biomass decreased by more than 75 percent over 27 years in protected areas in Germany, according to a new study.

- [**Salmon sex linked to geological change**](#) [周四, 19 10月 22:08]

It turns out that sex can move mountains. Researchers have found that the mating habits of salmon can alter the profile of stream beds, affecting the evolution of an entire watershed. The study is one of the first to quantitatively show that salmon can influence the shape of the land.

- [**Want to control your dreams? Here's how you can**](#) [周四, 19 10月 22:08]

New research has found that a specific combination of techniques will increase people's chances of having lucid dreams, in which the dreamer is aware they're dreaming while it's still happening and can control the experience.

- [**Scientists dig into the origin of organics on dwarf planet Ceres**](#) [周四, 19 10月 03:18]

Since NASA's Dawn spacecraft detected localized organic-rich material on Ceres, scientists have been digging into the data to explore different scenarios for its origin. After considering the viability of comet or asteroid delivery, the preponderance of evidence suggests the organics are most likely native to Ceres.

- [**Understanding the coevolving web of life as a network**](#) [周四, 19 10月 01:32]

Coevolution, which occurs when species interact and adapt to each other, is often studied in the context of pair-wise interactions between mutually beneficial symbiotic partners. But many species have mutualistic interactions with multiple partners, leading to complex networks of interacting species.

- [**Nature or nurture? Innate social behaviors in the mouse brain**](#) [周四, 19 10月 01:29]

The brain circuitry that controls innate, or instinctive, behaviors such as mating and fighting was thought to be genetically hardwired. Not so, neuroscientists now say.

• [**Inflammation trains the skin to heal faster**](#) [周四, 19 10月 01:28]

Stem cells in the skin remember an injury, helping them close recurring wounds faster, researchers have found. The discovery could advance research and treatment of psoriasis and other inflammatory diseases.

• [**Petals produce a 'blue halo' that helps bees find flowers**](#) [周四, 19 10月 01:28]

Latest research has found that several common flower species have nanoscale ridges on the surface of their petals that meddle with light when viewed from certain angles.

• [**Solar eruptions could electrify Martian moons**](#) [周四, 19 10月 00:41]

Powerful solar eruptions could electrically charge areas of the Martian moon Phobos to hundreds of volts, presenting a complex electrical environment that could possibly affect sensitive electronics carried by future robotic explorers, according to a new NASA study. The study also considered electrical charges that could develop as astronauts transit the surface on potential human missions to Phobos.

• [**Stiff fibers spun from slime**](#) [周三, 18 10月 23:35]

Nanoparticles from the secretion of velvet worms form recyclable polymer fibers.

• [**Potential human habitat located on the moon**](#) [周三, 18 10月 22:43]

A new study confirms the existence of a large open lava tube in the Marius Hills region of the moon, which could be used to protect astronauts from hazardous conditions on the surface.

• [**Ancient preen oil: Researchers discover 48-million-year-old lipids in a fossil bird**](#) [周三, 18 10月 21:12]

As a rule, soft parts do not withstand the ravages of time; hence, the majority of vertebrate fossils consist only of bones. Under these circumstances, a new discovery from the UNESCO World Heritage Site “Messel Pit” near Darmstadt in Germany comes as an even bigger surprise: a 48-million-year old skin gland from a bird, containing lipids of the same age. The oldest lipids ever recorded in a fossil vertebrate

were used by the bird to preen its plumage.

- [**Battling flames increases firefighters' exposure to carcinogens**](#) [周三, 18 10月 21:02]

The threat of getting burned by roaring flames is an obvious danger of firefighting, but other health risks are more subtle. For example, firefighters have been found to develop cancer at higher rates than the general population. Now researchers have measured how much firefighters' exposure to carcinogens and other harmful compounds increases when fighting fires. Their study also points to one possible way to reduce that exposure.

- [**Navigational view of the brain thanks to powerful X-rays**](#) [周三, 18 10月 04:37]

Imagine Google Earth with only the street view and a far-away satellite view but not much of a map view. Brain imaging, for the most part, has been missing just that, and a lot of research on how the brain computes happens on that map-like level. New imaging tackles this special view of the brain with the highest-energy X-rays in the country that illuminate thick sections of a mouse brain.

- [**New research opens the door to 'functional cure' for HIV**](#) [周三, 18 10月 03:30]

Scientists have for the first time shown that a novel compound effectively suppresses production of the virus in chronically infected cells.

- [**How we determine who's to blame**](#) [周三, 18 10月 00:44]

Using eye-tracking technology, cognitive scientists have obtained the first direct evidence that people use a process called counterfactual simulation to imagine how a situation could have played out differently to assign responsibility for an outcome.

- [**Flexible 'skin' can help robots, prosthetics perform everyday tasks by sensing shear force**](#) [周三, 18 10月 00:43]

Engineers have developed a flexible sensor 'skin' that can be stretched

over any part of a robot's body or prosthetic to accurately convey information about shear forces and vibration, which are critical to tasks ranging from cooking an egg to dismantling a bomb.

- [**Study reshapes understanding of climate change's impact on early societies**](#) [周三, 18 10月 00:43]

A new study linking paleoclimatology -- the reconstruction of past global climates -- with historical analysis shows a link between environmental stress and its impact on the economy, political stability, and war-fighting capacity of ancient Egypt.

- [**Scientists determine source of world's largest mud eruption**](#) [周二, 17 10月 23:43]

More than 11 years after the Lusi mud volcano first erupted on the Indonesian island of Java, researchers may have figured out why the mudflows haven't stopped: deep underground, Lusi is connected to a nearby volcanic system.

- [**Study shows how water could have flowed on 'cold and icy' ancient Mars**](#) [周二, 17 10月 23:43]

Research by planetary scientists finds that periodic melting of ice sheets on a cold early Mars would have created enough water to carve the ancient valleys and lakebeds seen on the planet today.

- [**What training exercise boosts brain power best? New research finds out**](#) [周二, 17 10月 23:43]

One of the two brain-training methods most scientists use in research is significantly better in improving memory and attention. It also results in more significant changes in brain activity.

- [**Domestication has not made dogs cooperate more with each other compared to wolves**](#) [周二, 17 10月 23:01]

Following domestication, dogs should be more tolerant and cooperative with conspecifics and humans compared to wolves. But looking at both in more naturalistic living conditions, however, speaks for more cooperative behavior of wolves. Researchers now show that the wild

ancestors are excelling their domesticated relatives in teamwork. In an experimental approach dogs but not wolves failed to cooperatively pull the two ends of a rope to obtain a piece of food.

- [**Keratin, proteins from 54-million-year-old sea turtle show survival trait evolution**](#) [周二, 17 10月 21:18]

Researchers have retrieved original pigment, beta-keratin and muscle proteins from a 54-million-year-old sea turtle hatchling. The work adds to the growing body of evidence supporting persistence of original molecules over millions of years and also provides direct evidence that a pigment-based survival trait common to modern sea turtles evolved at least 54 million years ago.

- [**Filling the early universe with knots can explain why the world is three-dimensional**](#) [周二, 17 10月 07:03]

Filling the universe with knots shortly after it popped into existence 13.8 billion years ago provides a neat explanation for why we inhabit a three-dimensional world. That is the basic idea advanced by an out-of-the-box theory developed by an international team of physicists.

- [**Whales and dolphins have rich 'human-like' cultures and societies**](#) [周二, 17 10月 00:22]

Whales and dolphins (cetaceans) live in tightly-knit social groups, have complex relationships, talk to each other and even have regional dialects -- much like human societies. A major new study has linked the complexity of Cetacean culture and behavior to the size of their brains.

- [**Bite on this: Alligators caught eating sharks**](#) [周二, 17 10月 00:21]

Jaws, beware! Alligators may be coming for you. A new study documents American alligators on the Atlantic and Gulf coasts are eating small sharks and stingrays. This is the first scientific documentation of a widespread interaction between the two predators.

- [**Hubble observes source of gravitational waves for the first time**](#) [周二, 17 10月 00:21]

The NASA/ESA Hubble Space Telescope has observed for the first time

the source of a gravitational wave, created by the merger of two neutron stars. This merger created a kilonova -- an object predicted by theory decades ago -- that ejects heavy elements such as gold and platinum into space. This event also provides the strongest evidence yet that short duration gamma-ray bursts are caused by mergers of neutron stars.

• [**Radio 'eyes' unlocking secrets of neutron-star collision**](#) [周一, 16 10月 22:28]

When a pair of superdense neutron stars collided and potentially formed a black hole in a galaxy 130 million light-years from Earth, they unleashed not only a train of gravitational waves but also an ongoing torrent of radio waves that are answering some of the biggest questions about the nature of such a cataclysmic event.

• [**Astronomers strike cosmic gold, confirm origin of precious metals in neutron star mergers**](#) [周一, 16 10月 22:28]

What many thought would be a long way off, the detection of gravitational waves from the merger of binary neutron stars, actually happened on Aug. 17. The observation of a blue and then red glow from the radioactive debris cloud left behind matched simulations of what the merger should look like, proving that such mergers are the source of most of the very heavy elements in the universe, including gold.

• [**Harvey runoff menaces Texas' coral reefs**](#) [周一, 16 10月 22:28]

The more than 13 trillion gallons of floodwater from Hurricane Harvey have created a massive plume of freshwater in the Gulf of Mexico that is threatening the coral reefs of the Flower Garden Banks National Marine Sanctuary about 100 miles offshore of Galveston.

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Health News

Top stories featured on ScienceDaily's Health & Medicine, Mind & Brain, and Living Well sections.

- [**The skinny on lipid immunology**](#) [周六, 21 10月 02:38]
Scientists reveal new insights into the basis for T cell receptor (TCR) autoreactivity to self-phospholipids, with implications for autoimmune diseases.
- [**The end of pneumonia? New vaccine offers hope**](#) [周六, 21 10月 02:38]
A new vaccine under development provoked an immune response to 72 forms of the bacteria that's responsible for pneumonia, sepsis and meningitis. That's up from the 23 forms of bacteria covered by current immunizations. The new vaccine, which represents the 'most comprehensive' coverage of pneumococcal disease to date, could greatly reduce the number of deaths from the disease.
- [**Parents' alcohol use can set the stage for teenage dating violence, study finds**](#) [周六, 21 10月 00:58]
Having a parent with an alcohol use disorder increases the risk for dating violence among teenagers, according to a study.
- [**To vape or not to vape? Probably: Not to vape**](#) [周五, 20 10月 22:53]
E-cigarettes appear to trigger unique immune responses as well as the same ones triggered by regular cigarettes, according to new research.
- [**Researchers use novel imaging to predict spinal degeneration**](#) [周五, 20 10月 22:17]
A main cause for spinal disc degeneration is thought to be a change in the water content in the intervertebral disk. A research team used a novel magnetic resonance imaging technique, called apparent diffusion

coefficient (ADC) maps, which directly assessed the movements and dynamics of the water in the intervertebral disk and other spinal structures. The ADC maps provided precise assessments and correlations with degeneration.

- [**How obesity promotes breast cancer**](#) [周五, 20 10月 22:16]

Obesity leads to the release of cytokines into the bloodstream which impact the metabolism of breast cancer cells, making them more aggressive as a result. The research team has already been able to halt this mechanism with an antibody treatment.

- [**How the smallest bacterial pathogens outwit host immune defenses by stealth mechanisms**](#) [周五, 20 10月 22:16]

Despite their relatively small genome, mycoplasmas can cause persistent and difficult-to-treat infections in humans and animals. A study has shown how mycoplasmas escape the immune response. Mycoplasmas 'mask' themselves: They use their small genome in a clever way and compensate for the loss of an enzyme that is important for this process. This could be shown for the first time in vivo, thus representing a breakthrough in the research of bacterial pathogens.

- [**Chromosomes may be knotted**](#) [周五, 20 10月 22:16]

Little is known about the structures of our genetic material, chromosomes, which consist of long strings that -- according to our experience -- should be likely to become knotted. However, up to now it has not been possible to study this experimentally. Researchers have now found that chromosomes may indeed be knotted.

- [**Can an aspirin a day keep liver cancer away?**](#) [周五, 20 10月 21:30]

A new study found that daily aspirin therapy was significantly associated with a reduced risk in hepatitis B related liver cancer.

- [**Physical inactivity and restless sleep exacerbate genetic risk of obesity**](#) [周五, 20 10月 21:22]

Low levels of physical activity and inefficient sleep patterns intensify the effects of genetic risk factors for obesity, according to new results.

- **['Y' a protein unicorn might matter in glaucoma](#)**

[周五, 20 10月 21:22]

A protein shaped like a 'Y' makes scientists do a double-take and may change the way they think about a protein sometimes implicated in glaucoma. The Y is a centerpiece in myocilin, binding four other components nicknamed propellers together like balloons on strings.

- **[Delayed word processing could predict patients' potential to develop Alzheimer's disease](#)**

[周五, 20 10月 21:22]

A delayed neurological response to processing the written word could be an indicator that a patient with mild memory problems is at an increased risk of developing Alzheimer's disease, research has discovered.

- **['Selfish brain' wins out when competing with muscle power, study finds](#)**

[周五, 20 10月 21:22]

New research on our internal trade-off when physical and mental performance are put in direct competition has found that cognition takes less of a hit, suggesting more energy is diverted to the brain than body muscle. Researchers say the findings support the 'selfish brain' theory of human evolution.

- **[Experts recommend fewer lab tests for hospitalized patients](#)**

[周五, 20 10月 21:22]

Experts have compiled published evidence and crafted an experience-based quality improvement blueprint to reduce repetitive lab testing for hospitalized patients.

- **[New function in gene-regulatory protein discovered](#)**

[周五, 20 10月 21:22]

Researchers show how the protein CBP affects the expression of genes through its interaction with the basal machinery that reads the instructions in our DNA.

- **[Maternal diet may program child for disease risk, but better nutrition later can change that](#)**

[周五, 20 10月 06:18]

A mother's diet during pregnancy, particularly one that is high-fat, may

program her baby for future risk of certain diseases such as diabetes, new research shows. The new study shows that switching the offspring to a new diet -- a low-fat diet, in this case -- can reverse that programming.

- [**The birth of a new protein**](#) [周五, 20 10月 05:16]

A yeast protein that evolved from scratch can fold into a compact three-dimensional shape -- contrary to the general understanding of young proteins. Recent evidence suggests new genes can arise from the non-coding sections, or 'junk,' DNA and that those new genes could code for brand-new proteins. Scientists thought such newly evolved proteins were works-in-progress that could not fold into complex shapes the way more ancient proteins do.

- [**Be concerned about how apps collect, share health data, expert says**](#) [周五, 20 10月 05:16]

Americans should be concerned about how health and wellness apps collect, save and share their personal health data, a medical media expert says.

- [**Eye-catching labels stigmatize many healthy foods**](#) [周五, 20 10月 05:16]

Labels such as organic, fair-trade and cage free may be eye-catching but are often free of any scientific basis and stigmatize many healthy foods, a new study found.

- [**The microbial anatomy of an organ**](#) [周五, 20 10月 05:16]

The first 3-D spatial visualization tool has been developed for mapping 'omics' data onto whole organs. The tool helps researchers and clinicians understand the effects of chemicals, such as microbial metabolites and medications, on a diseased organ in the context of microbes that also inhabit the region. The work could advance targeted drug delivery for cystic fibrosis and other conditions where medications are unable to penetrate.

- [**Three million Americans carry loaded handguns daily, study finds**](#) [周五, 20 10月 04:42]

An estimated 3 million adult American handgun owners carry a firearm loaded and on their person on a daily basis, and 9 million do so on a monthly basis, new research indicates. The vast majority cited protection as their primary reason for carrying a firearm. It is the first research in more than 20 years to scrutinize why, how often, and in what manner US adults carry loaded handguns.

- [**TBI laws effective at reducing rate of recurrent concussions, new study shows**](#) [周五, 20 10月 04:42]

A recent study from the Center for Injury Research and Policy at Nationwide Children's Hospital done in conjunction with researchers from Colorado School of Public Health at the University at Colorado and Temple University used data from a large, national sports injury surveillance system to determine the effect of state-level TBI laws on trends of new and recurrent concussions among US high school athletes.

- [**More permissive concealed-carry laws linked to higher homicide rates**](#) [周五, 20 10月 04:42]

Easier access to concealed firearms is associated with significantly higher rates of handgun-related homicide, according to a new study.

- [**Newly discovered viral marker could help predict flu severity in infected patients**](#) [周五, 20 10月 04:42]

Flu viruses contain defective genetic material that may activate the immune system in infected patients, and new research published in PLOS Pathogens suggests that lower levels of these molecules could increase flu severity.

- [**DNA damage found in veterans with Gulf War illness**](#) [周五, 20 10月 04:41]

Researchers say they have found the 'first direct biological evidence' of damage in veterans with Gulf War illness to DNA within cellular structures that produce energy in the body.

- [**Researchers drill down into gene behind frontotemporal lobar degeneration**](#) [周五, 20 10月 02:30]

Mutations in the TMEM106B gene significantly increases a person's risk of frontotemporal lobar degeneration (FTLD), the second most common cause of dementia in those under 65, researchers have demonstrated. While the data confirmed the gene's clinical relevance, it didn't tell researchers how it caused the disease -- which is vital to developing new therapeutics.

- [**Flu simulations suggest pandemics more likely in spring, early summer**](#) [周五, 20 10月 02:30]

New statistical simulations suggest that Northern Hemisphere flu pandemics are most likely to emerge in late spring or early summer at the tail end of the normal flu season, according to a new study.

- [**Brain training can improve our understanding of speech in noisy places**](#) [周五, 20 10月 02:30]

For many people with hearing challenges, trying to follow a conversation in a crowded restaurant or other noisy venue is a major struggle, even with hearing aids. Now researchers have some good news: time spent playing a specially designed, brain-training audiogame could help.

- [**Gut bacteria from wild mice boost health in lab mice**](#) [周五, 20 10月 02:30]

Laboratory mice that are given the gut bacteria of wild mice can survive a deadly flu virus infection and fight colorectal cancer dramatically better than laboratory mice with their own gut bacteria, researchers report.

- [**H7N9 influenza is both lethal and transmissible in animal model for flu**](#) [周五, 20 10月 02:30]

In 2013, an influenza virus began circulating among poultry in China. It caused several waves of human infection and as of late July 2017, nearly 1,600 people had tested positive for avian H7N9. Nearly 40 percent of those infected had died. In 2017, a medical researcher received a sample of H7N9 virus isolated from a patient in China who had died of the flu. He and his research team subsequently began work to characterize and

understand it.

- [**Study shows how nerves drive prostate cancer**](#) [周五, 20 10月 02:30]

Certain nerves sustain prostate cancer growth by triggering a switch that causes tumor vessels to proliferate, show researchers. Their earlier research -- which first implicated nerves in fueling prostate cancer -- has prompted a pilot study testing whether beta blockers (commonly used for treating hypertension) can kill cancer cells in tumors of men diagnosed with prostate cancer.

- [**Brain takes seconds to switch modes during tasks**](#) [周五, 20 10月 02:29]

The brain rapidly switches between operational modes in response to tasks and what is replayed can predict how well a task will be completed, according to a new study in rats.

- [**Tracing cell death pathway points to drug targets for brain damage, kidney injury, asthma**](#) [周五, 20 10月 02:29]

Scientists are unlocking the complexities of a recently discovered cell death process that plays a key role in health and disease, and new findings link their discovery to asthma, kidney injury and brain trauma. The results are the early steps toward drug development that could transform emergency and critical care treatment.

- [**Discovery lights path for Alzheimer's research**](#) [周五, 20 10月 02:29]

A metallic probe invented at Rice University that lights up when it binds to a misfolded amyloid beta peptide has identified a binding site that could facilitate better drugs to treat Alzheimer's disease. When the probe is illuminated, it catalyzes oxidation of the protein in a way that might keep it from aggregating in the brains of patients.

- [**Gene circuit switches on inside cancer cells, triggers immune attack**](#) [周五, 20 10月 02:29]

Researchers have developed a synthetic gene circuit that triggers the body's immune system to attack cancers when it detects signs of the disease.

- **[Country's prevalence of visual impairment, blindness associated with level of socioeconomic develop](#)** [周五, 20 10月 02:29]

In an analysis of data for 190 countries and territories, those with higher levels of socioeconomic development had a lower prevalence of visual impairment and blindness, according to a study.

- **[Childhood cancer survivors commonly stay at jobs to keep health insurance, new study finds](#)** [周五, 20 10月 02:29]

A significant number of childhood cancer survivors are worried about keeping their health insurance, to the point of letting it affect their career decisions, the results of a national cancer survey find.

- **[Renewable resource: To produce vital lipoic acid, sulfur is used, then replenished](#)** [周五, 20 10月 02:29]

New research shows how a protein is consumed, then reconstituted, during the production of a compound required for converting energy from food into a form that can be used by our cells. The results could help scientists to understand why humans with a fatal condition -- defects in an iron-sulfur carrier gene -- have deficiencies in this lipoic acid compound.

- **[One to 10 mutations are needed to drive cancer, scientists find](#)** [周五, 20 10月 02:29]

For the first time, scientists have provided unbiased estimates of the number of mutations needed for cancers to develop, in a study of more than 7,500 tumors across 29 cancer types. Researchers have adapted a technique from the field of evolution to confirm that, on average, one to ten driver mutations are needed for cancer to emerge.

- **[Key psychiatric drug target comes into focus](#)** [周五, 20 10月 02:29]

One way or another, many psychiatric drugs work by binding to receptor molecules in the brain that are sensitive to the neurotransmitter dopamine, a chemical signal that is central to how our experiences shape

our behavior. But because scientists still don't understand the differences between the many kinds of dopamine receptors present on brain cells, most of these drugs are 'messy,' binding to multiple different dopamine receptor molecules and leading to serious side effects ranging from moveme...

- [**Insulin signaling molecule in liver controls levels of triglyceride in blood**](#) [周五, 20 10月 02:28]

A new animal study shows how insulin controls the movement and storage of fat molecules in the liver and how a breakdown in this system could lead to non-alcoholic fatty liver disease and changes in circulating lipid levels associated with cardiovascular disease.

- [**Shifting relationship between flexibility, modularity in the brain, researchers find**](#) [周五, 20 10月 02:28]

A new study has found negative correlation between flexibility and modularity in the brain. Understanding how they interact is essential to the advance of neuroscience, the researchers said. Flexibility allows for better performance on complex tasks, and modularity allows proficiency on simple tasks.

- [**Gut bacterium indirectly causes symptoms by altering fruit fly microbiome**](#) [周五, 20 10月 02:27]

CagA, a protein produced by the bacterium *Helicobacter pylori*, can alter the population of microbes living in the fruit fly gut, leading to disease symptoms, according to new research.

- [**New machine learning system can automatically identify shapes of red blood cells**](#) [周五, 20 10月 02:26]

Using a computational approach known as deep learning, scientists have developed a new system to classify the shapes of red blood cells in a patient's blood. The findings, published in *PLOS Computational Biology*, could potentially help doctors monitor people with sickle cell disease.

- [**Fundamental research enhances understanding**](#)

[of major cancer gene](#) [周五, 20 10月 02:21]

Scientists have provided new insights into the role of PTEN, a major cancer gene, in controlling cell growth and behavior. PTEN is the second most commonly altered gene in human cancers, particularly prostate cancers, and this work could help to develop and target new treatments.

• [Key molecular link in major cell growth pathway](#) [周五, 20 10月 01:45]

A team of scientists has uncovered a surprising molecular link that connects how cells regulate growth with how they sense and make available the nutrients required for growth. The researchers' findings also implicate a new protein, SLC38A9, as a potential drug target in pancreatic cancer.

• [Genetic influences on the brain's reward, stress systems underlie co-occurring alcohol use disorder, chronic pain](#) [周五, 20 10月 00:38]

Alcohol use disorder (AUD) often co-occurs with chronic pain (CP), yet the relationship between the two is complex – involving genetic, neurophysiological, and behavioral elements – and is poorly understood. This review addressed the genetic influences on brain reward and stress systems that neurological research suggests may contribute to the co-occurrence of AUD and CP.

• [Last unknown structure of HIV-1 solved, another step in efforts to disarm the AIDS virus](#) [周五, 20 10月 00:37]

Researchers have solved the last unknown protein structure of HIV-1, the retrovirus that can cause AIDS. This will further explain how the virus infects human cells and how progeny viruses are assembled and released from infected cells.

• [Cell biology: Cleaning up? Not without helpers](#) [周五, 20 10月 00:18]

Scientists explain assembly and transport function of 'old' calcium pumps by 'new' partner proteins.

[Psychologists develop new model that links emotions and mental health](#) [周五, 20 10月 00:18]

For decades psychologists have studied how people regulate emotions using a multitude of ways to conceptualize and assess emotion regulation. Now a recent study shows how a new assessment model can give clinicians an exciting new way to think about clinical diagnoses including anxiety, mood, and developmental disorders.

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

• [**Microfluidics probe 'cholesterol' of the oil industry**](#) [周六, 21 10月 00:58]

Researchers employ microfluidic devices to show how and why dispersants are able to break up deposits of asphaltene that hinder the flow of crude oil in wellheads and pipelines.

• [**New quantum simulation protocol developed**](#) [周五, 20 10月 22:53]

Researchers are a step closer to understanding quantum mechanics after developing a new quantum simulation protocol.

• [**Innovative smart watch and smart ring**](#) [周五, 20 10月 22:17]

Researchers have developed a smart watch that takes the user to another dimension and a smart ring that provides powerful feedback.

• [**Gamma rays will reach beyond the limits of light**](#) [周五, 20 10月 22:16]

Researchers have discovered a new way to produce high energy photon beams. The new method makes it possible to produce these gamma rays in a highly efficient way, compared with today's technique. The obtained energy is a billion times higher than the energy of photons in visible light. These high intensity gamma rays significantly exceed all known limits, and pave the way towards new fundamental studies.

• [**Novel 'converter' heralds breakthrough in ultra-fast data processing at nanoscale**](#) [周五, 20 10月 21:22]

Scientists have recently invented a novel 'converter' that can harness the speed and small size of plasmons for high frequency data processing and transmission in nanoelectronics.

[**Insight into a hidden order seen with high field magnet**](#) [周五, 20 10月 21:22]

A specific uranium compound has puzzled researchers for thirty years. Although the crystal structure is simple, no one understands exactly what is happening once it is cooled below a certain temperature. Apparently, a 'hidden order' emerges, whose nature is completely unknown. Now physicists have characterized this hidden order state more precisely and studied it on a microscopic scale. To accomplish this, they utilized a high-field magnet that permits neutron experiments to be conducted under co...

[**Cool roofs have water saving benefits too**](#) [周五, 20 10月 21:22]

The energy and climate benefits of cool roofs have been well established: By reflecting rather than absorbing the sun's energy, light-colored roofs keep buildings, cities, and even the entire planet cooler. Now a new study has found that cool roofs can also save water by reducing how much is needed for urban irrigation.

[**NASA's MAVEN mission finds Mars has a twisted magnetic tail**](#) [周五, 20 10月 06:18]

Mars has an invisible magnetic 'tail' that is twisted by interaction with the solar wind, according to new research using data from NASA's MAVEN spacecraft.

[**New NASA study improves search for habitable worlds**](#) [周五, 20 10月 06:18]

New NASA research is helping to refine our understanding of candidate planets beyond our solar system that might support life.

[**Be concerned about how apps collect, share health data, expert says**](#) [周五, 20 10月 05:16]

Americans should be concerned about how health and wellness apps collect, save and share their personal health data, a medical media expert says.

[**Two-dimensional materials gets a new theory for**](#)

[control of properties](#) [周五, 20 10月 05:16]

Desirable properties including increased electrical conductivity, improved mechanical properties, or magnetism for memory storage or information processing may be possible because of a theoretical method to control grain boundaries in two-dimensional materials, according to materials scientists.

• [The microbial anatomy of an organ](#) [周五, 20 10月 05:16]

The first 3-D spatial visualization tool has been developed for mapping 'omics' data onto whole organs. The tool helps researchers and clinicians understand the effects of chemicals, such as microbial metabolites and medications, on a diseased organ in the context of microbes that also inhabit the region. The work could advance targeted drug delivery for cystic fibrosis and other conditions where medications are unable to penetrate.

• [Field trips of the future?](#) [周五, 20 10月 04:42]

A biologist examines the benefits and drawbacks of virtual and augmented reality in teaching environmental science.

• [The blob that ate the tokamak: Physicists gain understanding of bubbles at edge of plasmas](#) [周五, 20 10月 03:05]

Scientists have completed new simulations that could provide insight into how blobs at the plasma edge behave. The simulations performed kinetic simulations of two different regions of the plasma edge simultaneously.

• [Using optical chaos to control the momentum of light](#) [周五, 20 10月 03:05]

Controlling and moving light poses serious challenges. One major hurdle is that light travels at different speeds and in different phases in different components of an integrated circuit. For light to couple between optical components, it needs to be moving at the same momentum. Now, a team of researchers has demonstrated a new way to control the momentum of broadband light in a widely-used optical component known as a whispering gallery microcavity (WGM).

- **[Studying insect behavior? Make yourself an ethoscope!](#)** [周五, 20 10月 02:30]

Fruit flies have surprising similarities to humans. The mysteries of a broad range of human conditions can be studied in detail in these organisms, however this often requires the use of expensive custom equipment. team of scientists now present the ethoscope -- a cheap, easy-to-use and self-made customizable piece of equipment of their invention that can be used to study flies' behavior.

- **[Liquid metal discovery ushers in new wave of chemistry and electronics](#)** [周五, 20 10月 02:30]

Researchers use liquid metal to create atom-thick 2-D never before seen in nature. The research could transform how we do chemistry and could also be applied to enhance data storage and make faster electronics.

- **[Extreme light trapping](#)** [周五, 20 10月 00:38]

Physicists have built a nanostructure whose crystal lattice bends light as it enters the material and directs it in a path parallel to the surface, known as "parallel to interface refraction."

- **[Terahertz spectroscopy goes nano](#)** [周五, 20 10月 00:18]

Researchers have improved the resolution of terahertz emission spectroscopy -- a technique used to study a wide variety of materials -- by 1,000-fold, making the technique useful at the nanoscale.

- **[Nanomedicine researchers target disease at the molecular level](#)** [周四, 19 10月 23:57]

It's truly small-scale work. But researchers in nanomedicine – the study, development and application of materials under 100 nanometers in size to diagnose and treat disease – are making some big-time advances.

- **[Strange but true: Turning a material upside down can sometimes make it softer](#)** [周四, 19 10月 23:10]

Through the combined effect of flexoelectricity and piezoelectricity, researchers have found that polar materials can be made more or less resistant to dents when they are turned upside down... or when a voltage

is applied to switch their polarization. This research points to the future development of 'smart mechanical materials' for use in smart coatings and ferroelectric memories.

- [**Scientists solve a magnesium mystery in rechargeable battery performance**](#) [周四, 19 10月 23:10]

Scientists have discovered a surprising set of chemical reactions involving magnesium that degrade battery performance even before the battery can be charged up. The findings could steer the design of next-gen batteries.

- [**Noxious ice cloud on Saturn's moon Titan**](#) [周四, 19 10月 22:10]

Researchers with NASA's Cassini mission found evidence of a toxic hybrid ice in a wispy cloud high above the south pole of Saturn's largest moon, Titan.

- [**Researchers watch in real time as fat-encased drug nanoparticles invade skin cells**](#) [周四, 19 10月 22:10]

A new study describes the use of cutting-edge microscopy technology to visualize how liposomes escape from blood vessels into surrounding cells in a living mouse, offering clues that may help researchers design better drug delivery systems.

- [**Slow Internet? New technology to speed up home broadband dramatically**](#) [周四, 19 10月 22:10]

Slow internet speeds and the Internet 'rush hour' -- the peak time when data speeds drop by up to 30 percent -- could be history with new hardware that provides consistently high-speed broadband connectivity.

- [**New ways to achieve selectivity for biomarkers in bioelectronics**](#) [周四, 19 10月 22:09]

Materials science and engineering researchers have experimentally verified the electrochemical processes that control charge transfer rate from an organic polymer to a biomarker molecule. Their findings may enhance selectivity for biomarkers in bioelectronic devices.

- [**Mathematically modeling HIV drug pharmacodynamics**](#) [周四, 19 10月 22:09]

Complete elimination of Human Immunodeficiency Virus (HIV) presents a challenge due to latent viral reservoirs within the body that can help re-establish infection. In a new paper, researchers propose a mathematical model that investigates the effects of drug parameters and dosing schedules on HIV latent reservoirs and viral load dynamics.

- [**Superbug's artillery revealed: nanomachine secretes toxins**](#) [周四, 19 10月 22:09]

Researchers have created the first high-resolution structure depicting a crucial part of the 'superbug' *Pseudomonas aeruginosa*, classified by the WHO as having the highest level threat to human health. The image identifies the 'nanomachine' used by the highly virulent bacteria to secrete toxins, pointing the way for drug design targeting this.

- [**A solar flare recorded from Spain in 1886**](#) [周四, 19 10月 22:07]

Satellites have detected powerful solar flares in the last two months, but this phenomenon has been recorded for over a century. On Sept. 10, 1886, at the age of just 17, a young amateur astronomer using a modest telescope observed from Madrid one of these sudden flashes in a sunspot.

- [**Integrated lab-on-a-chip uses smartphone to quickly detect multiple pathogens**](#) [周四, 19 10月 22:04]

A multidisciplinary group has developed a novel platform to diagnose infectious disease at the point-of-care, using a smartphone as the detection instrument in conjunction with a test kit in the format of a credit card.

- [**Physics boosts artificial intelligence methods**](#) [周四, 19 10月 03:47]

Despite the central role of physics in quantum computing, until now, no problem of interest for physics researchers has been resolved by quantum computing techniques. Now, researchers report the first application of quantum computing to a physics problem.

- [**Research demonstrates method to alter coherence of light**](#) [周四, 19 10月 03:19]

In a finding that could have broad applications in optical devices, researchers have shown that they can transform incoherent light to almost fully coherent and vice versa.

- [**Scientists dig into the origin of organics on dwarf planet Ceres**](#) [周四, 19 10月 03:18]

Since NASA's Dawn spacecraft detected localized organic-rich material on Ceres, scientists have been digging into the data to explore different scenarios for its origin. After considering the viability of comet or asteroid delivery, the preponderance of evidence suggests the organics are most likely native to Ceres.

- [**New material for digital memories of the future**](#) [周四, 19 10月 01:32]

Scientists have developed the first material with conductivity properties that can be switched on and off using ferroelectric polarization.

- [**At tremendous precision, the proton and antiproton still seem identical**](#) [周四, 19 10月 01:29]

Using a novel two-particle measurement method, a group of researchers measured the magnetic moment of the antiproton at a precision 350 times higher than any previous measurement. The result shows that the magnetic moments of the proton and antiproton are tremendously close, meaning that so-called CPT asymmetry -- a key factor in the lack of antimatter -- must be very small if it exists at all.

- [**Riddle of matter remains unsolved: Proton and antiproton share fundamental properties**](#) [周四, 19 10月 01:28]

Physicists have been able to measure the magnetic force of antiprotons with almost unbelievable precision.

- [**Solar eruptions could electrify Martian moons**](#) [周四, 19 10月 00:41]

Powerful solar eruptions could electrically charge areas of the Martian moon Phobos to hundreds of volts, presenting a complex electrical

environment that could possibly affect sensitive electronics carried by future robotic explorers, according to a new NASA study. The study also considered electrical charges that could develop as astronauts transit the surface on potential human missions to Phobos.

- [**For \\$1000, anyone can purchase online ads to track your location and app use**](#) [周四, 19 10月 00:41]

New research finds that for a budget of roughly \$1000, it is possible for someone to track your location and app use by purchasing and targeting mobile ads. The team hopes to raise industry awareness about the potential privacy threat.

- [**Competing forces: How molecules maintain their structure**](#) [周三, 18 10月 23:35]

A double helix twisted around itself: this is the distinctive structure of DNA, which is made up of large molecules. Using synthetically produced molecules, chemists and physicists have investigated the forces which are at work inside the molecule to give it its three-dimensional structure.

- [**Stiff fibers spun from slime**](#) [周三, 18 10月 23:35]

Nanoparticles from the secretion of velvet worms form recyclable polymer fibers.

- [**Nanoelectronics breakthrough could lead to more efficient quantum devices**](#) [周三, 18 10月 23:35]

Researchers have made a breakthrough that could help your electronic devices get even smarter. Their findings examine electron behavior within nanoelectronics, as outlined in a new article.

- [**Customizing catalysts to boost product yields, decrease separation costs**](#) [周三, 18 10月 23:35]

For some crystalline catalysts, what you see on the surface is not always what you get in the bulk. Investigators discovered that treating a complex oxide crystal with either heat or chemicals caused different atoms to segregate on the surface, i.e., surface reconstruction. Those

differences created catalysts with dissimilar behaviors, which encouraged different reaction pathways and ultimately yielded distinct products.

- [**Reducing power plants' freshwater consumption with new silica filter**](#) [周三, 18 10月 23:35]

Power plants draw more freshwater than any other consumer in the United States, accounting for more than 50 percent of the nation's freshwater use at about 500 billion gallons daily. To help save this water, researchers have developed a new silica filter for power plant cooling waters that decreases the amount of freshwater power plants consume by increasing the number of times cooling tower water can be reused and recycled.

- [**A mission to Mars could make its own oxygen thanks to plasma technology**](#) [周三, 18 10月 23:33]

Plasma technology could hold the key to creating a sustainable oxygen supply on Mars, a new study has found. It suggests that Mars, with its 96 per cent carbon dioxide atmosphere, has nearly ideal conditions for creating oxygen from CO₂ through a process known as decomposition.

- [**Electrode materials from the microwave oven**](#) [周三, 18 10月 23:31]

Power on the go is in demand: The higher the battery capacity, the larger the range of electric cars and the longer the operating time of cell phones and laptops. Researchers have now developed a process that allows a fast, simple, and cost-effective production of the promising cathode material lithium cobalt phosphate in high quality.

- [**Potential human habitat located on the moon**](#) [周三, 18 10月 22:43]

A new study confirms the existence of a large open lava tube in the Marius Hills region of the moon, which could be used to protect astronauts from hazardous conditions on the surface.

- [**Force field analysis provides clues to protein-ion interaction**](#) [周三, 18 10月 21:22]

The importance of proteins and metal ion interactions is well

understood, but the mechanistic interactions between the two are still far from a complete picture. Researchers are working to quantitatively describe protein-ion interactions using what is called an atomic multipole optimized energetics for biomolecular applications force field.

• [Water droplet physics: The drop that's good to the very end](#) [周三, 18 10月 21:22]

Two researchers, using laser-flash photography of microscopic droplet-particle collisions, have discovered that water droplets still have liquid tricks to reveal. Previous research has primarily examined droplet collisions with flat surfaces, such as a wall, but this research team examined the less studied case of a droplet having a head-on collision with a solid, spherical particle.

• [Active sieving could improve dialysis and water purification filters](#) [周三, 18 10月 21:22]

Physicists have proven theoretically that active sieving, as opposed to its passive counterpart, can improve the separation abilities of filtration systems. Active sieving also has the potential to filter molecules based on movement dynamics, opening up a whole new avenue in the field of membrane science based on the ability to tune osmotic pressure.

• [Origami lattice paves the way for new noise-dampening barriers on the road](#) [周三, 18 10月 21:22]

Researchers have brought a new method into the sound-dampening fold, demonstrating an origami lattice prototype that can potentially reduce acoustic noise on roadways. The technique allows researchers to selectively dampen noise at various frequencies by adjusting the distance between noise-diffusing elements.

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [**Prozac in ocean water a possible threat to sea life**](#) [周六, 21 10月 00:58]

Oregon shore crabs exhibit risky behavior when they're exposed to the antidepressant Prozac, making it easier for predators to catch them, according to a new study.

- [**US ocean observation critical to understanding climate change, but lacks long-term national planning**](#) [周六, 21 10月 00:57]

Ocean observing systems are important as they provide information essential for monitoring and forecasting changes in Earth's climate on timescales ranging from days to centuries. A new report finds that continuity of ocean observations is vital to gain an accurate understanding of the climate, and calls for a decadal, national plan that is adequately resourced and implemented to ensure critical ocean information is available to understand and predict future changes.

- [**How the smallest bacterial pathogens outwit host immune defenses by stealth mechanisms**](#) [周五, 20 10月 22:16]

Despite their relatively small genome, mycoplasmas can cause persistent and difficult-to-treat infections in humans and animals. A study has shown how mycoplasmas escape the immune response. Mycoplasmas 'mask' themselves: They use their small genome in a clever way and compensate for the loss of an enzyme that is important for this process. This could be shown for the first time in vivo, thus representing a breakthrough in the research of bacterial pathogens.

• ['Antelope perfume' keeps flies away from cows](#) [周五, 20 10月 22:16]

In Africa, tsetse flies transfer the sleeping sickness also to cattle. The damage is estimated to be about 4.6 billion US dollars each year. Experts have developed an innovative way of preventing the disease. Tsetse flies avoid waterbucks, a widespread antelope species in Africa. The scientists imitated the smell of these antelopes.

• [Chromosomes may be knotted](#) [周五, 20 10月 22:16]

Little is known about the structures of our genetic material, chromosomes, which consist of long strings that -- according to our experience -- should be likely to become knotted. However, up to now it has not been possible to study this experimentally. Researchers have now found that chromosomes may indeed be knotted.

• [Carbon coating gives biochar its garden-greening power](#) [周五, 20 10月 22:16]

New research has demonstrated how composting of biochar creates a very thin organic coating that significantly improves the biochar's fertilizing capabilities.

• [Logged tropical rainforests still support biodiversity even when the heat is on](#) [周五, 20 10月 21:22]

Tropical rainforests continue to buffer wildlife from extreme temperatures even after logging, a new study has revealed.

• [Waterside lighting drastically disrupts wildlife in the surrounding ecosystem](#) [周五, 20 10月 21:22]

Streetlights near waterways attract flying insects from the water and change the predator community living in the grass beneath the lights, new research has found. The findings show that artificial night-time lighting could have implications for the surrounding ecosystem and biodiversity, which should be considered when designing new lighting concepts.

• [Life goes on for marine ecosystems after](#)

[**cataclysmic mass extinction**](#) [周五, 20 10月 21:22]

One of the largest global mass extinctions did not fundamentally change marine ecosystems, scientists have found.

• [**Cool roofs have water saving benefits too**](#) [周五, 20 10月 21:22]

The energy and climate benefits of cool roofs have been well established: By reflecting rather than absorbing the sun's energy, light-colored roofs keep buildings, cities, and even the entire planet cooler. Now a new study has found that cool roofs can also save water by reducing how much is needed for urban irrigation.

• [**New NASA study improves search for habitable worlds**](#) [周五, 20 10月 06:18]

New NASA research is helping to refine our understanding of candidate planets beyond our solar system that might support life.

• [**Climate shifts shorten marine food chain off California**](#) [周五, 20 10月 05:16]

Environmental disturbances such as El Niño shake up the marine food web off Southern California, new research shows, countering conventional thinking that the hierarchy of who-eats-who in the ocean remains largely constant over time.

• [**Research yields test to predict bitter pit disorder in Honeycrisp apples**](#) [周五, 20 10月 04:43]

A test to determine whether bitter pit -- a disorder that blindsides apple growers by showing up weeks or months after picking -- will develop in stored Honeycrisp apples was developed by a team of researchers, promising to potentially save millions of dollars annually in wasted fruit.

• [**Field trips of the future?**](#) [周五, 20 10月 04:42]

A biologist examines the benefits and drawbacks of virtual and augmented reality in teaching environmental science.

• [**New tyrannosaur fossil is most complete found in Southwestern US**](#) [周五, 20 10月 02:30]

A fossilized skeleton of a tyrannosaur discovered in Utah's Grand Staircase-Escalante National Monument was airlifted by helicopter Oct 15, and delivered to the Natural History Museum of Utah where it will be uncovered, prepared, and studied. The fossil is approximately 76 million years old and is likely an individual of the species *Teratophoneus curriei*.

- [**Studying insect behavior? Make yourself an ethoscope!**](#) [周五, 20 10月 02:30]

Fruit flies have surprising similarities to humans. The mysteries of a broad range of human conditions can be studied in detail in these organisms, however this often requires the use of expensive custom equipment. team of scientists now present the ethoscope -- a cheap, easy-to-use and self-made customizable piece of equipment of their invention that can be used to study flies' behavior.

- [**Flu simulations suggest pandemics more likely in spring, early summer**](#) [周五, 20 10月 02:30]

New statistical simulations suggest that Northern Hemisphere flu pandemics are most likely to emerge in late spring or early summer at the tail end of the normal flu season, according to a new study.

- [**Ancient DNA offers new view on saber-toothed cats' past**](#) [周五, 20 10月 02:30]

Researchers who've analyzed the complete mitochondrial genomes from ancient samples representing two species of saber-toothed cats have a new take on the animals' history over the last 50,000 years. The data suggest that the saber-toothed cats shared a common ancestor with all living cat-like species about 20 million years ago. The two saber-toothed cat species under study diverged from each other about 18 million years ago.

- [**Gut bacteria from wild mice boost health in lab mice**](#) [周五, 20 10月 02:30]

Laboratory mice that are given the gut bacteria of wild mice can survive a deadly flu virus infection and fight colorectal cancer dramatically

better than laboratory mice with their own gut bacteria, researchers report.

- [**Evolution in your back garden: Great tits may be adapting their beaks to birdfeeders**](#) [周五, 20 10月 02:30]

A British enthusiasm for feeding birds may have caused UK great tits to have evolved longer beaks than their European counterparts, according to new research. The findings identify for the first time the genetic differences between UK and Dutch great tits which researchers were then able to link to longer beaks in UK birds.

- [**H7N9 influenza is both lethal and transmissible in animal model for flu**](#) [周五, 20 10月 02:30]

In 2013, an influenza virus began circulating among poultry in China. It caused several waves of human infection and as of late July 2017, nearly 1,600 people had tested positive for avian H7N9. Nearly 40 percent of those infected had died. In 2017, a medical researcher received a sample of H7N9 virus isolated from a patient in China who had died of the flu. He and his research team subsequently began work to characterize and understand it.

- [**Water striders illustrate evolutionary processes**](#) [周五, 20 10月 02:29]

How do new species arise and diversify in nature? Natural selection offers an explanation, but the genetic and environmental conditions behind this mechanism are still poorly understood. Researchers have just figured out how water striders (family Veliidae) of the genus Rhagovelia developed fan-like structures at the tips of their legs. These structures allow them to move upstream against the current, a feat beyond the abilities of other water striders that don't have fans.

- [**Gut bacterium indirectly causes symptoms by altering fruit fly microbiome**](#) [周五, 20 10月 02:27]

CagA, a protein produced by the bacterium *Helicobacter pylori*, can alter the population of microbes living in the fruit fly gut, leading to disease symptoms, according to new research.

- [**Last unknown structure of HIV-1 solved, another step in efforts to disarm the AIDS virus**](#)

[周五, 20 10月 00:37]

Researchers have solved the last unknown protein structure of HIV-1, the retrovirus that can cause AIDS. This will further explain how the virus infects human cells and how progeny viruses are assembled and released from infected cells.

- [**Three-quarters of the total insect population lost in protected nature reserves**](#)

[周五, 20 10月 00:18]

Since 1989, in 63 nature reserves in Germany the total biomass of flying insects has decreased by more than 75 percent. This decrease has long been suspected but has turned out to be more severe than previously thought.

- [**Itsy bitsy spider: Fear of spiders and snakes is deeply embedded in us**](#)

[周四, 19 10月 23:09]

Snakes and spiders evoke fear and disgust in many people, even in developed countries where hardly anybody comes into contact with them. Until now, there has been debate about whether this aversion is innate or learnt. Scientists have recently discovered that it is hereditary: Even babies feel stressed when seeing these creatures - long before they could have learnt this reaction.

- [**A mosquito's secret weapon: a light touch and strong wings**](#)

[周四, 19 10月 22:10]

How do mosquitoes land and take off without our noticing? Using high-speed video cameras, researchers have found part of the answer: mosquitoes' long legs allow them to slowly and gently push off, but their wings provide the majority of the lift, even when fully laden with a blood meal. For comparison, mosquitoes push off with forces much less than those of an escaping fruit fly.

- [**Maintaining fish biomass the key to conserving reef fish biodiversity**](#)

[周四, 19 10月 22:10]

A new study has found that conserving fish diversity in Madagascar's

coral reef systems may depend on maintaining fish biomass above critical levels.

- [**Declining baby songbirds need forests to survive drought**](#) [周四, 19 10月 22:10]

A new study aimed to identify characteristics that promote healthy wood thrush populations on US Department of Defense land.

- [**Scientists see order in complex patterns of river deltas**](#) [周四, 19 10月 22:10]

River deltas, with their intricate networks of waterways, coastal barrier islands, wetlands and estuaries, often appear to have been formed by random processes, but scientists see order in the apparent chaos.

- [**Researchers watch in real time as fat-encased drug nanoparticles invade skin cells**](#) [周四, 19 10月 22:10]

A new study describes the use of cutting-edge microscopy technology to visualize how liposomes escape from blood vessels into surrounding cells in a living mouse, offering clues that may help researchers design better drug delivery systems.

- [**Scientists pinpoint jealousy in the monogamous mind**](#) [周四, 19 10月 22:10]

Scientists find that in male titi monkeys, jealousy is associated with heightened activity in the cingulate cortex, an area of the brain associated with social pain in humans, and the lateral septum, associated with pair bond formation in primates. A better understanding of jealousy may provide important clues on how to approach health and welfare problems such as addiction and domestic violence, as well as autism.

- [**Fossil coral reefs show sea level rose in bursts during last warming**](#) [周四, 19 10月 22:09]

Scientists have discovered that Earth's sea level did not rise steadily when the planet's glaciers last melted during a period of global warming; rather, sea level rose sharply in punctuated bursts.

- [**Dogs are more expressive when someone is looking**](#) [周四, 19 10月 22:09]

Dogs produce more facial expressions when humans are looking at them, according to new research.

- [**Superbug's artillery revealed: nanomachine secretes toxins**](#) [周四, 19 10月 22:09]

Researchers have created the first high-resolution structure depicting a crucial part of the 'superbug' *Pseudomonas aeruginosa*, classified by the WHO as having the highest level threat to human health. The image identifies the 'nanomachine' used by the highly virulent bacteria to secrete toxins, pointing the way for drug design targeting this.

- [**Living mulch builds profits, soil**](#) [周四, 19 10月 22:09]

Living mulch functions like mulch on any farm or garden except -- it's alive. No, it's not out of the latest horror movie; living mulch is a system farmers can use to benefit both profits and the soil. While the system has been around for a while, scientists are making it more efficient and sustainable.

- [**More than 75 percent decrease in total flying insect biomass over 27 years across Germany**](#) [周四, 19 10月 22:09]

The total flying insect biomass decreased by more than 75 percent over 27 years in protected areas in Germany, according to a new study.

- [**Salmon sex linked to geological change**](#) [周四, 19 10月 22:08]

It turns out that sex can move mountains. Researchers have found that the mating habits of salmon can alter the profile of stream beds, affecting the evolution of an entire watershed. The study is one of the first to quantitatively show that salmon can influence the shape of the land.

- [**Surprise new butterflyfish from the Philippine 'twilight zone'**](#) [周四, 19 10月 22:08]

A new species of striped Philippine butterflyfish -- the charismatic *Roa rumsfeldi* -- made a fantastic, 7,000-mile journey before surprising

scientists with its unknown status. Live specimens collected from a depth of 360 feet escaped special notice until a single black fin spine tipped off aquarium biologists back in San Francisco.

- [**Ice stream retreats under a cold climate**](#) [周四, 19 10月 22:08]

Warmer ocean surface triggered the ice retreat during The Younger Dryas.

- [**A solar flare recorded from Spain in 1886**](#) [周四, 19 10月 22:07]

Satellites have detected powerful solar flares in the last two months, but this phenomenon has been recorded for over a century. On Sept. 10, 1886, at the age of just 17, a young amateur astronomer using a modest telescope observed from Madrid one of these sudden flashes in a sunspot.

- [**Rare tree species safeguard biodiversity in a changing climate**](#) [周四, 19 10月 03:19]

Rare species of trees in rainforests may help safeguard biodiversity levels as the environment undergoes change, research shows.

- [**New light shed on early turquoise mining in Southwest**](#) [周四, 19 10月 03:18]

Researchers are blending archaeology and geochemistry to get a more complete picture of turquoise's mining and distribution in the pre-Hispanic Southwest.

- [**Obesity: Engineered proteins lower body weight in mice, rats and primates**](#) [周四, 19 10月 03:18]

Researchers have created engineered proteins that lowered body weight, bloodstream insulin, and cholesterol levels in obese mice, rats, and primates.

- [**Duplications of noncoding DNA may have affected evolution of human-specific traits**](#) [周四, 19 10月 01:32]

Duplications of large segments of noncoding DNA in the human genome may have contributed to the emergence of differences between

humans and nonhuman primates, according to new results. Identifying these duplications, which include regulatory sequences, and their effect on traits and behavior may help scientists explain genetic contributions to human disease.

- [**Understanding the coevolving web of life as a network**](#) [周四, 19 10月 01:32]

Coevolution, which occurs when species interact and adapt to each other, is often studied in the context of pair-wise interactions between mutually beneficial symbiotic partners. But many species have mutualistic interactions with multiple partners, leading to complex networks of interacting species.

- [**Nature or nurture? Innate social behaviors in the mouse brain**](#) [周四, 19 10月 01:29]

The brain circuitry that controls innate, or instinctive, behaviors such as mating and fighting was thought to be genetically hardwired. Not so, neuroscientists now say.

- [**Petals produce a 'blue halo' that helps bees find flowers**](#) [周四, 19 10月 01:28]

Latest research has found that several common flower species have nanoscale ridges on the surface of their petals that meddle with light when viewed from certain angles.

- [**Illinois sportfish recovery a result of 1972 Clean Water Act, scientists report**](#) [周四, 19 10月 00:17]

Populations of largemouth bass, bluegill, catfish and other sportfish are at the highest levels recorded in more than a century in the Illinois River, according to a new report. Their dramatic recovery, from populations close to zero near Chicago throughout much of the 20th century, began just after implementation of the Clean Water Act, the researchers say.

- [**DNA tests on albatross excrement reveal secret diet of top predator**](#) [周三, 18 10月 23:35]

A study that used DNA tests to analyse the scats of one of the world's most numerous albatrosses has revealed surprising results about the top predator's diet. DNA analysis of 1460 scats from breeding sites around the Southern Ocean has shown that the diet of black-browed albatrosses contains a much higher proportion of jellyfish than previously thought.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [**The end of pneumonia? New vaccine offers hope**](#)

[周六, 21 10月 02:38]

A new vaccine under development provoked an immune response to 72 forms of the bacteria that's responsible for pneumonia, sepsis and meningitis. That's up from the 23 forms of bacteria covered by current immunizations. The new vaccine, which represents the 'most comprehensive' coverage of pneumococcal disease to date, could greatly reduce the number of deaths from the disease.

- [**US ocean observation critical to understanding climate change, but lacks long-term national planning**](#)

[周六, 21 10月 00:57]

Ocean observing systems are important as they provide information essential for monitoring and forecasting changes in Earth's climate on timescales ranging from days to centuries. A new report finds that continuity of ocean observations is vital to gain an accurate understanding of the climate, and calls for a decadal, national plan that is adequately resourced and implemented to ensure critical ocean information is available to understand and predict future changes.

- [**Waterside lighting drastically disrupts wildlife in the surrounding ecosystem**](#)

[周五, 20 10月 21:22]

Streetlights near waterways attract flying insects from the water and change the predator community living in the grass beneath the lights, new research has found. The findings show that artificial night-time lighting could have implications for the surrounding ecosystem and biodiversity, which should be considered when designing new lighting

concepts.

- [**Be concerned about how apps collect, share health data, expert says**](#) [周五, 20 10月 05:16]

Americans should be concerned about how health and wellness apps collect, save and share their personal health data, a medical media expert says.

- [**Eye-catching labels stigmatize many healthy foods**](#) [周五, 20 10月 05:16]

Labels such as organic, fair-trade and cage free may be eye-catching but are often free of any scientific basis and stigmatize many healthy foods, a new study found.

- [**Three million Americans carry loaded handguns daily, study finds**](#) [周五, 20 10月 04:42]

An estimated 3 million adult American handgun owners carry a firearm loaded and on their person on a daily basis, and 9 million do so on a monthly basis, new research indicates. The vast majority cited protection as their primary reason for carrying a firearm. It is the first research in more than 20 years to scrutinize why, how often, and in what manner US adults carry loaded handguns.

- [**TBI laws effective at reducing rate of recurrent concussions, new study shows**](#) [周五, 20 10月 04:42]

A recent study from the Center for Injury Research and Policy at Nationwide Children's Hospital done in conjunction with researchers from Colorado School of Public Health at the University at Colorado and Temple University used data from a large, national sports injury surveillance system to determine the effect of state-level TBI laws on trends of new and recurrent concussions among US high school athletes.

- [**More permissive concealed-carry laws linked to higher homicide rates**](#) [周五, 20 10月 04:42]

Easier access to concealed firearms is associated with significantly higher rates of handgun-related homicide, according to a new study.

- **[Field trips of the future?](#)** [周五, 20 10月 04:42]

A biologist examines the benefits and drawbacks of virtual and augmented reality in teaching environmental science.

- **[Three-quarters of the total insect population lost in protected nature reserves](#)** [周五, 20 10月 00:18]

Since 1989, in 63 nature reserves in Germany the total biomass of flying insects has decreased by more than 75 percent. This decrease has long been suspected but has turned out to be more severe than previously thought.

- **[Six degrees of separation: Why it is a small world after all](#)** [周四, 19 10月 23:10]

This study examines how small-world networks occur within bigger and more complex structures.

- **[The best hedge fund managers are not psychopaths or narcissists, according to new study](#)** [周四, 19 10月 22:10]

When it comes to financial investments, hedge fund managers higher in 'dark triad' personality traits -- psychopathy, narcissism, and Machiavellianism -- perform more poorly than their peers, according to new personality psychology research. The difference is a little less than 1 percent annually compared to their peers, but with large investments over several years that slight underperformance can add up.

- **[Phones keeping students from concentrating during lectures](#)** [周四, 19 10月 22:08]

Daily, people spend over three hours on their phones. While ever-smarter digital devices have made many aspects of our lives more efficient, a growing body of evidence suggests that, by continuously distracting us, they are harming our ability to concentrate. Studies across the world show that students constantly use their phones when they are in class. A strong body of evidence suggests that media use during lectures is associated with lower academic performance.

• [**What characteristics do school shooters share?**](#) [周四, 19 10月 22:07]

Boys involved in school shootings often struggle to live up to what they perceive as their school's ideals surrounding masculinity. When socially shunned at school, they develop deep-set grudges against their classmates and teachers. The shooters become increasingly angry, depressed, and more violent in their gendered practice. A shooting rampage is their ultimate performance, according to experts.

• [**New light shed on early turquoise mining in Southwest**](#) [周四, 19 10月 03:18]

Researchers are blending archaeology and geochemistry to get a more complete picture of turquoise's mining and distribution in the pre-Hispanic Southwest.

• [**For \\$1000, anyone can purchase online ads to track your location and app use**](#) [周四, 19 10月 00:41]

New research finds that for a budget of roughly \$1000, it is possible for someone to track your location and app use by purchasing and targeting mobile ads. The team hopes to raise industry awareness about the potential privacy threat.

• [**Illinois sportfish recovery a result of 1972 Clean Water Act, scientists report**](#) [周四, 19 10月 00:17]

Populations of largemouth bass, bluegill, catfish and other sportfish are at the highest levels recorded in more than a century in the Illinois River, according to a new report. Their dramatic recovery, from populations close to zero near Chicago throughout much of the 20th century, began just after implementation of the Clean Water Act, the researchers say.

• [**Mass killings happen randomly, yet rate has remained steady, study finds**](#) [周三, 18 10月 23:35]

Mass killings may have increasing news coverage, but the events themselves have happened at a steady rate for more than a decade, according to a new study. Furthermore, some types of mass-killing

events seem to occur randomly over time, making prediction difficult and response crucial.

- [**Life in the city: Living near a forest keeps your amygdala healthier**](#) [周三, 18 10月 23:35]

A new study examined the relationship between the availability of nature near city dwellers' homes and their brain health. Its findings are relevant for urban planners among others.

- [**Reducing power plants' freshwater consumption with new silica filter**](#) [周三, 18 10月 23:35]

Power plants draw more freshwater than any other consumer in the United States, accounting for more than 50 percent of the nation's freshwater use at about 500 billion gallons daily. To help save this water, researchers have developed a new silica filter for power plant cooling waters that decreases the amount of freshwater power plants consume by increasing the number of times cooling tower water can be reused and recycled.

- [**Workers may 'choke' under pressure of non-monetary incentives**](#) [周三, 18 10月 21:16]

Competition for non-monetary awards can have adverse effects on performance and may cause employees to “choke” under pressure, according to a new study.

- [**High risk of injury in young elite athletes**](#) [周三, 18 10月 21:09]

Every week, an average of three in every ten adolescent elite athletes suffer an injury. Worst affected are young women, and the risk of injury increases with low self-esteem, especially in combination with less sleep and higher training volume and intensity, research from in Sweden shows.

- [**Art advancing science at the nanoscale**](#) [周三, 18 10月 21:02]

Could studying molecular biology ever be as fun as watching a Star Wars movie? Two scientists decided to create their own science film to entertain viewers, and ended up making new scientific discoveries in the

process. The researchers-turned-filmmakers used a novel combination of computer animation and simulation softwares to create a scientific model that is accurate down to the atomic scale, and hope that their success inspires more scientists to approach their work like artists.

- [**Arsenic in domestic well water could affect 2 million people in the US**](#) [周三, 18 10月 21:02]

Clean drinking water can be easy to take for granted if your home taps into treated water sources. But more than 44 million people in the U.S. get their water from private domestic wells, which are largely unregulated. Of those, a new report estimates that about 2 million people could be exposed to high levels of naturally occurring arsenic in their water.

- [**New Amazon threat? Deforestation from mining**](#) [周三, 18 10月 21:02]

Sprawling mining operations in Brazil have caused roughly 10 percent of all Amazon rainforest deforestation between 2005 and 2015 -- much higher than previous estimates -- says the first comprehensive study of mining deforestation in the iconic tropical rainforest. Surprisingly, the majority of mining deforestation (a full 90%) occurred outside the mining leases granted by Brazil's government, the new study finds.

- [**New simple method determines rate at which we burn calories walking up, down, flat**](#) [周三, 18 10月 21:01]

A new way to predict the energy a person expends walking will help predict and monitor the physiological status of walkers, including foot soldiers. Researchers have developed the Army-funded method, which significantly improves on two existing standards, and relies on three readily available variables. Accurate prediction is important because the rate at which people burn calories walking can vary tenfold depending on speed, carried load and whether uphill, at-grade or downhill.

- [**Chocolate production linked to increased deforestation in poor nations**](#) [周三, 18 10月 04:36]

Newly published research focuses on the link between cocoa exports and deforestation in developing nations.

- [**Amazonian hunters deplete wildlife but don't empty forests**](#) [周三, 18 10月 03:31]

Conservationists can be 'cautiously optimistic' about the prospect of sustainable subsistence hunting by Amazonian communities, according to new research. The research team spent over a year working with 60 Amazonian communities and hiked for miles through trackless forests to deploy nearly 400 motion-activated camera traps -- in a bid to understand which species are depleted by hunting and where.

- [**New examination of occupational licensing contradicts decades of research**](#) [周三, 18 10月 03:30]

From doctors to engineers to carpet layers to massage therapists, more than one in three Americans is required to hold a license to work in their occupation. Broad consensus among researchers holds that licensure creates wage premiums by establishing economic monopolies, but according to research, licensure does not limit competition nor does it increase wages.

- [**Preservation for the \(digital\) ages**](#) [周三, 18 10月 00:43]

Researchers working with classicists and computer scientists have developed a method to preserve digital humanities databases. The preservation strategy allows scholars to re-launch a database application in a variety of environments -- from individual computers, to virtual machines, to future web servers -- without compromising its interactive features.

- [**A new way to test body armor**](#) [周二, 17 10月 23:43]

In response to several high profile body armor failures, researchers have developed a new and extremely reliable way to test the ballistic fibers used in body armor.

- [**Nearly half of US medical care comes from emergency rooms**](#) [周二, 17 10月 21:18]

Nearly half of all US medical care is delivered by emergency departments, according to a new study. In recent years, the percentage of care delivered by emergency departments has grown. The paper

highlights the major role played by emergency rooms in US health care.

- [**Attending a middle vs K-8 school matters for student outcomes**](#) [周二, 17 10月 07:05]

Students who attend a middle school compared to a K-8 school are likely to have a lower perception of their reading skills, finds a new study.

- [**During crisis, exposure to conflicting information and stress linked, studies find**](#) [周二, 17 10月 07:05]

Exposure to high rates of conflicting information during an emergency is linked to increased levels of stress, and those who rely on text messages or social media reports from unofficial sources are more frequently exposed to rumors and experience greater distress, according to research.

- [**Tweeting rage: How immigration policies can polarize public discourse**](#) [周二, 17 10月 02:48]

A study of tweets in the months before and after the 2010 passage of Arizona's "show me your papers" law, findings showed that the average tweet about Mexican immigrants and Hispanics, in general, became more negative. Researchers said the social media data was useful in determining whether people had changed their attitudes about immigrants as a result of the law or whether they had begun behaving differently.

- [**Women in science ask fewer questions than men, according to new research**](#) [周二, 17 10月 02:24]

Stereotypes suggest that women love to talk, with some studies even finding that women say three times as much as men. But, new research shows there is an exception to this rule: professional STEM events, which could be indicative of the wider problem of gender inequality in the field.

- [**Break the attachment before selling your stuff**](#) [周二, 17 10月 01:26]

Ever tried to sell something you've owned for a while on Craigslist and

found that no one is willing to pony up what you're asking? It's because you're asking too much.

- [**Marketing study examines what types of searches click for car buyers**](#) [周二, 17 10月 00:21]

A new study examines how consumers allocated their time when searching offline and on the internet as they shopped for a new automobile, and what the outcomes were for price satisfaction.

- [**Report identifies factors associated with harassment, abuse in academic fieldwork**](#) [周二, 17 10月 00:21]

College students considering careers in fields like archaeology or geology that require extensive work at remote field sites might want to find out how potential supervisors and advisers conduct themselves in the field. Do they establish clear ground rules for the behavior of everyone on the team? Are the rules consistently enforced? According to a new report, such factors likely influence whether students will witness or experience harassment while working far from home.

- [**Study reveals risk factors for substance use problems, as well as resilience**](#) [周一, 16 10月 22:28]

A new study explores factors increasing the risk for substance use problems among African-American/Black and Latino adults residing in a high-risk urban community, as well as patterns of resilience. It reveals that serious risk factors are highly prevalent and strongly associated with substance misuse; however, a substantial proportion could be characterized as resilient, and evidenced substance use problems at rates comparable to the general U.S. population.

- [**Is rushing your child to the ER the right response?**](#) [周一, 16 10月 20:19]

If a child gets a small burn, starts choking or swallows medication, parents may struggle to decide whether to provide first aid at home or rush them to the hospital, suggests a new national poll.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- [**Prozac in ocean water a possible threat to sea life**](#) [周六, 21 10月 00:58]

Oregon shore crabs exhibit risky behavior when they're exposed to the antidepressant Prozac, making it easier for predators to catch them, according to a new study.

- [**NASA's MAVEN mission finds Mars has a twisted magnetic tail**](#) [周五, 20 10月 06:18]

Mars has an invisible magnetic 'tail' that is twisted by interaction with the solar wind, according to new research using data from NASA's MAVEN spacecraft.

- [**The blob that ate the tokamak: Physicists gain understanding of bubbles at edge of plasmas**](#) [周五, 20 10月 03:05]

Scientists have completed new simulations that could provide insight into how blobs at the plasma edge behave. The simulations performed kinetic simulations of two different regions of the plasma edge simultaneously.

- [**Using optical chaos to control the momentum of light**](#) [周五, 20 10月 03:05]

Controlling and moving light poses serious challenges. One major hurdle is that light travels at different speeds and in different phases in different components of an integrated circuit. For light to couple between optical components, it needs to be moving at the same momentum. Now, a team of researchers has demonstrated a new way to

control the momentum of broadband light in a widely-used optical component known as a whispering gallery microcavity (WGM).

- [**Studying insect behavior? Make yourself an ethoscope!**](#) [周五, 20 10月 02:30]

Fruit flies have surprising similarities to humans. The mysteries of a broad range of human conditions can be studied in detail in these organisms, however this often requires the use of expensive custom equipment. team of scientists now present the ethoscope -- a cheap, easy-to-use and self-made customizable piece of equipment of their invention that can be used to study flies' behavior.

- [**Evolution in your back garden: Great tits may be adapting their beaks to birdfeeders**](#) [周五, 20 10月 02:30]

A British enthusiasm for feeding birds may have caused UK great tits to have evolved longer beaks than their European counterparts, according to new research. The findings identify for the first time the genetic differences between UK and Dutch great tits which researchers were then able to link to longer beaks in UK birds.

- [**Liquid metal discovery ushers in new wave of chemistry and electronics**](#) [周五, 20 10月 02:30]

Researchers use liquid metal to create atom-thick 2-D never before seen in nature. The research could transform how we do chemistry and could also be applied to enhance data storage and make faster electronics.

- [**Gut bacterium indirectly causes symptoms by altering fruit fly microbiome**](#) [周五, 20 10月 02:27]

CagA, a protein produced by the bacterium *Helicobacter pylori*, can alter the population of microbes living in the fruit fly gut, leading to disease symptoms, according to new research.

- [**Extreme light trapping**](#) [周五, 20 10月 00:38]

Physicists have built a nanostructure whose crystal lattice bends light as it enters the material and directs it in a path parallel to the surface, known as "parallel to interface refraction."

- **[Strange but true: Turning a material upside down can sometimes make it softer](#)** [周四, 19 10月 23:10]

Through the combined effect of flexoelectricity and piezoelectricity, researchers have found that polar materials can be made more or less resistant to dents when they are turned upside down... or when a voltage is applied to switch their polarization. This research points to the future development of 'smart mechanical materials' for use in smart coatings and ferroelectric memories.

- **[Six degrees of separation: Why it is a small world after all](#)** [周四, 19 10月 23:10]

This study examines how small-world networks occur within bigger and more complex structures.

- **[Itsy bitsy spider: Fear of spiders and snakes is deeply embedded in us](#)** [周四, 19 10月 23:09]

Snakes and spiders evoke fear and disgust in many people, even in developed countries where hardly anybody comes into contact with them. Until now, there has been debate about whether this aversion is innate or learnt. Scientists have recently discovered that it is hereditary: Even babies feel stressed when seeing these creatures - long before they could have learnt this reaction.

- **[A mosquito's secret weapon: a light touch and strong wings](#)** [周四, 19 10月 22:10]

How do mosquitoes land and take off without our noticing? Using high-speed video cameras, researchers have found part of the answer: mosquitoes' long legs allow them to slowly and gently push off, but their wings provide the majority of the lift, even when fully laden with a blood meal. For comparison, mosquitoes push off with forces much less than those of an escaping fruit fly.

- **[Scientists pinpoint jealousy in the monogamous mind](#)** [周四, 19 10月 22:10]

Scientists find that in male titi monkeys, jealousy is associated with

heightened activity in the cingulate cortex, an area of the brain associated with social pain in humans, and the lateral septum, associated with pair bond formation in primates. A better understanding of jealousy may provide important clues on how to approach health and welfare problems such as addiction and domestic violence, as well as autism.

- [**The best hedge fund managers are not psychopaths or narcissists, according to new study**](#) [周四, 19 10月 22:10]

When it comes to financial investments, hedge fund managers higher in 'dark triad' personality traits -- psychopathy, narcissism, and Machiavellianism -- perform more poorly than their peers, according to new personality psychology research. The difference is a little less than 1 percent annually compared to their peers, but with large investments over several years that slight underperformance can add up.

- [**Salmon sex linked to geological change**](#) [周四, 19 10月 22:08]

It turns out that sex can move mountains. Researchers have found that the mating habits of salmon can alter the profile of stream beds, affecting the evolution of an entire watershed. The study is one of the first to quantitatively show that salmon can influence the shape of the land.

- [**Want to control your dreams? Here's how you can**](#) [周四, 19 10月 22:08]

New research has found that a specific combination of techniques will increase people's chances of having lucid dreams, in which the dreamer is aware they're dreaming while it's still happening and can control the experience.

- [**Scientists dig into the origin of organics on dwarf planet Ceres**](#) [周四, 19 10月 03:18]

Since NASA's Dawn spacecraft detected localized organic-rich material on Ceres, scientists have been digging into the data to explore different scenarios for its origin. After considering the viability of comet or asteroid delivery, the preponderance of evidence suggests the organics

are most likely native to Ceres.

- [**Petals produce a 'blue halo' that helps bees find flowers**](#) [周四, 19 10月 01:28]

Latest research has found that several common flower species have nanoscale ridges on the surface of their petals that meddle with light when viewed from certain angles.

- [**Solar eruptions could electrify Martian moons**](#) [周四, 19 10月 00:41]

Powerful solar eruptions could electrically charge areas of the Martian moon Phobos to hundreds of volts, presenting a complex electrical environment that could possibly affect sensitive electronics carried by future robotic explorers, according to a new NASA study. The study also considered electrical charges that could develop as astronauts transit the surface on potential human missions to Phobos.

- [**Stiff fibers spun from slime**](#) [周三, 18 10月 23:35]

Nanoparticles from the secretion of velvet worms form recyclable polymer fibers.

- [**Potential human habitat located on the moon**](#) [周三, 18 10月 22:43]

A new study confirms the existence of a large open lava tube in the Marius Hills region of the moon, which could be used to protect astronauts from hazardous conditions on the surface.

- [**When teeth grow on the body**](#) [周三, 18 10月 21:12]

Today, certain species of catfish are covered with bony plates bristling with thin teeth, like some extinct vertebrate lineages. These teeth, which regularly fall out and then grow back, are used for defense and, in males, also to seduce the females. Researchers wanted to understand how these teeth capable of regeneration can develop outside of the mouth. They discovered that the extra-oral teeth always grow on a bone, regardless of its type, even in the absence of a bony plate. This suggests a r...

- [**Flexible 'skin' can help robots, prosthetics perform everyday tasks by sensing shear force**](#) [周三, 18 10月 00:43]

Engineers have developed a flexible sensor 'skin' that can be stretched over any part of a robot's body or prosthetic to accurately convey information about shear forces and vibration, which are critical to tasks ranging from cooking an egg to dismantling a bomb.

- [**Looking for microbe 'fingerprints' on simulated Martian rocks**](#) [周二, 17 10月 23:01]

Scientists are searching for unique bio-signatures left on synthetic extraterrestrial minerals by microbial activity. A new paper describes investigations into these signatures at a miniaturized 'Mars farm' where researchers can observe interactions between the archaeon *Metallosphaera sedula* and Mars-like rocks. These microbes are capable of oxidizing and integrating metals into their metabolism.

- [**Liquid metal brings soft robotics a step closer**](#) [周二, 17 10月 21:19]

Scientists have invented a way to morph liquid metal into physical shapes. Researchers have applied electrical charges to manipulate liquid metal into 2-D shapes such as letters and a heart.

- [**Filling the early universe with knots can explain why the world is three-dimensional**](#) [周二, 17 10月 07:03]

Filling the universe with knots shortly after it popped into existence 13.8 billion years ago provides a neat explanation for why we inhabit a three-dimensional world. That is the basic idea advanced by an out-of-the-box theory developed by an international team of physicists.

- [**Dinosaur dung fertilizes planet, new research shows**](#) [周二, 17 10月 00:44]

Dinosaurs were, and large animals are, important not for the quantity of dung they produce, but for their ability to move long distances across landscapes, effectively mixing the nutrients, outline researchers in a new report.

- [**Bite on this: Alligators caught eating sharks**](#) [周二, 17 10月 00:21]

Jaws, beware! Alligators may be coming for you. A new study documents American alligators on the Atlantic and Gulf coasts are

eating small sharks and stingrays. This is the first scientific documentation of a widespread interaction between the two predators.

• **[Fanged kangaroo research could shed light on extinction](#)** [周一, 16 10月 21:27]

Fanged kangaroos -- an extinct family of small fanged Australian kangaroos -- might have survived at least five million years longer than previously thought. A new study has found the species might have competed for resources with ancestors of modern kangaroos.

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- [**Traffic signal countdown timers lead to improved driver responses**](#) [周三, 01 11月 03:12]

Countdown timers that let motorists know when a traffic light will go from green to yellow lead to safer responses from drivers, research suggests.

- [**Mini-microscopes reveal brain circuitry behind social behavior**](#) [周三, 01 11月 03:12]

A microscope lens implanted deep inside a mouse's brain shows different patterns of neural activity when the mouse interacts with males, females, or other stimuli. Now, researchers have discovered that sexual experience can trigger long-term changes in these brain patterns.

- [**Young bats learn bat 'dialects' from their nestmates**](#) [周三, 01 11月 02:37]

Young bats adopt a specific 'dialect' spoken by their own colonies, even when this dialect differs from the bat 'mother tongue,' a new study shows. By offering insight into the evolutionary origins of language acquisition skills, the study calls into question the uniqueness of this skill in humans.

- [**Humans don't use as much brainpower as we**](#)

[like to think](#) [周三, 01 11月 02:37]

When it comes to brainpower, humans aren't as exceptional as we like to think. For years, scientists assumed that humans devote a larger share of calories to their brains than other animals. Although the human brain makes up only 2 percent of body weight, it consumes more than 25 percent of the body's energy budget. But a comparison of the relative brain costs of 22 species found that other animals have hungry brains too.

['Tensor algebra' software speeds big-data analysis 100-fold](#) [周三, 01 11月 02:37]

Researchers have created a new system that automatically produces code optimized for sparse data.

[Tracking mosquitoes with your cellphone](#) [周三, 01 11月 02:37]

A simple recording of a mosquito's buzz on a cellphone could contribute to a global-scale mosquito tracking map of unprecedented detail, say experts.

[Little-known fruits contain powerful anti-inflammatory and anti-oxidant agents](#) [周三, 01 11月 02:37]

Research shows that five fruit species native to Brazil's Atlantic Rainforest biome have bioactive properties as outstanding as those of blueberries, cranberries, blackberries, and strawberries. By investigating the presence of anti-aging nutrients that also work at the prevention of cancer, diabetes and Alzheimer's, the study clears the path for the conservation and promotion of the genus *Eugenia*, which contains 400 species (some of them endangered) and presents huge potential in food and pharma...

[Uncomfortable sight from an ancient reflex of the eye](#) [周三, 01 11月 01:57]

The eyes are for seeing, but they have other important biological functions, including automatic visual reflexes that go on without awareness. The reflexive system of the human eye also produces a

conscious, visual experience, according to a new study.

- [**Elderly chromosomes activate genes differently than in the young**](#) [周三, 01 11月 01:57]

Grey hair, wisdom, and wrinkles on our skin mark us as we age, but it's the more subtle changes beneath the surface that make us old. Now, researchers have discovered that our chromosomes also wrinkle with age, changing how our immune system renews itself.

- [**Chromosome organization emerges from 1-D patterns**](#) [周三, 01 11月 01:57]

Researchers have developed a method to predict how a human chromosome folds based solely on the epigenetic marks that decorate chromatin inside cells.

- [**How to store information in your clothes invisibly, without electronics**](#) [周三, 01 11月 01:57]

Computer scientists have created fabrics and fashion accessories that can store data -- from security codes to identification tags -- without needing any on-board electronics or sensors.

- [**Spooky conservation: Saving endangered species over our dead bodies**](#) [周三, 01 11月 01:03]

The secret to the survival of critically endangered wildlife could lie beyond the grave. A researcher suggests revenue from human burials could fund nature reserves and parks for threatened species, effectively amounting to dead humans protecting living creatures.

- [**How to detect the risk of dyslexia before learning to read**](#) [周三, 01 11月 01:03]

Almost 10 percent of the world population suffers dyslexia. Establishing an early diagnosis would allow the development of training programs to palliate this disorder. We now may be nearer to reaching this goal thanks to a study associating auditory processing in children to their reading skills. The results offer a new approach for detecting the risk before the children learn to read.

- **[Strong maternal antibodies for HIV ineffective for protecting infants from HIV](#)** [周三, 01 11月 01:03]

HIV+ mothers who possess a strong neutralizing antibody response may be more likely to pass the virus on to her infant through breast feeding. In addition, infants born to mothers with a strong antibody response are significantly more likely to have a serious illness or death, regardless of whether or not they acquire the virus, report investigators.

- **[Orphaned elephants' social lives substantially altered by poaching](#)** [周三, 01 11月 01:03]

Colorado State University researchers found that orphaned elephants have less access to mature, dominant individuals than non-orphaned elephants, whose dominant social partners are their mothers and aunts.

- **[Research provides unique insight into extinction dynamics in late Triassic](#)** [周三, 01 11月 00:06]

A team of scientists and students is inching closer to revealing how a group of animals from the Late Triassic went extinct.

- **[Workplace incivility: The silent epidemic](#)** [周三, 01 11月 00:06]

Workplace incivility is taking over our organizations, professional relationships and everyday interactions. According to researchers, understanding why incivility happens and how to address it starts with awareness.

- **[Discarded cigarette butts: The next high performing hydrogen storage material?](#)** [周三, 01 11月 00:05]

Discarded cigarette butts are a major waste disposal and environmental pollution hazard. But chemists have discovered that cigarette butt-derived carbons have ultra-high surface area and unprecedented hydrogen storage capacity.

- **[Bilingual preschoolers show stronger inhibitory control](#)** [周三, 01 11月 00:03]

For students in preschool, speaking two languages may be better than

one, especially for developing inhibitory control. That idea isn't new, but a new study took a longitudinal approach to examine the bilingual advantage hypothesis, which suggests that the demands associated with managing two languages confer cognitive advantages that extend beyond the language domain.

• [Lens trick doubles odds for quantum interaction](#)

[周三, 01 11月 00:03]

It's not easy to bounce a single particle of light off a single atom that is less than a billionth of a meter wide. However, researchers have shown they can double the odds of success, an innovation that might be useful in quantum computing and metrology.

• [US cancer drug costs increasing despite competition](#)

[周三, 01 11月 00:03]

After a follow-up period of 12 years, the mean cumulative cost increase was 37 percent, including all the injectable anticancer drugs. Annual changes in pricing did not appear to be affected by new supplemental FDA approvals, new off-label indications or new competition.

• [Thermoelectric power: New ways to power portable electronics, sensors](#)

[周三, 01 11月 00:03]

Scientists have reported significant advances in the thermoelectric performance of organic semiconductors based on carbon nanotube thin films that could be integrated into fabrics to convert waste heat into electricity or serve as a small power source.

• [Scientists elevate quantum dot solar cell world record](#)

[周三, 01 11月 00:03]

Researchers have established a new world efficiency record for quantum dot solar cells, at 13.4 percent.

• [Stable, affordable homes don't just help patients, they save taxpayer dollars](#)

[周三, 01 11月 00:03]

By investing in housing, hospitals can help build healthier communities and save money by stemming the tide of emergency room visits and costly health interventions, research shows.

- [**Illuminated pajamas treat newborns for jaundice**](#) [周三, 01 11月 00:03]

Babies who suffer from jaundice after birth are treated with shortwave light. Researchers have now developed illuminated pajamas that replace the treatment in an incubator. This means newborns can get healthy while warm and happy in their mothers' arms.

- [**Voting does not reduce crime, study shows**](#) [周三, 01 11月 00:03]

Voting does not make people less likely to subsequently commit a crime, a randomized controlled experiment of 550,000 potential voters in the United States shows.

- [**Religious affiliation at the end of life is changing globally**](#) [周三, 01 11月 00:03]

The worldwide pattern of religious affiliation at the time of death is expected to change over the next 50 years, with distinct regional trends. This is the first study to analyze the demographics of religious affiliation at the time of death on a global scale and to make projections until 2060. Despite the importance of religious affiliation for health- and death-related behavior, there have been few global predictions of this kind.

- [**Locus coeruleus activity linked with hyperarousal in PTSD**](#) [周三, 01 11月 00:03]

A new study has linked signs of heightened arousal and reactivity -- a core symptom of posttraumatic stress disorder (PTSD) -- to overactivity of the locus coeruleus (LC), a brain region that mediates arousal and reactivity. By combining bodily responses and brain imaging data researchers have provided direct human evidence for a theory over 30 years old.

- [**Stay focused, if you can**](#) [周三, 01 11月 00:03]

What makes some people better able to resist temptation than others? Researchers are set to explore this question.

- [**Prenatal exposure to BPA at low levels can affect gene expression in developing rat brain**](#) [周三,

01 11月 00:03]

Prenatal exposure to bisphenol A (BPA) at levels below those currently considered safe for humans affects gene expression related to sexual differentiation and neurodevelopment in the developing rat brain.

- [**How a \\$10 microchip turns 2-D ultrasound machines into 3-D imaging devices**](#) [周二, 31 10月 23:15]

Technology that keeps track of how your smartphone is oriented can now give \$50,000 ultrasound machines many of the 3-D imaging abilities of their \$250,000 counterparts -- for the cost of a \$10 microchip.

- [**Opening the Van der Waals' sandwich**](#) [周二, 31 10月 23:15]

Eighty years after the theoretical prediction of the force required to overcome the van der Waals' bonding between layers in a crystal, engineering researchers have measured it directly.

- [**The world's shortest laser pulse: Seeing electron movement during chemical reactions**](#) [周二, 31 10月 23:15]

Researchers have succeeded in shortening the pulse duration of an X-ray laser to only 43 attoseconds. With a time resolution in the range of a few quintillionths of a second, they are now able for the first time to observe the movement of electrons during chemical reactions in slow motion.

- [**Role of a DNA repair mechanism**](#) [周二, 31 10月 23:15]

An important step forward in understanding more exactly what the mechanisms are that allow, if not correctly repaired, certain DNA breaks to be exchanged with others, so generating chromosomal translocation.

- [**Intricate beauty of a cracked glass**](#) [周二, 31 10月 23:14]

Typical crack speeds in glass easily surpass a kilometer per second, and broken surface features may be well smaller than a millimeter, so the processes that generate these patterns have been largely a mystery. Now, by replacing hard glass with soft but brittle gels, researchers have slowed down the cracks that precipitate fracture to mere meters per second, and unraveled the complex physical processes that take place during fracture in microscopic detail and in real time.

• [**'Protect your eyes while on the slopes,' scientists warn**](#) [周二, 31 10月 23:14]

Snow fanatics are no doubt aware of the risk of getting sunburnt on the slopes, but a new study shows that it is more than a red face that skiers and snowboarders should be concerned about.

• [**Medical-like tools for NASA to study samples of the solar system**](#) [周二, 31 10月 23:14]

A diagnostic tool, similar in theory to those used by the medical profession to noninvasively image internal organs, bones, soft tissue, and blood vessels, could be equally effective at 'triaging' extraterrestrial rocks and other samples before they are shipped to Earth for further analysis.

• [**Dinosaur-killing asteroid impact cooled Earth's climate more than previously thought**](#) [周二, 31 10月 23:14]

The Chicxulub asteroid impact that wiped out the dinosaurs likely released far more climate-altering sulfur gas into the atmosphere than originally thought, according to new research.

• [**How an interest in bipolar disorder drugs led to a better understanding of leukemia**](#) [周二, 31 10月 23:14]

A research project that began 20 years ago with an interest in how lithium treats mood disorders has yielded insights into the progression of blood cancers such as leukemia. The research centers on a protein called GSK-3.

• [**'Monster' planet discovery challenges formation theory**](#) [周二, 31 10月 22:51]

A giant planet, which should not exist according to planet formation theory, has been discovered around a distant star.

• [**Report reveals prominence of double vision**](#) [周二, 31 10月 22:21]

A new study reveals that double vision is associated with 850,000 outpatient and emergency department visits annually, but life-

threatening diagnoses are rare.

- [**Minor merger kicks supermassive black hole into high gear**](#) [周二, 31 10月 22:18]

Astronomers are studying the galaxy M77, which is famous for its super-active nucleus that releases enormous energy. The unprecedented deep image of the galaxy reveals evidence of a hidden minor merger billions of years ago. The discovery gives crucial evidence for the minor merger origin of active galactic nuclei.

- [**Genetic study uncovers evolutionary history of dingoes**](#) [周二, 31 10月 22:18]

A major study of dingo DNA has revealed dingoes most likely migrated to Australia in two separate waves via a former land bridge with Papua New Guinea. The find has significant implications for conservation, with researchers recommending the two genetically distinct populations of dingoes be treated as different groups for management and conservation purposes.

- [**Graphene enables high-speed electronics on flexible materials**](#) [周二, 31 10月 22:18]

A flexible detector for terahertz frequencies (1,000 gigahertz) has been developed using graphene transistors on plastic substrates. It is the first of its kind, and can extend the use of terahertz technology to applications that will require flexible electronics, such as wireless sensor networks and wearable technology.

- [**How the brain beats distractions to retain memories**](#) [周二, 31 10月 22:18]

Researchers have recently discovered a mechanism that could explain how the brain retains working memory when faced with distractions. These findings could endow cognitive flexibility to neural networks used for artificial intelligence.

- [**Flour power to boost food security**](#) [周二, 31 10月 22:18]

A glue-like protein that holds the wheat grain together could hold the

secret for yielding more, and healthier, flour from wheat.

- [**New biomarkers can detect concussions, even mild ones, through simple blood test**](#) [周二, 31 10月 20:56]

Proteins from brain cells called astrocytes can be detected in blood immediately after head injury, suggesting that a blood test may be used to detect concussions, even mild ones.

- [**Landmark discovery turns marathon of evolution into a sprint**](#) [周二, 31 10月 20:54]

A research collaboration has discovered a new way of rapidly generating a swathe of medically significant natural products after discovering a ground-breaking technique that turns the marathon of evolution into a sprint.

- [**Gene therapy protects against age-related cognitive, memory deficits**](#) [周二, 31 10月 20:54]

Regulation of the brain's Klotho gene using gene therapy protects against age-related learning and memory problems in mice, demonstrate scientists for the first time.

- [**Stem cells conduct cartilage regeneration but are not directly involved**](#) [周二, 31 10月 20:54]

Stem cell therapy has great potential for curing cartilage damage. However, it has remained unclear whether stem cells are responsible for regeneration or whether they trigger the process. Researchers have been able to resolve this issue by tracking the effects in a new, natural model. After injection, stem cells orchestrate the healing effect of endogenous cells but are not responsible for cartilage regeneration. The breakthrough was enabled by preventing the normal immune response to the molecu...

Traffic signal countdown timers lead to improved driver responses -- ScienceDaily

Countdown timers that let motorists know when a traffic light will go from green to yellow lead to safer responses from drivers, research at Oregon State University suggests.

The findings are important because of mistakes made in what traffic engineers call the "dilemma zone" -- the area in which a driver isn't sure whether to stop or keep going when the light turns yellow.

A traffic signal countdown timer, or TSCT, is a clock that digitally displays the time remaining for the current stoplight indication -- i.e., red, yellow or green.

Widely adopted by roughly two dozen countries around the world, traffic signal countdown timers are not used in the U.S. Crosswalk timers for pedestrians are allowed, but TSCTs are prohibited by the Department of Transportation.

"When you introduce inconsistencies -- sometimes you give drivers certain information, sometimes you don't - that has the potential to cause confusion," said David Hurwitz, transportation engineering researcher in OSU's College of Engineering and corresponding author on the study.

There were more than 37,000 traffic fatalities in the United States in 2016. Around 20 percent of those occurred at intersections, he said.

It's not known exactly how many U.S. intersections are signalized because no agency does a comprehensive count, but the National Transportation Operations Coalition estimates the number to be greater than 300,000.

A significant percentage of those feature fixed-time signals, which are recommended in areas with low vehicle speed and heavy pedestrian traffic.

Traffic signal countdown timers work well at fixed-time signals, Hurwitz said, but they may not be practical for actuated signals; at those intersections, he said, a light typically changes only one to four seconds after the decision to change it is made -- not enough

time for a countdown timer to be of value.

In this study, which used a green signal countdown timer, or GSCT, in Oregon State's driving simulator, the clock counted down the final 10 seconds of a green indication.

A subject pool of 55 drivers ranging in age from 19 to 73 produced a data set of 1,100 intersection interactions, half of which involved a GSCT. The presence of the countdown timer increased the probability that a driver in the dilemma zone would stop by an average of just over 13 percent and decreased deceleration rates by an average of 1.50 feet per second.

"These results suggest that the information provided to drivers by GSCTs may contribute to improved intersection safety in the U.S.," Hurwitz said. "When looking at driver response, deceleration rates were more gentle when presented with the countdown timers, and we did not find that drivers accelerated to try to beat the light -- those are positives for safety. Drivers were significantly more likely to slow down and stop when caught in the dilemma zone. The results in the lab were really consistent and statistically

convincing."

The findings, published recently in *Transportation Research Part F: Traffic Psychology and Behaviour*, build on a 2016 paper in *Transportation Research Part C: Emerging Technologies*.

The earlier results, which arose from a related research project, showed drivers were more ready to go when the light turned green at intersections with a red signal countdown timer, which indicates how much time remains until the light goes from red to green. The first vehicle in line got moving an average of 0.82 seconds more quickly in the presence of a timer, suggesting an intersection efficiency improvement thanks to reduction in time lost to startups.

The papers comprised dissertation work by then Ph.D. student Mohammad Islam, who now works for a Beaverton, Oregon-based company, Traffic Technology Services. Amy Wyman, an OSU Honors College undergraduate who completed her degree in 2017, collaborated on the publication.

TTS, whose chief executive officer, Thomas Bauer, is also an OSU College of Engineering alumnus, has

developed a cloud-computer-connected countdown timer for the automotive industry.

Several cars in the German luxury carmaker Audi's 2017 lineup already feature the timer, which can be viewed both on the instrument panel and via a heads-up display. The system is currently operational in several U.S. cities including Portland.

Unlike the traffic-signal-mounted timers, the onboard clocks are allowed in the U.S.

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Mini-microscopes reveal brain circuitry behind social behavior -- ScienceDaily

Tiny microscopes mounted on mice's heads have given researchers a peek into the neural circuitry of social behavior.

Instincts such as mating or fighting are innate behaviors generally thought to be hardwired into an animal's brain. But now, two studies that map brain activity in living mice reveal that social experiences can influence brain responses to other mice. The results, recently reported in the journals *Nature* and *Cell*, show how and where in the brain some instincts are shaped by learning, says Howard Hughes Medical Institute (HHMI) Investigator David Anderson of California Institute of Technology.

"We're starting to get a sense of what happens between the part of the brain that takes in sensory information and the part that produces behavior," Anderson says.

Neuroscientists want to understand how the brain converts sights, sounds, and smells into pictures of the outside world. For animals, smell also provides clues about the age and sex of others nearby; this information can trigger instinctive behaviors. Male and female mice sharing a cage will mate, for example, while two males will often fight for territory.

Anderson and HHMI Investigator Catherine Dulac of Harvard University have previously identified brain regions controlling social behaviors in mice. Anderson has used genetic and optogenetic approaches to identify brain regions responsible for the control of aggressive and mating behaviors. And Dulac has used similar approaches to study the neural pathways involved in smell-related social behaviors in male and female mice.

Now, the researchers have visualized brain activity in awake mice as they interacted normally with mice and other stimuli. Working independently, Dulac and Anderson mapped patterns of brain activity in different brain regions while mice sniffed, ignored, fought, or mated with other mice. Dulac also tracked brain activity triggered by predator and infant odors.

Lasting brain changes

Dulac and her colleagues tracked brain activity in the medial amygdala, an almond-shaped structure that transmits smell signals to the hypothalamus. First, the researchers used a genetic trick to introduce a protein that lights up in active brain cells. Then, the team mounted lightweight microscopes on the heads of individual mice and looked at which brain cells were active when each camera-wearing mouse met another mouse. A thin glass rod implanted in the amygdala collected light from active brain cells and served as the microscope's lens. The researchers recorded neural activity while videotaping the mice's behavior in different social situations.

Dulac's team saw that different clusters of neurons lit up when mice met a member of the opposite sex. In males and females, these sex-specific neural patterns were quite different, Dulac says. And, surprisingly, the act of mating actually transformed the brain's activity patterns. After housing virgin mice in a cage with a mouse of the opposite sex for 15 days, the mice had long-lasting changes in the brain, Dulac and colleagues discovered.

The key to this discovery was an ambitious experiment that had researchers tracking mouse behavior and neural activity (via the head-mounted mini-microscopes) regularly for more than three months straight -- a technical feat that scientists had not attempted before.

Sexual experience strengthens the brain's responses to the opposite sex's odors, and improves an animal's ability to tell males and females apart, the researchers found. That's a sign that experience -- learning -- can help shape an animal's instincts, Dulac says.

"It was surprising to see patterns of brain activity thought to be instinctively activated by odor actually change with experience -- and stay changed for over a month," Dulac says.

In male mice, the hormone oxytocin -- known for its role in maternal and social bonding -- is likely involved in regulating these long-term changes to the brain, Dulac's team found. In female mice, pregnancy also changed brain activity patterns. During and after pregnancy, a whiff of predator odor (soiled rat bedding) didn't trigger as big of a neural response as it did in mice before pregnancy. That finding stood out,

Dulac says, because pregnant females and new mothers have been shown to have reduced responses to stressors. Her team, which collaborated with HHMI Investigator Mark Schnitzer at Stanford University and Venkatesh Murthy at Harvard, reported their results October 26, 2017, in *Cell*.

Probing the hypothalamus

At Caltech, Anderson and his colleagues also wanted to visualize the neural circuitry involved with social behavior in male mice. The researchers, including Stanford's Schnitzer, used the same microscopic technique as Dulac's team but implanted the lens in the ventromedial hypothalamus, an evolutionarily ancient structure involved in social behavior. Anderson's team imaged the activity of a specific population of neurons that produce the estrogen receptor, which is well known for its influence on social behaviors.

Anderson's team placed the microscopes on virgin, socially isolated male mice and let them interact in an alternating manner with five different females and five different males, each for two minutes, for several consecutive days. The researchers imaged the same neurons across multiple trials and multiple days, and

correlated changes in neural activity with changes in social behaviors, such as sniffing, mounting, and attacking.

During the males' initial encounters with male or female visitors, researchers observed little mating or fighting, and the same neurons lit up in response to both sexes. But with continued social experience, the males gradually began to mate with female visitors, and then to attack male visitors. At the same time, more neurons began to respond specifically to one or the other sex, and fewer to both.

"We watched these activity patterns change in real time as a mouse's brain learned to tell the difference between males and females," Anderson says.

In a different set of experiments, Anderson's team showed that just a brief experience with a female mouse could make a big difference in a virgin male's brain, as well as in his aggressive behavior. As little as 30 minutes of sexual experience was enough to promote female- and male-specific neural activation patterns when tested 24 hours later. The short tryst also caused males to exhibit aggression the next day, whereas males without this experience were non-

aggressive. Thirty minutes of experience with a male had no such effect.

The results suggest that although mating and fighting are innate behaviors, mice's brains have to learn to tell the difference between males and females before they can properly exhibit both of these behaviors, Anderson says. "There's a learned component to these instinctive behaviors."

His team's findings also reveal that neural activity in the hypothalamus is dynamic, and can be shaped by experience, Anderson adds. Those properties indicate that this evolutionarily ancient region of the brain may be more similar to newer brain regions than previously thought, he says. He and colleagues reported their work October 18, 2017, in *Nature*.

Although Dulac's and Anderson's teams examined different brain regions, both researchers observed a similar relationship between sex-specific neural activity and social behavior.

But it's not yet possible to say whether the activation patterns observed by the two groups in different brain regions are influencing each other, Anderson says. The

connections between the hypothalamus and the amygdala are complicated, and experiments to follow information flow between the two are on the edge of what's technically possible, he adds.

But altogether, the current work has given researchers a detailed look into the neural circuitry underlying mouse social behavior, Dulac says. "It's wonderful to have a flurry of information about what the brain of an animal says as it meets another animal and how that changes with different social experiences. For me, this is a bit of a dream come true," she says.

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Young bats learn bat 'dialects' from their nestmates: Language acquisition not limited to human beings -- ScienceDaily

Young bats adopt a specific "dialect" spoken by their own colonies, even when this dialect differs from the bat "mother tongue," a new study publishing 31 October in the open access journal *PLOS Biology* shows. By offering insight into the evolutionary origins of language acquisition skills, the study, led by Dr. Yossi Yovel of Tel Aviv University, and his students Yosef Prat and Lindsay Azoulay, calls into question the uniqueness of this skill in humans.

For the research, the team raised 14 pups with their mothers in three different colonies. In these laboratory colonies, the scientists used speakers to play three specific subsets of natural bat vocalizations. The researchers exposed the young bats to the recordings over a period of one year, until they reached adulthood.

Although the young bats were exposed to their

mothers' 'normal' dialect and could communicate with their mothers, each group developed a dialect resembling the one they were exposed to through the recordings.

"The difference between the vocalizations of the mother bat and those of the colony are akin to a London accent and, say, a Scottish accent," Dr. Yovel explains. "The pups heard their mothers' 'London' dialect, but also heard the 'Scottish' dialect mimicked by many dozens of 'Scottish' bats. The pups eventually adopted a dialect that was more similar to the local 'Scottish' dialect than to the 'London' accent of their mothers."

"The ability to learn vocalizations from others is extremely important for speech acquisition in humans, but it's believed to be rare among animals," Dr. Yovel says. "Researchers have believed that this is what makes human language unique.

Songbirds are the most common animal models for 'vocal learning,' and they learn songs from specific tutors. These studies typically indicate that a bird learns to sing from one parent. But this study shows that bats listen and learn from an entire colony of

several hundred bats, not just from their parents. "In other words," says Yovel, "young bats pick up the dialect vocalized by their surrounding roost-mates."

The researchers will next examine how the acquisition of a new dialect influences the ability of bats to integrate into foreign colonies. "Will they adopt the local dialect or will they be rejected by the group? Or maybe the local colony will change its dialect to adopt that of our bats," Dr. Yovel says. "There are many interesting avenues yet to explore."

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Humans don't use as much brainpower as we like to think: Animals had energy-hungry brains long before we did -- ScienceDaily

For years, scientists assumed that humans devote a larger share of their daily calories to their brains than other animals. Although the human brain makes up only 2 percent of body weight, it consumes more than 25 percent of our baseline energy budget.

But a study published Oct. 31 in the *Journal of Human Evolution* comparing the relative brain costs of 22 species found that, when it comes to brainpower, humans aren't as exceptional as we like to think.

"We don't have a uniquely expensive brain," said study author Doug Boyer, assistant professor of evolutionary anthropology at Duke University. "This challenges a major dogma in human evolution studies."

Boyer and his graduate student Arianna Harrington decided to see how humans stack up in terms of brain

energy uptake.

Because energy travels to the brain via blood vessels, which deliver a form of sugar called glucose, the researchers measured the cross-sectional area of the bony canals that enclose the cranial arteries.

By coupling these measurements with previously published estimates of brain glucose uptake and internal skull volume as an indicator of brain size, they examined seven species, including mice, rats, squirrels, rabbits, monkeys and humans. The researchers were able to show that larger canals enclose arteries that deliver more blood, and thus glucose, to the brain.

Then, using a statistical technique called multiple regression, they calculated brain glucose uptake for an additional 15 species for which brain costs were unknown, including lemurs, monkeys and treeshrews, primate relatives from Southeast Asia.

As expected, the researchers found that humans allot proportionally more energy to their brains than rodents, Old World monkeys, and great apes such as orangutans and chimpanzees.

Relative to resting metabolic rate -- the total amount of calories an animal burns each day just to keep breathing, digesting and staying warm -- the human brain demands more than twice as many calories as the chimpanzee brain, and at least three to five times more calories than the brains of squirrels, mice and rabbits.

But other animals have hungry brains too.

In terms of relative brain cost, there appears to be little difference between a human and a pen-tailed treeshrew, for example.

Even the ring-tailed lemur and the tiny quarter-pound pygmy marmoset, the world's smallest monkey, devote as much of their body energy to their brains as we do.

"This shouldn't come as too much of a surprise," Boyer said. "The metabolic cost of a structure like the brain is mainly dependent on how big it is, and many animals have bigger brain-to-body mass ratios than humans."

The results suggest that the ability to grow a relatively more expensive brain evolved not at the dawn of humans, but millions of years before, when our primate ancestors and their close relatives split from the branch

of the mammal family tree that includes rodents and rabbits, Harrington said.

Previous studies calculated the amount of energy needed to fuel a brain based on neuron counts. But because the current study's method for estimating energy use relies on measurements of bone, rather than soft tissue such as neurons, it is now possible to estimate brain energy demand from the fossilized remains of animals that are extinct too, including early human ancestors.

"All you would need to take the measurements is an intact skull and some of the neck vertebrae," Harrington said.

What the data can't show is whether energetically expensive brains evolved first, and then predisposed some groups of animals to greater mental powers as a byproduct, or whether preexisting cognitive challenges favored individuals that devoted more energy to the brain, the researchers say.

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'Tensor algebra' software speeds big-data analysis 100-fold: System for performing 'tensor algebra' offers 100-fold speedups over previous software packages -- ScienceDaily

We live in the age of big data, but most of that data is "sparse." Imagine, for instance, a massive table that mapped all of Amazon's customers against all of its products, with a "1" for each product a given customer bought and a "0" otherwise. The table would be mostly zeroes.

With sparse data, analytic algorithms end up doing a lot of addition and multiplication by zero, which is wasted computation. Programmers get around this by writing custom code to avoid zero entries, but that code is complex, and it generally applies only to a narrow range of problems.

At the Association for Computing Machinery's Conference on Systems, Programming, Languages and Applications: Software for Humanity (SPLASH),

researchers from MIT, the French Alternative Energies and Atomic Energy Commission, and Adobe Research recently presented a new system that automatically produces code optimized for sparse data.

That code offers a 100-fold speedup over existing, non-optimized software packages. And its performance is comparable to that of meticulously hand-optimized code for specific sparse-data operations, while requiring far less work on the programmer's part.

The system is called Taco, for tensor algebra compiler. In computer-science parlance, a data structure like the Amazon table is called a "matrix," and a tensor is just a higher-dimensional analogue of a matrix. If that Amazon table also mapped customers and products against the customers' product ratings on the Amazon site and the words used in their product reviews, the result would be a four-dimensional tensor.

"Sparse representations have been there for more than 60 years," says Saman Amarasinghe, an MIT professor of electrical engineering and computer science (EECS) and senior author on the new paper. "But nobody knew how to generate code for them automatically. People figured out a few very specific operations -- sparse

matrix-vector multiply, sparse matrix-vector multiply plus a vector, sparse matrix-matrix multiply, sparse matrix-matrix-matrix multiply. The biggest contribution we make is the ability to generate code for any tensor-algebra expression when the matrices are sparse."

Joining Amarasinghe on the paper are first author Fredrik Kjolstad, an MIT graduate student in EECS; Stephen Chou, also a graduate student in EECS; David Lugato of the French Alternative Energies and Atomic Energy Commission; and Shoaib Kamil of Adobe Research.

Custom kernels

In recent years, the mathematical manipulation of tensors -- tensor algebra -- has become crucial to not only big-data analysis but machine learning, too. And it's been a staple of scientific research since Einstein's time.

Traditionally, to handle tensor algebra, mathematics software has decomposed tensor operations into their constituent parts. So, for instance, if a computation required two tensors to be multiplied and then added to

a third, the software would run its standard tensor multiplication routine on the first two tensors, store the result, and then run its standard tensor addition routine.

In the age of big data, however, this approach is too time-consuming. For efficient operation on massive data sets, Kjolstad explains, every sequence of tensor operations requires its own "kernel," or computational template.

"If you do it in one kernel, you can do it all at once, and you can make it go faster, instead of having to put the output in memory and then read it back in so that you can add it to something else," Kjolstad says. "You can just do it in the same loop."

Computer science researchers have developed kernels for some of the tensor operations most common in machine learning and big-data analytics, such as those enumerated by Amarasinghe. But the number of possible kernels is infinite: The kernel for adding together three tensors, for instance, is different from the kernel for adding together four, and the kernel for adding three three-dimensional tensors is different from the kernel for adding three four-dimensional tensors.

Many tensor operations involve multiplying an entry from one tensor with one from another. If either entry is zero, so is their product, and programs for manipulating large, sparse matrices can waste a huge amount of time adding and multiplying zeroes.

Hand-optimized code for sparse tensors identifies zero entries and streamlines operations involving them -- either carrying forward the nonzero entries in additions or omitting multiplications entirely. This makes tensor manipulations much faster, but it requires the programmer to do a lot more work.

The code for multiplying two matrices -- a simple type of tensor, with only two dimensions, like a table -- might, for instance, take 12 lines if the matrix is full (meaning that none of the entries can be omitted). But if the matrix is sparse, the same operation can require 100 lines of code or more, to track omissions and elisions.

Enter Taco

Taco adds all that extra code automatically. The programmer simply specifies the size of a tensor, whether it's full or sparse, and the location of the file

from which it should import its values. For any given operation on two tensors, Taco builds a hierarchical map that indicates, first, which paired entries from both tensors are nonzero and, then, which entries from each tensor are paired with zeroes. All pairs of zeroes it simply discards.

Taco also uses an efficient indexing scheme to store only the nonzero values of sparse tensors. With zero entries included, a publicly released tensor from Amazon, which maps customer ID numbers against purchases and descriptive terms culled from reviews, takes up 107 exabytes of data, or roughly 10 times the estimated storage capacity of all of Google's servers. But using the Taco compression scheme, it takes up only 13 gigabytes -- small enough to fit on a smartphone.

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The eyes are for seeing, but they have other important biological functions, including automatic visual reflexes that go on without awareness. The reflexive system of the human eye also produces a conscious, visual experience, according to a new study.

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Computer scientists have created fabrics and fashion accessories that can store data -- from security codes to identification tags -- without needing any on-board electronics or sensors.

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Researchers have established a new world efficiency record for quantum dot solar cells, at 13.4 percent.

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Technology that keeps track of how your smartphone is oriented can now give \$50,000 ultrasound machines many of the 3-D imaging abilities of their \$250,000 counterparts -- for the cost of a \$10 microchip.

- [**The world's shortest laser pulse: Seeing electron movement during chemical reactions**](#) [周二, 31 10月 23:15]

Researchers have succeeded in shortening the pulse duration of an X-ray laser to only 43 attoseconds. With a time resolution in the range of a few quintillionths of a second, they are now able for the first time to observe the movement of electrons during chemical reactions in slow motion.

- [**Medical-like tools for NASA to study samples of the solar system**](#) [周二, 31 10月 23:14]

A diagnostic tool, similar in theory to those used by the medical profession to noninvasively image internal organs, bones, soft tissue, and blood vessels, could be equally effective at 'triaging' extraterrestrial rocks and other samples before they are shipped to Earth for further analysis.

- [**Dinosaur-killing asteroid impact cooled Earth's climate more than previously thought**](#) [周二, 31 10月 23:14]

The Chicxulub asteroid impact that wiped out the dinosaurs likely released far more climate-altering sulfur gas into the atmosphere than originally thought, according to new research.

- [**'Monster' planet discovery challenges formation theory**](#) [周二, 31 10月 22:51]

A giant planet, which should not exist according to planet formation theory, has been discovered around a distant star.

- [**Minor merger kicks supermassive black hole into high gear**](#) [周二, 31 10月 22:18]

Astronomers are studying the galaxy M77, which is famous for its super-active nucleus that releases enormous energy. The unprecedented deep image of the galaxy reveals evidence of a hidden minor merger billions of years ago. The discovery gives crucial evidence for the minor merger origin of active galactic nuclei.

- [**Genetic study uncovers evolutionary history of dingoes**](#) [周二, 31 10月 22:18]

A major study of dingo DNA has revealed dingoes most likely migrated to Australia in two separate waves via a former land bridge with Papua New Guinea. The find has significant implications for conservation, with researchers recommending the two genetically distinct populations of dingoes be treated as different groups for management and conservation purposes.

- [**How memories ripple through the brain**](#) [周二, 31 10月 20:48]

Using an innovative "NeuroGrid" technology, scientists showed that sleep boosts communication between two brain regions whose connection is critical for the formation of memories. The work is devoted to accelerating the development of new approaches to probing the workings of the brain.

- [**Monster colliding black holes might lurk on the edge of spiral galaxies**](#) [周二, 31 10月 03:44]

The outskirts of spiral galaxies like our own could be crowded with colliding black holes of massive proportions and a prime location for scientists hunting the sources of gravitational waves, said researchers. Their study identifies an overlooked region potentially rife with orbiting black holes. Identifying host galaxies of merging massive black holes could help explain how orbiting pairs of black holes form.

- [**Right whales, already an endangered species, may face a dim future**](#) [周二, 31 10月 03:44]

Researchers show that right whales, already an endangered species, may face a dim future.

- [**Greenhouse gas concentrations surge to new**](#)

[record](#) [周二, 31 10月 02:19]

Concentrations of carbon dioxide in the atmosphere surged at a record-breaking speed in 2016 to the highest level in 800,000 years, according to a new report. The abrupt changes in the atmosphere witnessed in the past 70 years are without precedent.

• [Virtual reality reduces phantom pain in paraplegics](#) [周二, 31 10月 01:46]

Virtual reality reduces phantom body pain in paraplegics and creates the illusion that they can feel their paralyzed legs being touched again. The results could one day translate into therapies to reduce chronic pain in paraplegics.

• [How flu shot manufacturing forces influenza to mutate](#) [周二, 31 10月 01:46]

The common practice of growing influenza vaccine components in chicken eggs disrupts the major antibody target site on the virus surface, rendering the flu vaccine less effective in humans.

• [Mystery of raging black hole beams penetrated](#) [周二, 31 10月 01:12]

They are nature's very own Death Star beams - ultra-powerful jets of energy that shoot out from the vicinity of black holes like deadly rays from the Star Wars super-weapon.

• [White rot fungi's size explained by breadth of gene families involved](#) [周二, 31 10月 00:35]

Armillaria fungi are among the most devastating fungal pathogens, causing root rot disease in more than 500 plant species found in forests, parks and vineyards. As white rot fungi, they are capable of breaking down all components of plant cell walls, a capability that interests bioenergy researchers. Biologists have now analyzed and compared four Armillaria fungal genomes with those of related fungi to better understand the evolution of Armillaria's abilities.

• [Jupiter's X-ray auroras pulse independently](#) [周二, 31 10月 00:34]

Jupiter's intense northern and southern lights pulse independently of

each other according to new research.

- [**Breastfeeding for two months halves risk of SIDS**](#) [周二, 31 10月 00:34]

Breastfeeding for at least two months cuts a baby's risk of Sudden Infant Death Syndrome almost in half, a sweeping new international study has found.

- [**Pumpkin genomes sequenced, revealing uncommon evolutionary history**](#) [周一, 30 10月 21:54]

For some, pumpkins conjure carved Halloween decorations, but for many people around the world, these gourds provide nutrition. Scientists have sequenced the genomes of two important pumpkin species, *Cucurbita maxima* and *Cucurbita moschata*.

- [**Bonding benefits of breastfeeding extend years beyond infancy**](#) [周一, 30 10月 21:29]

Women who breastfeed their children longer exhibit more maternal sensitivity well past the infant and toddler years, according to a 10-year longitudinal study.

- [**Oldest recorded solar eclipse helps date the Egyptian pharaohs**](#) [周一, 30 10月 10:01]

Researchers have pinpointed the date of what could be the oldest solar eclipse yet recorded. The event, which occurred on Oct. 30, 1207 BC, is mentioned in the Bible, and could have consequences for the chronology of the ancient world.

- [**Small asteroid or comet 'visits' from beyond the solar system**](#) [周五, 27 10月 22:45]

A small, recently discovered asteroid -- or perhaps a comet -- appears to have originated from outside the solar system, coming from somewhere else in our galaxy. If so, it would be the first "interstellar object" to be observed and confirmed by astronomers.

- [**New technique produces tunable, nanoporous**](#)

[**materials**](#) [周五, 27 10月 21:44]

A collaborative group of researchers describe a new technique for creating novel nanoporous materials with unique properties that can be used to filter molecules or light.

• [**Advanced artificial limbs mapped in the brain**](#) [周五, 27 10月 21:44]

Scientists have used functional MRI to show how the brain re-maps motor and sensory pathways following targeted motor and sensory reinnervation (TMSR), a neuroprosthetic approach where residual limb nerves are rerouted towards intact muscles and skin regions to control a robotic limb.

• [**Water buffalo genome unveiled**](#) [周五, 27 10月 21:44]

Biologists have published the full genome of the water buffalo -- opening the way for improved breeding and conservation of this economically important animal.

• [**Nanomagnets levitate thanks to quantum physics**](#) [周五, 27 10月 21:44]

Quantum physicists have now shown that, despite Earnshaw's theorem, nanomagnets can be stably levitated in an external static magnetic field owing to quantum mechanical principles. The quantum angular momentum of electrons, which also causes magnetism, is accountable for this mechanism.

• [**Film research study shows how the brain reacts to difficult moral issues**](#) [周五, 27 10月 21:00]

The family relationship between film characters clearly affects the reactions in the viewers' brain, research shows. The study has also detected a significant conflict between the reactions of the brain and the person's own account.

• [**Martian landscapes formed from sand 'levitating' on a little boiling water**](#) [周五, 27 10月 20:57]

Scientists have discovered a process that could explain the long-debated mystery of how land features on Mars are formed in the absence of

significant amounts of water. Experiments reveal that Mars' thin atmosphere (about 7 mbar -- compared to 1,000 mbar on Earth) combined with periods of relatively warm surface temperatures causes water flowing on the surface to violently boil. This process can then move large amounts of sand and other sediment, which effectively 'levitates' on the boiling water...

- **[Heavy metal thunder: Protein can be switched on to conduct electricity like a metal](#)** [周五, 27 10月 20:55]

When pushing the boundaries of discovery, sometimes even the most experienced of scientists can get a surprise jolt from a completely unpredictable result. About four years ago, Stuart Lindsay's research team got a lab result that even he couldn't quite believe. As with most scientific surprises, it goes against all conventional wisdom: the first evidence of a protein that could conduct electricity like a metal.

- **[Winters on Mars are shaping the Red Planet's landscape](#)** [周五, 27 10月 20:55]

Winter temperatures on the Red Planet sublime carbon dioxide from a gas to a solid. These solid carbon dioxide blocks are then thought responsible for making gullies and furrows on Mars' landscape, based on innovative lab experiments.

- **[Learning from mussels: New way to make stronger, more stretchy polymers](#)** [周五, 27 10月 02:23]

A wide range of polymer-based materials, from tire rubber and wetsuit neoprene to Lycra clothing and silicone, are elastomers valued for their ability to flex and stretch without breaking and return to their original form.

- **[Bacteria have a sense of touch](#)** [周五, 27 10月 02:23]

Although bacteria have no sensory organs in the classical sense, they are still masters in perceiving their environment. A research group has now discovered that bacteria not only respond to chemical signals, but also possess a sense of touch. The researchers demonstrate how bacteria recognize surfaces and respond to this mechanical stimulus within

seconds. This mechanism is also used by pathogens to colonize and attack their host cells.

• [**Astronomers discover sunscreen snow falling on hot exoplanet**](#) [周五, 27 10月 01:53]

Astronomers have used the Hubble Space Telescope to find a blistering-hot giant planet outside our solar system where the atmosphere 'snows' titanium dioxide -- the active ingredient in sunscreen. These observations are the first detections of this 'snow-out' process, called a 'cold trap,' on an exoplanet. The research provides insight into the complexity of weather and atmospheric composition on exoplanets, and may someday be useful for gauging the habitability of Earth-size planets.

• [**Scientists detect comets outside our solar system**](#) [周五, 27 10月 01:53]

Scientists, working closely with amateur astronomers, have spotted the dusty tails of six exocomets -- comets outside our solar system -- orbiting a faint star 800 light years from Earth.

• [**'Bandit-masked' feathered dinosaur hid from predators using multiple types of camouflage**](#) [周五, 27 10月 01:52]

Researchers have revealed how a small feathered dinosaur used its color patterning, including a bandit mask-like stripe across its eyes, to avoid being detected by its predators and prey.

• [**Individual with complete spinal cord injury regains voluntary motor function**](#) [周四, 26 10月 22:31]

A man with a complete spinal cord injury, who had lost motor function below the level of the injury, has regained the ability to move his legs voluntarily and stand six years after his injury.

• [**Wobbling galaxies: New evidence for dark matter makes it even more exotic**](#) [周四, 26 10月 22:31]

Astronomers have discovered that the brightest galaxies within galaxy clusters 'wobble' relative to the cluster's center of mass. This unexpected result is inconsistent with predictions made by the current standard

model of dark matter. With further analysis it may provide insights into the nature of dark matter, perhaps even indicating that new physics is at work.

- [**Yellowstone spawned twin super-eruptions that altered global climate**](#) [周四, 26 10月 20:58]

A new geological record of the Yellowstone supervolcano's last catastrophic eruption is rewriting the story of what happened 630,000 years ago and how it affected Earth's climate. This eruption formed the vast Yellowstone caldera observed today, the second largest on Earth.

- [**Current climate change unparalleled over the last 100 million years?**](#) [周四, 26 10月 20:57]

A team of researchers has discovered a flaw in the way past ocean temperatures have been estimated up to now. Their findings could mean that the current period of climate change is unparalleled over the last 100 million years.

- [**'Mega-carnivore' dinosaur roamed southern Africa 200 million years ago**](#) [周四, 26 10月 03:06]

An international team of scientists has discovered the first evidence that a huge carnivorous dinosaur roamed southern Africa 200 million years ago.

- [**6,000-year-old skull could be from the world's earliest known tsunami victim**](#) [周四, 26 10月 03:06]

Scientists have discovered what they believe is the skull of the earliest known tsunami victim, a person who lived 6,000 years ago in Papua New Guinea. The skull itself was found almost a hundred years ago, but recent analysis of the sediments found with the skull reveals that they bear distinctive hallmarks of tsunami activity.

- [**Neuroscientists improve human memory by electrically stimulating brain**](#) [周四, 26 10月 03:06]

Neuroscientists have discovered precisely where and how to electrically stimulate the human brain to enhance people's recollection of distinct

memories.

- [**New property found in unusual crystalline materials**](#) [周四, 26 10月 02:11]

Researchers have discovered an unexpected property of some nanostructured metals, could lead to new ways of 'tuning' their properties.

- [**Investing in conservation pays off, study finds**](#) [周四, 26 10月 02:11]

Governments and donors have spent billions of dollars since the 1992 Rio Earth Summit attempting to slow the pace of species extinctions around the world. Now, a new article provides the first clear evidence that those efforts are working.

- [**Precise DNA editing made easy: New enzyme to rewrite the genome**](#) [周四, 26 10月 02:05]

A new type of DNA editing enzyme lets scientists directly and permanently change single base pairs of DNA from A*T to G*C. The process could one day enable precise DNA surgery to correct mutations that cause human diseases.

- [**Physicists have breakthrough on brittle smart phone screens**](#) [周四, 26 10月 02:05]

New 'potato stamp' technique combining silver and graphene may create cheaper, more flexible and eco-friendly screens.

- [**New RoboBee flies, dives, swims and explodes out the of water**](#) [周四, 26 10月 02:05]

A new, hybrid RoboBee can fly, dive into water, swim, propel itself back out of water, and safely land. Floating devices allow this multipurpose air-water microrobot to stabilize on the water's surface before an internal combustion system ignites to propel it back into the air. This latest-generation RoboBee, which is 1,000 times lighter than any previous aerial-to-aquatic robot, could be used for numerous applications, from search-and-rescue operations to environmental monitoring and biological ...

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Health News

Top stories featured on ScienceDaily's Health & Medicine, Mind & Brain, and Living Well sections.

- [**Traffic signal countdown timers lead to improved driver responses**](#) [周三, 01 11月 03:12]

Countdown timers that let motorists know when a traffic light will go from green to yellow lead to safer responses from drivers, research suggests.

- [**Mini-microscopes reveal brain circuitry behind social behavior**](#) [周三, 01 11月 03:12]

A microscope lens implanted deep inside a mouse's brain shows different patterns of neural activity when the mouse interacts with males, females, or other stimuli. Now, researchers have discovered that sexual experience can trigger long-term changes in these brain patterns.

- [**Young bats learn bat 'dialects' from their nestmates**](#) [周三, 01 11月 02:37]

Young bats adopt a specific 'dialect' spoken by their own colonies, even when this dialect differs from the bat 'mother tongue,' a new study shows. By offering insight into the evolutionary origins of language acquisition skills, the study calls into question the uniqueness of this skill in humans.

- [**Tracking mosquitoes with your cellphone**](#) [周三, 01 11月 02:37]

A simple recording of a mosquito's buzz on a cellphone could contribute to a global-scale mosquito tracking map of unprecedented detail, say experts.

- [**Little-known fruits contain powerful anti-**](#)

[**inflammatory and anti-oxidant agents**](#) [周三, 01 11月 02:37]

Research shows that five fruit species native to Brazil's Atlantic Rainforest biome have bioactive properties as outstanding as those of blueberries, cranberries, blackberries, and strawberries. By investigating the presence of anti-aging nutrients that also work at the prevention of cancer, diabetes and Alzheimer's, the study clears the path for the conservation and promotion of the genus Eugenia, which contains 400 species (some of them endangered) and presents huge potential in food and pharma...

. [**Uncomfortable sight from an ancient reflex of the eye**](#) [周三, 01 11月 01:57]

The eyes are for seeing, but they have other important biological functions, including automatic visual reflexes that go on without awareness. The reflexive system of the human eye also produces a conscious, visual experience, according to a new study.

. [**Elderly chromosomes activate genes differently than in the young**](#) [周三, 01 11月 01:57]

Grey hair, wisdom, and wrinkles on our skin mark us as we age, but it's the more subtle changes beneath the surface that make us old. Now, researchers have discovered that our chromosomes also wrinkle with age, changing how our immune system renews itself.

. [**Chromosome organization emerges from 1-D patterns**](#) [周三, 01 11月 01:57]

Researchers have developed a method to predict how a human chromosome folds based solely on the epigenetic marks that decorate chromatin inside cells.

. [**How to detect the risk of dyslexia before learning to read**](#) [周三, 01 11月 01:03]

Almost 10 percent of the world population suffers dyslexia. Establishing an early diagnosis would allow the development of training programs to palliate this disorder. We now may be nearer to reaching this goal thanks

to a study associating auditory processing in children to their reading skills. The results offer a new approach for detecting the risk before the children learn to read.

- [**Strong maternal antibodies for HIV ineffective for protecting infants from HIV**](#) [周三, 01 11月 01:03]

HIV+ mothers who possess a strong neutralizing antibody response may be more likely to pass the virus on to her infant through breast feeding. In addition, infants born to mothers with a strong antibody response are significantly more likely to have a serious illness or death, regardless of whether or not they acquire the virus, report investigators.

- [**Workplace incivility: The silent epidemic**](#) [周三, 01 11月 00:06]

Workplace incivility is taking over our organizations, professional relationships and everyday interactions. According to researchers, understanding why incivility happens and how to address it starts with awareness.

- [**Bilingual preschoolers show stronger inhibitory control**](#) [周三, 01 11月 00:03]

For students in preschool, speaking two languages may be better than one, especially for developing inhibitory control. That idea isn't new, but a new study took a longitudinal approach to examine the bilingual advantage hypothesis, which suggests that the demands associated with managing two languages confer cognitive advantages that extend beyond the language domain.

- [**US cancer drug costs increasing despite competition**](#) [周三, 01 11月 00:03]

After a follow-up period of 12 years, the mean cumulative cost increase was 37 percent, including all the injectable anticancer drugs. Annual changes in pricing did not appear to be affected by new supplemental FDA approvals, new off-label indications or new competition.

- [**Stable, affordable homes don't just help patients, they save taxpayer dollars**](#) [周三, 01 11月 00:03]

By investing in housing, hospitals can help build healthier communities and save money by stemming the tide of emergency room visits and costly health interventions, research shows.

- [**Illuminated pajamas treat newborns for jaundice**](#) [周三, 01 11月 00:03]

Babies who suffer from jaundice after birth are treated with shortwave light. Researchers have now developed illuminated pajamas that replace the treatment in an incubator. This means newborns can get healthy while warm and happy in their mothers' arms.

- [**Voting does not reduce crime, study shows**](#) [周三, 01 11月 00:03]

Voting does not make people less likely to subsequently commit a crime, a randomized controlled experiment of 550,000 potential voters in the United States shows.

- [**Religious affiliation at the end of life is changing globally**](#) [周三, 01 11月 00:03]

The worldwide pattern of religious affiliation at the time of death is expected to change over the next 50 years, with distinct regional trends. This is the first study to analyze the demographics of religious affiliation at the time of death on a global scale and to make projections until 2060. Despite the importance of religious affiliation for health- and death-related behavior, there have been few global predictions of this kind.

- [**Locus coeruleus activity linked with hyperarousal in PTSD**](#) [周三, 01 11月 00:03]

A new study has linked signs of heightened arousal and reactivity -- a core symptom of posttraumatic stress disorder (PTSD) -- to overactivity of the locus coeruleus (LC), a brain region that mediates arousal and reactivity. By combining bodily responses and brain imaging data researchers have provided direct human evidence for a theory over 30 years old.

- [**Stay focused, if you can**](#) [周三, 01 11月 00:03]

What makes some people better able to resist temptation than others?

Researchers are set to explore this question.

- [**Prenatal exposure to BPA at low levels can affect gene expression in developing rat brain**](#) [周三, 01 11月 00:03]

Prenatal exposure to bisphenol A (BPA) at levels below those currently considered safe for humans affects gene expression related to sexual differentiation and neurodevelopment in the developing rat brain.

- [**How a \\$10 microchip turns 2-D ultrasound machines into 3-D imaging devices**](#) [周二, 31 10月 23:15]

Technology that keeps track of how your smartphone is oriented can now give \$50,000 ultrasound machines many of the 3-D imaging abilities of their \$250,000 counterparts -- for the cost of a \$10 microchip.

- [**Role of a DNA repair mechanism**](#) [周二, 31 10月 23:15]

An important step forward in understanding more exactly what the mechanisms are that allow, if not correctly repaired, certain DNA breaks to be exchanged with others, so generating chromosomal translocation.

- [**How an interest in bipolar disorder drugs led to a better understanding of leukemia**](#) [周二, 31 10月 23:14]

A research project that began 20 years ago with an interest in how lithium treats mood disorders has yielded insights into the progression of blood cancers such as leukemia. The research centers on a protein called GSK-3.

- [**Report reveals prominence of double vision**](#) [周二, 31 10月 22:21]

A new study reveals that double vision is associated with 850,000 outpatient and emergency department visits annually, but life-threatening diagnoses are rare.

- [**How the brain beats distractions to retain memories**](#) [周二, 31 10月 22:18]

Researchers have recently discovered a mechanism that could explain how the brain retains working memory when faced with distractions.

These findings could endow cognitive flexibility to neural networks used for artificial intelligence.

- [**New biomarkers can detect concussions, even mild ones, through simple blood test**](#) [周二, 31 10月 20:56]

Proteins from brain cells called astrocytes can be detected in blood immediately after head injury, suggesting that a blood test may be used to detect concussions, even mild ones.

- [**Landmark discovery turns marathon of evolution into a sprint**](#) [周二, 31 10月 20:54]

A research collaboration has discovered a new way of rapidly generating a swathe of medically significant natural products after discovering a ground-breaking technique that turns the marathon of evolution into a sprint.

- [**Gene therapy protects against age-related cognitive, memory deficits**](#) [周二, 31 10月 20:54]

Regulation of the brain's Klotho gene using gene therapy protects against age-related learning and memory problems in mice, demonstrate scientists for the first time.

- [**Stem cells conduct cartilage regeneration but are not directly involved**](#) [周二, 31 10月 20:54]

Stem cell therapy has great potential for curing cartilage damage. However, it has remained unclear whether stem cells are responsible for regeneration or whether they trigger the process. Researchers have been able to resolve this issue by tracking the effects in a new, natural model. After injection, stem cells orchestrate the healing effect of endogenous cells but are not responsible for cartilage regeneration. The breakthrough was enabled by preventing the normal immune response to the molecu...

- [**New toolkit reveals novel cancer genes**](#) [周二, 31 10月 20:49]

A new statistical model has enabled researchers to pinpoint 27 novel genes thought to prevent cancer from forming, in an analysis of over

2,000 tumors across 12 human cancer types. The findings could help create new cancer treatments that target these genes, and open up other avenues of cancer research.

- [**Aging has distinct and opposite effects on tendon in males and females**](#) [周二, 31 10月 20:49]

New research has identified that in tendon aging has distinct and opposite effects on the genes expressed in males and females.

- [**Right-handed baseball players more successful when batting left-handed**](#) [周二, 31 10月 20:48]

It is known that baseball players who bat left-handed are overrepresented in the sport. But new research shows that baseball players who bat left but throw right-handed have a surprising advantage, and have a more successful career, than players who bat and throw left-handed.

- [**Genome scientists use UK Salmonella cases to shed light on African epidemic**](#) [周二, 31 10月 20:48]

Scientists have used Salmonella genome data from a UK public health surveillance study to gain new insights into the Salmonella epidemic in sub-Saharan Africa.

- [**Political views have limited impact on how we perceive climate anomalies**](#) [周二, 31 10月 20:48]

Individual perceptions of climate anomalies are largely immune to political bias, especially when people observe large and persistent departures from average conditions.

- [**Long-term states of mind can affect short-term financial decisions**](#) [周二, 31 10月 20:48]

A new study sheds more light on the quirks of people's actions in such cases and suggests that, in addition to immediate financial needs, persistent behavioral characteristics play a key role in even short-term pocketbook decisions.

- [**How memories ripple through the brain**](#) [周二, 31 10月 20:48]

Using an innovative "NeuroGrid" technology, scientists showed that sleep boosts communication between two brain regions whose connection is critical for the formation of memories. The work is devoted to accelerating the development of new approaches to probing the workings of the brain.

- [**Wristband devices detect dangerous seizures in patients with epilepsy**](#) [周二, 31 10月 20:48]

New research indicates that wristband devices may improve the detection and characterization of seizures in patients with epilepsy.

- [**Football position and length of play affect brain impact**](#) [周二, 31 10月 20:48]

Damage to white matter in the brains of former college and professional football players due to recurrent head impacts can be related to playing position and career duration, according to a new study.

- [**Research suggests new way to treat inflammatory gut disease and prevent rejection of bone marrow transplants**](#) [周二, 31 10月 20:48]

A new study explains how a widely used drug is effective against inflammatory bowel disease and rejection of bone marrow transplants, while suggesting another way to address both health issues.

- [**Higher thyroid hormone levels associated with artery disease and early death**](#) [周二, 31 10月 20:48]

High and high-normal levels of a thyroid hormone called free thyroxine or FT4, were associated with artery disease and death in elderly and middle-aged people.

- [**Spicy food may curb unhealthy cravings for salt**](#) [周二, 31 10月 20:48]

People who enjoy spicy foods appear to eat less salt and have lower blood pressure. Spicy foods may increase sensitivity to salt, reducing how much salt is eaten.

- **[Alzheimer's disease might be a 'whole body' problem](#)** [周二, 31 10月 20:48]

Canadian and Chinese scientists, using surgically-joined mice, find that amyloid-beta -- the protein that causes Alzheimer's disease -- can travel from other parts of the body to the brain, where it does its damage.

- **[9/11 WTC responders show increased physical disability due to PTSD](#)** [周二, 31 10月 03:46]

A new study of more than 1,100 WTC responders indicates a significant increase in physical disability among the responders.

- **[Less but more frequent exercise best to reduce weight? Study provides a clue](#)** [周二, 31 10月 03:45]

Low magnitude, high frequency mechanical stimulation (LMMS) reduces adipose (fat) tissue and thus may be a method of reducing weight and health risks such as diabetes. A new study takes this concept to another level.

- **[Fish oil or fish consumption? New recommendations for pregnant women trying to prevent childhood asthma](#)** [周二, 31 10月 03:44]

Consuming 2-3 servings of fish a week during pregnancy prevents childhood asthma just as much as fish oil supplements, say researchers.

- **[Financial ties of medical journal editors should be disclosed](#)** [周二, 31 10月 03:44]

Approximately half of the editors of 52 prestigious medical journals received payments from the pharmaceutical and medical device industry in 2014. And only a fraction of these journals publish conflict-of-interest policies for editors that address these payments, according to research.

- **[Are the grandkids worth it? Climate change policy depends on how we value human population](#)** [周二, 31 10月 03:44]

Protecting future generations from environmental destruction depends on how society values human population. Looking at two ethical approaches, a research team finds a smaller population could save tens of billions of dollars or more annually on climate change prevention policies, especially in wealthier countries.

[It's mathematically impossible to beat aging, scientists say](#) [周二, 31 10月 03:44]

Current understanding of the evolution of aging leaves open the possibility that aging could be stopped if only science could figure out a way to make selection between organisms perfect. However, the solution isn't that simple, researchers have found.

[Cause of brain sensitivity to lack of oxygen](#) [周二, 31 10月 03:44]

Researchers have discovered why the brain is more sensitive to oxygen deprivation than other organs. Hypoxia caused by a stroke, for example, activates a specific mechanism that is protective in other organs but can be detrimental to the brain.

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [**Traffic signal countdown timers lead to improved driver responses**](#) [周三, 01 11月 03:12]

Countdown timers that let motorists know when a traffic light will go from green to yellow lead to safer responses from drivers, research suggests.

- [**'Tensor algebra' software speeds big-data analysis 100-fold**](#) [周三, 01 11月 02:37]

Researchers have created a new system that automatically produces code optimized for sparse data.

- [**Tracking mosquitoes with your cellphone**](#) [周三, 01 11月 02:37]

A simple recording of a mosquito's buzz on a cellphone could contribute to a global-scale mosquito tracking map of unprecedented detail, say experts.

- [**How to store information in your clothes invisibly, without electronics**](#) [周三, 01 11月 01:57]

Computer scientists have created fabrics and fashion accessories that can store data -- from security codes to identification tags -- without needing any on-board electronics or sensors.

- [**Discarded cigarette butts: The next high performing hydrogen storage material?**](#) [周三, 01 11月 00:05]

Discarded cigarette butts are a major waste disposal and environmental pollution hazard. But chemists have discovered that cigarette butt-

derived carbons have ultra-high surface area and unprecedented hydrogen storage capacity.

- **[Lens trick doubles odds for quantum interaction](#)**

[周三, 01 11月 00:03]

It's not easy to bounce a single particle of light off a single atom that is less than a billionth of a meter wide. However, researchers have shown they can double the odds of success, an innovation that might be useful in quantum computing and metrology.

- **[Thermoelectric power: New ways to power portable electronics, sensors](#)**

[周三, 01 11月 00:03]

Scientists have reported significant advances in the thermoelectric performance of organic semiconductors based on carbon nanotube thin films that could be integrated into fabrics to convert waste heat into electricity or serve as a small power source.

- **[Scientists elevate quantum dot solar cell world record](#)**

[周三, 01 11月 00:03]

Researchers have established a new world efficiency record for quantum dot solar cells, at 13.4 percent.

- **[How a \\$10 microchip turns 2-D ultrasound machines into 3-D imaging devices](#)**

[周二, 31 10月 23:15]

Technology that keeps track of how your smartphone is oriented can now give \$50,000 ultrasound machines many of the 3-D imaging abilities of their \$250,000 counterparts -- for the cost of a \$10 microchip.

- **[Opening the Van der Waals' sandwich](#)**

[周二, 31 10月 23:15]

Eighty years after the theoretical prediction of the force required to overcome the van der Waals' bonding between layers in a crystal, engineering researchers have measured it directly.

- **[The world's shortest laser pulse: Seeing electron movement during chemical reactions](#)**

[周二, 31 10月 23:15]

Researchers have succeeded in shortening the pulse duration of an X-ray

laser to only 43 attoseconds. With a time resolution in the range of a few quintillionths of a second, they are now able for the first time to observe the movement of electrons during chemical reactions in slow motion.

- [**Intricate beauty of a cracked glass**](#) [周二, 31 10月 23:14]

Typical crack speeds in glass easily surpass a kilometer per second, and broken surface features may be well smaller than a millimeter, so the processes that generate these patterns have been largely a mystery. Now, by replacing hard glass with soft but brittle gels, researchers have slowed down the cracks that precipitate fracture to mere meters per second, and unraveled the complex physical processes that take place during fracture in microscopic detail and in real time.

- [**Medical-like tools for NASA to study samples of the solar system**](#) [周二, 31 10月 23:14]

A diagnostic tool, similar in theory to those used by the medical profession to noninvasively image internal organs, bones, soft tissue, and blood vessels, could be equally effective at 'triaging' extraterrestrial rocks and other samples before they are shipped to Earth for further analysis.

- [**'Monster' planet discovery challenges formation theory**](#) [周二, 31 10月 22:51]

A giant planet, which should not exist according to planet formation theory, has been discovered around a distant star.

- [**Minor merger kicks supermassive black hole into high gear**](#) [周二, 31 10月 22:18]

Astronomers are studying the galaxy M77, which is famous for its super-active nucleus that releases enormous energy. The unprecedented deep image of the galaxy reveals evidence of a hidden minor merger billions of years ago. The discovery gives crucial evidence for the minor merger origin of active galactic nuclei.

- [**Graphene enables high-speed electronics on flexible materials**](#) [周二, 31 10月 22:18]

A flexible detector for terahertz frequencies (1,000 gigahertz) has been developed using graphene transistors on plastic substrates. It is the first of its kind, and can extend the use of terahertz technology to applications that will require flexible electronics, such as wireless sensor networks and wearable technology.

- [**How the brain beats distractions to retain memories**](#) [周二, 31 10月 22:18]

Researchers have recently discovered a mechanism that could explain how the brain retains working memory when faced with distractions. These findings could endow cognitive flexibility to neural networks used for artificial intelligence.

- [**New fire-resistant coating to prevent failure in steel building fires**](#) [周二, 31 10月 20:54]

A few extra coats of 'paint' could be all that the steel in a building needs to prevent itself from buckling and failing in a fire, suggests new research.

- [**Wristband devices detect dangerous seizures in patients with epilepsy**](#) [周二, 31 10月 20:48]

New research indicates that wristband devices may improve the detection and characterization of seizures in patients with epilepsy.

- [**Making glass invisible: A nanoscience-based disappearing act**](#) [周二, 31 10月 03:44]

By texturing glass surfaces with nanosized features, scientists almost completely eliminated surface reflections -- an achievement that could enhance solar cell efficiency, improve consumers' experience with electronic displays, and support high-power laser applications.

- [**Monster colliding black holes might lurk on the edge of spiral galaxies**](#) [周二, 31 10月 03:44]

The outskirts of spiral galaxies like our own could be crowded with colliding black holes of massive proportions and a prime location for scientists hunting the sources of gravitational waves, said researchers.

Their study identifies an overlooked region potentially rife with orbiting black holes. Identifying host galaxies of merging massive black holes could help explain how orbiting pairs of black holes form.

- [**Research aims to help renewable jet fuel take flight**](#) [周二, 31 10月 03:44]

The International Air Transport Association predicts that 7.2 billion passengers will fly in 2035, nearly doubling the 3.8 billion in 2016. So how do we make flying easier on the environment? Instead of petroleum, researchers have now developed new processes to ramp up production of bio-based fuel made from corncoobs and wood chips.

- [**Voltage-driven liquid metal fractals**](#) [周二, 31 10月 03:44]

Researchers have found that gallium indium (EGaIn), a liquid metal with one of the highest surface tensions, can be induced to spread and form patterns called fractals with the application of low voltage. The work has implications for controlling the shape of liquid metals.

- [**It's mathematically impossible to beat aging, scientists say**](#) [周二, 31 10月 03:44]

Current understanding of the evolution of aging leaves open the possibility that aging could be stopped if only science could figure out a way to make selection between organisms perfect. However, the solution isn't that simple, researchers have found.

- [**Focused ultrasound shows promise for treating Parkinson's tremor**](#) [周二, 31 10月 02:13]

An initial test to determine if a scalpel-free form of brain surgery can reduce tremor caused by Parkinson's disease has produced encouraging results. Further research is warranted, the researchers conclude.

- [**Cobalt and tungsten key to cheaper, cleaner hydrogen**](#) [周二, 31 10月 01:46]

Electrolysis, splitting the water molecule with electricity, is the cleanest way to obtain hydrogen, a clean and renewable fuel. Now, researchers have designed a new catalyst that reduces the cost of electrolytic

hydrogen production. Catalysts reduce the amount of electricity needed to break the chemical bonds, speed up the reaction and minimize the energy waste.

- [**Social media data use needs tighter research controls, experts say**](#) [周二, 31 10月 01:46]

Information shared on social media is being regularly used in research projects without users' consent, a study suggests. Experts have called for tighter control of the practice, with fresh guidelines needed to ensure personal data is being used appropriately.

- [**Robotics principles help wave energy converters better absorb power of ocean waves**](#) [周二, 31 10月 01:15]

Compared to wind and solar energy, wave energy has remained relatively expensive and hard to capture, but engineers are working to change that by drawing inspiration from other industries. The engineering team has designed, modeled and tested a control system that doubles the amount of power a wave energy converter can absorb from ocean waves, making electricity produced from wave energy less expensive.

- [**Breakthrough with 3D printed stainless steel**](#) [周二, 31 10月 01:14]

Researchers have achieved a breakthrough in 3D printing one of the most common forms of marine grade stainless steel -- a low-carbon type called 316L -- that promises an unparalleled combination of high-strength and high-ductility properties for the ubiquitous alloy.

- [**New method makes bioethanol from waste -- in existing plants**](#) [周二, 31 10月 01:12]

It is possible to produce bioethanol from agricultural and industrial waste in existing plants in a socioeconomically sustainable way, according to new research from Sweden.

- [**Mystery of raging black hole beams penetrated**](#) [周二, 31 10月 01:12]

They are nature's very own Death Star beams - ultra-powerful jets of energy that shoot out from the vicinity of black holes like deadly rays

from the Star Wars super-weapon.

- [**How nanoscale patterning can decrease metal fatigue**](#) [周二, 31 10月 00:35]

Fatigue due to repetitive strain is the leading cause of failure in metal components and structures, but new research shows how crystalline structures called nanotwins can slow the accumulation of fatigue-related damage.

- [**US' power supply has capacity to adapt to climate change**](#) [周二, 31 10月 00:34]

Scientists have found that climate change ultimately will have a negative effect on the reliability of electricity generation in the United States, but today's infrastructure may be more adaptable to future climate conditions than previously thought.

- [**Jupiter's X-ray auroras pulse independently**](#) [周二, 31 10月 00:34]

Jupiter's intense northern and southern lights pulse independently of each other according to new research.

- [**3-D-printed device builds better nanofibers**](#) [周二, 31 10月 00:33]

Researchers describe a new device for producing nanofiber meshes, which matches the production rate and power efficiency of its best-performing predecessor --- but significantly reduces variation in the fibers' diameters, an important consideration in most applications

- [**Quantum dots visualize tiny vibrational resonances**](#) [周一, 30 10月 23:23]

When laser light is used to drive the motion of a thin, rigid membrane, the membrane vibrates in resonance with the light. The resulting patterns can be visualized through an array of quantum dots, where these tiny structures emit light at a frequency that responds to movement.

- [**New fast-charging, high-energy electric-car battery technology**](#) [周一, 30 10月 23:22]

Researchers have developed a novel hydrogen isotope separation system

based on a porous metal organic framework (MOF).

- **[Both the aggressor and the victim: Alarming number of teens cyberbully themselves](#)** [周一, 30 10月 23:22]

A new form of self-harm in youth has emerged and is cause for concern. The behavior: 'digital self-harm' or 'self-trolling,' where adolescents post, send or share mean things about themselves anonymously online. The concern: it is happening at alarming rates and could be a cry for help. A new study is the first to examine the extent of this behavior and is the most comprehensive investigation of this understudied problem.

- **[Nanoscale platform aims to control protein levels](#)** [周一, 30 10月 23:22]

A nanoscale antibody first found in camels combined with a protein-degrading molecule is an effective new platform to control protein levels in cells, according to scientists.

- **[Gradation-tint smart window](#)** [周一, 30 10月 21:56]

Scientists have developed smart glass capable of producing various shades on its surface. Unlike the conventional types, the newly developed tinting smart glass allows users to easily change the shaded area of a window. For example, a user would be able to change the shaded area of a window in accordance with the elevation of the sun. The technology may be applicable to various types of windows, including those of automobiles and buildings, enabling them to offer both shade and clear visibility s...

- **[Effect of nano-diamond on magnetorheological fluids](#)** [周一, 30 10月 21:29]

Nano-diamond had a significant increase in MRF. The shear yield strength and settling stability of the MRF could be highly enhanced. The higher the strength of the magnetic field was, the higher the difference in the shear yield strength was. These phenomena demonstrated that the physical properties of the nano-diamond could have a higher impact on MRF, which was of high significance to the preparation of MRFs with excellent performance.

- [**'Instant replay' for computer systems shows cyber attack details**](#) [周一, 30 10月 21:29]

Until now, assessing the extent and impact of network or computer system attacks has been largely a time-consuming manual process. A new software system being developed by cybersecurity researchers will largely automate that process, allowing investigators to quickly and accurately pinpoint how intruders entered the network, what data they took and which computer systems were compromised.

- [**'Combosquatting' attack hides in plain sight to trick computer users**](#) [周一, 30 10月 21:29]

To guard against unknowingly visiting malicious websites, computer users have been taught to double-check website URLs before they click on a link. But attackers are now taking advantage of that practice to trick users into visiting website domains that contain familiar trademarks -- but with additional words that change the destination to an attack site.

- [**Microscopic defects make lithium-ion batteries better**](#) [周一, 30 10月 20:47]

High-performance electrodes for lithium-ion batteries can be improved by paying closer attention to their defects -- and capitalizing on them, according to scientists.

- [**Liquids take a shine to terahertz radiation**](#) [周一, 30 10月 20:47]

In a significant breakthrough, scientists have devised a high power radiation source in the much sought after terahertz (THz) region of the electromagnetic spectrum. These powers are achieved in a compact setting on a tabletop. The energies emitted by the liquids are thousands of times larger than those from most conventional tabletop sources.

- [**Moving neuroscience into the fast lane**](#) [周一, 30 10月 20:47]

Scientists have developed a high-throughput system to study mouse behavior and physiology. The system allows mice to train themselves for behavioral tasks, and even to self-fix their heads for recording neural activity from the brain.

- [**Good vibrations: Smart access to homes and cars using fingers**](#) [周一, 30 10月 20:47]

Engineers have created VibWrite, a smart access system that senses finger vibrations to verify users. The low-cost security system could eventually be used to gain access to homes, apartment buildings, cars, appliances -- anything with a solid surface.

- [**New studies on disordered cathodes may provide much-needed jolt to lithium batteries**](#) [周六, 28 10月 22:40]

Scientists have come up with a set of rules for making new disordered materials, a process that had previously been driven by trial-and-error. They also found a way to incorporate fluorine, which makes the material both more stable and have higher capacity.

- [**A light in the dark: NASA sounding rocket probes the dark regions of space**](#) [周六, 28 10月 04:18]

Spread out over unfathomable distances, this cold, diffuse gas between galaxies -- called the intergalactic medium, or IGM for short -- hardly emits any light, making it difficult to study.

- [**Guiding the random laser**](#) [周六, 28 10月 02:16]

At its most basic level, a random laser is precisely what its name implies; random. It's random in the spectrum of light it produces and in the way that light is emitted. So, how do you control some of the randomness to make useful devices? It's a question that's led a team of researchers to a discovery that's taking laser technology to the next level.

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [**Mini-microscopes reveal brain circuitry behind social behavior**](#) [周三, 01 11月 03:12]

A microscope lens implanted deep inside a mouse's brain shows different patterns of neural activity when the mouse interacts with males, females, or other stimuli. Now, researchers have discovered that sexual experience can trigger long-term changes in these brain patterns.

- [**Young bats learn bat 'dialects' from their nestmates**](#) [周三, 01 11月 02:37]

Young bats adopt a specific 'dialect' spoken by their own colonies, even when this dialect differs from the bat 'mother tongue,' a new study shows. By offering insight into the evolutionary origins of language acquisition skills, the study calls into question the uniqueness of this skill in humans.

- [**Humans don't use as much brainpower as we like to think**](#) [周三, 01 11月 02:37]

When it comes to brainpower, humans aren't as exceptional as we like to think. For years, scientists assumed that humans devote a larger share of calories to their brains than other animals. Although the human brain makes up only 2 percent of body weight, it consumes more than 25 percent of the body's energy budget. But a comparison of the relative brain costs of 22 species found that other animals have hungry brains too.

- [**Tracking mosquitoes with your cellphone**](#) [周三, 01 11月 02:37]

A simple recording of a mosquito's buzz on a cellphone could contribute to a global-scale mosquito tracking map of unprecedented detail, say experts.

• [**Little-known fruits contain powerful anti-inflammatory and anti-oxidant agents**](#) [周三, 01 11月 02:37]

Research shows that five fruit species native to Brazil's Atlantic Rainforest biome have bioactive properties as outstanding as those of blueberries, cranberries, blackberries, and strawberries. By investigating the presence of anti-aging nutrients that also work at the prevention of cancer, diabetes and Alzheimer's, the study clears the path for the conservation and promotion of the genus Eugenia, which contains 400 species (some of them endangered) and presents huge potential in food and pharma...

• [**Elderly chromosomes activate genes differently than in the young**](#) [周三, 01 11月 01:57]

Grey hair, wisdom, and wrinkles on our skin mark us as we age, but it's the more subtle changes beneath the surface that make us old. Now, researchers have discovered that our chromosomes also wrinkle with age, changing how our immune system renews itself.

• [**Spooky conservation: Saving endangered species over our dead bodies**](#) [周三, 01 11月 01:03]

The secret to the survival of critically endangered wildlife could lie beyond the grave. A researcher suggests revenue from human burials could fund nature reserves and parks for threatened species, effectively amounting to dead humans protecting living creatures.

• [**Orphaned elephants' social lives substantially altered by poaching**](#) [周三, 01 11月 01:03]

Colorado State University researchers found that orphaned elephants have less access to mature, dominant individuals than non-orphaned elephants, whose dominant social partners are their mothers and aunts.

• [**Research provides unique insight into extinction**](#)

[dynamics in late Triassic](#) [周三, 01 11月 00:06]

A team of scientists and students is inching closer to revealing how a group of animals from the Late Triassic went extinct.

• [Discarded cigarette butts: The next high performing hydrogen storage material?](#) [周三, 01 11月 00:05]

Discarded cigarette butts are a major waste disposal and environmental pollution hazard. But chemists have discovered that cigarette butt-derived carbons have ultra-high surface area and unprecedented hydrogen storage capacity.

• [Dinosaur-killing asteroid impact cooled Earth's climate more than previously thought](#) [周二, 31 10月 23:14]

The Chicxulub asteroid impact that wiped out the dinosaurs likely released far more climate-altering sulfur gas into the atmosphere than originally thought, according to new research.

• [Genetic study uncovers evolutionary history of dingoes](#) [周二, 31 10月 22:18]

A major study of dingo DNA has revealed dingoes most likely migrated to Australia in two separate waves via a former land bridge with Papua New Guinea. The find has significant implications for conservation, with researchers recommending the two genetically distinct populations of dingoes be treated as different groups for management and conservation purposes.

• [Flour power to boost food security](#) [周二, 31 10月 22:18]

A glue-like protein that holds the wheat grain together could hold the secret for yielding more, and healthier, flour from wheat.

• [Landmark discovery turns marathon of evolution into a sprint](#) [周二, 31 10月 20:54]

A research collaboration has discovered a new way of rapidly generating a swathe of medically significant natural products after discovering a ground-breaking technique that turns the marathon of evolution into a sprint.

- **[Stem cells conduct cartilage regeneration but are not directly involved](#)** [周二, 31 10月 20:54]

Stem cell therapy has great potential for curing cartilage damage. However, it has remained unclear whether stem cells are responsible for regeneration or whether they trigger the process. Researchers have been able to resolve this issue by tracking the effects in a new, natural model. After injection, stem cells orchestrate the healing effect of endogenous cells but are not responsible for cartilage regeneration. The breakthrough was enabled by preventing the normal immune response to the molecu...

- **[Genome scientists use UK Salmonella cases to shed light on African epidemic](#)** [周二, 31 10月 20:48]

Scientists have used Salmonella genome data from a UK public health surveillance study to gain new insights into the Salmonella epidemic in sub-Saharan Africa.

- **[Political views have limited impact on how we perceive climate anomalies](#)** [周二, 31 10月 20:48]

Individual perceptions of climate anomalies are largely immune to political bias, especially when people observe large and persistent departures from average conditions.

- **[Native trees, shrubs provide more food for birds](#)** [周二, 31 10月 20:48]

Plant native trees and shrubs in your yard, and you can really help songbirds. In a study of the Carolina chickadee in the metropolitan DC area, researchers found that native trees and shrubs support much more 'bird food' -- caterpillars -- than non-natives do.

- **[Spicy food may curb unhealthy cravings for salt](#)** [周二, 31 10月 20:48]

People who enjoy spicy foods appear to eat less salt and have lower blood pressure. Spicy foods may increase sensitivity to salt, reducing how much salt is eaten.

- **[Future volcanic eruptions could cause more](#)**

[climate disruption](#) [周二, 31 10月 20:48]

Major volcanic eruptions in the future have the potential to affect global temperatures and precipitation more dramatically than in the past because of climate change, according to a new study.

• [Lemurs are weird because Madagascar's fruit is weird](#) [周二, 31 10月 20:48]

Lemurs eat way less fruit than most other primates, and scientists have a new hypothesis as to why: the fruit on Madagascar, where the lemurs live, is unusually low in protein. Scientists posit that the evolution of unusual dietary behaviors in lemurs, from leaf-eating to hibernating, is tied to fruit quality.

• [Fish oil or fish consumption? New recommendations for pregnant women trying to prevent childhood asthma](#) [周二, 31 10月 03:44]

Consuming 2-3 servings of fish a week during pregnancy prevents childhood asthma just as much as fish oil supplements, say researchers.

• [Examining potatoes' past could improve spuds of the future](#) [周二, 31 10月 03:44]

Examining the ancestors of the modern, North American cultivated potato has revealed a set of common genes and important genetic pathways that have helped spuds adapt over thousands of years. New research shows potential genetic keys that could ensure the crop will thrive in the future.

• [The advent of 'green' cattle](#) [周二, 31 10月 03:44]

Implications of livestock farming on climate change should not be drawn from aggregate statistics, reveals a study based on a new method of carbon footprinting for pasture-based cattle production systems that can assess the impacts of individual animals.

• [Research aims to help renewable jet fuel take flight](#) [周二, 31 10月 03:44]

The International Air Transport Association predicts that 7.2 billion

passengers will fly in 2035, nearly doubling the 3.8 billion in 2016. So how do we make flying easier on the environment? Instead of petroleum, researchers have now developed new processes to ramp up production of bio-based fuel made from corn cobs and wood chips.

- [**Right whales, already an endangered species, may face a dim future**](#) [周二, 31 10月 03:44]

Researchers show that right whales, already an endangered species, may face a dim future.

- [**Are the grandkids worth it? Climate change policy depends on how we value human population**](#) [周二, 31 10月 03:44]

Protecting future generations from environmental destruction depends on how society values human population. Looking at two ethical approaches, a research team finds a smaller population could save tens of billions of dollars or more annually on climate change prevention policies, especially in wealthier countries.

- [**Greenhouse gas concentrations surge to new record**](#) [周二, 31 10月 02:19]

Concentrations of carbon dioxide in the atmosphere surged at a record-breaking speed in 2016 to the highest level in 800,000 years, according to a new report. The abrupt changes in the atmosphere witnessed in the past 70 years are without precedent.

- [**Study may add to resource managers' toolbox**](#) [周二, 31 10月 02:13]

Fish 'condition' can help guide management efforts for Chesapeake Bay, suggests a new research study.

- [**Surprising monkey study: Bad times do not cause group members to change behavior**](#) [周二, 31 10月 01:56]

Researchers have observed an unexpected behavioral pattern in monkeys in Puerto Rico. As the population density in the group rises, the group as a whole produces fewer babies -- this is no surprise. But, to

the surprise of researchers, it turned out that the group's individual members did not change behavior. How does this add up?

- [**Cobalt and tungsten key to cheaper, cleaner hydrogen**](#) [周二, 31 10月 01:46]

Electrolysis, splitting the water molecule with electricity, is the cleanest way to obtain hydrogen, a clean and renewable fuel. Now, researchers have designed a new catalyst that reduces the cost of electrolytic hydrogen production. Catalysts reduce the amount of electricity needed to break the chemical bonds, speed up the reaction and minimize the energy waste.

- [**How flu shot manufacturing forces influenza to mutate**](#) [周二, 31 10月 01:46]

The common practice of growing influenza vaccine components in chicken eggs disrupts the major antibody target site on the virus surface, rendering the flu vaccine less effective in humans.

- [**Robotics principles help wave energy converters better absorb power of ocean waves**](#) [周二, 31 10月 01:15]

Compared to wind and solar energy, wave energy has remained relatively expensive and hard to capture, but engineers are working to change that by drawing inspiration from other industries. The engineering team has designed, modeled and tested a control system that doubles the amount of power a wave energy converter can absorb from ocean waves, making electricity produced from wave energy less expensive.

- [**New method makes bioethanol from waste -- in existing plants**](#) [周二, 31 10月 01:12]

It is possible to produce bioethanol from agricultural and industrial waste in existing plants in a socioeconomically sustainable way, according to new research from Sweden.

- [**White rot fungi's size explained by breadth of gene families involved**](#) [周二, 31 10月 00:35]

Armillaria fungi are among the most devastating fungal pathogens, causing root rot disease in more than 500 plant species found in forests, parks and vineyards. As white rot fungi, they are capable of breaking down all components of plant cell walls, a capability that interests bioenergy researchers. Biologists have now analyzed and compared four Armillaria fungal genomes with those of related fungi to better understand the evolution of Armillaria's abilities.

- [**US' power supply has capacity to adapt to climate change**](#) [周二, 31 10月 00:34]

Scientists have found that climate change ultimately will have a negative effect on the reliability of electricity generation in the United States, but today's infrastructure may be more adaptable to future climate conditions than previously thought.

- [**Building a sustainable future: Urgent action needed**](#) [周一, 30 10月 23:24]

We need to act urgently to increase the energy efficiency of our buildings as the world's emerging middle classes put increasing demands on our planet's energy resources.

- [**New tool predicts risk of plant disease and infestation worldwide**](#) [周一, 30 10月 23:23]

Researchers have developed a technique to predict the risk of disease or infestation in plants. By considering pest-host interactions and the geographical distribution of vulnerable plants, their new algorithms can provide maps of potential disease hotspots, helping governments to identify the risk for outbreaks, before they happen.

- [**Nanoscale platform aims to control protein levels**](#) [周一, 30 10月 23:22]

A nanoscale antibody first found in camels combined with a protein-degrading molecule is an effective new platform to control protein levels in cells, according to scientists.

- [**Cover crops provide bed and breakfast layover**](#)

[for migrating birds](#) [周一, 30 10月 23:22]

After harvesting a corn or soybean crop, farmers may plant a cover crop for a variety of reasons -- to reduce soil erosion and nutrient runoff, increase organic matter in the soil, and improve water quality. Now there's another reason. New research shows that migratory birds prefer to rest and refuel in fields with cover crops.

• [Less fat, more hair and younger skin: Study in mice shows benefits from calorie-restricted diet](#) [周一, 30 10月 23:22]

Scientists show that mice subjected to the diet presented body fat reduction and fur production increase. The research group also noted that liver, pancreas and brain cells from these mice boasted a higher performance in activities related to metabolic regulation.

• [Pumpkin genomes sequenced, revealing uncommon evolutionary history](#) [周一, 30 10月 21:54]

For some, pumpkins conjure carved Halloween decorations, but for many people around the world, these gourds provide nutrition. Scientists have sequenced the genomes of two important pumpkin species, *Cucurbita maxima* and *Cucurbita moschata*.

• [Sulfur respiration in mammals and antioxidant activity](#) [周一, 30 10月 21:28]

Researchers have gained new insight into the formation of a group of compounds found in almost all organisms, which are reportedly shown to be a powerful antioxidant that protects cells from damage by free radicals. They found that these compounds were also essential in supporting the mitochondrial energy metabolism, which is known as sulfur respiration, and identified it for the first time in humans and other mammals.

• [Bears not bothered by diet high in saturated fats](#) [周一, 30 10月 20:47]

Campgrounds and cottages are getaways for humans. They are also locations where grizzly bears are acquiring appetites for human foods that are high in saturated fats. Diets high in saturated fats are associated

with many diseases in humans. Does the health of a bear suffer too?

- [**How environment plays key role in changing movement behavior of animals**](#) [周一, 30 10月 20:47]

Mathematicians have developed a theory which helps to unravel long-standing mysteries of animal movement.

- [**Moving neuroscience into the fast lane**](#) [周一, 30 10月 20:47]

Scientists have developed a high-throughput system to study mouse behavior and physiology. The system allows mice to train themselves for behavioral tasks, and even to self-fix their heads for recording neural activity from the brain.

- [**Driving drug resistance out of fungi**](#) [周一, 30 10月 20:47]

Scientists have developed a CRISPR-Cas9-based 'gene drive' platform to create diploid strains of the pathogen in which both gene copies could be efficiently deleted. The technique may lead the way toward a better understanding of drug resistance and biofilm-forming mechanisms, and through future research, it could help pinpoint new drug targets and combination therapies.

- [**Caribbean's largest concentration of indigenous pre-Columbian rock art**](#) [周一, 30 10月 10:01]

New research reveals key discoveries including first direct rock art dates in the Caribbean, how pre-Columbian rock-art was made and paint recipes.

- [**Oldest recorded solar eclipse helps date the Egyptian pharaohs**](#) [周一, 30 10月 10:01]

Researchers have pinpointed the date of what could be the oldest solar eclipse yet recorded. The event, which occurred on Oct. 30, 1207 BC, is mentioned in the Bible, and could have consequences for the chronology of the ancient world.

- [**How beetles bounce back from forest fires**](#) [周六, 28 10月 22:42]

Research has illuminated the piecemeal patterns of recolonization among a hardy species of beetle regularly affected by managed burns.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [**Spooky conservation: Saving endangered species over our dead bodies**](#) [周三, 01 11月 01:03]

The secret to the survival of critically endangered wildlife could lie beyond the grave. A researcher suggests revenue from human burials could fund nature reserves and parks for threatened species, effectively amounting to dead humans protecting living creatures.

- [**How to detect the risk of dyslexia before learning to read**](#) [周三, 01 11月 01:03]

Almost 10 percent of the world population suffers dyslexia. Establishing an early diagnosis would allow the development of training programs to palliate this disorder. We now may be nearer to reaching this goal thanks to a study associating auditory processing in children to their reading skills. The results offer a new approach for detecting the risk before the children learn to read.

- [**Workplace incivility: The silent epidemic**](#) [周三, 01 11月 00:06]

Workplace incivility is taking over our organizations, professional relationships and everyday interactions. According to researchers, understanding why incivility happens and how to address it starts with awareness.

- [**Discarded cigarette butts: The next high performing hydrogen storage material?**](#) [周三, 01 11月 00:05]

Discarded cigarette butts are a major waste disposal and environmental pollution hazard. But chemists have discovered that cigarette butt-

derived carbons have ultra-high surface area and unprecedented hydrogen storage capacity.

- [**Bilingual preschoolers show stronger inhibitory control**](#) [周三, 01 11月 00:03]

For students in preschool, speaking two languages may be better than one, especially for developing inhibitory control. That idea isn't new, but a new study took a longitudinal approach to examine the bilingual advantage hypothesis, which suggests that the demands associated with managing two languages confer cognitive advantages that extend beyond the language domain.

- [**Stable, affordable homes don't just help patients, they save taxpayer dollars**](#) [周三, 01 11月 00:03]

By investing in housing, hospitals can help build healthier communities and save money by stemming the tide of emergency room visits and costly health interventions, research shows.

- [**Voting does not reduce crime, study shows**](#) [周三, 01 11月 00:03]

Voting does not make people less likely to subsequently commit a crime, a randomized controlled experiment of 550,000 potential voters in the United States shows.

- [**Political views have limited impact on how we perceive climate anomalies**](#) [周二, 31 10月 20:48]

Individual perceptions of climate anomalies are largely immune to political bias, especially when people observe large and persistent departures from average conditions.

- [**Long-term states of mind can affect short-term financial decisions**](#) [周二, 31 10月 20:48]

A new study sheds more light on the quirks of people's actions in such cases and suggests that, in addition to immediate financial needs, persistent behavioral characteristics play a key role in even short-term pocketbook decisions.

- [**Financial ties of medical journal editors should be disclosed**](#) [周二, 31 10月 03:44]

Approximately half of the editors of 52 prestigious medical journals received payments from the pharmaceutical and medical device industry in 2014. And only a fraction of these journals publish conflict-of-interest policies for editors that address these payments, according to research.

- [**Are the grandkids worth it? Climate change policy depends on how we value human population**](#) [周二, 31 10月 03:44]

Protecting future generations from environmental destruction depends on how society values human population. Looking at two ethical approaches, a research team finds a smaller population could save tens of billions of dollars or more annually on climate change prevention policies, especially in wealthier countries.

- [**Study may add to resource managers' toolbox**](#) [周二, 31 10月 02:13]

Fish 'condition' can help guide management efforts for Chesapeake Bay, suggests a new research study.

- [**Effects of Medicaid expansion focus of new study**](#) [周二, 31 10月 01:56]

A new article examines the effects of Medicaid expansion on low-income individuals' access to health care.

- [**Social media data use needs tighter research controls, experts say**](#) [周二, 31 10月 01:46]

Information shared on social media is being regularly used in research projects without users' consent, a study suggests. Experts have called for tighter control of the practice, with fresh guidelines needed to ensure personal data is being used appropriately.

- [**Robotics principles help wave energy converters better absorb power of ocean waves**](#) [周二, 31 10月 01:15]

Compared to wind and solar energy, wave energy has remained

relatively expensive and hard to capture, but engineers are working to change that by drawing inspiration from other industries. The engineering team has designed, modeled and tested a control system that doubles the amount of power a wave energy converter can absorb from ocean waves, making electricity produced from wave energy less expensive.

- [**Immigrants living in the country without authorization at risk for anxiety and depression**](#)

[周二, 31 10月 00:33]

Nearly a quarter of Mexican immigrants who live near the California-Mexico border without legal authorization have a mental disorder, particularly depression or anxiety.

- [**Building a sustainable future: Urgent action needed**](#)

[周一, 30 10月 23:24]

We need to act urgently to increase the energy efficiency of our buildings as the world's emerging middle classes put increasing demands on our planet's energy resources.

- [**'Combosquatting' attack hides in plain sight to trick computer users**](#)

[周一, 30 10月 21:29]

To guard against unknowingly visiting malicious websites, computer users have been taught to double-check website URLs before they click on a link. But attackers are now taking advantage of that practice to trick users into visiting website domains that contain familiar trademarks -- but with additional words that change the destination to an attack site.

- [**Montessori preschool boosts academic results and reduces income-based inequality**](#)

[周一, 30 10月 20:48]

Researchers find that children in Montessori preschools show improved academic performance and social understanding, while enjoying their school work more. Strikingly, children from low-income families, who typically don't perform as well at school, show similar academic performance as children from high-income families. Children with low executive function also benefit from Montessori preschools.

• [**Modern civilization doesn't diminish violence, study shows**](#) [周五, 27 10月 22:48]

Modern civilization may not have dulled humankind's bloodlust, but living in a large, organized society may increase the likelihood of surviving a war, an anthropology professor reports.

• [**Efforts to revive coal industry unlikely to work, may slow job growth**](#) [周五, 27 10月 20:55]

Current federal efforts to revive the coal industry will likely do more harm than good to fragile Appalachian communities transitioning from coal as a major source of employment, according to a new study.

• [**Global trade entrenches poverty traps**](#) [周五, 27 10月 05:13]

A new theorem suggests that greater engagement in the international exchange can actually reinforce productivity-impeding practices that keep countries in poverty.

• [**Does population size affect rates of violence?**](#) [周五, 27 10月 04:45]

A new article argues small-scale societies are likely to be victims, rather than perpetrators, of violence.

• [**You can't tell a gerrymandered district by its shape**](#) [周五, 27 10月 02:25]

When it comes to judging the fairness of electoral districts, we can't believe our eyes.

• [**Global road-building explosion could be disastrous for people and nature, say scientists**](#) [周五, 27 10月 02:23]

The global explosion of new roads is rife with economic, social, and environmental dangers, according to a new study.

• [**How cities can best fight climate change**](#) [周五, 27 10月 01:53]

It will be easier for cities to reduce emissions coming from residential energy use rather than from local transportation, say researchers -- and this reduction will happen mostly thanks to better building practices, not greater housing density.

• [**Dynamic catalytic converters for clean air in the city**](#) [周四, 26 10月 22:31]

Reducing pollutant emission of vehicles and meeting stricter exhaust gas standards are major challenges when developing catalytic converters. A new concept might help to efficiently treat exhaust gases after the cold start of engines and in urban traffic and to reduce the consumption of expensive noble metal.

• [**Britain's marginalized youth show a 'sense of purpose' in greater numbers than youngsters in mainstream schools, research reveals**](#) [周四, 26 10月 21:08]

Greater numbers of marginalized young people report having a 'sense of purpose' in their lives, compared with those in mainstream education.

• [**Can open and honest scientists win public trust?**](#)

[周四, 26 10月 03:06]

With the increased politicization of science, more and more people continue to be skeptical of research, especially when it comes to hot-button topics such as climate change and vaccines. Now researchers wondered whether it would be better for scientists to acknowledge some of their personal or social values up front when reporting on their studies in order to gain trust.

• [**Philly's tax on soda made prices bubble up**](#) [周四, 26 10月 02:26]

An economist was at a research conference in Philadelphia when he happened upon a sweet natural experiment in the making. An expert in risky health behaviors linked to obesity, he read a newspaper article about how an upcoming city tax on sugar-sweetened drinks would be challenging to implement in the Philadelphia International Airport, which straddles the city border: soda would be taxed in some terminals but not others.

• [**Immigrant parents, refugees face greater mental health challenges; Kids' learning at risk**](#) [周四, 26 10月 02:11]

Canadian immigrant parents, refugees, women and minorities are at greater risk of mental health issues and socioeconomic challenges, with

their children more likely to suffer learning setbacks before kindergarten, a pair of studies have shown.

• [**Investing in conservation pays off, study finds**](#) [周四, 26 10月 02:11]

Governments and donors have spent billions of dollars since the 1992 Rio Earth Summit attempting to slow the pace of species extinctions around the world. Now, a new article provides the first clear evidence that those efforts are working.

• [**Flu forecasting tool uses evolution to make earlier predictions**](#) [周四, 26 10月 02:05]

A new flu forecasting tool aims to make better predictions by combining data about how the virus spreads with an estimate of how much the current virus evolved compared to recent years. The new model accurately predicted the total number of cases for each season in the US from 2002 to 2016, and produced an accurate, real-time prediction for the 2016-17 season before it started last year.

• [**New fractal-like concentrating solar power receivers are better at absorbing sunlight**](#) [周四, 26 10月 00:24]

Engineers have developed new fractal-like, concentrating solar power receivers for small- to medium-scale use that are up to 20 percent more effective at absorbing sunlight than current technology.

• [**Among 'green' energy, hydropower is the most dangerous**](#) [周三, 25 10月 22:31]

Many governments are promoting a move away from fossil fuels towards renewable energy sources. However, in a new study, scientists highlight some of the ecological dangers this wave of 'green' energy poses.

• [**Marine species threatened by deep-sea mining**](#) [周三, 25 10月 22:31]

Underwater mining poses a great danger to animals inhabiting the seafloors. A new research study describes the most abundant species, a sponge, which can now be used to regulate mining operations and help us better understand their environmental impacts.

- **[Living close to green spaces is associated with better attention in children](#)** [周三, 25 10月 22:31]

How do green spaces affect cognitive development in children? A new study concludes that children with more greenness around their homes may develop better attention capacities.

- **[Non-native species do not make native fish more vulnerable to pollution in Mediterranean rivers](#)** [周三, 25 10月 22:06]

The presence of exotic fish in rivers does not alter the native fish response to the environmental pollution, according to an article.

- **[Large declines seen in teen substance abuse, delinquency](#)** [周三, 25 10月 21:05]

In recent years, teens have become far less likely to abuse alcohol, nicotine and illicit drugs, according to researchers. Teens also are less likely to engage in behaviors like fighting and stealing, and the researchers believe the declines in substance use and delinquency are connected.

- **[Determining when humans started impacting the planet on a large scale](#)** [周三, 25 10月 21:05]

Humans have so profoundly altered the Earth that, some scientists argue, our current geologic epoch requires a new name: the Anthropocene. But defining the precise start of the era is tricky. Would it begin with the spread of domesticated farm animals or the appearance of radioactive elements from nuclear bomb tests? Scientists report a method to measure levels of human-made contaminants in sediments that could help pinpoint the Anthropocene's onset.

- **[Energy firm branding not deals influences customer switching](#)** [周三, 25 10月 11:32]

Energy companies in the UK are using specific branding approaches instead of product innovation to keep customers, according to new research.

. [National security implications of gene editing](#) [周三, 25

10月 11:28]

A trio of scientists have participated in an international think tank this month on the intersection of genome editing technology and national security.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- [Tracking mosquitoes with your cellphone](#) [周三, 01 11月 02:37]

A simple recording of a mosquito's buzz on a cellphone could contribute to a global-scale mosquito tracking map of unprecedented detail, say experts.

- [How to store information in your clothes invisibly, without electronics](#) [周三, 01 11月 01:57]

Computer scientists have created fabrics and fashion accessories that can store data -- from security codes to identification tags -- without needing any on-board electronics or sensors.

- [The world's shortest laser pulse: Seeing electron movement during chemical reactions](#) [周二, 31 10月 23:15]

Researchers have succeeded in shortening the pulse duration of an X-ray laser to only 43 attoseconds. With a time resolution in the range of a few quintillionths of a second, they are now able for the first time to observe the movement of electrons during chemical reactions in slow motion.

- [Intricate beauty of a cracked glass](#) [周二, 31 10月 23:14]

Typical crack speeds in glass easily surpass a kilometer per second, and broken surface features may be well smaller than a millimeter, so the processes that generate these patterns have been largely a mystery. Now, by replacing hard glass with soft but brittle gels, researchers have slowed down the cracks that precipitate fracture to mere meters per second, and unraveled the complex physical processes that take place during fracture in microscopic detail and in real time.

- [**'Monster' planet discovery challenges formation theory**](#) [周二, 31 10月 22:51]

A giant planet, which should not exist according to planet formation theory, has been discovered around a distant star.

- [**Mystery of raging black hole beams penetrated**](#) [周二, 31 10月 01:12]

They are nature's very own Death Star beams - ultra-powerful jets of energy that shoot out from the vicinity of black holes like deadly rays from the Star Wars super-weapon.

- [**Both the aggressor and the victim: Alarming number of teens cyberbully themselves**](#) [周一, 30 10月 23:22]

A new form of self-harm in youth has emerged and is cause for concern. The behavior: 'digital self-harm' or 'self-trolling,' where adolescents post, send or share mean things about themselves anonymously online. The concern: it is happening at alarming rates and could be a cry for help. A new study is the first to examine the extent of this behavior and is the most comprehensive investigation of this understudied problem.

- [**Good vibrations: Smart access to homes and cars using fingers**](#) [周一, 30 10月 20:47]

Engineers have created VibWrite, a smart access system that senses finger vibrations to verify users. The low-cost security system could eventually be used to gain access to homes, apartment buildings, cars, appliances -- anything with a solid surface.

- [**Sleepwalkers are better at automatic walking**](#) [周六, 28 10月 02:15]

Sleepwalkers who are awake may have a multi-tasking advantage over non-sleepwalkers, according to recent research that uses virtual reality.

- [**From Cellulose to 3-D Objects**](#) [周六, 28 10月 00:27]

In our modern world, eliminating plastics is inconceivable. Unfortunately, they do have disadvantages, including the formation of CO₂ in both production and combustion, depletion of fossil feedstocks, and growth of landfills. Researchers have now introduced a new way forward, a polymer made entirely from biomass that can easily

and inexpensively be used in 3-D printing. Objects produced in this way are of high quality, easily recyclable, and highly solvent-resistant.

- [**New technique produces tunable, nanoporous materials**](#) [周五, 27 10月 21:44]

A collaborative group of researchers describe a new technique for creating novel nanoporous materials with unique properties that can be used to filter molecules or light.

- [**Advanced artificial limbs mapped in the brain**](#) [周五, 27 10月 21:44]

Scientists have used functional MRI to show how the brain re-maps motor and sensory pathways following targeted motor and sensory reinnervation (TMSR), a neuroprosthetic approach where residual limb nerves are rerouted towards intact muscles and skin regions to control a robotic limb.

- [**Nanomagnets levitate thanks to quantum physics**](#) [周五, 27 10月 21:44]

Quantum physicists have now shown that, despite Earnshaw's theorem, nanomagnets can be stably levitated in an external static magnetic field owing to quantum mechanical principles. The quantum angular momentum of electrons, which also causes magnetism, is accountable for this mechanism.

- [**Martian landscapes formed from sand 'levitating' on a little boiling water**](#) [周五, 27 10月 20:57]

Scientists have discovered a process that could explain the long-debated mystery of how land features on Mars are formed in the absence of significant amounts of water. Experiments reveal that Mars' thin atmosphere (about 7 mbar -- compared to 1,000 mbar on Earth) combined with periods of relatively warm surface temperatures causes water flowing on the surface to violently boil. This process can then move large amounts of sand and other sediment, which effectively 'levitates' on the boiling water...

- [**Heavy metal thunder: Protein can be switched**](#)

[on to conduct electricity like a metal](#) [周五, 27 10月 20:55]

When pushing the boundaries of discovery, sometimes even the most experienced of scientists can get a surprise jolt from a completely unpredictable result. About four years ago, Stuart Lindsay's research team got a lab result that even he couldn't quite believe. As with most scientific surprises, it goes against all conventional wisdom: the first evidence of a protein that could conduct electricity like a metal.

• [Winters on Mars are shaping the Red Planet's landscape](#) [周五, 27 10月 20:55]

Winter temperatures on the Red Planet sublime carbon dioxide from a gas to a solid. These solid carbon dioxide blocks are then thought responsible for making gullies and furrows on Mars' landscape, based on innovative lab experiments.

• [Bat feces: A reliable source of climate change](#) [周五, 27 10月 01:53]

Isotopes found in bat guano over the last 1,200 years provide scientists with information on how the climate was and is changing.

• [Astronomers discover sunscreen snow falling on hot exoplanet](#) [周五, 27 10月 01:53]

Astronomers have used the Hubble Space Telescope to find a blistering-hot giant planet outside our solar system where the atmosphere 'snows' titanium dioxide -- the active ingredient in sunscreen. These observations are the first detections of this 'snow-out' process, called a 'cold trap,' on an exoplanet. The research provides insight into the complexity of weather and atmospheric composition on exoplanets, and may someday be useful for gauging the habitability of Earth-size planets.

• ['Bandit-masked' feathered dinosaur hid from predators using multiple types of camouflage](#) [周五, 27 10月 01:52]

Researchers have revealed how a small feathered dinosaur used its color patterning, including a bandit mask-like stripe across its eyes, to avoid being detected by its predators and prey.

- [**Wobbling galaxies: New evidence for dark matter makes it even more exotic**](#) [周四, 26 10月 22:31]

Astronomers have discovered that the brightest galaxies within galaxy clusters 'wobble' relative to the cluster's center of mass. This unexpected result is inconsistent with predictions made by the current standard model of dark matter. With further analysis it may provide insights into the nature of dark matter, perhaps even indicating that new physics is at work.

- [**'Mega-carnivore' dinosaur roamed southern Africa 200 million years ago**](#) [周四, 26 10月 03:06]

An international team of scientists has discovered the first evidence that a huge carnivorous dinosaur roamed southern Africa 200 million year ago.

- [**6,000-year-old skull could be from the world's earliest known tsunami victim**](#) [周四, 26 10月 03:06]

Scientists have discovered what they believe is the skull of the earliest known tsunami victim, a person who lived 6,000 years ago in Papua New Guinea. The skull itself was found almost a hundred years ago, but recent analysis of the sediments found with the skull reveals that they bear distinctive hallmarks of tsunami activity.

- [**New property found in unusual crystalline materials**](#) [周四, 26 10月 02:11]

Researchers have discovered an unexpected property of some nanostructured metals, could lead to new ways of 'tuning' their properties.

- [**New RoboBee flies, dives, swims and explodes out the of water**](#) [周四, 26 10月 02:05]

A new, hybrid RoboBee can fly, dive into water, swim, propel itself back out of water, and safely land. Floating devices allow this multipurpose air-water microrobot to stabilize on the water's surface before an internal combustion system ignites to propel it back into the

air. This latest-generation RoboBee, which is 1,000 times lighter than any previous aerial-to-aquatic robot, could be used for numerous applications, from search-and-rescue operations to environmental monitoring and biological ...

· [Could squirrel fur trade have contributed to England's medieval leprosy outbreak?](#) [周三, 25 10月 22:31]

Genetic analysis of a pre-Norman skull unearthed in a garden in Suffolk has added to a growing body of evidence that East Anglia may have been the epicentre of an epidemic of leprosy that spread through medieval England. The authors of the new study suggest that an explanation for the prevalence of leprosy in medieval East Anglia may possibly be found in the sustained Scandinavian trade in squirrel fur -- an animal known to carry the disease.

· [Why arched backs are attractive](#) [周三, 25 10月 22:31]

Researchers have provided scientific evidence for what lap dancers and those who twerk probably have known all along -- men are captivated by the arched back of a woman. A team used 3-D models and eye-tracking technology to show how the subsequent slight thrusting out of a woman's hips can hold a man's gaze.

· [Skin found to play a role in controlling blood pressure](#) [周三, 25 10月 22:31]

Skin plays a surprising role in helping regulate blood pressure and heart rate, according to scientists. While this discovery was made in mice, the researchers believe it is likely to be true also in humans.

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ScienceDaily

周三, 11 10月 2017

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[周三, 11 10月 2017]

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- [**How the cone snail's deadly venom can help us build better medicines**](#) [周三, 11 10月 03:29]

By researching deadly cone snail venom, researchers hope to find solutions to tough medical problems and diseases.

- [**Step toward creating planes that travel at hypersonic speed**](#) [周三, 11 10月 03:29]

A recent study could lead to a drastic decrease in flight times. The study is one of the first steps toward the creation of planes able to move at hypersonic speeds, five to 10 times the speed of sound.

- [**Improving Lake Erie's water quality**](#) [周三, 11 10月 03:28]

The conditions in Lake Erie continue to pose several health risks to Ohioans in coastal communities, making it difficult to maintain good water quality for citizens, state and local policymakers. Researchers in the Great Lakes region are now working toward innovative solutions.

- [**Raging Bull: First study to find link between testosterone and stock market instability**](#) [周三, 11 10月 03:27]

In the U.S. today, the majority of professional stock market traders are young males and new evidence suggests biology strongly influences their trading behavior. According to a new study this could be a

significant contributor to fluctuations in the market, as high testosterone levels can cause these traders to overestimate future stock values and change their trading behavior, leading to dangerous price bubbles and subsequent crashes.

- [**How fever in early pregnancy causes heart, facial birth defects**](#) [周三, 11 10月 02:44]

Researchers have known for decades that fevers in the first trimester of pregnancy increase risk for some heart defects and facial deformities such as cleft lip or palate. Exactly how this happens is unclear. Scientists have debated whether a virus or other infection source causes the defects, or if fever alone is the underlying problem.

- [**When the brain's wiring breaks**](#) [周三, 11 10月 02:32]

Among all the bad things that can happen to the brain when it is severely jolted - in a car accident, for example - one of the most common and worrisome is axon damage. Axons are the long stalks that grow out of the bodies of neurons. When the brain receives a strong blow, axons can break or swiftly degenerate. Researchers have revealed new molecular details of this and a path toward repair.

- [**Bright light therapy at midday helped patients with bipolar depression**](#) [周三, 11 10月 02:32]

Daily exposure to bright white light at midday significantly decreased symptoms of depression and increased functioning in people with bipolar disorder, a recent study found. More than 68 percent of patients who received midday bright light achieved a normal level of mood, compared to 22.2 percent of patients who received a dim placebo light.

- [**Unexpected regulation of transcription factors critical to development**](#) [周三, 11 10月 02:32]

Developmental biologists have for the first time described how two transcription factors that are 'absolutely essential for human development' are regulated by a cell surface metalloprotease known as ADAM13. The discovery adds to knowledge of how cells migrate in vertebrate embryos, how stem cells differentiate and how cancer cells

metastasize.

- [**Children with ADHD Likely to Have Touch-Processing Abnormalities**](#) [周三, 11 10月 02:24]

Children with attention deficit hyperactive disorder (ADHD) are likely to also have trouble with touch (tactile) processing. A new study finds that children with ADHD fare worse on several tests of tactile functioning, including reaction time and detecting a weak stimulus on the skin (detection threshold).

- [**More than half of police killings not officially documented on US death certificates, study finds**](#) [周三, 11 10月 02:14]

Official death certificates in the US failed to count more than half of the people killed by police in 2015 -- and the problem of undercounting is especially pronounced in lower-income counties and for deaths that are due to Tasers, according to a new study.

- [**A molecular garbage disposal complex has a role in packing the genome**](#) [周三, 11 10月 02:03]

New research has found that the proteasome, an essential protein complex that breaks down proteins in cells, has another unexpected function: directly regulating the packing of DNA in the nucleus.

- [**Humpback whale blow microbiome described**](#) [周三, 11 10月 01:39]

For the first time, scientists have identified an extensive conserved group of bacteria within healthy humpback whales' blow -- the moist breath that whales spray out of their blowholes when they exhale.

- [**Sequencing test enables precise identification of drug-resistant TB**](#) [周三, 11 10月 01:39]

Two studies document how a new advanced genetic sequencing approach can help thwart the growing worldwide threat posed by drug-resistant mutations of tuberculosis (TB). The threat of TB is increasing in some places as mutant versions of the disease become more and more resistant to current drug treatments.

- **[Mom's immune response could trigger social deficits for kids with autism](#)** [周三, 11 10月 01:39]

Children with autism are more likely to show severe social symptoms if their mother had chronic asthma or allergies while pregnant, a new study reveals.

- **[Changes in perspective may affect how useful drones really are](#)** [周三, 11 10月 01:39]

Users have trouble utilizing images from unmanned aerial systems (UASs), or drones, to find the position of objects on the ground, research shows. This finding highlights challenges facing the use of UAS technology for emergency operations and other applications, while offering guidance for future technology and training development.

- **[Tough humanmade rubbers for future Soldier protection systems](#)** [周三, 11 10月 01:39]

Researchers advanced a unique experimental device to better test the durability of high performance and robust polymeric materials that appear to strengthen themselves under attack by rapid impact.

- **[Being unaware of memory loss predicts Alzheimer's disease, new study shows](#)** [周三, 11 10月 01:39]

While memory loss is an early symptom of Alzheimer's disease, its presence doesn't mean a person will develop dementia. A new study has found a clinically useful way to predict who won't develop Alzheimer's disease, based on patients' awareness of their memory problems.

- **[Flexible sensors can detect movement in GI tract](#)** [周三, 11 10月 01:39]

A flexible ingestible sensor has been devised that could help doctors to diagnose problems caused by a slowdown of food flowing through the digestive tract. The sensors could also be used to detect food pressing on the stomach, helping doctors to monitor food intake by patients being treated for obesity.

- **[Growing human brain cells in the lab](#)** [周三, 11 10月 01:39]

A cost-effective technology has been developed to produce large

quantities of human brain cells in two simple steps. By surmounting major challenges in human neuron-based drug discovery, researchers believe this technique will be adopted widely in both basic science and industry.

- [**Protein restricts sap uptake by aphids**](#) [周三, 11 10月 01:02]

Researchers have discovered how plants can defend themselves against aphids. They recorded aphid behavior on video, and identified a plant protein that keeps aphids from feeding.

- [**Sharing of science is most likely among male scientists**](#) [周三, 11 10月 00:54]

Even though science is becoming increasingly competitive, scientists are still very willing to share their work with colleagues. This is especially true for male scientists among each other and less so for females among each other or between the sexes.

- [**Cells that die with a bang contribute to high death rate in bloodstream infections**](#) [周三, 11 10月 00:41]

Cells lining blood vessels in the lungs that are exposed to bacterial toxins don't die easy, according to a new study. When these blood vessel cells come into contact with bacterial toxins called lipopolysaccharides, an explosive form of cell death known as pyroptosis occurs. Without these enzymes, pyroptosis cannot occur, making these caspases attractive targets for drugs that can prevent tissue damage caused by infections.

- [**Indian government needs to do more to tackle rising sale of unapproved antibiotics, experts say**](#) [周三, 11 10月 00:41]

In India, the sale of antibiotics requiring the tightest control and regulation is rising the fastest, according to a new analysis. The correspondence highlights serious hurdles for controlling antimicrobial resistance in the country.

- [**Do male fish prefer them big and colorful?**](#) [周三, 11 10月 00:41]

Male black-finned goodeid or mexcalpique fish know what they want

when they pick a female to mate with; they prefer them big-bellied and as orange as possible. Interestingly, females displaying these traits are the ones most able to produce more offspring that survive, two researchers from the National Autonomous University of Mexico have found.

• [Regional differences among chandelier cells discovered](#) [周三, 11 10月 00:41]

The brain is composed of distinct regions that differ in their functional roles and cellular architecture. It remains largely unknown to what extent a single type in different brain regions displays similarity in gene expression, connectivity, and developmental origins. Researchers have discovered regional differences among chandelier cells, a unique class of inhibitory neurons, and showed that location matters when it comes to brain cells' gene expression, connections, and innervation area.

• [Breath instead of a blood test](#) [周三, 11 10月 00:41]

Blow into the tube, please. In the future, the procedure will not just be used by police checking for alcohol intoxication, but also for testing the condition of athletes and for people who want to lose that extra bit of weight. A new sensor makes it possible to measure when the body starts burning fat with a convenient breathalyser.

• [Marine snowfall at the equator](#) [周三, 11 10月 00:41]

Animal excrements and parts of dead organisms constantly sink from the surface of the oceans towards the deep sea. This particle flow plays an important role in the global carbon cycle and consequently for the climate. Little is known so far about its distribution in the water column. An international research team has now published a detailed image of the distribution of the marine snowfall in the equatorial ocean.

• [Gene that influences nicotine dependence identified](#) [周三, 11 10月 00:41]

A DNA variant -- located in the DNMT3B gene and commonly found in people of European and African descent -- increases the likelihood of developing nicotine dependence, smoking heavily, and developing lung cancer, according to a new study.

• [**Machine learning translates 'hidden' information to reveal chemistry in action**](#) [周三, 11 10月 00:41]

Scientists have developed a new way to capture the details of chemistry choreography as it happens. The method -- which relies on computers that have learned to recognize hidden signs of the steps -- should help them improve the performance of catalysts to drive reactions toward desired products faster.

• [**Genetic advance for male birth control**](#) [周三, 11 10月 00:41]

When it comes to birth control, many males turn to two options: condoms or vasectomies. While the two choices are effective, both methods merely focus on blocking the transportation of sperm.

• [**Ancient asteroid impact exposes the moon's interior**](#) [周三, 11 10月 00:41]

A large basin on the moon has revealed that its interior is made of a different mineral than Earth's interior, contradicting the theory that the interior of the planets look mostly the same.

• [**Mass extinctions led to low species diversity, dinosaur rule**](#) [周三, 11 10月 00:40]

Two of Earth's five mass extinction events -- times when more than half of the world's species died -- resulted in the survival of a low number of so-called 'weedy' species that spread their sameness across the world as the Earth recovered from these dramatic upheavals. The findings could shed light on modern high extinction rates and how biological communities may change in the future.

• [**Breeding salt-tolerant plants**](#) [周三, 11 10月 00:40]

The quinoa plant might serve as a model for making other crops salt-tolerant. It grows well on saline soils because the excess salt is simply dumped into special bladders on its leaves.

• [**Parasite study paves way for therapies to tackle deadly infections**](#) [周二, 10 10月 23:46]

New understanding of a parasite that causes a million cases of disease each year could point towards effective drug treatments.

- [**Forest grazing counteracts the effectiveness of trees to reduce flood risk**](#) [周二, 10 10月 23:46]

Planting trees can reduce flood risk, but a high intensity forest land use, such as grazing, can counteract the positive effect of the trees, a recently published study suggests. The study investigated the rate that water infiltrated the soil under trees at an experimental agroforestry site in Scotland.

- [**Conservationists' eco-footprints suggest education alone won't change behavior**](#) [周二, 10 10月 23:46]

A new study shows that even those presumably best informed on the environment find it hard to consistently 'walk the walk,' prompting scientists to question whether relying solely on information campaigns will ever be enough.

- [**A new genetic marker accounts for up to 1.4 percent of cases of hereditary colon cancer**](#) [周二, 10 10月 23:46]

Scientists have identified a new genetic marker that accounts for up to 1.4 percent of cases of hereditary colon cancer. Patients with mutations in this gene, if identified, could follow a clinical approach much more consistent with their genetics.

- [**Electrons surfing on a laser beam**](#) [周二, 10 10月 23:46]

The largest particle accelerator in the world - the Large Hadron Collider at CERN in Switzerland -- has a circumference of around 26 kilometers. Researchers are now attempting to go to the other extreme by building the world's smallest machine of this kind -- a particle accelerator that fits on a microchip.

- [**This soft robotic gripper can screw in your light bulbs for you**](#) [周二, 10 10月 23:46]

How many robots does it take to screw in a light bulb? The answer: just one, assuming you're talking about a newly created robotic gripper. The

engineering team has designed and built a gripper that can pick up and manipulate objects without needing to see them and needing to be trained.

- [**Oxytocin and breastfeeding: Elucidation of a molecular mechanism**](#) [周二, 10 10月 23:46]

Oxytocin is indispensable for developing the social brain. Suckling babies absorb oxytocin from mother's milk, but gut closure occurs soon after birth to prevent uptake of undesired and desired macromolecules. Researchers have found that the molecule RAGE, on the intestinal epithelium, transports oxytocin into the blood even after gut closure. This finding suggests the advantage of breastfeeding and oral oxytocin administration to increase its concentration in blood and mother-child bond.

- [**A step towards a new drug to treat fungal infections that kill 1.6 million people annually**](#) [周二, 10 10月 23:46]

Scientists are a step closer to developing a drug to treat life-threatening fungal infections that cause more than 1.6 million deaths annually.

- [**Seeing the next dimension of computer chips**](#) [周二, 10 10月 23:46]

Researchers used a scanning tunneling microscope to image the side-surfaces of 3-D silicon crystals for the first time. The pictures, captured with atomic-level of resolution, can help semiconductor manufacturers build the next generation of computer chips with three-dimensional features.

- [**Scientists discover more about the ingredients for star formation**](#) [周二, 10 10月 22:58]

In the local universe close to us, about 70 percent of the hydrogen gas is found in individual atoms, while the rest is in molecules. Astronomers had expected that as they looked back in time, younger galaxies would contain more and more molecular hydrogen until it dominated the gas in the galaxy. Instead, they found that atomic hydrogen makes up the majority of gas in younger galaxies too.

- [**Insight into our 50-plus lifespan still evolving, genetic study shows**](#) [周二, 10 10月 22:58]

The scientific reasons why people live beyond the age of 50 are more complex than thought, according to a new genetic study.

- [**Green gentrification can limit the favorable effects of green areas on health**](#) [周二, 10 10月 22:58]

A new study suggests that more socially disadvantaged neighbors do not benefit equally from the effects newly created green areas have on health. Scientists consider that greener cities are not healthier and more equal for everyone.

- [**Salt marsh research warns of pumpkin-colored 'zombies'**](#) [周二, 10 10月 22:57]

Salt marsh research shows that growing abundance of tiny shrimp infected by a microscopic parasite may portend future threats to humankind through disease.

- [**Study puts different tone on hidden hearing loss theory**](#) [周二, 10 10月 22:57]

A recent study does not support the belief that 'hidden hearing loss' is likely to affect young adults who use headphones and attend concerts.

- [**No 'narcissism epidemic' among college students, study finds**](#) [周二, 10 10月 22:57]

Today's college students are slightly less narcissistic than their counterparts were in the 1990s, researchers report in a new study - not significantly more, as some have proposed. The study analyzed data from 1,166 students at the University of California, Berkeley in the 1990s, and from tens of thousands of students at the University of Illinois at Urbana-Champaign and the University of California, Davis in the 2000s and 2010s.

- [**Areas of glioblastoma tumors correlate with separate subtypes of glioma stem cells**](#) [周二, 10 10月 22:57]

For the first time, research shows that glioblastoma (GBM) is driven by two distinct subsets of cancer stem cells. Moreover, each subtype of glioma stem cells is driven by distinct transcriptional programs for growth and treatment resistance. The subsets also responded better to combination treatment in the mouse model.

· **[Gene drives have the potential to suppress mosquito populations, but resistant mosquitoes crop up](#)** [周二, 10 10月 22:57]

Researchers successfully built a gene drive to reduce female fertility in the mosquito that spreads malaria, but mutations gradually arose that blocked the spread of the new genes.

How the cone snail's deadly venom can help us build better medicines -- ScienceDaily

Cone snails have inspired humans for centuries. Coastal communities have often traded their beautiful shells like money and put them in jewelry. Many artists, including Rembrandt, have featured them in sketches and paintings. Now, scientists at the National Institute of Standards and Technology (NIST) are finding these deadly predators inspiring, too, as they seek new ways to cure old medical problems using the poisonous snails as models.

"This is the same venom used to kill dinosaurs in 'Jurassic Park,'" says NIST biochemist Frank Marí, with a chuckle. "It is scary stuff, but that power could be used for a different kind of good in real life."

Like all NIST scientists, Marí measures things. Specifically, he measures RNA and the associated proteins at work inside marine animals. As technology has improved over the years, he and his team have

become better able to examine, analyze and catalog the molecules at work in some of the ocean's lesser-known creatures, including cone snails. This year, his lab made several significant discoveries about their venom, discoveries that might ultimately lead to the development of new medicines for hard-to-treat diseases. By imitating the way that these small, quiet creatures deliver poison, scientists may be able to better deliver cures.

On any given day, Marí can be found walking up and down the rows of burbling aquarium tanks at the Hollings Marine Laboratory in Charleston, South Carolina, checking on the 60 individual cone snails that have lived in his lab for the past 15 years. Once a week, he and his staff make a kind of delicate negotiation with them, trading a dead fish for a dose of poison to be gathered in a tube and stored away for use in ongoing scientific measurements and investigations.

"Cone snails are so unusual," Marí says. "They are not really like any other creature on Earth, and working with them is almost like working with an extraterrestrial. But that's also fun. The cone snail system is like a candy store to someone like me."

More than 800 species of cone snails have been found worldwide, mostly in warmer, tropical areas. They are reclusive, faceless creatures and not aggressive, but will sting defensively when picked up by an unwitting shell collector. The smallest cone snails impart a sting that is about as powerful as a bee sting, but the sting of larger species can kill an adult human in a matter of hours. The deadliest cone snail is thought to be the "cigarette snail" of the Indo-Pacific, a snail roughly the length of a man's thumb that can deliver a toxin so strong that you'd only have time to finish one cigarette before dying from its attack.

Although his collection includes several species, Mari's special area of focus is the purple cone snail (*Conus purpurascens*). It's a creature mostly found in the Eastern Pacific coastal waters off the Gulf of California down to Peru and offshore around the Galapagos Islands, slowly moving along the rocky bottom where it grows to be a few inches long. Like all snails from the *Conus* genus, these nocturnal animals are common, but often go unseen by casual beachgoers.

Despite their own slow tendencies, these snails have evolved to skillfully hunt far speedier animals in the dark by firing a single harpoon-like tooth into other

snails, fish and worms. Once injected, the prey becomes instantly paralyzed and unable to make a getaway. The snail then slowly pulls the immobilized meal inside its shell to be digested, whole. Each tooth is discarded after use and immediately replaced by another. Some cone snails travel with 20 or so of these teeth embedded in their systems, loaded and ready to be fired off when the next meal happens to swim along.

In its native state, cone snail venom would obviously not make a great treatment for human ailments. But by unpacking it bit by bit and measuring each component on the molecular level, Marí and his team aim to understand and catalog how each aspect of this poison does its job.

"There's a lot we are just learning about them," Marí says.

Why, for instance, is cone snail venom able to penetrate another animal's nervous system so quickly? And how does it paralyze a victim so effectively? Even more puzzling, some individual purple cone snails are not toxic at all, which Marí thinks might be related to stages of development in the snails.

The answers to all of these cone snail questions could be used to create new medicines that move through a patient's body in a quicker and more efficient manner, such as new types of insulin for the treatment of diabetes or better treatments for neurological diseases like Alzheimer's. Some think venom research can provide new delivery systems for drugs that would aim to curtail quick-spreading forms of cancer. Others want to use the venom's ingredients for the treatment of addiction. One component of cone snail venom has even been used in anti-wrinkle creams now on the market that put the power of inflammation to work under the skin, puffing out creases and fine lines on human faces.

For a paper just published in *Scientific Reports*, Marí and his team used cone snail toxins as molecular probes to identify an important overlap between the immune and central nervous systems in humans. Their work demonstrated for the first time that a classic toxin -- one usually associated with the central nervous system -- can also have an impact in the immune system, whereby some cells are signaled in specific ways once certain kinds of cone snail peptides, known as conotoxins, enter the body. The new information may aid in the development of therapies for eradicating

gastric, breast and lung cancers, as well as in the control of tuberculosis, since all of those illnesses trigger overproduction of some cells. Rather than using the toxin as an actual cure, the work would provide a road map for better understanding (and maybe controlling) the growth of undesirable cells.

For another study published recently in the *Journal of Proteomics*; and his team worked on the isolation and characterization of an enzyme in the cone snail venom called Conohyal-P1. They used an ultrahigh-resolution mass spectrometer, one of the most powerful tools available to identify and count proteins in a sample. A similar enzyme is found in both lionfish and bee venoms. Surprisingly, it is also found in many kinds of mammalian sperm, where it helps to weaken cell walls of ovaries and facilitate entry of the sperm and successful reproduction.

"We knew that this enzyme was able to break down extracellular tissue," says Mari, referring to the outermost membranes of cells. "We now have been able to carefully evaluate the activity of the enzyme for anyone to use in future work. In addition, we have identified a new subtype that had not been known before."

In a third paper, published recently in the journal *Neuropharmacology* (link is external), Marí and his team evaluated toxins in the cone snail venom by testing them on the central nervous systems of fruit flies. Although the fruit fly is very different from humans in many ways, its central nervous system can provide a great model for a wide variety of medical studies because the basic structure of cells in fruit fly brains is similar to the structure of cells in human brains. So, if a fruit fly brain cell reacts one way, scientists know a human cell will, too.

Marí's team specifically wanted to know how conotoxins interact with a variety of molecular targets in the nervous system of their prey. Purple cone snail venom contains a large number of these protein building blocks, more than 2,000 of them.

"The venom is incredibly complex," Marí says. "We wanted to answer the question: which parts could be used as medicine?"

In this case, they found that the flies' response to injections of cone snail venom primarily took place in the receptors that govern muscle movement and addiction. Such details could be useful in the

development of new drugs for Parkinson's disease, which often ravages the muscular-skeletal system, impairing a patient's ability to control basic body movements. It might also help with the development of effective nicotine addiction treatments.

"The pattern on a cone snail shell is very beautiful," Marí says. "But I think the biology and biochemistry are even more beautiful, and as we explore all the different aspects of the venom, we can open all kinds of new opportunities for medical use. We are finally able to crack the code."

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Step toward creating planes that travel at hypersonic speed: Air travel times could be drastically reduced by rare material -- ScienceDaily

An average flight from Miami to Seattle takes about six hours and 40 minutes, but imagine being able to reduce that time to 50 minutes or less. A recent study by researchers at NASA and Binghamton University, State University of New York, could lead to a drastic decrease in flight times. The study, funded in part by the U.S. Air Force, is one of the first steps toward the creation of planes able to move at hypersonic speeds, five to 10 times the speed of sound.

There are currently quite a few obstacles when it comes to building these super planes, said Binghamton University Associate Professor of Mechanical Engineering Changhong Ke. The first of which is finding a material that can hold up to hypersonic travel.

"Our study used what are called boron nitride nanotubes (BNNTs). NASA currently owns one of the

few facilities in the world able to produce quality BNNTs," said Ke. Typically, carbon nanotubes have been used in planes for their strength -- they're stronger than steel -- and their ability to conduct heat. However, BNNTs are the wave of the future when it comes to air travel.

"While carbon nanotubes can stay stable at temperatures up to 400 degrees Celsius, our study found that BNNTs can withstand up to 900 degrees Celsius," said Ke. "BNNTs are also able to handle high amounts of stress and are extremely lightweight."

Withstanding high temperatures is an important requirement for any material meant to build the world's next super planes. However, Ke clarified that the material has to be able to maintain both structural and mechanical properties in an oxygen environment.

"We weren't testing this material in a vacuum, like what you would experience in space. Materials can withstand much higher temperatures in space. We wanted to see if BNNTs could hold up in the type of environment an average fighter jet or commercial plane would experience," he said.

While the study has brought new light to the strength and stability of BNNTs, their use on planes may not be a reality for another five to 10 years.

"Right now, BNNTs cost about \$1,000 per gram. It would be impractical to use a product that expensive," said Ke.

But, that does not mean it will never happen. Carbon nanotubes were about the same price 20 years ago. As more studies indicated the usefulness of carbon nanotubes, the production rates increased and prices went down to the current rate, between \$10 and \$20 per gram. Ke sees the same fate coming down the line for BNNTs.

Ke plans to continue this type of research on BNNTs. He has worked with the U.S. Air Force on several research projects and in 2010 was chosen for the U.S. Air Force's Young Investigator Research Program, a program with fewer than 20 percent of applicants accepted. While the advances of BNNTs will probably be used first in fighter jets, Ke said he can see this type of technology trickling down to commercial flights.

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Improving Lake Erie's water quality -- ScienceDaily

The conditions in Lake Erie continue to pose several health risks to Ohioans in coastal communities, making it difficult to maintain good water quality for citizens, state and local policymakers.

A recent publication in *Frontiers in Marine Science* shows how researchers in the Great Lakes region are working toward innovative solutions. John Lekki, Ph.D., NASA Glenn Research Center's principal investigator, in collaboration with co-investigators from local universities including Kent State University won a NASA water quality proposal in June 2017. This recent grant offers an opportunity to implement Kent State's approach to identifying harmful algal blooms in and around Lake Erie.

Joseph Ortiz, Ph.D., a professor of geology in Kent State's College of Arts and Sciences, is a seasoned veteran at studying the problems posed by cyanobacterial harmful algal blooms (cyanoHABs) that have plagued Lake Erie towns and cities for years. Dr.

Ortiz is the lead author of the journal article titled "Intercomparison of Approaches to the Empirical Line Method for Vicarious Hyperspectral Reflectance Calibration" published recently. Dr. Ortiz is a co-investigator on the grant from NASA that will allow him and his colleagues at several institutions in Ohio and Michigan to apply what they have learned from studying Lake Erie's waters. This is part of a large collaborative study, which covers the waters of the western basin of Lake Erie from Maumee Bay to the Detroit Plume and Sandusky Bay.

Blue-green algae, scientifically known as cyanobacteria, are common to freshwater systems like lakes and streams. Under certain conditions, they can produce highly potent cyanotoxins like microcystin, which attacks the liver and blood. When blue-green algae grow unchecked, some of these cyanobacteria can produce cyanoHABs. It was these toxic cyanobacteria that overran the western end of Lake Erie and parts of the Maumee River in 2014. This caused the mass contamination of Toledo's drinking water.

Since then, scientists including Dr. Ortiz have focused on how they can isolate the toxic cyanobacterial signal

by using a hyperspectral imager to more closely monitor its growth and movement. This will more accurately target water treatment efforts aimed at reducing the impact of these cyanobacteria.

Dr. Ortiz's approach is based on the fact that color-producing agents in the water have different absorption and scattering effects on light.

"Any material that absorbs or scatters light is going to produce a reflective spectrum that is indicative of what is present, although multiple signals are often present that need to be unmixed," Dr. Ortiz said. "Our new paper demonstrates that the spectral decomposition method is relatively insensitive to the type of atmospheric correction method applied, and it separates out that noise -- atmospheric errors -- to give us a cleaner signal. We can then compare these unmixed spectra to the pigments in our library of water and sediment samples. The comparison to known pigments helps us determine what's in the water."

Dr. Ortiz said NASA Glenn's hyperspectral instrumentation and the bio-optical expertise that developed the instrument are key tools that bring the team together. Used in this way, the NASA device

measures the wavelengths of light reflecting from the water as well as the downwelling sunlight that illuminates the scene.

"That information is necessary to correct the data from the instrument and allows us to reduce errors related to differences in measurement timing," Dr. Ortiz said.

Story Source:

[Materials](#) provided by [Kent State University](#). *Note: Content may be edited for style and length.*

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Raging Bull: First study to find link between testosterone and stock market instability -- ScienceDaily

In the U.S. today, the majority of professional stock market traders are young males and new evidence suggests biology strongly influences their trading behavior. According to a new study in the INFORMS journal *Management Science*, this could be a significant contributor to fluctuations in the market, as high testosterone levels can cause these traders to overestimate future stock values and change their trading behavior, leading to dangerous price bubbles and subsequent crashes.

The study, "The Bull of Wall Street: Experimental Analysis of Testosterone and Asset Trading," was conducted by Amos Nadler of the Ivey Business School at Western University, Peiran Jiao of the University of Oxford, Paul Zak and Veronika Alexander of the Center for Neuroeconomics Studies at Claremont Graduate University, and Cameron Johnson at the Behavioral Health Institute at Loma Linda.

The double blind study involved 140 young males, each of whom received a topical gel containing either testosterone or a placebo, prior to participating in an experimental asset market in which they were able to post bid and ask prices, as well as buy and sell financial assets to earn real money.

The authors found that among groups that received testosterone relative to those who received a placebo, larger price bubbles formed, mispricing lasted longer, market dynamics changed to reflect increasing bidding and selling volume, and their perception of a stock's value changed despite its being displayed throughout the study. While the traders who received the placebo displayed "buy low to sell high" behavior, those who had received testosterone adhered to "buy high to sell higher."

"This research suggests the need to consider hormonal influences on decision-making in professional settings, because biological factors can exacerbate capital risk," said Nadler. "Perhaps the simplest recommendation is to implement 'cool down' periods to interrupt exceptionally positive feedback cycles and return the focus to assets' fundamental valuations to reduce the possibility of biased decision-making."

"Based on our findings, professional traders, investment advisories, and hedge funds should limit the risk taken by young male traders," continued Nadler. "This is the first study to have shown that testosterone changes the way the brain calculates value and returns in the stock market and therefore -- testosterone's neurologic influence will cause traders to make suboptimal decisions unless systems prevent them from occurring."

Story Source:

[Materials](#) provided by [Institute for Operations Research and the Management Sciences](#). *Note: Content may be edited for style and length.*

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How fever in early pregnancy causes heart, facial birth defects: Research in animals suggests some defects could be prevented with a fever reducer -- ScienceDaily

Researchers have known for decades that fevers in the first trimester of pregnancy increase risk for some heart defects and facial deformities such as cleft lip or palate. Exactly how this happens is unclear. Scientists have debated whether a virus or other infection source causes the defects, or if fever alone is the underlying problem.

Duke researchers now have evidence indicating that the fever itself, not its root source, is what interferes with the development of the heart and jaw during the first three to eight weeks of pregnancy. Their findings, demonstrated in animal embryos, will be published Oct. 10 in the journal *Science Signaling*.

The results suggest a portion of congenital birth defects could be prevented by lowering the mother's fever with

the judicious use of acetaminophen during the first trimester, said senior author Eric Benner, M.D., Ph.D., a neonatologist and assistant professor of pediatrics at Duke.

"My hope is that right now, as women are planning to become pregnant and their doctors advise them to start taking prenatal vitamins and folic acid, their doctor also informs them if they get a fever, they should not hesitate to call and consider taking a fever reducer, specifically acetaminophen (Tylenol), which has been studied extensively and determined to be safe during the first trimester," Benner said. "While doctors advise most women to avoid any drug during pregnancy, there may be benefits to taking acetaminophen to reduce fever. Women should discuss all risks and benefits with their doctors."

Benner cautions that nonsteroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen and aspirin also reduce fevers, but some NSAIDs are not safe to use during the later stages of pregnancy. There is also ongoing debate over whether sustained use of acetaminophen is safe during pregnancy to manage ongoing conditions such as arthritis, Benner said.

"However, its judicious use for an acute problem such as fever is considered safe. These findings suggest we can reduce the risk of birth defects that otherwise could lead to serious health complications requiring surgery," he said.

To observe how fever impacts a developing fetus, the researchers studied zebrafish and chicken embryos. Among their discoveries, the scientists found that neural crest cells -- cells that are critical building blocks for the heart, face and jaw -- contain temperature-sensitive properties.

"We found that these neural crest cells contain temperature-sensitive ion channels that typically are found in your sensory neurons," Benner said. "They're the channels that, when you stick your hand in a hot cup of water, tell your body the temperature has changed."

The Duke researchers engineered a noninvasive magnet-based technology to create fever-like conditions in two specific temperature-sensitive ion channels called TRPV1 and TRPV4 in the neural crest cells involved in developing the heart and face. When those neural crest cells were subjected to conditions

mimicking a transient fever, the embryos developed craniofacial irregularities and heart defects, including double outlet right ventricle, Tetralogy of Fallot and other outflow obstructions.

The type of defect depends on whether the fever occurs during heart development or head and face development. What researchers still do not know is whether or how the severity or duration of a fever impacts development, Benner said.

"We have known since the early 1980s that fevers are associated with birth defects, but how that was happening has been a complete mystery," Benner said. It is challenging to gather data from mothers on the circumstances, severity or duration of a fever from many months before, he said.

"I hope moving forward, we can educate more women about fever as a risk factor for birth defects and let them know they shouldn't just tough it out if they develop a fever," Benner said. "They should ask their doctor before getting pregnant whether they may benefit from taking a fever-reducer such as acetaminophen in the event they develop a fever."

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All Top News

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- [How fever in early pregnancy causes heart, facial birth defects](#) [周三, 11 10月 02:44]

Researchers have known for decades that fevers in the first trimester of pregnancy increase risk for some heart defects and facial deformities such as cleft lip or palate. Exactly how this happens is unclear. Scientists have debated whether a virus or other infection source causes the defects, or if fever alone is the underlying problem.

- [Humpback whale blow microbiome described](#) [周三, 11 10月 01:39]

For the first time, scientists have identified an extensive conserved group of bacteria within healthy humpback whales' blow -- the moist breath that whales spray out of their blowholes when they exhale.

- [Breath instead of a blood test](#) [周三, 11 10月 00:41]

Blow into the tube, please. In the future, the procedure will not just be used by police checking for alcohol intoxication, but also for testing the condition of athletes and for people who want to lose that extra bit of weight. A new sensor makes it possible to measure when the body starts burning fat with a convenient breathalyser.

- [Mass extinctions led to low species diversity, dinosaur rule](#) [周三, 11 10月 00:40]

Two of Earth's five mass extinction events -- times when more than half of the world's species died -- resulted in the survival of a low number of so-called 'weedy' species that spread their sameness across the world as the Earth recovered from these dramatic upheavals. The findings could shed light on modern high extinction rates and how biological communities may change in the future.

- **[Diversity of large animals plays an important role in carbon cycle](#)** [周二, 10 10月 22:56]

With abundant data on plants, large animals and their activity, and carbon soil levels in the Amazon, research suggests that large animal diversity influences carbon stocks and contributes to climate change mitigation.

- **[Size doesn't matter, at least for hammerheads and swimming performance](#)** [周二, 10 10月 22:56]

Different head shapes and different body sizes of hammerhead sharks should result in differences in their swimming performance right? Researchers have conducted the first study to examine the whole body shape and swimming kinematics of two closely related yet very different hammerhead sharks, with some unexpected results.

- **[Best way to recognize emotions in others: Listen](#)** [周二, 10 10月 22:56]

If you want to know how someone is feeling, it might be better to close your eyes and use your ears: People tend to read others' emotions more accurately when they listen and don't look, according to research.

- **['Fake fin' discovery reveals new ichthyosaur species](#)** [周二, 10 10月 22:56]

An ichthyosaur first discovered in the 1970s but then dismissed and consigned to museum storerooms across the country has been re-examined and found to be a new species.

- **[Genetically boosting the nutritional value of corn could benefit millions](#)** [周二, 10 10月 03:49]

Scientists have found an efficient way to enhance the nutritional value of corn -- the world's largest commodity crop -- by inserting a bacterial gene that causes it to produce a key nutrient called methionine, according to a new study.

- **[Huge energy potential in open ocean wind farms in the North Atlantic](#)** [周二, 10 10月 03:49]

Because wind speeds are higher on average over ocean than over land, wind turbines in the open ocean could in theory intercept more than five times as much energy as wind turbines over land. This presents an enticing opportunity for generating renewable energy through wind turbines. But it was unknown whether the faster ocean winds could actually be converted to increased amounts of electricity.

- [**Human brain recalls visual features in reverse order than it detects them**](#) [周二, 10 10月 03:49]

New research has contributed to solving a paradox of perception, literally upending models of how the brain constructs interpretations of the outside world. When observing a scene, the brain first processes details -- spots, lines and simple shapes -- and uses that information to build internal representations of more complex objects, like cars and people. But during recall, the brain remembers those larger concepts first. This could shed light on concepts such as eyewitness testimony to autism.

- [**'Turbo charge' for your brain?**](#) [周二, 10 10月 03:49]

Two brain regions -- the medial frontal and lateral prefrontal cortices -- control most executive function. Researchers used high-definition transcranial alternating current stimulation (HD-tACS) to synchronize oscillations between them, improving brain processing. De-synchronizing did the opposite.

- [**Amazon farmers discovered the secret of domesticating wild rice 4,000 years ago**](#) [周二, 10 10月 03:47]

Amazonian farmers discovered how to manipulate wild rice so the plants could provide more food 4,000 years ago, long before Europeans colonized America, archaeologists have discovered.

- [**Farsighted children struggle with attention, study finds**](#) [周二, 10 10月 00:40]

Farsighted preschoolers and kindergartners have a harder time paying attention and that could put them at risk of slipping behind in school, a new study suggests.

- [**The female brain reacts more strongly to prosocial behavior than the male brain, study finds**](#) [周二, 10 10月 00:32]

Women are more generous than men, behavioral experiments show. Now, researchers have been able to demonstrate that female and male brains process prosocial and selfish behavior differently. For women, prosocial behavior triggers a stronger reward signal, while male reward systems respond more strongly to selfish behavior.

- [**Bacteria self-organize to build working sensors**](#) [周二, 10 10月 00:32]

By programming bacteria with a synthetic gene circuit that can recruit gold nanoparticles to the surface of their colony, researchers can build functional devices. A proof-of-concept study uses this technique to build dome-shaped pressure sensors with the help of living bacteria.

- [**Solar energy: Prototype shows how tiny photodetectors can double their efficiency**](#) [周二, 10 10月 00:32]

Physicists have developed a photodetector -- a device that converts light into electrons -- by combining two distinct inorganic materials and producing quantum mechanical processes that could revolutionize the way solar energy is collected. The researchers stacked two atomic layers of tungsten diselenide on a single atomic layer of molybdenum diselenide. Such stacking results in properties vastly different from those of the parent layers, allowing for customized electronic engineering at the tini...

- [**Droughts and wildfires: How global warming is drying up the North American monsoon**](#) [周二, 10 10月 00:31]

Previous researchers had concluded that global warming was simply delaying the North American monsoon, which brings summer rains to the southwestern US and northwestern Mexico. But a new, high-resolution climate model that corrects for persistent sea surface temperature (SST) biases now accurately reflects current rainfall conditions and demonstrates that the monsoon is not simply delayed, but

that the region's total rainfall is facing a dramatic reduction.

- [**Novel circuit design boosts wearable thermoelectric generators**](#) [周一, 09 10月 21:33]

Using flexible conducting polymers and novel circuitry patterns printed on paper, researchers have demonstrated proof-of-concept wearable thermoelectric generators that can harvest energy from body heat to power simple biosensors for measuring heart rate, respiration or other factors.

- [**Official fish trade 'hugely underestimates' global catches**](#) [周一, 09 10月 21:29]

Conservation of dwindling fish stocks is being severely hampered by poor controls on global trade, according to new research.

- [**Mars study yields clues to possible cradle of life**](#) [周六, 07 10月 03:49]

The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth. The research offers evidence that these deposits were formed by heated water from a volcanically active part of the planet's crust entering the bottom of a large sea long ago.

- [**New telescope attachment allows ground-based observations of new worlds**](#) [周六, 07 10月 02:22]

A new, low-cost attachment to telescopes allows previously unachievable precision in ground-based observations of planets beyond our solar system. With it, ground-based telescopes can produce measurements of light intensity that rival the highest quality photometric observations from space.

- [**Breast cancer linked to bacterial imbalances**](#) [周六, 07 10月 00:40]

Researchers have uncovered differences in the bacterial composition of breast tissue of healthy women vs. women with breast cancer. The research team has discovered for the first time that healthy breast tissue contains more of the bacterial species *Methylobacterium*, a finding which could offer a new perspective in the battle against breast cancer.

- [**Exotic quantum particle observed in bilayer graphene**](#) [周五, 06 10月 21:22]

Physicists have definitively observed an intensely studied anomaly in condensed matter physics -- the even-denominator fractional quantum Hall state -- via transport measurement in bilayer graphene.

- [**Old Faithful's geological heart revealed**](#) [周五, 06 10月 07:02]

Scientists have mapped the near-surface geology around Old Faithful, revealing the reservoir of heated water that feeds the geyser's surface vent and how the ground shaking behaves in between eruptions.

- [**3-D quantum gas atomic clock offers new dimensions in measurement**](#) [周五, 06 10月 02:18]

Physicists have created an entirely new design for an atomic clock, in which strontium atoms are packed into a tiny three-dimensional cube at 1,000 times the density of previous one-dimensional clocks. In doing so, they are the first to harness the ultra-controlled behavior of a so-called 'quantum gas' to make a practical measurement device.

- [**Carbon feedback from forest soils to accelerate global warming**](#) [周五, 06 10月 02:18]

After 26 years, the world's longest-running experiment to discover how warming temperatures affect forest soils has revealed a surprising, cyclical response: Soil warming stimulates periods of abundant carbon release from the soil to the atmosphere alternating with periods of no detectable loss in soil carbon stores. The study indicates that in a warming world, a self-reinforcing and perhaps uncontrollable carbon feedback will occur between forest soils and the climate system, accelerating global...

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [**Prehistoric humans are likely to have formed mating networks to avoid inbreeding**](#) [周五, 06 10月 02:17]

Early humans seem to have recognized the dangers of inbreeding at least 34,000 years ago, and developed surprisingly sophisticated social and mating networks to avoid it, new research has found.

- [**12,000 years ago, Florida hurricanes heated up despite chilly seas**](#) [周五, 06 10月 00:50]

Category 5 hurricanes may have slammed Florida repeatedly during the chilly Younger Dryas, 12,000 years ago. The cause? Hurricane-suppressing effects of cooler sea surface were out-weighed by side effects of slowed ocean circulation.

- [**Brain study reveals how insects make beeline for home**](#) [周五, 06 10月 00:50]

Scientists have discovered how the wiring of bees' brains helps them plot the most direct route back to their hive.

- [**Once declared extinct, Lord Howe Island stick insects really do live**](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead Lord Howe Island stick insects have some good news: those rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

- [**More traits associated with your Neanderthal DNA**](#) [周五, 06 10月 00:11]

After humans and Neanderthals met many thousands of years ago, the two species began interbreeding. Recent studies have shown that some of those Neanderthal genes have contributed to human immunity and modern diseases. Now researchers have found that our Neanderthal inheritance has contributed to other characteristics, too, including skin

tone, hair color, sleep patterns, mood, and even a person's smoking status.

- [**Violent helium reaction on white dwarf surface triggers supernova explosion**](#) [周四, 05 10月 23:11]

Astronomers have found solid evidence about what triggered a star to explode, which will contribute to a further understanding of supernova history and behavior.

- [**'Squirtable' elastic surgical glue seals wounds in 60 seconds**](#) [周四, 05 10月 22:27]

A highly elastic and adhesive surgical glue that quickly seals wounds without the need for common staples or sutures could transform how surgeries are performed.

- [**Mars' moon Phobos examined in a different light**](#) [周四, 05 10月 22:27]

NASA's longest-lived mission to Mars has gained its first look at the Martian moon Phobos, pursuing a deeper understanding by examining it in infrared wavelengths.

- [**Who fatally undermined Scott's Antarctic expedition?**](#) [周四, 05 10月 22:26]

What doomed Captain Robert Falcon Scott's British Antarctic Expedition in 1912? Scientists have uncovered documents and diary entries that suggest a team member stole food Scott needed, failed to pass on orders that would have sent out a dog team to meet the men and then changed his story over time to cover up his role in their deaths.

- [**Too much sugar? Even 'healthy people' are at risk of developing heart disease**](#) [周四, 05 10月 08:20]

Healthy people who consume high levels of sugar are at an increased risk of developing cardiovascular disease.

- [**Milky Way's 'most-mysterious star' continues to confound**](#) [周四, 05 10月 07:05]

In 2015, a star called KIC 8462852 caused quite a stir in and beyond the astronomy community due to a series of rapid, unexplained dimming events. The latest findings from astronomers take a longer look at the star, going back to 2006 -- before its strange behavior was detected by Kepler.

- [**No clear evidence that most new cancer drugs extend or improve life**](#) [周四, 05 10月 07:04]

The majority of cancer drugs approved in Europe between 2009 and 2013 entered the market without clear evidence that they improved survival or quality of life for patients, finds a study.

- [**Sunlight and 'right' microbes convert Arctic carbon into carbon dioxide**](#) [周四, 05 10月 04:38]

A new study outlines the mechanisms and points to the importance of both sunlight and the right microbial community as keys to converting permafrost carbon to CO₂.

- [**New nanomaterial can extract hydrogen fuel from seawater**](#) [周四, 05 10月 04:20]

A new hybrid nanomaterial harvests solar energy and uses it to extract hydrogen from seawater, cheaply and efficiently. Future commercialization could mean a new source of environmentally friendly fuel and less dependence on fossil fuels.

- [**Ancient humans left Africa to escape drying climate**](#) [周四, 05 10月 03:12]

Humans migrated out of Africa as the climate shifted from wet to dry about 60,000 years ago, according to new paleoclimate research. What the northeast Africa climate was like when people migrated from Africa into Eurasia between 70,000 and 55,000 years ago is still uncertain. The new research shows around 70,000 years ago, the Horn of Africa climate shifted from a wet phase called 'Green Sahara' to even drier than the region is now.

- [**Why does divorce run in families? The answer**](#)

[may be genetics](#) [周四, 05 10月 03:12]

Children of divorced parents are more likely to get divorced when compared to those who grew up in two-parent families -- and genetic factors are the primary explanation, according to a new study.

• [The super-Earth that came home for dinner](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire solar system to one side. It is a possible "Planet Nine" -- a world perhaps 10 times the mass of Earth and 20 times farther from the sun than Neptune.

• [Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

• [Bumblebees shed light on why some individuals are smarter than others](#) [周四, 05 10月 01:28]

By examining the brains of bees trained to different tasks, the researchers found that the number of connections between nerve cells may hold the answer to questions about individual cognitive differences. Bees with a greater density of nerve connections (known as synaptic complexes) in a specific part of their brains had better memories and learned faster than bees with fewer connections in these areas.

• [In Iceland stream, possible glimpse of warming future](#) [周四, 05 10月 01:26]

When a normally cold stream in Iceland was warmed, the make-up of life inside changed as larger organisms thrived while smaller ones struggled. The findings carry implications for life in a warming climate.

- [**Anxiety and depression caused by childhood bullying decline over time**](#) [周四, 05 10月 00:05]

A new study has provided the strongest evidence to date that exposure to bullying causes mental health issues such as anxiety years later.

- [**Flights worldwide face increased risk of severe turbulence due to climate change**](#) [周四, 05 10月 00:04]

Flights all around the world could be encountering lots more turbulence in the future, according to the first ever global projections of in-flight bumpiness.

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Health News

Top stories featured on ScienceDaily's Health & Medicine, Mind & Brain, and Living Well sections.

- [**How the cone snail's deadly venom can help us build better medicines**](#) [周三, 11 10月 03:29]

By researching deadly cone snail venom, researchers hope to find solutions to tough medical problems and diseases.

- [**Raging Bull: First study to find link between testosterone and stock market instability**](#) [周三, 11 10月 03:27]

In the U.S. today, the majority of professional stock market traders are young males and new evidence suggests biology strongly influences their trading behavior. According to a new study this could be a significant contributor to fluctuations in the market, as high testosterone levels can cause these traders to overestimate future stock values and change their trading behavior, leading to dangerous price bubbles and subsequent crashes.

- [**When the brain's wiring breaks**](#) [周三, 11 10月 02:32]

Among all the bad things that can happen to the brain when it is severely jolted - in a car accident, for example - one of the most common and worrisome is axon damage. Axons are the long stalks that grow out of the bodies of neurons. When the brain receives a strong blow, axons can break or swiftly degenerate. Researchers have revealed new molecular details of this and a path toward repair.

- [**Bright light therapy at midday helped patients with bipolar depression**](#) [周三, 11 10月 02:32]

Daily exposure to bright white light at midday significantly decreased

symptoms of depression and increased functioning in people with bipolar disorder, a recent study found. More than 68 percent of patients who received midday bright light achieved a normal level of mood, compared to 22.2 percent of patients who received a dim placebo light.

- [**Unexpected regulation of transcription factors critical to development**](#) [周三, 11 10月 02:32]

Developmental biologists have for the first time described how two transcription factors that are 'absolutely essential for human development' are regulated by a cell surface metalloprotease known as ADAM13. The discovery adds to knowledge of how cells migrate in vertebrate embryos, how stem cells differentiate and how cancer cells metastasize.

- [**Children with ADHD Likely to Have Touch-Processing Abnormalities**](#) [周三, 11 10月 02:24]

Children with attention deficit hyperactive disorder (ADHD) are likely to also have trouble with touch (tactile) processing. A new study finds that children with ADHD fare worse on several tests of tactile functioning, including reaction time and detecting a weak stimulus on the skin (detection threshold).

- [**More than half of police killings not officially documented on US death certificates, study finds**](#)

[周三, 11 10月 02:14]

Official death certificates in the US failed to count more than half of the people killed by police in 2015 -- and the problem of undercounting is especially pronounced in lower-income counties and for deaths that are due to Tasers, according to a new study.

- [**Sequencing test enables precise identification of drug-resistant TB**](#) [周三, 11 10月 01:39]

Two studies document how a new advanced genetic sequencing approach can help thwart the growing worldwide threat posed by drug-resistant mutations of tuberculosis (TB). The threat of TB is increasing in some places as mutant versions of the disease become more and more

resistant to current drug treatments.

- [**Mom's immune response could trigger social deficits for kids with autism**](#) [周三, 11 10月 01:39]

Children with autism are more likely to show severe social symptoms if their mother had chronic asthma or allergies while pregnant, a new study reveals.

- [**Being unaware of memory loss predicts Alzheimer's disease, new study shows**](#) [周三, 11 10月 01:39]

While memory loss is an early symptom of Alzheimer's disease, its presence doesn't mean a person will develop dementia. A new study has found a clinically useful way to predict who won't develop Alzheimer's disease, based on patients' awareness of their memory problems.

- [**Flexible sensors can detect movement in GI tract**](#) [周三, 11 10月 01:39]

A flexible ingestible sensor has been devised that could help doctors to diagnose problems caused by a slowdown of food flowing through the digestive tract. The sensors could also be used to detect food pressing on the stomach, helping doctors to monitor food intake by patients being treated for obesity.

- [**Growing human brain cells in the lab**](#) [周三, 11 10月 01:39]

A cost-effective technology has been developed to produce large quantities of human brain cells in two simple steps. By surmounting major challenges in human neuron-based drug discovery, researchers believe this technique will be adopted widely in both basic science and industry.

- [**Sharing of science is most likely among male scientists**](#) [周三, 11 10月 00:54]

Even though science is becoming increasingly competitive, scientists are still very willing to share their work with colleagues. This is especially true for male scientists among each other and less so for females among each other or between the sexes.

- [**Cells that die with a bang contribute to high**](#)

death rate in bloodstream infections [周三, 11 10月 00:41]

Cells lining blood vessels in the lungs that are exposed to bacterial toxins don't die easy, according to a new study. When these blood vessel cells come into contact with bacterial toxins called lipopolysaccharides, an explosive form of cell death known as pyroptosis occurs. Without these enzymes, pyroptosis cannot occur, making these caspases attractive targets for drugs that can prevent tissue damage caused by infections.

Indian government needs to do more to tackle rising sale of unapproved antibiotics, experts say

[周三, 11 10月 00:41]

In India, the sale of antibiotics requiring the tightest control and regulation is rising the fastest, according to a new analysis. The correspondence highlights serious hurdles for controlling antimicrobial resistance in the country.

Regional differences among chandelier cells discovered [周三, 11 10月 00:41]

The brain is composed of distinct regions that differ in their functional roles and cellular architecture. It remains largely unknown to what extent a single type in different brain regions displays similarity in gene expression, connectivity, and developmental origins. Researchers have discovered regional differences among chandelier cells, a unique class of inhibitory neurons, and showed that location matters when it comes to brain cells' gene expression, connections, and innervation area.

Breath instead of a blood test [周三, 11 10月 00:41]

Blow into the tube, please. In the future, the procedure will not just be used by police checking for alcohol intoxication, but also for testing the condition of athletes and for people who want to lose that extra bit of weight. A new sensor makes it possible to measure when the body starts burning fat with a convenient breathalyser.

Gene that influences nicotine dependence identified [周三, 11 10月 00:41]

A DNA variant -- located in the DNMT3B gene and commonly found in people of European and African descent -- increases the likelihood of developing nicotine dependence, smoking heavily, and developing lung cancer, according to a new study.

• [**Genetic advance for male birth control**](#) [周三, 11 10月 00:41]

When it comes to birth control, many males turn to two options: condoms or vasectomies. While the two choices are effective, both methods merely focus on blocking the transportation of sperm.

• [**Parasite study paves way for therapies to tackle deadly infections**](#) [周二, 10 10月 23:46]

New understanding of a parasite that causes a million cases of disease each year could point towards effective drug treatments.

• [**A new genetic marker accounts for up to 1.4 percent of cases of hereditary colon cancer**](#) [周二, 10 10月 23:46]

Scientists have identified a new genetic marker that accounts for up to 1.4 percent of cases of hereditary colon cancer. Patients with mutations in this gene, if identified, could follow a clinical approach much more consistent with their genetics.

• [**Oxytocin and breastfeeding: Elucidation of a molecular mechanism**](#) [周二, 10 10月 23:46]

Oxytocin is indispensable for developing the social brain. Suckling babies absorb oxytocin from mother's milk, but gut closure occurs soon after birth to prevent uptake of undesired and desired macromolecules. Researchers have found that the molecule RAGE, on the intestinal epithelium, transports oxytocin into the blood even after gut closure. This finding suggests the advantage of breastfeeding and oral oxytocin administration to increase its concentration in blood and mother-child bond.

• [**A step towards a new drug to treat fungal infections that kill 1.6 million people annually**](#) [周二, 10 10月 23:46]

Scientists are a step closer to developing a drug to treat life-threatening

fungal infections that cause more than 1.6 million deaths annually.

- [**Insight into our 50-plus lifespan still evolving, genetic study shows**](#) [周二, 10 10月 22:58]

The scientific reasons why people live beyond the age of 50 are more complex than thought, according to a new genetic study.

- [**Study puts different tone on hidden hearing loss theory**](#) [周二, 10 10月 22:57]

A recent study does not support the belief that 'hidden hearing loss' is likely to affect young adults who use headphones and attend concerts.

- [**No 'narcissism epidemic' among college students, study finds**](#) [周二, 10 10月 22:57]

Today's college students are slightly less narcissistic than their counterparts were in the 1990s, researchers report in a new study - not significantly more, as some have proposed. The study analyzed data from 1,166 students at the University of California, Berkeley in the 1990s, and from tens of thousands of students at the University of Illinois at Urbana-Champaign and the University of California, Davis in the 2000s and 2010s.

- [**Areas of glioblastoma tumors correlate with separate subtypes of glioma stem cells**](#) [周二, 10 10月 22:57]

For the first time, research shows that glioblastoma (GBM) is driven by two distinct subsets of cancer stem cells. Moreover, each subtype of glioma stem cells is driven by distinct transcriptional programs for growth and treatment resistance. The subsets also responded better to combination treatment in the mouse model.

- [**Computer program detects differences between human cells**](#) [周二, 10 10月 22:57]

'How many different cell types are there in a human body? And how do these differences develop? Nobody really knows.' But thanks to a new method, that may be about to change.

- **[Calorie postings on menus cause more health mentions in online restaurant reviews](#)** [周二, 10 10月 22:57]

A study investigated whether the calorie posting on menus impacts consumer evaluations of the restaurant. The study finds that health mentions about the foods increased significantly in online reviews after calorie posting. The result suggests that calorie posting can not only shift consumers towards healthier alternatives when inside a restaurant, but can also impact other customers reading the reviews by redirecting them towards healthier restaurants and food items.

- **[Cannabidiol benefits and mechanisms shown in mouse study of Dravet syndrome](#)** [周二, 10 10月 22:56]

Cannabidiol, a non-intoxicating derivative from cannabis, has been shown to reduce seizures and autism-like behaviors in a mouse model of a genetic disorder, Dravet syndrome. Children with this devastating condition have difficult-to-treat epilepsy, cognitive impairments, and problems with social interactions. The researchers also studied how therapeutic effects of cannabidiol relate to changes in signaling between certain brain neurons.

- **[Ibuprofen better choice over oral morphine for pain relief in children after minor surgery, randomized controlled trial demonstrates](#)** [周二, 10 10月 22:56]

Widely available ibuprofen is a better choice for pain relief in children who have undergone minor orthopedic outpatient surgery, as it has fewer adverse effects compared with oral morphine, according to results from a clinical trial.

- **[Home-brewed poppy seed tea can be lethal](#)** [周二, 10 10月 22:56]

A home-brewing technique used to extract morphine from unwashed poppy seeds can produce lethal doses of the drug, according to new research.

- **[Best way to recognize emotions in others: Listen](#)** [周二, 10 10月 22:56]

If you want to know how someone is feeling, it might be better to close your eyes and use your ears: People tend to read others' emotions more accurately when they listen and don't look, according to research.

- [**A lesson for Canada: Quebec pharmacare system creates winners and losers**](#) [周二, 10 10月 22:56]

Quebec spends \$200 more per person than the rest of Canada to provide prescription drug coverage to everyone in the province, finds new research that could inform plans for a nationwide universal drug plan.

- [**Major breakthrough identifies new mechanism for the development of schizophrenia**](#) [周二, 10 10月 22:56]

The new research shows that dysfunctional brain blood vessels may be associated with the development of schizophrenia. There is potential for new treatments of schizophrenia by developing new drugs to target these abnormal blood vessels.

- [**Likely new treatment target identified for diabetic retinopathy**](#) [周二, 10 10月 22:56]

In oxygen-compromising conditions like diabetes, the body grows new blood vessels to help, but the result is often leaky, dysfunctional vessels that make bad matters worse. Now scientists have identified a new target for reducing that dysfunctional blood vessel development in the eye in a common condition called diabetic retinopathy, the leading cause of blindness in working-age adults.

- [**HIV: The benefits of prophylaxis of tuberculosis are confirmed**](#) [周二, 10 10月 22:53]

Long-term follow-up confirms that tuberculosis chemoprophylaxis in HIV-infected people is more than ever relevant in resource-limited countries.

- [**Glowing Tumor Dye to Identifies Cancerous Lymph Nodes**](#) [周二, 10 10月 21:16]

Surgeons are using a fluorescent dye that makes cancerous cells glow in hopes of identifying suspicious lymph nodes during head and neck

cancer procedures. The study is among the first in the world to look at the effectiveness of intraoperative molecular imaging (IMI) of lymph nodes in patients with head and neck cancer.

- [**Our ability to focus on one voice in crowds is triggered by voice pitch**](#) [周二, 10 10月 21:15]

Scientists have discovered that a group of neurons in the brain's auditory stem help us to tune into specific conversations in a crowded room.

- [**Common acid reflux medications promote chronic liver disease**](#) [周二, 10 10月 20:57]

Approximately 10 percent of Americans take a proton pump inhibitor drug to relieve symptoms of frequent heartburn and acid reflux. That percentage can be much higher for people with chronic liver disease. Researchers have discovered evidence in mice and humans that these medications alter gut bacteria in a way that promotes three types of chronic liver disease.

- [**p53 'master switch' remains top target in gene signaling network controlling cancer suppression**](#) [周二, 10 10月 07:21]

“People have always been after the silver bullet against cancer and there are few things that are as relevant across cancer types as p53. Now the question is what is the best approach to harness it,” says senior author Joaquin Espinosa, PhD.

- [**Gene identified that may provide potential therapy for cerebral cavernous malformations**](#) [周二, 10 10月 07:21]

Researchers have identified a series of molecular clues to understanding the formation of cerebral cavernous malformations (CCMs). The study offers the first genome-wide analysis of the transcriptome of brain microvascular endothelial cells after KRIT1 inactivation.

- [**School year 'relative age' causing bias in ADHD diagnosis, says research**](#) [周二, 10 10月 07:15]

Younger primary school children are more likely to be diagnosed with attention deficit hyperactivity disorder (ADHD) than their older peers within the same school year, new research has shown.

- [**Risk factors for heart health linked to marital ups and downs, at least for men**](#) [周二, 10 10月 07:05]

Risk factors for heart health seem to be linked to changes over time in the quality of marital relationships -- at least for men -- finds a study.

- [**Fatty diet may boost risk of relapse in kids with multiple sclerosis, while high vegetable intake may halve risk**](#) [周二, 10 10月 07:05]

A fatty diet may boost the risk of a relapse in kids with multiple sclerosis (MS) by as much as 56 per cent, with saturated fat associated with a tripling in risk, suggests new research.

- [**Few restrictions on prescription opioids through Medicare, study finds**](#) [周二, 10 10月 05:31]

Medicare plans place few restrictions on the coverage of prescription opioids, despite federal guidelines recommending such restrictions, a new study finds. The research results highlight an untapped opportunity for Medicare formularies to limit opioid prescribing, the researchers said.

- [**Human brain recalls visual features in reverse order than it detects them**](#) [周二, 10 10月 03:49]

New research has contributed to solving a paradox of perception, literally upending models of how the brain constructs interpretations of the outside world. When observing a scene, the brain first processes details -- spots, lines and simple shapes -- and uses that information to build internal representations of more complex objects, like cars and people. But during recall, the brain remembers those larger concepts first. This could shed light on concepts such as eyewitness testimony to autism.

- [**'Turbo charge' for your brain?**](#) [周二, 10 10月 03:49]

Two brain regions -- the medial frontal and lateral prefrontal cortices -- control most executive function. Researchers used high-definition transcranial alternating current stimulation (HD-tACS) to synchronize oscillations between them, improving brain processing. De-synchronizing did the opposite.

• [Alzheimer's gene poses both risk and benefits](#) [周二,

10 10月 03:48]

Scientists studying the molecular roots of Alzheimer's disease have encountered a good news/bad news scenario. The bad news is that in the early stages of the disease, high-risk TREM2 variants can hobble the immune system's ability to protect the brain from amyloid beta. The good news, according to researchers, is that later in the disease, the absence of TREM2 protein seems to protect the brain from damage.

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [**Step toward creating planes that travel at hypersonic speed**](#) [周三, 11 10月 03:29]

A recent study could lead to a drastic decrease in flight times. The study is one of the first steps toward the creation of planes able to move at hypersonic speeds, five to 10 times the speed of sound.

- [**Raging Bull: First study to find link between testosterone and stock market instability**](#) [周三, 11 10月 03:27]

In the U.S. today, the majority of professional stock market traders are young males and new evidence suggests biology strongly influences their trading behavior. According to a new study this could be a significant contributor to fluctuations in the market, as high testosterone levels can cause these traders to overestimate future stock values and change their trading behavior, leading to dangerous price bubbles and subsequent crashes.

- [**Changes in perspective may affect how useful drones really are**](#) [周三, 11 10月 01:39]

Users have trouble utilizing images from unmanned aerial systems (UASs), or drones, to find the position of objects on the ground, research shows. This finding highlights challenges facing the use of UAS technology for emergency operations and other applications, while offering guidance for future technology and training development.

- [**Tough humanmade rubbers for future Soldier protection systems**](#) [周三, 11 10月 01:39]

Researchers advanced a unique experimental device to better test the durability of high performance and robust polymeric materials that appear to strengthen themselves under attack by rapid impact.

• [Flexible sensors can detect movement in GI tract](#)

[周三, 11 10月 01:39]

A flexible ingestible sensor has been devised that could help doctors to diagnose problems caused by a slowdown of food flowing through the digestive tract. The sensors could also be used to detect food pressing on the stomach, helping doctors to monitor food intake by patients being treated for obesity.

• [Breath instead of a blood test](#)

[周三, 11 10月 00:41]

Blow into the tube, please. In the future, the procedure will not just be used by police checking for alcohol intoxication, but also for testing the condition of athletes and for people who want to lose that extra bit of weight. A new sensor makes it possible to measure when the body starts burning fat with a convenient breathalyser.

• [Machine learning translates 'hidden' information to reveal chemistry in action](#)

[周三, 11 10月

00:41]

Scientists have developed a new way to capture the details of chemistry choreography as it happens. The method -- which relies on computers that have learned to recognize hidden signs of the steps -- should help them improve the performance of catalysts to drive reactions toward desired products faster.

• [Ancient asteroid impact exposes the moon's interior](#)

[周三, 11 10月 00:41]

A large basin on the moon has revealed that its interior is made of a different mineral than Earth's interior, contradicting the theory that the interior of the planets look mostly the same.

• [Electrons surfing on a laser beam](#)

[周二, 10 10月 23:46]

The largest particle accelerator in the world - the Large Hadron Collider at CERN in Switzerland -- has a circumference of around 26 kilometers. Researchers are now attempting to go to the other extreme by building

the world's smallest machine of this kind -- a particle accelerator that fits on a microchip.

- [**This soft robotic gripper can screw in your light bulbs for you**](#) [周二, 10 10月 23:46]

How many robots does it take to screw in a light bulb? The answer: just one, assuming you're talking about a newly created robotic gripper. The engineering team has designed and built a gripper that can pick up and manipulate objects without needing to see them and needing to be trained.

- [**Seeing the next dimension of computer chips**](#) [周二, 10 10月 23:46]

Researchers used a scanning tunneling microscope to image the side-surfaces of 3-D silicon crystals for the first time. The pictures, captured with atomic-level of resolution, can help semiconductor manufacturers build the next generation of computer chips with three-dimensional features.

- [**Scientists discover more about the ingredients for star formation**](#) [周二, 10 10月 22:58]

In the local universe close to us, about 70 percent of the hydrogen gas is found in individual atoms, while the rest is in molecules. Astronomers had expected that as they looked back in time, younger galaxies would contain more and more molecular hydrogen until it dominated the gas in the galaxy. Instead, they found that atomic hydrogen makes up the majority of gas in younger galaxies too.

- [**Computer program detects differences between human cells**](#) [周二, 10 10月 22:57]

'How many different cell types are there in a human body? And how do these differences develop? Nobody really knows.' But thanks to a new method, that may be about to change.

- [**When a porous solid retains its properties in liquid form**](#) [周二, 10 10月 22:57]

Known for their exceptional porosity that enables the trapping or

transport of molecules, metal-organic frameworks (MOFs) take the form of a powder, which makes them difficult to format. For the first time, scientists have evidenced the surprising ability of a type of MOF to retain its porous properties in the liquid and then glass state. These findings open the way towards new industrial applications.

- [**Three million francs' worth of gold and silver going to waste**](#) [周二, 10 10月 21:13]

Trace elements are increasingly widely used in the high-tech and medical sectors – for example, the transition metal tantalum and the semimetal germanium in electronic components, niobium and titanium in alloys and coatings, or gadolinium as a contrast medium and in luminous paints. While the ultimate fate of the various elements has been little studied to date, a large proportion is known to enter wastewater.

- [**Illegal use of natural resources in the protected Brazilian Amazon mapped**](#) [周二, 10 10月 20:55]

New research uses law enforcement data collected from 2010 to 2015 to understand the geographical distribution of the illegal use of natural resources across the region's protected area network. In the study, a total of 4,243 reports of illegal use of natural resources were evaluated and mapped. These reports generated US \$224.6 million in fines.

- [**Invisibility is within sight**](#) [周二, 10 10月 04:11]

The theoretical discovery of transparent particles that break the previously accepted limit of visibility opens a new door in the search for perfect transparency, report scientists.

- [**Building a barrier against oxidation**](#) [周二, 10 10月 04:11]

Chemically stabilizing atomically flat materials improves their potential for commercial application, report scientists.

- [**Huge energy potential in open ocean wind farms in the North Atlantic**](#) [周二, 10 10月 03:49]

Because wind speeds are higher on average over ocean than over land, wind turbines in the open ocean could in theory intercept more than five

times as much energy as wind turbines over land. This presents an enticing opportunity for generating renewable energy through wind turbines. But it was unknown whether the faster ocean winds could actually be converted to increased amounts of electricity.

• [Bacteria self-organize to build working sensors](#) [周二, 10 10月 00:32]

By programming bacteria with a synthetic gene circuit that can recruit gold nanoparticles to the surface of their colony, researchers can build functional devices. A proof-of-concept study uses this technique to build dome-shaped pressure sensors with the help of living bacteria.

• [A zero-index waveguide](#) [周二, 10 10月 00:32]

In 2015, researchers developed the first on-chip metamaterial with a refractive index of zero, meaning that the phase of light could be stretched infinitely long. The metamaterial represented a new method to manipulate light and was an important step forward for integrated photonic circuits. Now, researchers have developed a zero-index waveguide compatible with current silicon photonic technologies. In doing so, the team observed a physical phenomenon that is usually unobservable -- a standing wa...

• [Solar energy: Prototype shows how tiny photodetectors can double their efficiency](#) [周二, 10 10月 00:32]

Physicists have developed a photodetector -- a device that converts light into electrons -- by combining two distinct inorganic materials and producing quantum mechanical processes that could revolutionize the way solar energy is collected. The researchers stacked two atomic layers of tungsten diselenide on a single atomic layer of molybdenum diselenide. Such stacking results in properties vastly different from those of the parent layers, allowing for customized electronic engineering at the tini...

• [Novel circuit design boosts wearable thermoelectric generators](#) [周一, 09 10月 21:33]

Using flexible conducting polymers and novel circuitry patterns printed on paper, researchers have demonstrated proof-of-concept wearable

thermoelectric generators that can harvest energy from body heat to power simple biosensors for measuring heart rate, respiration or other factors.

- [**A safe optical fiber for delivering light and drugs into the body**](#) [周一, 09 10月 21:32]

An electrical engineer and a biomaterials engineer have joined their expertise to develop a flexible, biodegradable optical fiber to deliver light into the body for medical applications.

- [**Surgery: Sticking instead of stitching**](#) [周一, 09 10月 21:32]

In spite of medical advances, wound-related complications arising after operations can still be life-threatening. In order to avoid these complications in the future, a new nanoparticle-based tissue glue has been developed by researchers at Empa.

- [**Digital services collect unnecessary personal information**](#) [周一, 09 10月 21:29]

Digital services that require users to log in with a personal account often collect more information about users than is needed. Certain policies may encroach on our privacy.

- [**New electro-organic synthesis allows sustainable and green production of fine chemicals**](#) [周六, 07 10月 04:49]

Scientists have succeeded in developing a state-of-the-art and innovative electro-organic synthesis.

- [**Mars study yields clues to possible cradle of life**](#) [周六, 07 10月 03:49]

The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth. The research offers evidence that these deposits were formed by heated water from a volcanically active part of the planet's crust entering the bottom of a large sea long ago.

- [**A dash of gold improves microlasers**](#) [周六, 07 10月 02:22]

By attaching gold nanoparticles to the surface of a microlaser, researchers demonstrated a frequency comb that takes up less space and

requires 1000 times less power than current comb technology.

- [**New telescope attachment allows ground-based observations of new worlds**](#) [周六, 07 10月 02:22]

A new, low-cost attachment to telescopes allows previously unachievable precision in ground-based observations of planets beyond our solar system. With it, ground-based telescopes can produce measurements of light intensity that rival the highest quality photometric observations from space.

- [**Breakthrough in direct activation of CO₂ and CH₄ into liquid fuels and chemicals**](#) [周六, 07 10月 00:40]

Researchers have made a significant breakthrough in the direct conversion of carbon dioxide (CO₂) and methane (CH₄) into liquid fuels and chemicals which could help industry to reduce greenhouse gas emissions whilst producing valuable chemical feedstocks.

- [**Energy against the current on a quantum scale, without contradicting the laws of physics**](#) [周五, 06 10月 23:23]

In a classical thermodynamic system, the heat current flows from the hotter body to the colder one, or electricity from the higher voltage to the lower one. The same thing happens in quantum systems, but this state can be changed, and the flow of energy and particles can be reversed if a quantum observer is inserted into the system.

- [**Sensitivity to time improves performance at remotely controlling devices**](#) [周五, 06 10月 23:23]

A new study finds that people who are more sensitive to the passage of time are better at accounting for the latency -- or time lag -- inherent in remotely controlling robots or other tools.

- [**Predicting insect feeding preferences after deforestation**](#) [周五, 06 10月 22:18]

Understanding how parasitoids and hosts interact, and how their interactions change with human influence, is critically important to understanding ecosystems. New research finds mathematical models can

predict complex insect behavioral changes using a simple description of insect preferences.

- [**Segregation-induced ordered superstructures at general grain boundaries in a Ni-Bi alloy**](#) [周五, 06 10月 22:18]

Randomly selected, high-angle, general grain boundaries in a nickel-bismuth (Ni-Bi) polycrystalline alloy can undergo interfacial reconstruction to form ordered superstructures, a discovery that enriches the theories and fundamental understandings of both grain boundary segregation and liquid metal embrittlement in physical metallurgy.

- [**Exotic quantum particle observed in bilayer graphene**](#) [周五, 06 10月 21:22]

Physicists have definitively observed an intensely studied anomaly in condensed matter physics -- the even-denominator fractional quantum Hall state -- via transport measurement in bilayer graphene.

- [**Electron behavior under extreme conditions described for the first time**](#) [周五, 06 10月 21:02]

Researchers have modeled the actions of electrons under extreme temperatures and densities, such as those found within planets and stars.

- [**Engineers invent breakthrough millimeter-wave circulator IC**](#) [周五, 06 10月 20:59]

Researchers continue to break new ground in developing magnet-free non-reciprocal components in modern semiconductor processes. They have built the first magnet-free non-reciprocal circulator on a silicon chip that operates at millimeter-wave frequencies, enabling circulators to be built in conventional semiconductor chips and operate at millimeter-wave frequencies, enabling full-duplex or two-way wireless.

- [**Shrinking the proton again**](#) [周五, 06 10月 07:04]

Scientists, using high precision laser spectroscopy of atomic hydrogen, confirm the surprisingly small value of the proton radius determined from muonic hydrogen.

- [**'Transformative' research unrealistic to predict, scientists tell granting agencies**](#) [周五, 06 10月 07:03]

Research-funding agencies that require scientists to declare at the proposal stage how their projects will be 'transformative' may actually be hindering discovery.

- [**Smartphone-controlled smart bandage for better, faster healing**](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [**New technology uses mouth gestures to interact in virtual reality**](#) [周五, 06 10月 02:42]

Researchers have developed a new technology that allows users to interact in a virtual reality environment using only mouth gestures.

- [**Simulating a brain-cooling treatment that could one day ease epilepsy**](#) [周五, 06 10月 02:18]

Using computer simulation techniques, scientists have gained new insights into the mechanism by which lowering the temperature of specific brain regions could potentially treat epileptic seizures.

- [**3-D quantum gas atomic clock offers new dimensions in measurement**](#) [周五, 06 10月 02:18]

Physicists have created an entirely new design for an atomic clock, in which strontium atoms are packed into a tiny three-dimensional cube at 1,000 times the density of previous one-dimensional clocks. In doing so, they are the first to harness the ultra-controlled behavior of a so-called 'quantum gas' to make a practical measurement device.

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean

water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [**Why lab researchers should talk with industry counterparts**](#) [周五, 06 10月 02:17]

A research team has found both obstacles and lessons from the process of getting a novel membrane for chemical processing out of the lab into the commercial world.

- [**Scientists enlist supercomputers, machine learning to automatically identify brain tumors**](#) [周五, 06 10月 02:17]

Researchers have developed a brain tumor identification method that combines biophysical models of tumor growth with machine learning algorithms.

- [**Road pricing most effective in reducing vehicle emissions**](#) [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

- [**New test opens path for better 2-D catalysts**](#) [周五, 06 10月 02:17]

Scientists have developed technology for rapid screening of two-dimensional materials for electrocatalysis of hydrogen. The method could accelerate the development of 2-D materials for energy applications.

- [**Heart: No evidence for piezoelectricity or ferroelectricity in the aorta**](#) [周五, 06 10月 02:17]

While some studies have supported the idea that the walls of the aorta are piezoelectric or ferroelectric, the most recent research finds no evidence of these properties. Researchers investigated by testing

samples of pig aorta using a traditional setup, known as Sawyer-Tower, to detect ferroelectricity. Their experiments suggest the aorta has no special properties, and instead acts as a standard dielectric material that does not conduct current.

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [**How the cone snail's deadly venom can help us build better medicines**](#) [周三, 11 10月 03:29]

By researching deadly cone snail venom, researchers hope to find solutions to tough medical problems and diseases.

- [**Improving Lake Erie's water quality**](#) [周三, 11 10月 03:28]

The conditions in Lake Erie continue to pose several health risks to Ohioans in coastal communities, making it difficult to maintain good water quality for citizens, state and local policymakers. Researchers in the Great Lakes region are now working toward innovative solutions.

- [**Unexpected regulation of transcription factors critical to development**](#) [周三, 11 10月 02:32]

Developmental biologists have for the first time described how two transcription factors that are 'absolutely essential for human development' are regulated by a cell surface metalloprotease known as ADAM13. The discovery adds to knowledge of how cells migrate in vertebrate embryos, how stem cells differentiate and how cancer cells metastasize.

- [**A molecular garbage disposal complex has a role in packing the genome**](#) [周三, 11 10月 02:03]

New research has found that the proteasome, an essential protein complex that breaks down proteins in cells, has another unexpected function: directly regulating the packing of DNA in the nucleus.

- [**Humpback whale blow microbiome described**](#) [周三, 11 10月 01:39]

For the first time, scientists have identified an extensive conserved group of bacteria within healthy humpback whales' blow -- the moist breath that whales spray out of their blowholes when they exhale.

• [**Protein restricts sap uptake by aphids**](#) [周三, 11 10月 01:02]

Researchers have discovered how plants can defend themselves against aphids. They recorded aphid behavior on video, and identified a plant protein that keeps aphids from feeding.

• [**Do male fish prefer them big and colorful?**](#) [周三, 11 10月 00:41]

Male black-finned goodeid or mexcalpique fish know what they want when they pick a female to mate with; they prefer them big-bellied and as orange as possible. Interestingly, females displaying these traits are the ones most able to produce more offspring that survive, two researchers from the National Autonomous University of Mexico have found.

• [**Marine snowfall at the equator**](#) [周三, 11 10月 00:41]

Animal excrements and parts of dead organisms constantly sink from the surface of the oceans towards the deep sea. This particle flow plays an important role in the global carbon cycle and consequently for the climate. Little is known so far about its distribution in the water column. An international research team has now published a detailed image of the distribution of the marine snowfall in the equatorial ocean.

• [**Mass extinctions led to low species diversity, dinosaur rule**](#) [周三, 11 10月 00:40]

Two of Earth's five mass extinction events -- times when more than half of the world's species died -- resulted in the survival of a low number of so-called 'weedy' species that spread their sameness across the world as the Earth recovered from these dramatic upheavals. The findings could shed light on modern high extinction rates and how biological communities may change in the future.

• [**Breeding salt-tolerant plants**](#) [周三, 11 10月 00:40]

The quinoa plant might serve as a model for making other crops salt-tolerant. It grows well on saline soils because the excess salt is simply

dumped into special bladders on its leaves.

- [**Parasite study paves way for therapies to tackle deadly infections**](#) [周二, 10 10月 23:46]

New understanding of a parasite that causes a million cases of disease each year could point towards effective drug treatments.

- [**Forest grazing counteracts the effectiveness of trees to reduce flood risk**](#) [周二, 10 10月 23:46]

Planting trees can reduce flood risk, but a high intensity forest land use, such as grazing, can counteract the positive effect of the trees, a recently published study suggests. The study investigated the rate that water infiltrated the soil under trees at an experimental agroforestry site in Scotland.

- [**Conservationists' eco-footprints suggest education alone won't change behavior**](#) [周二, 10 10月 23:46]

A new study shows that even those presumably best informed on the environment find it hard to consistently 'walk the walk,' prompting scientists to question whether relying solely on information campaigns will ever be enough.

- [**A step towards a new drug to treat fungal infections that kill 1.6 million people annually**](#) [周二, 10 10月 23:46]

Scientists are a step closer to developing a drug to treat life-threatening fungal infections that cause more than 1.6 million deaths annually.

- [**Green gentrification can limit the favorable effects of green areas on health**](#) [周二, 10 10月 22:58]

A new study suggests that more socially disadvantaged neighbors do not benefit equally from the effects newly created green areas have on health. Scientists consider that greener cities are not healthier and more equal for everyone.

- [**Salt marsh research warns of pumpkin-colored 'zombies'**](#) [周二, 10 10月 22:57]

Salt marsh research shows that growing abundance of tiny shrimp infected by a microscopic parasite may portend future threats to humankind through disease.

- [**Gene drives have the potential to suppress mosquito populations, but resistant mosquitoes crop up**](#) [周二, 10 10月 22:57]

Researchers successfully built a gene drive to reduce female fertility in the mosquito that spreads malaria, but mutations gradually arose that blocked the spread of the new genes.

- [**Clear lakes disguise impaired water quality**](#) [周二, 10 10月 22:57]

Look at a hundred lakes in the United States' agricultural heartland and you'll likely see green lakes surrounded by green fields. Agricultural fertilizers that help crops grow also fuel growth of algae and cyanobacteria that in excess can turn lakes the color of pea soup. Yet when scientists looked at 13 years of data from 139 lakes in intensively agricultural areas of Iowa they saw lakes that were surprisingly clear despite extremely high nutrient concentrations.

- [**Diversity of large animals plays an important role in carbon cycle**](#) [周二, 10 10月 22:56]

With abundant data on plants, large animals and their activity, and carbon soil levels in the Amazon, research suggests that large animal diversity influences carbon stocks and contributes to climate change mitigation.

- [**Evolutionary stepping stone to beet-red beets discovered**](#) [周二, 10 10月 22:56]

Scientists describe an ancient loosening up of a key biochemical pathway that set the stage for the ancestors of beets to develop their characteristic red pigment.

- [**Cannabidiol benefits and mechanisms shown in mouse study of Dravet syndrome**](#) [周二, 10 10月 22:56]

Cannabidiol, a non-intoxicating derivative from cannabis, has been

shown to reduce seizures and autism-like behaviors in a mouse model of a genetic disorder, Dravet syndrome. Children with this devastating condition have difficult-to-treat epilepsy, cognitive impairments, and problems with social interactions. The researchers also studied how therapeutic effects of cannabidiol relate to changes in signaling between certain brain neurons.

- [**Home-brewed poppy seed tea can be lethal**](#) [周二, 10 10月 22:56]

A home-brewing technique used to extract morphine from unwashed poppy seeds can produce lethal doses of the drug, according to new research.

- [**Size doesn't matter, at least for hammerheads and swimming performance**](#) [周二, 10 10月 22:56]

Different head shapes and different body sizes of hammerhead sharks should result in differences in their swimming performance right? Researchers have conducted the first study to examine the whole body shape and swimming kinematics of two closely related yet very different hammerhead sharks, with some unexpected results.

- [**'Fake fin' discovery reveals new ichthyosaur species**](#) [周二, 10 10月 22:56]

An ichthyosaur first discovered in the 1970s but then dismissed and consigned to museum storerooms across the country has been re-examined and found to be a new species.

- [**DNA study in the Pacific reveals 2000 percent increase in our knowledge of mollusc biodiversity**](#) [周二, 10 10月 22:56]

Scientists working in the Pacific have revealed a remarkable 2000% increase in our knowledge of the biodiversity of seafloor molluscs in a region being explored for deep-sea mining. Using the latest DNA-taxonomy methodology, they have newly-described and recorded 21 species where only one was previously known. The discoveries were made in the eastern region of the CCZ, a vast 5 million km² region of the

central Pacific.

- [**Dinosaur blood? New research urges caution regarding fossilized soft tissue**](#) [周二, 10 10月 22:54]

Scientists have conducted experiments to accelerate degradation in keratinous tissues such as feathers, scales and hair in order to simulate the processes that occur over deep time as something becomes a fossil.

- [**Three million francs' worth of gold and silver going to waste**](#) [周二, 10 10月 21:13]

Trace elements are increasingly widely used in the high-tech and medical sectors – for example, the transition metal tantalum and the semimetal germanium in electronic components, niobium and titanium in alloys and coatings, or gadolinium as a contrast medium and in luminous paints. While the ultimate fate of the various elements has been little studied to date, a large proportion is known to enter wastewater.

- [**Little growth observed in India's methane emissions**](#) [周二, 10 10月 20:56]

Methane is the second most powerful greenhouse gas and concentrations are rising in the atmosphere. Because of its potency and quick decay in the atmosphere, countries have recognized that reduction of methane emissions are a means toward mitigating global warming.

- [**Illegal use of natural resources in the protected Brazilian Amazon mapped**](#) [周二, 10 10月 20:55]

New research uses law enforcement data collected from 2010 to 2015 to understand the geographical distribution of the illegal use of natural resources across the region's protected area network. In the study, a total of 4,243 reports of illegal use of natural resources were evaluated and mapped. These reports generated US \$224.6 million in fines.

- [**What soot-covered, hundred-year-old birds can tell us about saving the environment**](#) [周二, 10 10月 03:50]

Birds in museum collections from Rust Belt cities around the turn of the

century are covered with black soot from air pollution at the time. Scientists have compared the amount of soot on birds through the years to track environmental pollution over the last 135 years.

- [**Genetically boosting the nutritional value of corn could benefit millions**](#) [周二, 10 10月 03:49]

Scientists have found an efficient way to enhance the nutritional value of corn -- the world's largest commodity crop -- by inserting a bacterial gene that causes it to produce a key nutrient called methionine, according to a new study.

- [**Formation of coal almost turned our planet into a snowball**](#) [周二, 10 10月 03:49]

While burning coal today causes Earth to overheat, about 300 million years ago the formation of that same coal brought our planet close to global glaciation. For the first time, scientists show the massive effect in a new study.

- [**Huge energy potential in open ocean wind farms in the North Atlantic**](#) [周二, 10 10月 03:49]

Because wind speeds are higher on average over ocean than over land, wind turbines in the open ocean could in theory intercept more than five times as much energy as wind turbines over land. This presents an enticing opportunity for generating renewable energy through wind turbines. But it was unknown whether the faster ocean winds could actually be converted to increased amounts of electricity.

- [**Amazon farmers discovered the secret of domesticating wild rice 4,000 years ago**](#) [周二, 10 10月 03:47]

Amazonian farmers discovered how to manipulate wild rice so the plants could provide more food 4,000 years ago, long before Europeans colonized America, archaeologists have discovered.

- [**How honeybees read the waggle dance**](#) [周二, 10 10月 01:54]

Neurons that enable honeybees to sense the waggle dance -- a form of symbolic communication used by female bees to inform the hivemates

about the location of a food source -- have now been investigated.

- [**A spoonful of oil: Fats and oils help to unlock full nutritional benefits of veggies, study suggests**](#)

[周二, 10 10月 00:40]

Some dressing with your greens may help you absorb more nutrients, according to a new study. The research found enhanced absorption of multiple fat-soluble vitamins in addition to beta-carotene and three other carotenoids. The results may ease the guilt of countless dieters who fret about adding dressing to their salads.

- [**Type 1 diabetes and the microbiota: MAIT cells as biomarkers and new therapeutic targets**](#)

[周二, 10 10月 00:34]

Scientists have discovered that the onset of type 1 diabetes is preceded by modification of MAIT lymphocytes. These cells -- associated with mucosae and able to recognize elements of the microbiota -- could therefore serve as new biomarkers for early detection and prevention of the illness.

- [**Bacteria self-organize to build working sensors**](#)

[周二, 10 10月 00:32]

By programming bacteria with a synthetic gene circuit that can recruit gold nanoparticles to the surface of their colony, researchers can build functional devices. A proof-of-concept study uses this technique to build dome-shaped pressure sensors with the help of living bacteria.

- [**Solar energy: Prototype shows how tiny photodetectors can double their efficiency**](#)

[周二, 10 10月 00:32]

Physicists have developed a photodetector -- a device that converts light into electrons -- by combining two distinct inorganic materials and producing quantum mechanical processes that could revolutionize the way solar energy is collected. The researchers stacked two atomic layers of tungsten diselenide on a single atomic layer of molybdenum diselenide. Such stacking results in properties vastly different from those of the parent layers, allowing for customized electronic engineering at the tini...

- [**Scientists complete conservation puzzle, shaping understanding of life on Earth**](#) [周二, 10 10月 00:31]

An international team of scientists has completed the 'atlas of life' -- the first global review and map of every vertebrate on Earth. The 39 scientists have produced a catalogue and atlas of the world's reptiles. By linking this atlas with existing maps for birds, mammals and amphibians, the team have found many new areas where conservation action is vital.

- [**Droughts and wildfires: How global warming is drying up the North American monsoon**](#) [周二, 10 10月 00:31]

Previous researchers had concluded that global warming was simply delaying the North American monsoon, which brings summer rains to the southwestern US and northwestern Mexico. But a new, high-resolution climate model that corrects for persistent sea surface temperature (SST) biases now accurately reflects current rainfall conditions and demonstrates that the monsoon is not simply delayed, but that the region's total rainfall is facing a dramatic reduction.

- [**Disease-carrying mosquitoes abound in deforested lands**](#) [周一, 09 10月 21:32]

UF scientists synthesized and examined data from prior studies that had looked at how many pathogen-carrying mosquito species made their homes in forested lands vs. non-forested lands in 12 countries worldwide, including the United States.

- [**Official fish trade 'hugely underestimates' global catches**](#) [周一, 09 10月 21:29]

Conservation of dwindling fish stocks is being severely hampered by poor controls on global trade, according to new research.

- [**Establishing a conservation breeding program to save the last saola**](#) [周一, 09 10月 21:29]

The saola (*Pseudoryx nghetinhensis*), a primitive wild cattle endemic to the Annamite mountain range in Vietnam and Lao People's Democratic

Republic (PDR), is in immediate danger of extinction. The primary threat to its survival is intensive commercial snaring to supply the thriving wild meat trade in Indochina. In order to save the saola it is essential to establish a conservation breeding program.

- [**Birds reveal the importance of good neighbors for health, aging**](#) [周一, 09 10月 21:28]

Birds who live next door to family members or to other birds they know well are physically healthier and age more slowly, according to new research.

- [**Global kids study: More trees, less disease**](#) [周一, 09 10月 20:44]

A study of 300,000 children in 35 nations says children whose watersheds have greater tree cover are less likely to experience diarrheal disease, the second leading cause of death for kids under the age of five. The study is the first to quantify the connection between watershed quality and individual health outcomes of children at the global scale. The study results from a major new database that enables 'big data' approaches.

- [**Sustainable irrigation may harm other development goals**](#) [周一, 09 10月 20:43]

Pursuing sustainable irrigation without significant irrigation efficiency gains could negatively impact environmental and development goals in many areas of the world, a new study has found.

- [**Indigenous Nations' environmental stewardship in tackling invasive species**](#) [周日, 08 10月 23:33]

As invasive species are threatening ecological habitats throughout the US and Canada, the role of Indigenous nations as environmental stewards has often been overlooked, according to a new study. The findings provide examples of the many ways Indigenous nations are adapting to invasive species, documenting their impact and implementing active response strategies based on an online survey of over 140 Indigenous respondents.

[**US Olympians at 2016 Rio Games were infected with West Nile virus, not Zika**](#) [周日, 08 10月 05:29]

US Olympic and Paralympic athletes and staff who traveled to Rio de Janeiro, Brazil, for the 2016 Summer Games did not become infected with Zika virus but did test positive for other tropical, mosquito-borne viral infections, including West Nile Virus, Dengue Fever and Chikungunya.

[**DNA barcoding technology helping monitor health of all-important boreal forest**](#) [周六, 07 10月 04:48]

The Boreal forest is essential to Canada and the world, storing carbon, purifying water and air and regulating climate. But keeping tabs on the health of this vulnerable biome has proven to be a painstaking and time-consuming undertaking - until now. Cutting-edge DNA metabarcoding technology can help speed up and improve the monitoring process, according to a new study.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [**Raging Bull: First study to find link between testosterone and stock market instability**](#) [周三, 11 10月 03:27]

In the U.S. today, the majority of professional stock market traders are young males and new evidence suggests biology strongly influences their trading behavior. According to a new study this could be a significant contributor to fluctuations in the market, as high testosterone levels can cause these traders to overestimate future stock values and change their trading behavior, leading to dangerous price bubbles and subsequent crashes.

- [**More than half of police killings not officially documented on US death certificates, study finds**](#) [周三, 11 10月 02:14]

Official death certificates in the US failed to count more than half of the people killed by police in 2015 -- and the problem of undercounting is especially pronounced in lower-income counties and for deaths that are due to Tasers, according to a new study.

- [**Sharing of science is most likely among male scientists**](#) [周三, 11 10月 00:54]

Even though science is becoming increasingly competitive, scientists are still very willing to share their work with colleagues. This is especially true for male scientists among each other and less so for females among each other or between the sexes.

- [**Indian government needs to do more to tackle rising sale of unapproved antibiotics, experts say**](#)

[周三, 11 10月 00:41]

In India, the sale of antibiotics requiring the tightest control and regulation is rising the fastest, according to a new analysis. The correspondence highlights serious hurdles for controlling antimicrobial resistance in the country.

- [**Conservationists' eco-footprints suggest education alone won't change behavior**](#) [周二, 10 10月 23:46]

A new study shows that even those presumably best informed on the environment find it hard to consistently 'walk the walk,' prompting scientists to question whether relying solely on information campaigns will ever be enough.

- [**Green gentrification can limit the favorable effects of green areas on health**](#) [周二, 10 10月 22:58]

A new study suggests that more socially disadvantaged neighbors do not benefit equally from the effects newly created green areas have on health. Scientists consider that greener cities are not healthier and more equal for everyone.

- [**No 'narcissism epidemic' among college students, study finds**](#) [周二, 10 10月 22:57]

Today's college students are slightly less narcissistic than their counterparts were in the 1990s, researchers report in a new study - not significantly more, as some have proposed. The study analyzed data from 1,166 students at the University of California, Berkeley in the 1990s, and from tens of thousands of students at the University of Illinois at Urbana-Champaign and the University of California, Davis in the 2000s and 2010s.

- [**A lesson for Canada: Quebec pharmacare system creates winners and losers**](#) [周二, 10 10月 22:56]

Quebec spends \$200 more per person than the rest of Canada to provide prescription drug coverage to everyone in the province, finds new research that could inform plans for a nationwide universal drug plan.

- [**Illegal use of natural resources in the protected**](#)

[**Brazilian Amazon mapped**](#) [周二, 10 10月 20:55]

New research uses law enforcement data collected from 2010 to 2015 to understand the geographical distribution of the illegal use of natural resources across the region's protected area network. In the study, a total of 4,243 reports of illegal use of natural resources were evaluated and mapped. These reports generated US \$224.6 million in fines.

• [**Heads-up, ceos: Corporate social responsibility may get you fired, study finds**](#) [周二, 10 10月 07:20]

Investing in product safety, employee diversity and carbon footprint reduction are all examples of corporate social responsibility (CSR) that can result in high praise for a chief executive — or get them fired — according to new research.

• [**School year 'relative age' causing bias in ADHD diagnosis, says research**](#) [周二, 10 10月 07:15]

Younger primary school children are more likely to be diagnosed with attention deficit hyperactivity disorder (ADHD) than their older peers within the same school year, new research has shown.

• [**Huge energy potential in open ocean wind farms in the North Atlantic**](#) [周二, 10 10月 03:49]

Because wind speeds are higher on average over ocean than over land, wind turbines in the open ocean could in theory intercept more than five times as much energy as wind turbines over land. This presents an enticing opportunity for generating renewable energy through wind turbines. But it was unknown whether the faster ocean winds could actually be converted to increased amounts of electricity.

• [**'Turbo charge' for your brain?**](#) [周二, 10 10月 03:49]

Two brain regions -- the medial frontal and lateral prefrontal cortices -- control most executive function. Researchers used high-definition transcranial alternating current stimulation (HD-tACS) to synchronize oscillations between them, improving brain processing. De-synchronizing did the opposite.

- **[The female brain reacts more strongly to prosocial behavior than the male brain, study finds](#)** [周二, 10 10月 00:32]

Women are more generous than men, behavioral experiments show. Now, researchers have been able to demonstrate that female and male brains process prosocial and selfish behavior differently. For women, prosocial behavior triggers a stronger reward signal, while male reward systems respond more strongly to selfish behavior.

- **[Scientists complete conservation puzzle, shaping understanding of life on Earth](#)** [周二, 10 10月 00:31]

An international team of scientists has completed the 'atlas of life' -- the first global review and map of every vertebrate on Earth. The 39 scientists have produced a catalogue and atlas of the world's reptiles. By linking this atlas with existing maps for birds, mammals and amphibians, the team have found many new areas where conservation action is vital.

- **[A new kind of influenza vaccine: One shot might do the trick](#)** [周一, 09 10月 21:33]

Certain proteins in the influenza virus remain constant year after year. Researchers are taking one of those conserved proteins, Matrix-2 (M2), and packaging it in a nanoscale, controlled-release "capsule" in an attempt to create a quick-acting, long-lasting, multi-strain vaccine against pandemic influenza A.

- **[Official fish trade 'hugely underestimates' global catches](#)** [周一, 09 10月 21:29]

Conservation of dwindling fish stocks is being severely hampered by poor controls on global trade, according to new research.

- **[Sustainable irrigation may harm other development goals](#)** [周一, 09 10月 20:43]

Pursuing sustainable irrigation without significant irrigation efficiency gains could negatively impact environmental and development goals in

many areas of the world, a new study has found.

- [**New study analyzes volcanic fatalities in more detail than ever before**](#) [周五, 06 10月 22:18]

Building on existing information and databases relating to volcanic fatalities, scientists have, for the first time, been able to classify victims by activity or occupation and look at the distance of their death from the volcano.

- [**Social acceptance more important than economic factors in fertility treatment availability**](#) [周五, 06 10月 20:59]

A new British study has shed light on some of the reasons why Assisted Reproductive Technologies (ART) usage varies across Europe -- pinpointing moral and social acceptance of the treatment and religion as key. Scientists have, for the first time, assessed the relative importance of the role that economic, demographic and cultural normative factors play in the process.

- [**Pushy or laid back? Economic factors influence parenting style**](#) [周五, 06 10月 07:03]

A new study argues that parenting styles are shaped by economic factors that incentivize one strategy over others.

- [**'Transformative' research unrealistic to predict, scientists tell granting agencies**](#) [周五, 06 10月 07:03]

Research-funding agencies that require scientists to declare at the proposal stage how their projects will be 'transformative' may actually be hindering discovery.

- [**Screen children with reading difficulties for hearing problems**](#) [周五, 06 10月 07:02]

A new study found 25 percent of its young participants who had reading difficulties showed mild or moderate hearing impairment, of which their parents and teachers were unaware.

- [**Multiple research approaches are key to pandemic preparedness**](#) [周五, 06 10月 03:11]

Preparedness in the face of major disease outbreaks can save thousands of lives. A new article examines the multifaceted nature of effective preparedness and the role that biomedical research plays. Specifically, the article examines three approaches to pandemic preparedness: pathogen-specific work, platform-based technologies, and prototype-pathogen efforts.

- [**Interpreting hurricane forecast displays can be difficult for general public**](#) [周五, 06 10月 03:11]

The 2017 hurricane season has highlighted the critical need to communicate a storm's impact path and intensity accurately, but new research shows significant misunderstandings of the two most commonly used storm forecast visualization methods.

- [**Do earthquakes have a 'tell'?**](#) [周五, 06 10月 03:11]

Data scientists and seismologists could potentially forecast strong earthquakes through algorithms designed to detect and monitor 'deep tremor.'

- [**Decision to rescind Waters of the United States rule \(WOTUS\) based on flawed analysis**](#) [周五, 06 10月 02:18]

New evidence suggests that the Trump Administration's proposal to rescind the 2015 Waters of the United States (WOTUS) rule that would limit the scope of the Clean Water Act inappropriately overlooks wetlands-related values.

- [**Middle managers may turn to unethical behavior to face unrealistic expectations**](#) [周五, 06 10月 02:17]

While unethical behavior in organizations is often portrayed as flowing down from top management, or creeping up from low-level positions, a team of researchers suggest that middle management also can play a key role in promoting wide-spread unethical behavior among their subordinates.

- **Why lab researchers should talk with industry counterparts** [周五, 06 10月 02:17]

A research team has found both obstacles and lessons from the process of getting a novel membrane for chemical processing out of the lab into the commercial world.

- **Delivering bad news? Don't beat around the bush** [周五, 06 10月 02:17]

New research shows that when it comes to receiving bad news, most people prefer directness, candor and very little -- if any -- buffer.

- **Road pricing most effective in reducing vehicle emissions** [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

- **Identifying ways to minimize the harm of energy drinks** [周五, 06 10月 02:17]

Because many countries allow the sale of energy drinks to young people, identifying ways to minimize potential harm from energy drinks is critical. A new study provided unique insights into intervention strategies suggested by young people themselves to reduce consumption. In addition to more research and education, these strategies included policy changes targeting energy drink sales, packaging, price, and visibility.

- **Planning for the future** [周五, 06 10月 02:17]

Over the past decade, increasing temperatures across much of Africa and decreasing rainfall across East Africa have come to represent an alarming climate trend. Chief among concerns is the impact such

conditions have on human health.

- [**Something universal occurs in the brain when it processes stories, regardless of language**](#) [周五, 06 10月 02:17]

New brain research shows that reading stories generates activity in the same regions of the brain for speakers of three different languages.

- [**Air pollution exposure on home-to-school routes reduces the growth of working memory**](#) [周五, 06 10月 00:50]

A new study has demonstrated that exposure to air pollution on the way to school can have damaging effects on children's cognitive development. The study found an association between a reduction in working memory and exposure to fine particulate matter (PM2.5) and black carbon during the walking commute to and from school.

- [**Fingerprints lack scientific basis for legal certainty**](#) [周四, 05 10月 23:11]

A new report on the quality of latent fingerprint analysis says that courtroom testimony and reports stating or even implying that fingerprints collected from a crime scene belong to a single person are indefensible and lack scientific foundation.

- [**Perpetrators of genocide say they're 'good people'**](#) [周四, 05 10月 22:33]

The men who were tried for their role in the 1994 Rwandan genocide that killed up to 1 million people want you to know that they're actually very good people. That's the most common way accused men try to account for their actions in testimony before the International Criminal Tribunal for Rwanda, a new study has found.

- [**Beer brands popular among youth violate code with youth-appealing ads**](#) [周四, 05 10月 22:27]

Alcohol brands popular among underage drinkers are more likely to air television advertisements that violate the industry's voluntary code by including youth-appealing content, according to a new study.

• [**Low-cost, high-volume services make up big portion of spending on unneeded health care**](#) [周四, 05 10月 22:27]

Low-cost, high-volume health services account for a high percentage of unnecessary health spending, adding strain to the health care system.

• [**Caution ahead: The growing challenge for drivers' attention**](#) [周四, 05 10月 22:27]

Many of the infotainment features in most 2017 vehicles are so distracting they should not be enabled while a vehicle is in motion, according to a new study. The study found In-Vehicle Information Systems take drivers' attention off the road for too long to be safe.

• [**DNA-based Zika vaccine is safe and effective at inducing immune response**](#) [周四, 05 10月 07:05]

A new generation DNA-based Zika vaccine demonstrated both safety and ability to elicit an immune response against Zika in humans in a phase 1 clinical trial.

• [**Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

• [**Parole violations, not new crimes, help drive prison's revolving door**](#) [周四, 05 10月 02:27]

Failing a drug test, associating with felons and other technical parole violations are among the key drivers of prison's 'revolving door,' according to new American research.

• [**Win-win for spotted owls and forest management**](#) [周四, 05 10月 02:01]

Remote sensing technology has detected what could be a win for both spotted owls and forestry management, according to a study.

- [**In warmer climates, Greenlandic deltas have grown**](#) [周四, 05 10月 01:35]

Unlike most other deltas worldwide, Greenland's are growing -- a trend with major consequences for both fishing and tourism.

- [**Assessing regional earthquake risk and hazards in the age of exascale**](#) [周四, 05 10月 00:05]

Researchers are building the first-ever end-to-end simulation code to precisely capture the geology and physics of regional earthquakes, and how the shaking impacts buildings.

- [**Albatross feces show diet of fishery discards**](#) [周四, 05 10月 00:04]

The first-ever analysis of fish DNA in albatross scat indicates a high level of interaction between seabirds and commercial fisheries. This non-invasive method could be used to assess whether fisheries are complying with discard policies. Extending the analysis to other marine predators could help monitor marine biodiversity and broader marine ecosystem changes.

- [**Safe motherhood campaign associated with more prenatal visits, birth planning, study finds**](#) [周四, 05 10月 00:04]

In Tanzania, pregnant women who were exposed to a national safe motherhood campaign designed to get them to visit health facilities for prenatal care and delivery were more likely to create birth plans and to attend more prenatal appointments.

- [**Rampant consumption of hippo teeth**](#) [周三, 04 10月 22:14]

Investigators have examined the case of hippo teeth and revealed discordance in trade volumes declared between importers and exporters -- a scenario that could threaten the survival of the species.

- [**Doing homework is associated with change in students' personality**](#) [周三, 04 10月 22:07]

Homework may have a positive influence on students' conscientiousness. Students who do more homework than their peers show positive changes in conscientiousness, according to new research. Thus, schools may be doing more than contributing to students' learning, but they may also be effecting changes of their students' personality.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- [**Step toward creating planes that travel at hypersonic speed**](#) [周三, 11 10月 03:29]

A recent study could lead to a drastic decrease in flight times. The study is one of the first steps toward the creation of planes able to move at hypersonic speeds, five to 10 times the speed of sound.

- [**Do male fish prefer them big and colorful?**](#) [周三, 11 10月 00:41]

Male black-finned goodeid or mexcalpique fish know what they want when they pick a female to mate with; they prefer them big-bellied and as orange as possible. Interestingly, females displaying these traits are the ones most able to produce more offspring that survive, two researchers from the National Autonomous University of Mexico have found.

- [**This soft robotic gripper can screw in your light bulbs for you**](#) [周二, 10 10月 23:46]

How many robots does it take to screw in a light bulb? The answer: just one, assuming you're talking about a newly created robotic gripper. The engineering team has designed and built a gripper that can pick up and manipulate objects without needing to see them and needing to be trained.

- [**Salt marsh research warns of pumpkin-colored 'zombies'**](#) [周二, 10 10月 22:57]

Salt marsh research shows that growing abundance of tiny shrimp infected by a microscopic parasite may portend future threats to

humankind through disease.

- [**'Fake fin' discovery reveals new ichthyosaur species**](#) [周二, 10 10月 22:56]

An ichthyosaur first discovered in the 1970s but then dismissed and consigned to museum storerooms across the country has been re-examined and found to be a new species.

- [**Invisibility is within sight**](#) [周二, 10 10月 04:11]

The theoretical discovery of transparent particles that break the previously accepted limit of visibility opens a new door in the search for perfect transparency, report scientists.

- [**What soot-covered, hundred-year-old birds can tell us about saving the environment**](#) [周二, 10 10月 03:50]

Birds in museum collections from Rust Belt cities around the turn of the century are covered with black soot from air pollution at the time. Scientists have compared the amount of soot on birds through the years to track environmental pollution over the last 135 years.

- [**'Turbo charge' for your brain?**](#) [周二, 10 10月 03:49]

Two brain regions -- the medial frontal and lateral prefrontal cortices -- control most executive function. Researchers used high-definition transcranial alternating current stimulation (HD-tACS) to synchronize oscillations between them, improving brain processing. De-synchronizing did the opposite.

- [**Human minibrains reveal effects of psychedelic substance**](#) [周一, 09 10月 20:44]

Scientists have identified changes in signaling pathways associated with neural plasticity, inflammation and neurodegeneration triggered by a compound from the family of dimethyltryptamine known as 5-MeO-DMT.

- [**Smartphone-controlled smart bandage for better, faster healing**](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics,

painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [**New technology uses mouth gestures to interact in virtual reality**](#) [周五, 06 10月 02:42]

Researchers have developed a new technology that allows users to interact in a virtual reality environment using only mouth gestures.

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [**How yellow and blue make green in parrots**](#) [周五, 06 10月 00:11]

Many brightly colored birds get their pigments from the foods that they eat, but that's not true of parrots. Now, researchers reporting a study of familiar pet store parakeets -- also known as budgies -- have new evidence to explain how the birds produce their characteristic yellow, blue, and green feathers.

- [**Once declared extinct, Lord Howe Island stick insects really do live**](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead Lord Howe Island stick insects have some good news: those rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

- [**More traits associated with your Neanderthal DNA**](#) [周五, 06 10月 00:11]

After humans and Neanderthals met many thousands of years ago, the two species began interbreeding. Recent studies have shown that some

of those Neanderthal genes have contributed to human immunity and modern diseases. Now researchers have found that our Neanderthal inheritance has contributed to other characteristics, too, including skin tone, hair color, sleep patterns, mood, and even a person's smoking status.

[**How much can watching hockey stress your heart?**](#) [周四, 05 10月 22:27]

A new study suggests that both the thrill of victory and the agony of defeat can have a substantial effect on the cardiovascular system. Investigators took the pulse of fans during a hockey game and found that on average, their heart rate increased by 75 percent when watching on TV, and by a whopping 110 percent (more than doubled, equivalent to the cardiac stress with vigorous exercise) when watching in person.

[**Milky Way's 'most-mysterious star' continues to confound**](#) [周四, 05 10月 07:05]

In 2015, a star called KIC 8462852 caused quite a stir in and beyond the astronomy community due to a series of rapid, unexplained dimming events. The latest findings from astronomers take a longer look at the star, going back to 2006 -- before its strange behavior was detected by Kepler.

[**The super-Earth that came home for dinner**](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire solar system to one side. It is a possible "Planet Nine" -- a world perhaps 10 times the mass of Earth and 20 times farther from the sun than Neptune.

[**Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate

machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

• [**Female fish like males who sing**](#) [周四, 05 10月 00:05]

Noisier seas seem to hamper fish reproduction. New research shows that noise pollution impedes reproduction in sand and common gobies, both of which are important food sources for juvenile cod.

• [**Burmese python's hungry escapades may have consequences for human health**](#) [周三, 04 10月 22:12]

As the large, invasive Burmese python eats its way through south Florida's mammals, the mosquitoes in the area have fewer types of animals to bite. Now, more mosquitoes are drawing blood from a rat that carries a virus dangerous to humans.

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- [**High blood pressure linked to common heart valve disorder**](#) [周三, 18 10月 03:31]

For the first time, a strong link has been established between high blood pressure and the most common heart valve disorder in high-income countries.

- [**Amazonian hunters deplete wildlife but don't empty forests**](#) [周三, 18 10月 03:31]

Conservationists can be 'cautiously optimistic' about the prospect of sustainable subsistence hunting by Amazonian communities, according to new research. The research team spent over a year working with 60 Amazonian communities and hiked for miles through trackless forests to deploy nearly 400 motion-activated camera traps -- in a bid to understand which species are depleted by hunting and where.

- [**New examination of occupational licensing contradicts decades of research**](#) [周三, 18 10月 03:30]

From doctors to engineers to carpet layers to massage therapists, more than one in three Americans is required to hold a license to work in their occupation. Broad consensus among researchers holds that licensure creates wage premiums by establishing economic monopolies, but according to research, licensure does not limit competition nor does it

increase wages.

- [How we determine who's to blame](#) [周三, 18 10月 00:44]

Using eye-tracking technology, cognitive scientists have obtained the first direct evidence that people use a process called counterfactual simulation to imagine how a situation could have played out differently to assign responsibility for an outcome.

- [To keep Saturn's A ring contained, its moons stand united](#) [周三, 18 10月 00:43]

For three decades, astronomers thought that only Saturn's moon Janus confined the planet's A ring -- the largest and farthest of the visible rings. But after poring over NASA's Cassini mission data, astronomers now conclude that the teamwork of seven moons keeps this ring corralled.

- [Flexible 'skin' can help robots, prosthetics perform everyday tasks by sensing shear force](#) [周三, 18 10月 00:43]

Engineers have developed a flexible sensor 'skin' that can be stretched over any part of a robot's body or prosthetic to accurately convey information about shear forces and vibration, which are critical to tasks ranging from cooking an egg to dismantling a bomb.

- [Cancer: New compound targets energy generation, thereby killing metastatic cells](#) [周三, 18 10月 00:43]

Researchers have identified an enzyme that supports the survival and dissemination of metastatic cells, and developed a synthetic compound that targets the enzyme and kills the metastatic cells in mice with cancer.

- [Preservation for the \(digital\) ages](#) [周三, 18 10月 00:43]

Researchers working with classicists and computer scientists have developed a method to preserve digital humanities databases. The preservation strategy allows scholars to re-launch a database application in a variety of environments -- from individual computers, to virtual machines, to future web servers -- without compromising its interactive features.

- [**Study reshapes understanding of climate change's impact on early societies**](#) [周三, 18 10月 00:43]

A new study linking paleoclimatology -- the reconstruction of past global climates -- with historical analysis shows a link between environmental stress and its impact on the economy, political stability, and war-fighting capacity of ancient Egypt.

- [**Assessment shows metagenomics software has much room for improvement**](#) [周三, 18 10月 00:42]

A recent critical assessment of software tools represents a key step toward taming the 'Wild West' nature of the burgeoning field of metagenomics.

- [**Scientists determine source of world's largest mud eruption**](#) [周二, 17 10月 23:43]

More than 11 years after the Lusi mud volcano first erupted on the Indonesian island of Java, researchers may have figured out why the mudflows haven't stopped: deep underground, Lusi is connected to a nearby volcanic system.

- [**Study shows how water could have flowed on 'cold and icy' ancient Mars**](#) [周二, 17 10月 23:43]

Research by planetary scientists finds that periodic melting of ice sheets on a cold early Mars would have created enough water to carve the ancient valleys and lakebeds seen on the planet today.

- [**Tropical beetles face extinction threat**](#) [周二, 17 10月 23:43]

Climate change is putting many tropical high altitude beetles at risk of extinction, warn an international team of scientists.

- [**What training exercise boosts brain power best? New research finds out**](#) [周二, 17 10月 23:43]

One of the two brain-training methods most scientists use in research is significantly better in improving memory and attention. It also results in more significant changes in brain activity.

- [**A new way to test body armor**](#) [周二, 17 10月 23:43]

In response to several high profile body armor failures, researchers have developed a new and extremely reliable way to test the ballistic fibers used in body armor.

- [**Loops of liquid metal can improve future fusion power plants, scientists say**](#) [周二, 17 10月 23:43]

Researchers have proposed an innovative design to improve the ability of future fusion power plants to generate safe, clean and abundant energy in a steady state, or constant, manner. The design uses loops of liquid lithium to clean and recycle the tritium, the radioactive hydrogen isotope that fuels fusion reactions, and to protect the divertor plates from intense exhaust heat from the tokamak that contains the reactions.

- [**A new way to harness wasted methane**](#) [周二, 17 10月 23:43]

Scientists have identified a process that could be used to harness methane that is now wasted by being burned off at wellheads.

- [**Scientists create most powerful micro-scale bio-solar cell yet**](#) [周二, 17 10月 23:01]

Researchers have created a micro-scale biological solar cell that generates a higher power density for longer than any existing cell of its kind.

- [**Domestication has not made dogs cooperate more with each other compared to wolves**](#) [周二, 17 10月 23:01]

Following domestication, dogs should be more tolerant and cooperative with conspecifics and humans compared to wolves. But looking at both in more naturalistic living conditions, however, speaks for more cooperative behavior of wolves. Researchers now show that the wild ancestors are excelling their domesticated relatives in teamwork. In an experimental approach dogs but not wolves failed to cooperatively pull the two ends of a rope to obtain a piece of food.

- [**HIV infection, even with antiretroviral therapy, appears to damage a growing child's brain**](#) [周二, 17 10月 23:01]

23:01]

One of the largest and best-documented trials of children receiving early antiretroviral therapy -- the CHER clinical trial in South Africa -- finds ongoing white matter damage in HIV-positive children at the age of 7 years. The study aims to contribute to a better understanding of brain development in HIV-infected and exposed children, as well as the impact of long-term antiretroviral treatment.

- [**Electroplating: The birth of a single nucleus caught in camera**](#) [周二, 17 10月 23:00]

Electroplating, or electrodeposition, is one of the most important processes in chemistry, in which a metal cation in solution can be reduced to its elemental form by applying an electrical potential to an electrode.

- [**New techniques boost performance of non-volatile memory systems**](#) [周二, 17 10月 23:00]

Computer engineering researchers have developed new software and hardware designs that should limit programming errors and improve system performance in devices that use non-volatile memory technologies.

- [**On-and-off fasting helps fight obesity, study finds**](#) [周二, 17 10月 23:00]

Up to sixteen weeks of intermittent fasting without otherwise having to count calories helps fight obesity and other metabolic disorders. Such fasting already shows benefits after only six weeks, according to a new study.

- [**Need for speed makes genome editing efficient, if not better**](#) [周二, 17 10月 23:00]

Researchers have developed a computational model to quantify the mechanism by which CRISPR-Cas9 proteins find their genome-editing targets.

- [**New imaging approach maps whole-brain changes from Alzheimer's disease in mice**](#) [周二, 17 10月

23:00]

A new imaging system that offers a better way to monitor the brain changes indicative of Alzheimer's in mouse models of the disease could help speed new drug development.

• [**Youth football: How young athletes are exposed to high-magnitude head impacts**](#) [周二, 17 10月 21:19]

Researchers examined exposure to high-magnitude head impacts (accelerations greater than 40g) in young athletes, 9 to 12 years of age, during football games and practice drills to determine under what circumstances these impacts occur and how representative practice activities are of game activities with respect to the impacts. This type of information can help coaches and league officials make informed decisions in structuring both practices and games to reduce risks in these young athletes.

• [**Saving hearts after heart attacks: Overexpression of a gene enhances repair of dead muscle**](#) [周二, 17 10月 21:19]

Biomedical engineers report a significant advance in efforts to repair a damaged heart after a heart attack, using grafted heart-muscle cells to create a repair patch. The key was overexpressing a gene that activates the cell-cycle of the grafted muscle cells, so they grow and divide more than control grafted cells.

• [**Signaling pathway may be key to why autism is more common in boys**](#) [周二, 17 10月 21:19]

Researchers have discovered sex differences in a brain signaling pathway involved in reward learning and motivation that make male mice more vulnerable to an autism-causing genetic glitch.

• [**'Hiding in plain sight:' Discovery raises questions over scale of overlooked biodiversity**](#) [周二, 17 10月 21:19]

Scientists have used cutting edge DNA technology to demonstrate that one of Europe's top freshwater predators is actually two species rather than one.

- **[Timing of melanoma diagnosis, treatment critical to survival](#)** [周二, 17 10月 21:19]

A new study underscores the importance of early detection and treatment of melanoma, the deadliest form of skin cancer. The research indicates that the sooner patients were treated, the better their survival, particularly for stage I melanoma.

- **[Keratin, proteins from 54-million-year-old sea turtle show survival trait evolution](#)** [周二, 17 10月 21:18]

Researchers have retrieved original pigment, beta-keratin and muscle proteins from a 54-million-year-old sea turtle hatchling. The work adds to the growing body of evidence supporting persistence of original molecules over millions of years and also provides direct evidence that a pigment-based survival trait common to modern sea turtles evolved at least 54 million years ago.

- **[Many pelvic tumors in women may have common origin: Fallopian tubes](#)** [周二, 17 10月 21:18]

Most, and possibly all, ovarian cancers start, not in ovaries, but instead in the fallopian tubes attached to them, report investigators.

- **[World first for reading digitally encoded synthetic molecules](#)** [周二, 17 10月 21:18]

For the first time ever, using mass spectrometry, researchers have successfully read several bytes of data recorded on a molecular scale using synthetic polymers. Their work sets a new benchmark for the amount of data -- stored as a sequence of molecular units (monomers) -- that may be read using this routine method. It also sets the stage for data storage on a scale 100 times smaller than that of current hard drives.

- **[Nearly half of US medical care comes from emergency rooms](#)** [周二, 17 10月 21:18]

Nearly half of all US medical care is delivered by emergency departments, according to a new study. In recent years, the percentage of care delivered by emergency departments has grown. The paper

highlights the major role played by emergency rooms in US health care.

- [**Attending a middle vs K-8 school matters for student outcomes**](#) [周二, 17 10月 07:05]

Students who attend a middle school compared to a K-8 school are likely to have a lower perception of their reading skills, finds a new study.

- [**During crisis, exposure to conflicting information and stress linked, studies find**](#) [周二, 17 10月 07:05]

Exposure to high rates of conflicting information during an emergency is linked to increased levels of stress, and those who rely on text messages or social media reports from unofficial sources are more frequently exposed to rumors and experience greater distress, according to research.

- [**Germ-free hatching eggs: An alternative to formaldehyde application**](#) [周二, 17 10月 07:05]

Hatching eggs in large-scale hatcheries are currently treated with formaldehyde to eliminate germs. Researchers have now developed a natural alternative.

- [**Sales of sugar-sweetened drinks at restaurant chain fall by 11 percent after small levy**](#) [周二, 17 10月 07:04]

Introducing a small levy of 10 pence per drink to the price of sugar-sweetened beverages (SSBs) sold in Jamie's Italian restaurants across the UK is likely to have contributed to a significant decline in SSB sales, according to new research.

- [**No evidence that widely marketed technique to treat leaky bladder/prolapse works**](#) [周二, 17 10月 07:04]

There is no scientific evidence that a workout widely marketed to manage the symptoms of a leaky bladder and/or womb prolapse actually works, conclude experts.

- [**GP referral to Weight Watchers avoided type 2**](#)

diabetes in third of patients [周二, 17 10月 07:04]

More than a third of patients at risk of developing type 2 diabetes avoided developing the condition after they were referred by their family doctor (GP) to a diabetes prevention program delivered by the commercial weight management provider, Weight Watchers, finds research.

Oysters offer hot spot for reducing nutrient pollution [周二, 17 10月 07:03]

Marine scientists have quantified potentially denitrifying bacteria in the oyster gut and shell, with important implications for efforts to reduce nutrient levels in coastal waters through oyster restoration.

Shaping animal, vegetable and mineral [周二, 17 10月 07:03]

A new technique to grow any target shape from any starting shape has now been developed by researchers, outlines a new report.

Novel mechanism of resistance to anti-cancer drugs [周二, 17 10月 07:03]

Investigators have discovered a novel non-genetic cause of resistance to the targeted anti-cancer therapy cetuximab. Their findings suggest a strategy for overcoming this resistance.

Proteins and polymers: Spinning strands hint at folding dynamics [周二, 17 10月 07:03]

Scientists have created flexible strings of magnetized beads to model how natural and synthetic strands bend and fold in dynamic conditions. The work could enhance knowledge of how proteins and DNA fold in biological systems and how synthetic fibers interact in fluids.

Portable 3-D scanner assesses patients with elephantiasis [周二, 17 10月 07:03]

An estimated 120 million people worldwide are infected with lymphatic filariasis, a parasitic, mosquito-borne disease that can cause major swelling and deformity of the legs, a condition known as elephantiasis. Scientists have shown that a portable scanning device can measure limb

enlargement and disfigurement faster and more easily in patients with elephantiasis. The research tool makes it easy to obtain accurate measurements and determine whether treatments to reduce swelling are effective.

- [**Biology of childhood brain tumor subtypes offers clues to precision treatments**](#) [周二, 17 10月 07:03]

Researchers investigating pediatric low-grade gliomas (PLGG), the most common type of brain tumor in children, have discovered key biological differences in how mutated genes combine with other genes to drive this childhood cancer. By shedding light on subtle distinctions in tumor biology, these findings offer clues to designing more effective anticancer treatments to precisely target tumors in individual patients.

- [**Skimping on sleep may contribute to gestational diabetes**](#) [周二, 17 10月 07:03]

A new study has found that lack of sleep among pregnant women may be a contributing factor to the development of gestational diabetes.

- [**Invasive ladybird species threatens other ladybirds in England**](#) [周二, 17 10月 07:03]

The harlequin ladybird was widely introduced across continental Europe to limit the population of pest insects.

- [**Physically active white men at high risk for plaque buildup in arteries**](#) [周二, 17 10月 02:48]

White men who exercise at high levels are 86 percent more likely than people who exercise at low levels to experience a buildup of plaque in the heart arteries by middle age, a new study suggests.

- [**Tweeting rage: How immigration policies can polarize public discourse**](#) [周二, 17 10月 02:48]

A study of tweets in the months before and after the 2010 passage of Arizona's "show me your papers" law, findings showed that the average tweet about Mexican immigrants and Hispanics, in general, became more negative. Researchers said the social media data was useful in

determining whether people had changed their attitudes about immigrants as a result of the law or whether they had begun behaving differently.

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High blood pressure linked to common heart valve disorder -- ScienceDaily

For the first time, a strong link has been established between high blood pressure and the most common heart valve disorder in high-income countries, by new research from The George Institute for Global Health at the University of Oxford.

The study, published in the journal *PLoS Medicine*, followed 5.5 million adults in the UK over 10 years. It found that higher blood pressure in early life was associated with a significantly greater future risk of mitral regurgitation, a condition which makes the heart less efficient at pumping blood around the body, and in severe cases can lead to heart failure.

"Our research suggests this common and disabling valve disorder is not an inevitable consequence of aging, as previously assumed, but may be preventable," said Professor Kazem Rahimi, lead author of the study and deputy director of The George Institute UK.

"Given the large and growing burden of mitral valve

disease, particularly among older people, we believe these findings are likely to have significant implications for medical policy and practice around the world."

Mitral regurgitation leads to a backflow of blood into the heart, causing symptoms such as shortness of breath, tiredness, dizziness and chest pain. It is more common in older people, and may be associated with a greater risk of mortality.

Peter Williams, 59, of Oxfordshire, experienced the condition before having surgery to repair his mitral valve in 2016.

"I've always been an active person, but it slowed me down a lot," he said. "I was tired and short of breath, and struggling to walk distances that wouldn't normally have bothered me. My breathing was so noisy at night that it actually woke me up."

Despite significant advances in the understanding of valve disease, mitral regurgitation has until now been largely considered a degenerative disorder, resulting from a weakening of the valve over time due to 'wear and tear'.

This has led medical practitioners to focus on treatment -- namely surgery to repair or replace the valve -- rather than prevention. The new study suggests further research is needed to test whether lowering blood pressure -- through exercise, diet or blood pressure-lowering drugs -- could reduce the risk of the disorder occurring.

"With worldwide aging and population growth, we are likely to see an increasing number of cases of this condition," said Professor Rahimi. "We need to find effective and affordable measures to tackle it, and our study suggests one possible avenue for prevention, by reducing high blood pressure."

Story Source:

[Materials](#) provided by [University of Oxford](#). *Note: Content may be edited for style and length.*

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Amazonian hunters deplete wildlife but don't empty forests -- ScienceDaily

Conservationists can be "cautiously optimistic" about the prospect of sustainable subsistence hunting by Amazonian communities -- according to new research from the University of East Anglia.

Human exploitation of natural resources is a key driver of global biodiversity loss. In tropical forests, overhunting has been implicated in widespread local species extinction and the creation of 'empty forests'.

But a new study published in *PLOS ONE* reveals that subsistence hunters from small communities in large areas of intact forest and with access to healthy fish stocks do not appear to be emptying their forests.

This finding only rings true for smaller species and those less sensitive to hunting pressure, however. Numbers of large primates and other large mammals were still found to be depleted near to communities.

Lead author Dr Mark Abrahams, from UEA's School

of Environmental Sciences, said: "Understanding the impacts of subsistence hunting in tropical forests is crucial not only to safeguard the world's most biodiverse terrestrial ecosystems, but also to secure a sustainable future for forest-dependent communities."

The research team used novel camera trapping and interview methods to study species in the Amazon.

Working with 60 Amazonian communities in the Juruá and Uatumã regions of Amazonas, Brazil, they deployed 383 motion-activated camera traps and conducted 78 interviews with subsistence hunters.

Hiking for miles through trackless forests to deploy cameras at varying distances from communities, the study sought to understand which species are depleted by hunting and where.

Key findings:

- Large-bodied species and species forming large groups, are depleted near Amazonian communities.
- The biomass of the entire species assemblage is greatly reduced close to Amazonian towns.

- Subsistence hunting did not empty the forest of game vertebrates in the study regions, which retain high forest cover, sources of alternative protein and low human population densities.

The camera trap and interview data showed that large-bodied species and species forming large groups, such as white lipped peccaries, woolly monkeys and tapirs, are indeed depleted near to communities.

Smaller species and those less sensitive to hunting pressure, did not show evidence of depletion near to communities.

By contrast, the biomass of the entire species assemblage was greatly reduced close to towns.

Dr Abrahams said: "Our results imply that conservationists can be cautiously optimistic about the prospect of sustainable subsistence hunting by Amazonian communities. Small communities, living in large areas of intact forest and with access to healthy stocks of fish, do not appear to be emptying their forests.

"But this is clearly no excuse for complacency. Large

primates and large ungulates, which are depleted by hunting, play vital ecological roles such as seed dispersal and are crucial to the health of the forest.

"Also, areas where human populations are larger, fish stocks are less abundant and remaining forest cover is less extensive, are likely to experience a far more severe depletion of game animals."

Prof Carlos Peres, also from UEA's School of Environmental Sciences, said: "Our analysis shows that the sustainability of protein acquisition in tropical forests is primarily governed by the spatial context of mortality sinks, human population density, and availability of alternative protein."

Story Source:

Materials provided by [University of East Anglia](#).

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New examination of occupational licensing contradicts decades of research: Professional licensure does not limit competition nor does it increase wages -- ScienceDaily

From doctors to engineers to carpet layers to massage therapists, more than one in three Americans is required to hold a license to work in their occupation. Broad consensus among researchers holds that licensure creates wage premiums by establishing economic monopolies, but according to Northwestern University research, licensure does not limit competition nor does it increase wages.

A new study, which is based on a new occupational dataset covering 30 years, contradicts decades of research on the impact of occupational licensing. The most comprehensive examination of licensing to date, the study relies on more than 4.5 million workers across 500 occupations.

The most substantial growth in professional licensure

has been in blue-collar occupations, particularly the production and transportation sector, which has more than doubled its licensed workforce over the past 30 years.

"I argue that licensure, instead of increasing wages, creates a set of institutional mechanisms that enhance entry into the occupation, particularly for historically disadvantaged groups, while simultaneously stagnating quality," said Beth Redbird, assistant professor of sociology in the Weinberg College of Arts and Sciences at Northwestern and author of the study.

Redbird said her study is different from previous examinations as it relies on two important innovations.

"By tracking licensing legislation across all 50 states, through an exhaustive search of statutes and administrative codes, licensed hairdressers in one state are compared to unlicensed hairdressers in another state, within that same year, licensed occupational therapists are compared to unlicensed occupational therapists, and so on.

"The second major innovation is that, for the first time, the effect of licensing can be studied over time. Using

a longitudinal approach, this study examines wages in the years following enactment and sees exactly how they change when a law is passed," said Redbird, a faculty fellow with Northwestern's Institute for Policy Research.

Redbird said the typical weekly wage declines by between 0.19 percent and 1.23 percent due to licensure. Furthermore, results of the study show that after licensing, the number of workers in the occupation increases by an average of more than seven percent over original levels.

Redbird said the research could have implications for changing how workers enter an occupation.

"Through the lens of licensure, occupational elites can define the 'proper' way to practice, since license requirements are essentially comprehensive lists of ways to be excluded or removed. However, this may also limit innovation, reduce experimentation and perhaps hinder growth in knowledge. While practitioners in unlicensed markets are free to compete on all aspects of their occupations, licensed workers must obey legal limitations on both what they do and how they do it.

"On a broader scale, this formalization may rigidify the reward structure of an occupation, solidifying wage inequality," Redbird said. "Current research into wage gaps shows that, while more women enter licensed occupations, licensing also tends to increase the wage gap as it reduces mobility for women."

Story Source:

[Materials](#) provided by [Northwestern University](#).

Original written by Hilary Hurd Anyaso. *Note: Content may be edited for style and length.*

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How we determine who's to blame: Before assigning responsibility, our minds simulate alternative outcomes, study shows -- ScienceDaily

How do people assign a cause to events they witness? Some philosophers have suggested that people determine responsibility for a particular outcome by imagining what would have happened if a suspected cause had not intervened.

This kind of reasoning, known as counterfactual simulation, is believed to occur in many situations. For example, soccer referees deciding whether a player should be credited with an "own goal" -- a goal accidentally scored for the opposing team -- must try to determine what would have happened had the player not touched the ball.

This process can be conscious, as in the soccer example, or unconscious, so that we are not even aware we are doing it. Using technology that tracks eye movements, cognitive scientists at MIT have now

obtained the first direct evidence that people unconsciously use counterfactual simulation to imagine how a situation could have played out differently.

"This is the first time that we or anybody have been able to see those simulations happening online, to count how many a person is making, and show the correlation between those simulations and their judgments," says Josh Tenenbaum, a professor in MIT's Department of Brain and Cognitive Sciences, a member of MIT's Computer Science and Artificial Intelligence Laboratory, and the senior author of the new study.

Tobias Gerstenberg, a postdoc at MIT who will be joining Stanford's Psychology Department as an assistant professor next year, is the lead author of the paper, which appears in the Oct. 17 issue of *Psychological Science*. Other authors of the paper are MIT postdoc Matthew Peterson, Stanford University Associate Professor Noah Goodman, and University College London Professor David Lagnado.

Follow the ball

Until now, studies of counterfactual simulation could

only use reports from people describing how they made judgments about responsibility, which offered only indirect evidence of how their minds were working.

Gerstenberg, Tenenbaum, and their colleagues set out to find more direct evidence by tracking people's eye movements as they watched two billiard balls collide. The researchers created 18 videos showing different possible outcomes of the collisions. In some cases, the collision knocked one of the balls through a gate; in others, it prevented the ball from doing so.

Before watching the videos, some participants were told that they would be asked to rate how strongly they agreed with statements related to ball A's effect on ball B, such as, "Ball A caused ball B to go through the gate." Other participants were asked simply what the outcome of the collision was.

As the subjects watched the videos, the researchers were able to track their eye movements using an infrared light that reflects off the pupil and reveals where the eye is looking. This allowed the researchers, for the first time, to gain a window into how the mind imagines possible outcomes that did not occur.

"What's really cool about eye tracking is it lets you see things that you're not consciously aware of," Tenenbaum says. "When psychologists and philosophers have proposed the idea of counterfactual simulation, they haven't necessarily meant that you do this consciously. It's something going on behind the surface, and eye tracking is able to reveal that."

The researchers found that when participants were asked questions about ball A's effect on the path of ball B, their eyes followed the course that ball B would have taken had ball A not interfered. Furthermore, the more uncertainty there was as to whether ball A had an effect on the outcome, the more often participants looked toward ball B's imaginary trajectory.

"It's in the close cases where you see the most counterfactual looks. They're using those looks to resolve the uncertainty," Tenenbaum says.

Participants who were asked only what the actual outcome had been did not perform the same eye movements along ball B's alternative pathway.

How people think

The researchers are now using this approach to study more complex situations in which people use counterfactual simulation to make judgments of causality.

"We think this process of counterfactual simulation is really pervasive," Gerstenberg says. "In many cases it may not be supported by eye movements, because there are many kinds of abstract counterfactual thinking that we just do in our mind. But the billiard-ball collisions lead to a particular kind of counterfactual simulation where we can see it."

One example the researchers are studying is the following: Imagine ball C is headed for the gate, while balls A and B each head toward C. Either one could knock C off course, but A gets there first. Is B off the hook, or should it still bear some responsibility for the outcome?

"Part of what we are trying to do with this work is get a little bit more clarity on how people deal with these complex cases. In an ideal world, the work we're doing can inform the notions of causality that are used in the law," Gerstenberg says. "There is quite a bit of interaction between computer science, psychology, and

legal science. We're all in the same game of trying to understand how people think about causation."

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To keep Saturn's A ring contained, its moons stand united -- ScienceDaily

For three decades, astronomers thought that only Saturn's moon Janus confined the planet's A ring -- the largest and farthest of the visible rings. But after poring over NASA's Cassini mission data, Cornell astronomers now conclude that the teamwork of seven moons keeps this ring corralled.

Without forces to hold the A ring in check, the ring would keep spreading out and ultimately disappear. "Cassini provided detail on the mass of Saturn's moons and the physical characteristics of the rings, so mathematically speaking, we concluded that the moon Janus alone cannot keep the rings from spreading out," said Radwan Tajeddine, a research associate in astronomy and lead author of the new research.

The scientists discovered that confinement of the A ring is shared among the moons Pan, Atlas, Prometheus, Pandora, Epimetheus, Mimas and Janus. "All of these moons work as a group to contain the ring. Together they are strong. United they stand," said

Tajeddine.

Cassini, which crashed into Saturn Sept. 15 at the mission's end, provided valuable data and detailed images of the planet's rings. The A ring looks similar to a vinyl record; it has "density waves" that resemble a record's grooves that are created by what astronomers call moon resonances. These resonance markers enabled scientists to deduce that the moons' gravitational influence help to slow and reduce the spreading ring's momentum.

There are hundreds of density waves spread over the A ring that are generated by different moon resonances. Tajeddine compares it to tug of war with many knots along the gravitational rope. All of these gravitational pushes by these moons slow the ring down and pull momentum from it. So much momentum is lost by the time the ring gets to Janus that the forces create the edge of the A ring.

Senior author Joe Burns, Ph.D. '66, the Irving Porter Church Professor of Engineering and professor of astronomy said: "This was exactly the sort of information we had hoped the Cassini mission would provide, and by doing so it has allowed us to solve this

puzzle."

Tajeddine said scientists are still not sure how the rings formed, but the mechanism of their confinement is finally understood. "That's the novelty of this idea. No one imagined that rings were held by shared responsibility," he said.

"The density waves created by moons are beautiful to look at, but they actually participate in confining the ring," said Tajeddine. "Janus has been getting all of the credit for stopping the A ring, which has been unfair to the other moons."

"What Confines the Rings of Saturn?" will be published Oct. 18 in the *Astrophysical Journal*.

Tajeddine also presented this research in a poster at the American Astronomical Society's Division of Planetary Science meeting Oct. 17 in Provo, Utah.

In addition to Burns and Tajeddine, the paper's co-authors are Philip D. Nicholson, professor of astronomy; Maryame El Moutamid, research associate; and Pierre-Yves Longaretti of the Institut de Planétologie et d'Astrophysique de Grenoble, France. The research was funded by the Cassini mission.

Story Source:

[Materials](#) provided by [Cornell University](#). Original written by Blaine Friedlander. *Note: Content may be edited for style and length.*

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All Top News

Top science stories featured on ScienceDaily's home page.

- [How we determine who's to blame](#) [周三, 18 10月 00:44]
Using eye-tracking technology, cognitive scientists have obtained the first direct evidence that people use a process called counterfactual simulation to imagine how a situation could have played out differently to assign responsibility for an outcome.
- [Flexible 'skin' can help robots, prosthetics perform everyday tasks by sensing shear force](#) [周三, 18 10月 00:43]
Engineers have developed a flexible sensor 'skin' that can be stretched over any part of a robot's body or prosthetic to accurately convey information about shear forces and vibration, which are critical to tasks ranging from cooking an egg to dismantling a bomb.
- [Study reshapes understanding of climate change's impact on early societies](#) [周三, 18 10月 00:43]
A new study linking paleoclimatology -- the reconstruction of past global climates -- with historical analysis shows a link between environmental stress and its impact on the economy, political stability, and war-fighting capacity of ancient Egypt.
- [Scientists determine source of world's largest mud eruption](#) [周二, 17 10月 23:43]
More than 11 years after the Lusi mud volcano first erupted on the Indonesian island of Java, researchers may have figured out why the mudflows haven't stopped: deep underground, Lusi is connected to a nearby volcanic system.
- [Study shows how water could have flowed on](#)

'cold and icy' ancient Mars [周二, 17 10月 23:43]

Research by planetary scientists finds that periodic melting of ice sheets on a cold early Mars would have created enough water to carve the ancient valleys and lakebeds seen on the planet today.

• **What training exercise boosts brain power best?**

New research finds out [周二, 17 10月 23:43]

One of the two brain-training methods most scientists use in research is significantly better in improving memory and attention. It also results in more significant changes in brain activity.

• **Domestication has not made dogs cooperate more with each other compared to wolves** [周二, 17 10月 23:01]

Following domestication, dogs should be more tolerant and cooperative with conspecifics and humans compared to wolves. But looking at both in more naturalistic living conditions, however, speaks for more cooperative behavior of wolves. Researchers now show that the wild ancestors are excelling their domesticated relatives in teamwork. In an experimental approach dogs but not wolves failed to cooperatively pull the two ends of a rope to obtain a piece of food.

• **Keratin, proteins from 54-million-year-old sea turtle show survival trait evolution** [周二, 17 10月 21:18]

Researchers have retrieved original pigment, beta-keratin and muscle proteins from a 54-million-year-old sea turtle hatchling. The work adds to the growing body of evidence supporting persistence of original molecules over millions of years and also provides direct evidence that a pigment-based survival trait common to modern sea turtles evolved at least 54 million years ago.

• **Whales and dolphins have rich 'human-like' cultures and societies** [周二, 17 10月 00:22]

Whales and dolphins (cetaceans) live in tightly-knit social groups, have complex relationships, talk to each other and even have regional dialects -- much like human societies. A major new study has linked the

complexity of Cetacean culture and behavior to the size of their brains.

• [**Bite on this: Alligators caught eating sharks**](#) [周二, 17 10月 00:21]

Jaws, beware! Alligators may be coming for you. A new study documents American alligators on the Atlantic and Gulf coasts are eating small sharks and stingrays. This is the first scientific documentation of a widespread interaction between the two predators.

• [**Hubble observes source of gravitational waves for the first time**](#) [周二, 17 10月 00:21]

The NASA/ESA Hubble Space Telescope has observed for the first time the source of a gravitational wave, created by the merger of two neutron stars. This merger created a kilonova -- an object predicted by theory decades ago -- that ejects heavy elements such as gold and platinum into space. This event also provides the strongest evidence yet that short duration gamma-ray bursts are caused by mergers of neutron stars.

• [**Radio 'eyes' unlocking secrets of neutron-star collision**](#) [周一, 16 10月 22:28]

When a pair of superdense neutron stars collided and potentially formed a black hole in a galaxy 130 million light-years from Earth, they unleashed not only a train of gravitational waves but also an ongoing torrent of radio waves that are answering some of the biggest questions about the nature of such a cataclysmic event.

• [**Astronomers strike cosmic gold, confirm origin of precious metals in neutron star mergers**](#) [周一, 16 10月 22:28]

What many thought would be a long way off, the detection of gravitational waves from the merger of binary neutron stars, actually happened on Aug. 17. The observation of a blue and then red glow from the radioactive debris cloud left behind matched simulations of what the merger should look like, proving that such mergers are the source of most of the very heavy elements in the universe, including gold.

• [**Harvey runoff menaces Texas' coral reefs**](#) [周一, 16 10月 22:28]

The more than 13 trillion gallons of floodwater from Hurricane Harvey

have created a massive plume of freshwater in the Gulf of Mexico that is threatening the coral reefs of the Flower Garden Banks National Marine Sanctuary about 100 miles offshore of Galveston.

- [**First observations of merging neutron stars mark a new era in astronomy**](#) [周一, 16 10月 22:28]

After LIGO detected gravitational waves from the merger of two neutron stars, the race was on to detect a visible counterpart, because unlike the colliding black holes responsible for LIGO's four previous detections, this event was expected to produce an explosion of visible light. Researchers have now found the source of the gravitational waves, capturing the first images of the event with the Swope Telescope in Chile.

- [**Fanged kangaroo research could shed light on extinction**](#) [周一, 16 10月 21:27]

Fanged kangaroos -- an extinct family of small fanged Australian kangaroos -- might have survived at least five million years longer than previously thought. A new study has found the species might have competed for resources with ancestors of modern kangaroos.

- [**Melting ice makes the sea around Greenland less saline**](#) [周五, 13 10月 23:30]

For the first time, ocean data from Northeast Greenland reveals the long-term impact of the melting of the Greenland ice sheet. The observed increase in freshwater content will affect the conditions in all Greenland fjords and may ultimately affect the global ocean currents that keep Europe warm.

- [**Star Dust Helps Explain Mysterious Dimming Star**](#) [周五, 13 10月 21:19]

Astronomers are working to understand the mysterious dimming of Tabby's Star. The astronomers report that space dust orbiting the star -- not alien megastructures -- is the likely cause of the star's long-term dimming.

- [**New insight into the limits of possible life on Mars**](#) [周五, 13 10月 21:10]

Researchers investigating whether liquid water could exist on Mars have provided new insight into the limits of life on the red planet.

- [**Learning and staying in shape key to longer lifespan, study finds**](#) [周五, 13 10月 21:10]

People who are overweight cut their life expectancy by two months for every extra kilogram of weight they carry, research suggests. A major study has also found that education leads to a longer life, with almost a year added for each year spent studying beyond school.

- [**Is it gonna blow? Measuring volcanic emissions from space**](#) [周五, 13 10月 08:02]

Carbon dioxide measured by a NASA satellite pinpoints sources of the gas from human and volcanic activities, which may help monitor greenhouse gases responsible for climate change.

- [**Intense storms batter Saturn's largest moon, scientists report**](#) [周五, 13 10月 05:25]

Titan, the largest of Saturn's more than 60 moons, has surprisingly intense rainstorms, according to research by a team of UCLA planetary scientists and geologists. Although the storms are relatively rare -- they occur less than once per Titan year, which is 29 and a half Earth years -- they occur much more frequently than the scientists expected.

- [**Spotting the spin of the Majorana fermion under the microscope**](#) [周五, 13 10月 02:33]

Using a new twist on a technique for imaging atomic structures, researchers have detected a unique quantum property of the Majorana fermion, an elusive particle with the potential for use in quantum information systems.

- [**Newfoundland populated multiple times by distinct groups, DNA evidence shows**](#) [周五, 13 10月 02:33]

Researchers who've examined genetic evidence from mitochondrial DNA provide evidence that two groups of indigenous people in Canada, known as the Maritime Archaic and Beothuk, brought different matrilineal lineages to the island, adding further support to the notion that those groups had distinct population histories.

- [**Baby talk in any language: Shifting the timbre of our voices**](#) [周五, 13 10月 02:33]

When talking with their young infants, parents instinctively use 'baby talk,' a unique form of speech including exaggerated pitch contours and short, repetitive phrases. Now, researchers have found another unique feature of the way mothers talk to their babies: they shift the timbre of their voice in a rather specific way. The findings hold true regardless of a mother's native language.

- [**Genes responsible for diversity of human skin colors identified**](#) [周五, 13 10月 02:33]

A study of diverse African groups by geneticists has identified new genetic variants associated with skin pigmentation. The findings help explain the vast range of skin color on the African continent, shed light on human evolution and inform an understanding of the genetic risk factors for conditions such as skin cancer.

- [**Engineers develop a programmable 'camouflaging' material inspired by octopus skin**](#) [周五, 13 10月 02:33]

Engineers have invented stretchable surfaces with programmable 3-D texture morphing, a synthetic 'camouflaging skin' inspired by studying and modeling the real thing in octopus and cuttlefish.

- [**Paleogenomic analysis sheds light on Easter Island mysteries**](#) [周五, 13 10月 00:30]

New paleogenomic research appears to rule out the likelihood that inhabitants of Easter Island intermixed with South Americans prior to the arrival of Europeans on the island in 1722.

- [**Devourer of planets? Astronomers dub star**](#)

['Kronos'](#) [周五, 13 10月 00:28]

'Kronos' is enhanced in metals and other rock-forming elements but not in volatiles, prompting a team of researchers to conclude that it absorbed as much as 15 Earth masses worth of rocky planets. Its twin, 'Krios,' does not show this unusual pattern of enhancement.

• [Brain waves reflect different types of learning](#) [周五, 13 10月 00:28]

Researchers have, for the first time, identified neural signatures of explicit and implicit learning.

• [Geologic evidence is the forerunner of ominous prospects for a warming Earth](#) [周四, 12 10月 23:48]

While strong seasonal hurricanes have devastated many of the Caribbean and Bahamian islands this year, geologic studies on several of these islands illustrate that more extreme conditions existed in the past. A new analysis shows that the limestone islands of the Bahamas and Bermuda experienced climate changes that were even more extreme than historical events.

• [Scientists begin bold conservation effort to save the vaquita porpoise from extinction](#) [周四, 12 10月 22:37]

An international team of experts has gathered in San Felipe, Mexico at the request of the Mexican government (SEMARNAT) and has begun a bold, compassionate plan known as VaquitaCPR to save the endangered vaquita porpoise from extinction.

• [Pumas found to exhibit behaviors like social animals](#) [周四, 12 10月 22:36]

Pumas, long known as solitary carnivores, are more social than previously thought, according to a new study. The findings provide the first evidence of complex social strategies in any solitary carnivore -- and may have implications for multiple species, including other wild cats around the world.

• [Haumea, the most peculiar of Pluto companions, has a ring around it](#) [周四, 12 10月 21:33]

The trans-neptunian belt contains four dwarf planets, among which Haumea stands out for its extremely elongated shape and rapid rotation. A stellar occultation makes it possible to establish the main physical characteristics of this previously little known body -- among which most surprising was the presence of a ring.

• [**New threat to the ozone layer**](#) [周四, 12 10月 21:10]

'Ozone depletion is a well-known phenomenon and, thanks to the success of the Montreal Protocol, is widely perceived as a problem solved,' say some. But an international team of researchers, has now found an unexpected, growing danger to the ozone layer from substances not regulated by the treaty.

• [**Last common ancestor of humans and apes weighed about five kilograms**](#) [周四, 12 10月 21:09]

New research suggests that the last common ancestor of apes -- including great apes and humans -- was much smaller than previously thought, about the size of a gibbon. The findings, published today in the journal Nature Communications, are fundamental to understanding the evolution of the human family tree.

• [**Experimental Ebola vaccines elicit year-long immune response**](#) [周四, 12 10月 06:06]

Results from a large randomized, placebo-controlled clinical trial in Liberia show that two candidate Ebola vaccines pose no major safety concerns and can elicit immune responses by one month after initial vaccination that last for at least one year. The findings are based on a study of 1,500 adults that began during the West Africa Ebola outbreak.

• [**'Killer' toothaches likely cause misery for captive orca: Whales chew concrete and steel tank surfaces**](#) [周四, 12 10月 06:05]

An international research team has undertaken the first in-depth investigation of the teeth of captive orca (killer whales) and have found them a sorry state, which raises serious concerns for these majestic mammals' overall health and welfare.

- [**Engineers identify key to albatross' marathon flight**](#) [周四, 12 10月 06:02]

Engineers have developed a new model to simulate dynamic soaring, and have used it to identify the optimal flight pattern that an albatross should take in order to harvest the most wind and energy. They found that as an albatross banks or turns to dive down and soar up, it should do so in shallow arcs, keeping almost to a straight, forward trajectory.

- [**Giant exoplanet hunters: Look for debris disks**](#) [周四, 12 10月 01:52]

There's no map showing all the billions of exoplanets hiding in our galaxy -- they're so distant and faint compared to their stars, it's hard to find them. Now, astronomers hunting for new worlds have established a possible signpost for giant exoplanets.

- [**New type of stem cell line produced offers expanded potential for research and treatments**](#) [周四, 12 10月 01:17]

Researchers have created expanded potential stem cells (EPSCs) in mice, for the first time, that have a greater potential for development than current stem cell lines. These stem cells have the features of the very first cells in the developing embryo, and can develop into any type of cell.

- [**Bycatch responsible for decline of endangered New Zealand sea lion**](#) [周四, 12 10月 01:17]

Getting caught in fishing nets is a major cause of death for the increasingly endangered New Zealand sea lion, according to new research.

- [**'Ridiculously healthy' elderly have the same gut microbiome as healthy 30-year-olds**](#) [周四, 12 10月 00:37]

In one of the largest microbiota studies conducted in humans, researchers have shown a potential link between healthy aging and a healthy gut.

- [**Kune Kune piglets possess social learning skills**](#)

[and have an astonishingly good memory](#) [周四, 12 10月 00:03]

Pigs are socially competent and capable of learning. But the combination of these skills, learning by observing others, has been insufficiently studied so far. Exact copying and understanding of demonstrated actions -- highly developed learning abilities -- could not be proven. A new study with Kune Kune pigs, has now shown for the first time that pigs do learn from each other. The intelligent animals also possess remarkable long-term memory after internalizing a technique.

• [Scientists discover one of the most luminous 'new stars' ever](#) [周四, 12 10月 00:03]

Astronomers have discovered possibly the most luminous 'new star' ever -- a nova discovered in the direction of one of our closest neighboring galaxies: The Small Magellanic Cloud.

• [One of planet's largest volcanic eruptions](#) [周三, 11 10月 21:11]

Researchers have determined that the Pacific Northwest was home to one of the Earth's largest known volcanic eruptions, a millennia-long spewing of sulfuric gas that blocked out the sun and cooled the planet. Only two other eruptions -- the basalt floods of the Siberian Traps and the Deccan Traps -- were larger, and they led to two of the Earth's great extinctions.

• [Anticipated social media buzz can drive tourism](#) [周三, 11 10月 10:45]

How much positive feedback travelers think they'll get on social media can predict whether they intend to visit a tourism destination, a new study has found.

• [World will have more obese children and adolescents than underweight by 2022](#) [周三, 11 10月 10:44]

The number of obese children and adolescents (aged 5 to 19 years) worldwide has risen tenfold in the past four decades, according to a new study. If current trends continue, more children and adolescents will be obese than moderately or severely underweight by 2022.

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Health News

Top stories featured on ScienceDaily's Health & Medicine, Mind & Brain, and Living Well sections.

- [**High blood pressure linked to common heart valve disorder**](#) [周三, 18 10月 03:31]

For the first time, a strong link has been established between high blood pressure and the most common heart valve disorder in high-income countries.

- [**New examination of occupational licensing contradicts decades of research**](#) [周三, 18 10月 03:30]

From doctors to engineers to carpet layers to massage therapists, more than one in three Americans is required to hold a license to work in their occupation. Broad consensus among researchers holds that licensure creates wage premiums by establishing economic monopolies, but according to research, licensure does not limit competition nor does it increase wages.

- [**How we determine who's to blame**](#) [周三, 18 10月 00:44]

Using eye-tracking technology, cognitive scientists have obtained the first direct evidence that people use a process called counterfactual simulation to imagine how a situation could have played out differently to assign responsibility for an outcome.

- [**Flexible 'skin' can help robots, prosthetics perform everyday tasks by sensing shear force**](#) [周三, 18 10月 00:43]

Engineers have developed a flexible sensor 'skin' that can be stretched over any part of a robot's body or prosthetic to accurately convey information about shear forces and vibration, which are critical to tasks

ranging from cooking an egg to dismantling a bomb.

• [**Cancer: New compound targets energy generation, thereby killing metastatic cells**](#) [周三, 18 10月 00:43]

Researchers have identified an enzyme that supports the survival and dissemination of metastatic cells, and developed a synthetic compound that targets the enzyme and kills the metastatic cells in mice with cancer.

• [**Assessment shows metagenomics software has much room for improvement**](#) [周三, 18 10月 00:42]

A recent critical assessment of software tools represents a key step toward taming the 'Wild West' nature of the burgeoning field of metagenomics.

• [**What training exercise boosts brain power best? New research finds out**](#) [周二, 17 10月 23:43]

One of the two brain-training methods most scientists use in research is significantly better in improving memory and attention. It also results in more significant changes in brain activity.

• [**HIV infection, even with antiretroviral therapy, appears to damage a growing child's brain**](#) [周二, 17 10月 23:01]

One of the largest and best-documented trials of children receiving early antiretroviral therapy -- the CHER clinical trial in South Africa -- finds ongoing white matter damage in HIV-positive children at the age of 7 years. The study aims to contribute to a better understanding of brain development in HIV-infected and exposed children, as well as the impact of long-term antiretroviral treatment.

• [**On-and-off fasting helps fight obesity, study finds**](#) [周二, 17 10月 23:00]

Up to sixteen weeks of intermittent fasting without otherwise having to count calories helps fight obesity and other metabolic disorders. Such fasting already shows benefits after only six weeks, according to a new study.

- [**Need for speed makes genome editing efficient, if not better**](#) [周二, 17 10月 23:00]

Researchers have developed a computational model to quantify the mechanism by which CRISPR-Cas9 proteins find their genome-editing targets.

- [**New imaging approach maps whole-brain changes from Alzheimer's disease in mice**](#) [周二, 17 10月 23:00]

A new imaging system that offers a better way to monitor the brain changes indicative of Alzheimer's in mouse models of the disease could help speed new drug development.

- [**Youth football: How young athletes are exposed to high-magnitude head impacts**](#) [周二, 17 10月 21:19]

Researchers examined exposure to high-magnitude head impacts (accelerations greater than 40g) in young athletes, 9 to 12 years of age, during football games and practice drills to determine under what circumstances these impacts occur and how representative practice activities are of game activities with respect to the impacts. This type of information can help coaches and league officials make informed decisions in structuring both practices and games to reduce risks in these young athletes.

- [**Saving hearts after heart attacks: Overexpression of a gene enhances repair of dead muscle**](#) [周二, 17 10月 21:19]

Biomedical engineers report a significant advance in efforts to repair a damaged heart after a heart attack, using grafted heart-muscle cells to create a repair patch. The key was overexpressing a gene that activates the cell-cycle of the grafted muscle cells, so they grow and divide more than control grafted cells.

- [**Signaling pathway may be key to why autism is more common in boys**](#) [周二, 17 10月 21:19]

Researchers have discovered sex differences in a brain signaling pathway involved in reward learning and motivation that make male mice more vulnerable to an autism-causing genetic glitch.

- [**Timing of melanoma diagnosis, treatment critical to survival**](#) [周二, 17 10月 21:19]

A new study underscores the importance of early detection and treatment of melanoma, the deadliest form of skin cancer. The research indicates that the sooner patients were treated, the better their survival, particularly for stage I melanoma.

- [**Many pelvic tumors in women may have common origin: Fallopian tubes**](#) [周二, 17 10月 21:18]

Most, and possibly all, ovarian cancers start, not in ovaries, but instead in the fallopian tubes attached to them, report investigators.

- [**Nearly half of US medical care comes from emergency rooms**](#) [周二, 17 10月 21:18]

Nearly half of all US medical care is delivered by emergency departments, according to a new study. In recent years, the percentage of care delivered by emergency departments has grown. The paper highlights the major role played by emergency rooms in US health care.

- [**Attending a middle vs K-8 school matters for student outcomes**](#) [周二, 17 10月 07:05]

Students who attend a middle school compared to a K-8 school are likely to have a lower perception of their reading skills, finds a new study.

- [**During crisis, exposure to conflicting information and stress linked, studies find**](#) [周二, 17 10月 07:05]

Exposure to high rates of conflicting information during an emergency is linked to increased levels of stress, and those who rely on text messages or social media reports from unofficial sources are more frequently exposed to rumors and experience greater distress, according to research.

- [**Sales of sugar-sweetened drinks at restaurant chain fall by 11 percent after small levy**](#) [周二, 17 10月 07:04]

Introducing a small levy of 10 pence per drink to the price of sugar-sweetened beverages (SSBs) sold in Jamie's Italian restaurants across the UK is likely to have contributed to a significant decline in SSB sales, according to new research.

- [**No evidence that widely marketed technique to treat leaky bladder/prolapse works**](#) [周二, 17 10月 07:04]

There is no scientific evidence that a workout widely marketed to manage the symptoms of a leaky bladder and/or womb prolapse actually works, conclude experts.

- [**GP referral to Weight Watchers avoided type 2 diabetes in third of patients**](#) [周二, 17 10月 07:04]

More than a third of patients at risk of developing type 2 diabetes avoided developing the condition after they were referred by their family doctor (GP) to a diabetes prevention program delivered by the commercial weight management provider, Weight Watchers, finds research.

- [**Novel mechanism of resistance to anti-cancer drugs**](#) [周二, 17 10月 07:03]

Investigators have discovered a novel non-genetic cause of resistance to the targeted anti-cancer therapy cetuximab. Their findings suggest a strategy for overcoming this resistance.

- [**Biology of childhood brain tumor subtypes offers clues to precision treatments**](#) [周二, 17 10月 07:03]

Researchers investigating pediatric low-grade gliomas (PLGG), the most common type of brain tumor in children, have discovered key biological differences in how mutated genes combine with other genes to drive this childhood cancer. By shedding light on subtle distinctions in tumor biology, these findings offer clues to designing more effective anticancer treatments to precisely target tumors in individual patients.

- [**Skimping on sleep may contribute to gestational diabetes**](#) [周二, 17 10月 07:03]

A new study has found that lack of sleep among pregnant women may be a contributing factor to the development of gestational diabetes.

- [**Physically active white men at high risk for plaque buildup in arteries**](#) [周二, 17 10月 02:48]

White men who exercise at high levels are 86 percent more likely than people who exercise at low levels to experience a buildup of plaque in the heart arteries by middle age, a new study suggests.

- [**Tweeting rage: How immigration policies can polarize public discourse**](#) [周二, 17 10月 02:48]

A study of tweets in the months before and after the 2010 passage of Arizona's "show me your papers" law, findings showed that the average tweet about Mexican immigrants and Hispanics, in general, became more negative. Researchers said the social media data was useful in determining whether people had changed their attitudes about immigrants as a result of the law or whether they had begun behaving differently.

- [**Mechanism explains how seizures may lead to memory loss**](#) [周二, 17 10月 02:47]

A team of researchers reveals a mechanism that can explain how even relatively infrequent seizures can lead to long-lasting cognitive deficits in animal models.

- [**Stress might be just as unhealthy as junk food to digestive system**](#) [周二, 17 10月 02:24]

We all know that a poor diet is unhealthy, but a new study finds that stress may just as harmful to our bodies as a really bad diet.

- [**Women in science ask fewer questions than men, according to new research**](#) [周二, 17 10月 02:24]

Stereotypes suggest that women love to talk, with some studies even

finding that women say three times as much as men. But, new research shows there is an exception to this rule: professional STEM events, which could be indicative of the wider problem of gender inequality in the field.

- [**Brain training shows promise for patients with bipolar disorder**](#) [周二, 17 10月 01:27]

Computerized brain training can result in improved cognitive skills in individuals with bipolar disorder, researchers have discovered for the first time.

- [**A new target for marijuana**](#) [周二, 17 10月 01:27]

Cellular-level changes to a part of the brain's reward system induced by chronic exposure to the psychoactive component of marijuana may contribute to the drug's pleasurable and potentially addictive qualities, suggests a study in young mice.

- [**Break the attachment before selling your stuff**](#) [周二, 17 10月 01:26]

Ever tried to sell something you've owned for a while on Craigslist and found that no one is willing to pony up what you're asking? It's because you're asking too much.

- [**Family members play important role in managing chronic illness**](#) [周二, 17 10月 01:26]

Family members often play an important role in managing chronic illnesses, and a family approach may produce more effective, long-term benefits for the patient, according to a researcher.

- [**How many opioid painkillers do surgery patients need? New prescribing recommendations unveiled**](#) [周二, 17 10月 00:45]

Surgeons performing 11 common operations can turn to a free new prescribing tool based on data about how many opioid painkillers patients across Michigan actually took after their operations.

- [**Neutrons observe vitamin B6-dependent enzyme**](#)

[activity useful for drug development](#) [周二, 17 10月 00:44]

Scientists have performed neutron structural analysis of a vitamin B6-dependent protein, potentially opening avenues for new antibiotics and drugs to battle diseases such as drug-resistant tuberculosis, malaria and diabetes. Specifically, the team used neutron crystallography to study the location of hydrogen atoms in aspartate aminotransferase, or AAT, an enzyme vital to the metabolism of certain amino acids.

• [Bolstering fat cells offers potential new leukemia treatment](#) [周二, 17 10月 00:21]

Killing cancer cells indirectly by powering up fat cells in the bone marrow could help acute myeloid leukemia patients, says a new study. Researchers found that boosting adipocytes, or fat cells, located in the bone marrow suppressed cancerous leukemia cells but -- in a surprise to the research team -- also induced the regeneration of healthy blood cells.

• [Gestational diabetes and cardiovascular disease risk](#) [周二, 17 10月 00:21]

A history of gestational diabetes was associated with a modest higher long-term risk of cardiovascular disease in women in a new study, although the absolute rate of cardiovascular disease was low in the study's younger group of predominantly white women and adhering to a healthy lifestyle over time appeared to help mitigate the risk, according to a new article.

• [Learning during development is regulated by an unexpected brain region](#) [周二, 17 10月 00:21]

Half a century of research on how the brain learns to integrate visual inputs from the two eyes has provided important insights in critical period regulation, leading to the conclusion that it occurs within the cortex. Scientists have now made the surprising discovery that a brain region that passes on input from the eyes to the cortex also plays a crucial role in opening the critical period of binocular vision.

• [Marketing study examines what types of](#)

[searches click for car buyers](#) [周二, 17 10月 00:21]

A new study examines how consumers allocated their time when searching offline and on the internet as they shopped for a new automobile, and what the outcomes were for price satisfaction.

[How cells induce inflammation upon detection of cytoplasmic DNA](#) [周二, 17 10月 00:21]

A research team has elucidated the mechanism by which human cells induce inflammation upon detection of cytoplasmic DNA. Notably, the signal network involved differs from that used in the same context in mice.

[Report identifies factors associated with harassment, abuse in academic fieldwork](#) [周二, 17 10月 00:21]

College students considering careers in fields like archaeology or geology that require extensive work at remote field sites might want to find out how potential supervisors and advisers conduct themselves in the field. Do they establish clear ground rules for the behavior of everyone on the team? Are the rules consistently enforced? According to a new report, such factors likely influence whether students will witness or experience harassment while working far from home.

[Childhood poverty, poor support may drive up pregnant woman's biological age](#) [周二, 17 10月 00:21]

Pregnant women who had low socioeconomic status during childhood and who have poor family social support appear to prematurely age on a cellular level, potentially raising the risk for complications, a new study has found.

[Nidoviruses redundantly express genes and encode more proteins than previously believed, study finds](#) [周二, 17 10月 00:21]

Arteriviruses, a family of single-stranded RNA viruses that belongs to the order Nidovirales, produce more proteins and messenger RNAs than previously reported, a finding that provides important insights about a

virus that could potentially evolve to infect humans in the future, according to a new research study.

- [**Scientists identify biomarker for progression, drug response in brain cancer**](#) [周一, 16 10月 22:28]

Scientists have reported results from a glioblastoma study in which they validated a biomarker indicative of a patient's prognosis and likely response to specific therapies.

- [**Study reveals risk factors for substance use problems, as well as resilience**](#) [周一, 16 10月 22:28]

A new study explores factors increasing the risk for substance use problems among African-American/Black and Latino adults residing in a high-risk urban community, as well as patterns of resilience. It reveals that serious risk factors are highly prevalent and strongly associated with substance misuse; however, a substantial proportion could be characterized as resilient, and evidenced substance use problems at rates comparable to the general U.S. population.

- [**Scientists demonstrate path to linking the genome to healthy tissues, disease**](#) [周一, 16 10月 22:28]

A study has reached a major milestone in establishing a baseline understanding of gene expression across healthy human tissues, and linking genes to disease.

- [**Cocktail tests on toxic waste called for**](#) [周一, 16 10月 21:27]

Surprisingly low concentrations of toxic chemicals -- from fungicides to antidepressants -- can change the way some aquatic creatures swim and feed, according to new research. In addition, depending on the cocktail of toxins they can produce unexpected results.

- [**Blood pressure medication does not completely restore vascular function**](#) [周一, 16 10月 20:32]

Treatments for high blood pressure do not totally reverse its damaging effects on the vascular rhythms that help circulation of the blood say researchers.

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [**To keep Saturn's A ring contained, its moons stand united**](#) [周三, 18 10月 00:43]

For three decades, astronomers thought that only Saturn's moon Janus confined the planet's A ring -- the largest and farthest of the visible rings. But after poring over NASA's Cassini mission data, astronomers now conclude that the teamwork of seven moons keeps this ring corralled.

- [**Flexible 'skin' can help robots, prosthetics perform everyday tasks by sensing shear force**](#) [周三, 18 10月 00:43]

Engineers have developed a flexible sensor 'skin' that can be stretched over any part of a robot's body or prosthetic to accurately convey information about shear forces and vibration, which are critical to tasks ranging from cooking an egg to dismantling a bomb.

- [**Preservation for the \(digital\) ages**](#) [周三, 18 10月 00:43]

Researchers working with classicists and computer scientists have developed a method to preserve digital humanities databases. The preservation strategy allows scholars to re-launch a database application in a variety of environments -- from individual computers, to virtual machines, to future web servers -- without compromising its interactive features.

- [**Assessment shows metagenomics software has much room for improvement**](#) [周三, 18 10月 00:42]

A recent critical assessment of software tools represents a key step

toward taming the 'Wild West' nature of the burgeoning field of metagenomics.

- [**Study shows how water could have flowed on 'cold and icy' ancient Mars**](#) [周二, 17 10月 23:43]

Research by planetary scientists finds that periodic melting of ice sheets on a cold early Mars would have created enough water to carve the ancient valleys and lakebeds seen on the planet today.

- [**A new way to test body armor**](#) [周二, 17 10月 23:43]

In response to several high profile body armor failures, researchers have developed a new and extremely reliable way to test the ballistic fibers used in body armor.

- [**Loops of liquid metal can improve future fusion power plants, scientists say**](#) [周二, 17 10月 23:43]

Researchers have proposed an innovative design to improve the ability of future fusion power plants to generate safe, clean and abundant energy in a steady state, or constant, manner. The design uses loops of liquid lithium to clean and recycle the tritium, the radioactive hydrogen isotope that fuels fusion reactions, and to protect the divertor plates from intense exhaust heat from the tokamak that contains the reactions.

- [**A new way to harness wasted methane**](#) [周二, 17 10月 23:43]

Scientists have identified a process that could be used to harness methane that is now wasted by being burned off at wellheads.

- [**Scientists create most powerful micro-scale bio-solar cell yet**](#) [周二, 17 10月 23:01]

Researchers have created a micro-scale biological solar cell that generates a higher power density for longer than any existing cell of its kind.

- [**New techniques boost performance of non-volatile memory systems**](#) [周二, 17 10月 23:00]

Computer engineering researchers have developed new software and hardware designs that should limit programming errors and improve

system performance in devices that use non-volatile memory technologies.

- [**Need for speed makes genome editing efficient, if not better**](#) [周二, 17 10月 23:00]

Researchers have developed a computational model to quantify the mechanism by which CRISPR-Cas9 proteins find their genome-editing targets.

- [**New imaging approach maps whole-brain changes from Alzheimer's disease in mice**](#) [周二, 17 10月 23:00]

A new imaging system that offers a better way to monitor the brain changes indicative of Alzheimer's in mouse models of the disease could help speed new drug development.

- [**World first for reading digitally encoded synthetic molecules**](#) [周二, 17 10月 21:18]

For the first time ever, using mass spectrometry, researchers have successfully read several bytes of data recorded on a molecular scale using synthetic polymers. Their work sets a new benchmark for the amount of data -- stored as a sequence of molecular units (monomers) -- that may be read using this routine method. It also sets the stage for data storage on a scale 100 times smaller than that of current hard drives.

- [**Shaping animal, vegetable and mineral**](#) [周二, 17 10月 07:03]

A new technique to grow any target shape from any starting shape has now been developed by researchers, outlines a new report.

- [**Proteins and polymers: Spinning strands hint at folding dynamics**](#) [周二, 17 10月 07:03]

Scientists have created flexible strings of magnetized beads to model how natural and synthetic strands bend and fold in dynamic conditions. The work could enhance knowledge of how proteins and DNA fold in biological systems and how synthetic fibers interact in fluids.

- [**Portable 3-D scanner assesses patients with**](#)

[**elephantiasis**](#) [周二, 17 10月 07:03]

An estimated 120 million people worldwide are infected with lymphatic filariasis, a parasitic, mosquito-borne disease that can cause major swelling and deformity of the legs, a condition known as elephantiasis. Scientists have shown that a portable scanning device can measure limb enlargement and disfigurement faster and more easily in patients with elephantiasis. The research tool makes it easy to obtain accurate measurements and determine whether treatments to reduce swelling are effective.

• [**Tweeting rage: How immigration policies can polarize public discourse**](#) [周二, 17 10月 02:48]

A study of tweets in the months before and after the 2010 passage of Arizona's "show me your papers" law, findings showed that the average tweet about Mexican immigrants and Hispanics, in general, became more negative. Researchers said the social media data was useful in determining whether people had changed their attitudes about immigrants as a result of the law or whether they had begun behaving differently.

• [**Brain training shows promise for patients with bipolar disorder**](#) [周二, 17 10月 01:27]

Computerized brain training can result in improved cognitive skills in individuals with bipolar disorder, researchers have discovered for the first time.

• [**Catch a fleeting kilonova**](#) [周二, 17 10月 01:26]

Alerted by the first-ever gravitational waves caused by two neutron stars merging, astronomers detect the resulting optical flash.

• [**Toward efficient high-pressure desalination**](#) [周二, 17 10月 01:26]

One of the biggest operational challenges for desalination plants is the fouling of membranes by microbes. New research suggests a novel approach to reducing the rate of fouling, and thus improving desalination plant efficiency.

[**Chemical treatment improves quantum dot lasers**](#) [周二, 17 10月 01:26]

One of the secrets to making tiny laser devices such as ophthalmic surgery scalpels work even more efficiently is the use of tiny semiconductor particles, called quantum dots. In new research the ~nanometer-sized dots are being doctored, or 'doped,' with additional electrons, a treatment that nudges the dots ever closer to producing the desired laser light with less stimulation and energy loss.

[**Auto-fix tool gets more programmers to upgrade code, study finds**](#) [周二, 17 10月 00:21]

Failure to make necessary upgrades to software code can have dire consequences, such as the major data breach at Equifax. A recent study finds that auto-fix tools are effective ways to get programmers to make the relevant upgrades -- if programmers opt to use them.

[**Seeing the light of neutron star collisions**](#) [周二, 17 10月 00:21]

When two neutron stars collided on Aug. 17, a widespread search for electromagnetic radiation from the event led to observations of light from the afterglow of the explosion, finally connecting a gravitational-wave-producing event with conventional astronomy using light, according to an international team of astronomers.

[**Marketing study examines what types of searches click for car buyers**](#) [周二, 17 10月 00:21]

A new study examines how consumers allocated their time when searching offline and on the internet as they shopped for a new automobile, and what the outcomes were for price satisfaction.

[**Nanoantenna arrays power a new generation of fluorescence-based sensors**](#) [周二, 17 10月 00:21]

Researchers have designed and tested a series of plasmonic nanoantenna arrays that could lead to the development of a new generation of ultrasensitive and low-cost fluorescence sensors that could be used to monitor water quality.

- [**Hubble observes source of gravitational waves for the first time**](#) [周二, 17 10月 00:21]

The NASA/ESA Hubble Space Telescope has observed for the first time the source of a gravitational wave, created by the merger of two neutron stars. This merger created a kilonova -- an object predicted by theory decades ago -- that ejects heavy elements such as gold and platinum into space. This event also provides the strongest evidence yet that short duration gamma-ray bursts are caused by mergers of neutron stars.

- [**Gravitational waves plus new clues from space reveal new way to make a black hole**](#) [周一, 16 10月 22:28]

For the first time, scientists have detected both gravitational waves and light shooting toward our planet from the birthplace of a new black hole created by the merger of two neutron stars. The discovery marks the beginning of a new era of

- [**Gamma-ray burst detection just what researchers exclusively predicted**](#) [周一, 16 10月 22:28]

More than a month before a game-changing detection of a short gamma-ray burst, scientists predicted such a discovery would occur.

- [**Radio 'eyes' unlocking secrets of neutron-star collision**](#) [周一, 16 10月 22:28]

When a pair of superdense neutron stars collided and potentially formed a black hole in a galaxy 130 million light-years from Earth, they unleashed not only a train of gravitational waves but also an ongoing torrent of radio waves that are answering some of the biggest questions about the nature of such a cataclysmic event.

- [**Astronomers strike cosmic gold, confirm origin of precious metals in neutron star mergers**](#) [周一, 16 10月 22:28]

What many thought would be a long way off, the detection of gravitational waves from the merger of binary neutron stars, actually happened on Aug. 17. The observation of a blue and then red glow from the radioactive debris cloud left behind matched simulations of what the

merger should look like, proving that such mergers are the source of most of the very heavy elements in the universe, including gold.

- [**Major advance in nanopore detection of peptides and proteins**](#) [周一, 16 10月 22:28]

Nanopore technology, which is used to sequence DNA, is cheap, hand-held and works in the jungle and in space. The use of this technology to identify peptides or proteins is now a step closer. Scientists have used a patented nanopore to identify the fingerprints of proteins and peptides, and it can even detect polypeptides differing by one amino acid.

- [**First observations of merging neutron stars mark a new era in astronomy**](#) [周一, 16 10月 22:28]

After LIGO detected gravitational waves from the merger of two neutron stars, the race was on to detect a visible counterpart, because unlike the colliding black holes responsible for LIGO's four previous detections, this event was expected to produce an explosion of visible light. Researchers have now found the source of the gravitational waves, capturing the first images of the event with the Swope Telescope in Chile.

- [**Quantum simulator: First functioning component**](#) [周一, 16 10月 21:24]

Hurricanes, traffic jams, demographic development – to predict the effect of such events, computer simulations are required. Many processes in nature, however, are so complicated that conventional computers fail. Quantum simulators may solve this problem. One of the basic phenomena in nature is the interaction between light and matter in photosynthesis. Physicists have now made a big step towards quantum mechanics understanding of plant metabolism.

- [**How scientists used NASA data to predict the corona of the Aug. 21 Total Solar Eclipse**](#) [周六, 14 10月 23:17]

When the total solar eclipse swept across the United States on Aug. 21, 2017, NASA satellites captured a diverse set of images from space. But

days before the eclipse, some NASA satellites also enabled scientists to predict what the corona -- the Sun's outer atmosphere -- would look like during the eclipse, from the ground. In addition to offering a case study to test our predictive abilities, the predictions also enabled some eclipse scientists to choose their study targets in advance.

- [**Solar research: NASA sounding rocket instrument spots signatures of long-sought small solar flares**](#) [周六, 14 10月 02:03]

Like most solar sounding rockets, the second flight of the FOXSI instrument -- short for Focusing Optics X-ray Solar Imager -- lasted 15 minutes, with just six minutes of data collection. But in that short time, the cutting-edge instrument found the best evidence to date of a phenomenon scientists have been seeking for years: signatures of tiny solar flares that could help explain the mysterious extreme heating of the Sun's outer atmosphere.

- [**Astronomers find potential solution into how planets form**](#) [周六, 14 10月 00:32]

The quest to discover how planets found in the far reaches of the universe are born has taken a new, crucial twist.

- [**Spin current detection in quantum materials unlocks potential for alternative electronics**](#) [周六, 14 10月 00:31]

A new method that precisely measures the mysterious behavior and magnetic properties of electrons flowing across the surface of quantum materials could open a path to next-generation electronics. A team of scientists has developed an innovative microscopy technique to detect the spin of electrons in topological insulators, a new kind of quantum material that could be used in applications such as spintronics and quantum computing.

- [**Solar research: On the generation of solar spicules and Alfvénic waves**](#) [周六, 14 10月 00:31]

Combining computer observations and simulations, a new model shows

that the presence of neutrals in the gas facilitates the magnetic fields to penetrate through the surface of the Sun producing the spicules.

• [**First atomic structure from cryo-EM facility**](#) [周五, 13 10月 22:33]

Researchers have outlined a 3-D atomic structure of the ion channel found in mammals that is implicated in a rare, inherited neurodegenerative disease in humans.

• [**Space radiation won't stop NASA's human exploration**](#) [周五, 13 10月 21:52]

While it's true that space radiation is one of the biggest challenges for a human journey to Mars, it's also true that NASA is developing technologies and countermeasures to ensure a safe and successful journey to the red planet.

• [**Purple power: Synthetic 'purple membranes' transform sunlight to hydrogen fuel**](#) [周五, 13 10月 21:19]

A new way has been found to produce solar fuels by developing “synthetic purple membranes.” These membranes involve an assembly of lipid nanodiscs, man-made proteins, and semiconducting nanoparticles that, when taken together, can transform sunlight into hydrogen fuel.

• [**Star Dust Helps Explain Mysterious Dimming Star**](#) [周五, 13 10月 21:19]

Astronomers are working to understand the mysterious dimming of Tabby's Star. The astronomers report that space dust orbiting the star -- not alien megastructures -- is the likely cause of the star's long-term dimming.

• [**Wildlife in the ditches need a detox cure**](#) [周五, 13 10月 21:17]

When it's raining on the roads, slops of road dust and contaminants drain into the road trenches. What does it do to wildlife living by the road?

• [**DISTRO: Researchers create digital objects from incomplete 3D data**](#) [周五, 13 10月 21:17]

Depth sensors, such as those of the Microsoft Kinect, are very powerful, but unfortunately they do not work equally well on all materials, which leads to noisy data or even missing measurements.

- [Cold molecules on collision course](#) [周五, 13 10月 21:15]

Using a new cooling technique scientists succeed at observing collisions in a dense beam of cold and slow dipolar molecules.

- [New insight into the limits of possible life on Mars](#) [周五, 13 10月 21:10]

Researchers investigating whether liquid water could exist on Mars have provided new insight into the limits of life on the red planet.

- [Single photon reveals quantum entanglement of 16 million atoms](#) [周五, 13 10月 21:10]

Quantum theory predicts that a vast number of atoms can be entangled and intertwined by a very strong quantum relationship even in a macroscopic structure. Until now, experimental evidence has been mostly lacking, despite recent advances have shown the entanglement of 2,900 atoms. Scientists recently reengineered their data processing, demonstrating that 16 million atoms were entangled in a one-centimeter crystal.

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [**Amazonian hunters deplete wildlife but don't empty forests**](#) [周三, 18 10月 03:31]

Conservationists can be 'cautiously optimistic' about the prospect of sustainable subsistence hunting by Amazonian communities, according to new research. The research team spent over a year working with 60 Amazonian communities and hiked for miles through trackless forests to deploy nearly 400 motion-activated camera traps -- in a bid to understand which species are depleted by hunting and where.

- [**Study reshapes understanding of climate change's impact on early societies**](#) [周三, 18 10月 00:43]

A new study linking paleoclimatology -- the reconstruction of past global climates -- with historical analysis shows a link between environmental stress and its impact on the economy, political stability, and war-fighting capacity of ancient Egypt.

- [**Assessment shows metagenomics software has much room for improvement**](#) [周三, 18 10月 00:42]

A recent critical assessment of software tools represents a key step toward taming the 'Wild West' nature of the burgeoning field of metagenomics.

- [**Scientists determine source of world's largest mud eruption**](#) [周二, 17 10月 23:43]

More than 11 years after the Lusi mud volcano first erupted on the Indonesian island of Java, researchers may have figured out why the

mudflows haven't stopped: deep underground, Lusi is connected to a nearby volcanic system.

- [**Study shows how water could have flowed on 'cold and icy' ancient Mars**](#) [周二, 17 10月 23:43]

Research by planetary scientists finds that periodic melting of ice sheets on a cold early Mars would have created enough water to carve the ancient valleys and lakebeds seen on the planet today.

- [**Tropical beetles face extinction threat**](#) [周二, 17 10月 23:43]

Climate change is putting many tropical high altitude beetles at risk of extinction, warn an international team of scientists.

- [**A new way to harness wasted methane**](#) [周二, 17 10月 23:43]

Scientists have identified a process that could be used to harness methane that is now wasted by being burned off at wellheads.

- [**Scientists create most powerful micro-scale bio-solar cell yet**](#) [周二, 17 10月 23:01]

Researchers have created a micro-scale biological solar cell that generates a higher power density for longer than any existing cell of its kind.

- [**Domestication has not made dogs cooperate more with each other compared to wolves**](#) [周二, 17 10月 23:01]

Following domestication, dogs should be more tolerant and cooperative with conspecifics and humans compared to wolves. But looking at both in more naturalistic living conditions, however, speaks for more cooperative behavior of wolves. Researchers now show that the wild ancestors are excelling their domesticated relatives in teamwork. In an experimental approach dogs but not wolves failed to cooperatively pull the two ends of a rope to obtain a piece of food.

- [**Electroplating: The birth of a single nucleus caught in camera**](#) [周二, 17 10月 23:00]

Electroplating, or electrodeposition, is one of the most important

processes in chemistry, in which a metal cation in solution can be reduced to its elemental form by applying an electrical potential to an electrode.

- [**Need for speed makes genome editing efficient, if not better**](#) [周二, 17 10月 23:00]

Researchers have developed a computational model to quantify the mechanism by which CRISPR-Cas9 proteins find their genome-editing targets.

- [**'Hiding in plain sight:' Discovery raises questions over scale of overlooked biodiversity**](#) [周二, 17 10月 21:19]

Scientists have used cutting edge DNA technology to demonstrate that one of Europe's top freshwater predators is actually two species rather than one.

- [**Keratin, proteins from 54-million-year-old sea turtle show survival trait evolution**](#) [周二, 17 10月 21:18]

Researchers have retrieved original pigment, beta-keratin and muscle proteins from a 54-million-year-old sea turtle hatchling. The work adds to the growing body of evidence supporting persistence of original molecules over millions of years and also provides direct evidence that a pigment-based survival trait common to modern sea turtles evolved at least 54 million years ago.

- [**Germ-free hatching eggs: An alternative to formaldehyde application**](#) [周二, 17 10月 07:05]

Hatching eggs in large-scale hatcheries are currently treated with formaldehyde to eliminate germs. Researchers have now developed a natural alternative.

- [**Oysters offer hot spot for reducing nutrient pollution**](#) [周二, 17 10月 07:03]

Marine scientists have quantified potentially denitrifying bacteria in the oyster gut and shell, with important implications for efforts to reduce nutrient levels in coastal waters through oyster restoration.

- [**Invasive ladybird species threatens other ladybirds in England**](#) [周二, 17 10月 07:03]

The harlequin ladybird was widely introduced across continental Europe to limit the population of pest insects.

- [**Clues to the Innate Drug Resistance of a Cocoa-Fermenting Pathogen**](#) [周二, 17 10月 02:48]

At first glance, the yeast *Candida krusei* seems as innocuous as microbes come: it's used for fermenting cocoa beans and gives chocolate its pleasant aroma. But it's increasingly being found as a pathogen in immunocompromised patients — and *C. krusei* infections aren't always easy to cure.

- [**Stress might be just as unhealthy as junk food to digestive system**](#) [周二, 17 10月 02:24]

We all know that a poor diet is unhealthy, but a new study finds that stress may just as harmful to our bodies as a really bad diet.

- [**A new target for marijuana**](#) [周二, 17 10月 01:27]

Cellular-level changes to a part of the brain's reward system induced by chronic exposure to the psychoactive component of marijuana may contribute to the drug's pleasurable and potentially addictive qualities, suggests a study in young mice.

- [**Toward efficient high-pressure desalination**](#) [周二, 17 10月 01:26]

One of the biggest operational challenges for desalination plants is the fouling of membranes by microbes. New research suggests a novel approach to reducing the rate of fouling, and thus improving desalination plant efficiency.

- [**Whales and dolphins have rich 'human-like' cultures and societies**](#) [周二, 17 10月 00:22]

Whales and dolphins (cetaceans) live in tightly-knit social groups, have complex relationships, talk to each other and even have regional dialects -- much like human societies. A major new study has linked the

complexity of Cetacean culture and behavior to the size of their brains.

• [**Bite on this: Alligators caught eating sharks**](#) [周二, 17 10月 00:21]

Jaws, beware! Alligators may be coming for you. A new study documents American alligators on the Atlantic and Gulf coasts are eating small sharks and stingrays. This is the first scientific documentation of a widespread interaction between the two predators.

• [**How cells induce inflammation upon detection of cytoplasmic DNA**](#) [周二, 17 10月 00:21]

A research team has elucidated the mechanism by which human cells induce inflammation upon detection of cytoplasmic DNA. Notably, the signal network involved differs from that used in the same context in mice.

• [**When lemons give you life: Herpetofauna adaptation to citrus orchards in Belize**](#) [周一, 16 10月 22:28]

Reptile and amphibian communities exhibit a promising level of resilience to agricultural lands. In a new study, herpetologists compared forested areas to manicured citrus orchards and reclaimed orchard forests in Belize. Further intriguing discoveries were made when the Category 1 Hurricane Earl hit the study site.

• [**Harvey runoff menaces Texas' coral reefs**](#) [周一, 16 10月 22:28]

The more than 13 trillion gallons of floodwater from Hurricane Harvey have created a massive plume of freshwater in the Gulf of Mexico that is threatening the coral reefs of the Flower Garden Banks National Marine Sanctuary about 100 miles offshore of Galveston.

• [**Fanged kangaroo research could shed light on extinction**](#) [周一, 16 10月 21:27]

Fanged kangaroos -- an extinct family of small fanged Australian kangaroos -- might have survived at least five million years longer than previously thought. A new study has found the species might have competed for resources with ancestors of modern kangaroos.

- [**Cocktail tests on toxic waste called for**](#) [周一, 16 10月 21:27]

Surprisingly low concentrations of toxic chemicals -- from fungicides to antidepressants -- can change the way some aquatic creatures swim and feed, according to new research. In addition, depending on the cocktail of toxins they can produce unexpected results.

- [**Quantum simulator: First functioning component**](#) [周一, 16 10月 21:24]

Hurricanes, traffic jams, demographic development – to predict the effect of such events, computer simulations are required. Many processes in nature, however, are so complicated that conventional computers fail. Quantum simulators may solve this problem. One of the basic phenomena in nature is the interaction between light and matter in photosynthesis. Physicists have now made a big step towards quantum mechanics understanding of plant metabolism.

- [**Germ-free hatching eggs: An alternative to formaldehyde application**](#) [周一, 16 10月 20:31]

Hatching eggs in large-scale hatcheries are currently treated with formaldehyde to eliminate germs. Researchers have now developed a natural alternative.

- [**How to save giant tropical fruit bats: Work with local hunters who use bat teeth as money**](#) [周一, 16 10月 20:19]

Flying foxes -- giant fruit bats that look like winged German shepherd puppies -- are in trouble. But scientists suggest a new way to help protect the bats on the Solomon Islands: working with local hunters who use the bats' teeth as currency. The traditional practice, it turns out, is a positive thing for bat conservation.

- [**New antibiotic resistance genes found**](#) [周一, 16 10月 20:19]

Researchers have found several previously unknown genes that make bacteria resistant to last-resort antibiotics. The genes were found by searching large volumes of bacterial DNA.

- [**Giant sea bass worth more alive as undersea**](#)

[wonders than as commercial catch](#) [周六, 14 10月 23:16]

An investigation of the different economic values of giant sea bass finds they are worth more alive as undersea wonders than as commercial catch.

• [Gutters teem with inconspicuous life](#) [周六, 14 10月 01:22]

Scientists have shown that Parisian street gutters are oases of microscopic life, home to microalgae, fungi, sponges, and mollusks. Grouped into communities, these microorganisms may help clean rainwater and urban waste by decomposing solid debris and pollutants. A deeper understanding of the role and composition of these communities could help elucidate the services rendered by gutter ecosystems. The researchers' findings are the first to reveal the unsuspected biodiversity of microscopic life i...

• [Worms reveal secrets of aging](#) [周六, 14 10月 00:51]

Investigators have identified a new molecular pathway that controls lifespan and healthspan in worms and mammals. Researchers have shown that worms with excess levels of certain proteins lived longer and healthier than normal worms. In addition, mice with excess levels of these proteins demonstrated a delay in blood vessel dysfunction associated with aging. The study has major implications for our understanding of aging and age-associated disorders.

• [Atrazine alters the sex ratio in Blanchard's cricket frogs](#) [周六, 14 10月 00:32]

A study found that Blanchard's cricket frogs are highly sensitive to atrazine. When exposed, there were up to 55 percent fewer males than females compared with the control group, indicating that atrazine can affect the sex ratio. However, cricket frog populations do persist in areas with widespread atrazine application, despite reports of range contractions for enigmatic reasons.

• [Melting ice makes the sea around Greenland less saline](#) [周五, 13 10月 23:30]

For the first time, ocean data from Northeast Greenland reveals the long-

term impact of the melting of the Greenland ice sheet. The observed increase in freshwater content will affect the conditions in all Greenland fjords and may ultimately affect the global ocean currents that keep Europe warm.

• [**Usutu virus is back: Not only in blackbirds but also in humans**](#) [周五, 13 10月 22:33]

Usutu virus, a flavivirus of African origin, was first detected in Austria in 2001, when it caused a severe bird die-off, mainly of blackbirds. The virus was active in the eastern part of Austria until 2005, killing many blackbirds, but also other songbirds. During 10 subsequent years no Usutu virus associated bird mortality was observed in Austria -- contrary to neighboring Hungary. Last year Usutu virus was identified again in two blackbirds -- and in 2017 already in sixteen songbirds. In anothe...

• [**Cell biology: Proteins may prevent dysfunction, disease by relaxing, study shows**](#) [周五, 13 10月 21:19]

A team of researchers used simulations and X-rays to conclude that disordered proteins remain unfolded and expanded as they float loose in the cytoplasm of a cell. The answer affects how we envision the movement of a protein through its life--essential for understanding how proteins fold, what goes wrong during disorders and disease and how to model their behavior.

• [**Contests for female attention turns males into better performers in fruit flies**](#) [周五, 13 10月 21:17]

Giving females an opportunity to choose the male they mate with leads to the evolution of better performing males, according to new research into the behavior of fruit flies.

• [**Wildlife in the ditches need a detox cure**](#) [周五, 13 10月 21:17]

When it's raining on the roads, slops of road dust and contaminants drain into the road trenches. What does it do to wildlife living by the road?

• [**Does size matter? Bigger cod fish contain more mercury**](#) [周五, 13 10月 21:17]

The levels of mercury in the Oslofjord cod has increased over the last 30 years, despite reduced emissions of this toxic element. In the same period, the average size of sampled cod has increased. Are the elevated levels of mercury simply a result of larger cod?

- [**Baltic clams, worms release as much greenhouse gas as 20,000 dairy cows**](#) [周五, 13 10月 21:10]

Ocean clams and worms are releasing a significant amount of potentially harmful greenhouse gas into the atmosphere, scientists have shown.

- [**'Magic mushrooms' may 'reset' the brains of depressed patients, study suggests**](#) [周五, 13 10月 21:10]

Patients taking psilocybin to treat depression show reduced symptoms weeks after treatment following a 'reset' of their brain activity.

- [**Scientists uncover a centuries-old case of mistaken identity in the Chesapeake Bay**](#) [周五, 13 10月 21:10]

Scientists recently discovered that some jellyfish in the Bay are quite different from their ocean cousins. This led scientists to declare them as two different species.

- [**How E. coli bacteria adapt under stress**](#) [周五, 13 10月 21:10]

Researchers have developed a genome-scale model that can accurately predict how E. coli bacteria respond to temperature changes and genetic mutations. The work sheds light on how cells adapt under environmental stress and has applications in precision medicine, where adaptive cell modeling could provide patient-specific treatments for bacterial infections.

- [**Mantis shrimp-inspired camera enables glimpse into hidden world**](#) [周五, 13 10月 08:02]

By mimicking the eye of the mantis shrimp, researchers have developed an ultra-sensitive camera capable of sensing both color and polarization. The bioinspired imager can potentially improve early cancer detection and help provide a new understanding of underwater phenomena, the researchers said. See a video of describing the study on YouTube.

• [**Is it gonna blow? Measuring volcanic emissions from space**](#) [周五, 13 10月 08:02]

Carbon dioxide measured by a NASA satellite pinpoints sources of the gas from human and volcanic activities, which may help monitor greenhouse gases responsible for climate change.

• [**Understanding rare Earth emulsions**](#) [周五, 13 10月 08:02]

Through a series of theoretical simulations, researchers discovered that surface polarization in mixed media increases attraction among elements.

• [**Combination of El Niño and 2016 Ecuador earthquake likely worsened Zika outbreak**](#) [周五, 13 10月 08:02]

A Zika virus outbreak in coastal Ecuador in 2016 was likely worsened by a strong El Niño and a magnitude 7.8 earthquake that struck the region in April, according to a new study.

• [**New headway in desalination technology**](#) [周五, 13 10月 04:40]

Engineers have taken a step forward in developing a saltwater desalination process that is potentially cheaper than reverse osmosis and borrows from battery technology. In their study, the researchers are focusing on new materials that could make desalination of brackish waters economically desirable and energy efficient.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [**Amazonian hunters deplete wildlife but don't empty forests**](#) [周三, 18 10月 03:31]

Conservationists can be 'cautiously optimistic' about the prospect of sustainable subsistence hunting by Amazonian communities, according to new research. The research team spent over a year working with 60 Amazonian communities and hiked for miles through trackless forests to deploy nearly 400 motion-activated camera traps -- in a bid to understand which species are depleted by hunting and where.

- [**New examination of occupational licensing contradicts decades of research**](#) [周三, 18 10月 03:30]

From doctors to engineers to carpet layers to massage therapists, more than one in three Americans is required to hold a license to work in their occupation. Broad consensus among researchers holds that licensure creates wage premiums by establishing economic monopolies, but according to research, licensure does not limit competition nor does it increase wages.

- [**A new way to test body armor**](#) [周二, 17 10月 23:43]

In response to several high profile body armor failures, researchers have developed a new and extremely reliable way to test the ballistic fibers used in body armor.

- [**Nearly half of US medical care comes from emergency rooms**](#) [周二, 17 10月 21:18]

Nearly half of all US medical care is delivered by emergency departments, according to a new study. In recent years, the percentage of

care delivered by emergency departments has grown. The paper highlights the major role played by emergency rooms in US health care.

- [**Attending a middle vs K-8 school matters for student outcomes**](#) [周二, 17 10月 07:05]

Students who attend a middle school compared to a K-8 school are likely to have a lower perception of their reading skills, finds a new study.

- [**During crisis, exposure to conflicting information and stress linked, studies find**](#) [周二, 17 10月 07:05]

Exposure to high rates of conflicting information during an emergency is linked to increased levels of stress, and those who rely on text messages or social media reports from unofficial sources are more frequently exposed to rumors and experience greater distress, according to research.

- [**Tweeting rage: How immigration policies can polarize public discourse**](#) [周二, 17 10月 02:48]

A study of tweets in the months before and after the 2010 passage of Arizona's "show me your papers" law, findings showed that the average tweet about Mexican immigrants and Hispanics, in general, became more negative. Researchers said the social media data was useful in determining whether people had changed their attitudes about immigrants as a result of the law or whether they had begun behaving differently.

- [**Women in science ask fewer questions than men, according to new research**](#) [周二, 17 10月 02:24]

Stereotypes suggest that women love to talk, with some studies even finding that women say three times as much as men. But, new research shows there is an exception to this rule: professional STEM events, which could be indicative of the wider problem of gender inequality in the field.

- [**Break the attachment before selling your stuff**](#) [周二, 17 10月 01:26]

Ever tried to sell something you've owned for a while on Craigslist and found that no one is willing to pony up what you're asking? It's because you're asking too much.

- [**Marketing study examines what types of searches click for car buyers**](#) [周二, 17 10月 00:21]

A new study examines how consumers allocated their time when searching offline and on the internet as they shopped for a new automobile, and what the outcomes were for price satisfaction.

- [**Report identifies factors associated with harassment, abuse in academic fieldwork**](#) [周二, 17 10月 00:21]

College students considering careers in fields like archaeology or geology that require extensive work at remote field sites might want to find out how potential supervisors and advisers conduct themselves in the field. Do they establish clear ground rules for the behavior of everyone on the team? Are the rules consistently enforced? According to a new report, such factors likely influence whether students will witness or experience harassment while working far from home.

- [**Is rushing your child to the ER the right response?**](#) [周一, 16 10月 20:19]

If a child gets a small burn, starts choking or swallows medication, parents may struggle to decide whether to provide first aid at home or rush them to the hospital, suggests a new national poll.

- [**Making healthier decisions, step by step**](#) [周五, 13 10月 21:52]

For 10 days, scientists posted signs at the bottom of a set of airport stairs and escalators encouraging them to take the stairs. They found when the signs were present, people were about twice as likely to use the stairs.

- [**Wildlife in the ditches need a detox cure**](#) [周五, 13 10月 21:17]

When it's raining on the roads, slops of road dust and contaminants drain into the road trenches. What does it do to wildlife living by the road?

- [**Tweets can help predict the outcome of soccer**](#)

[matches](#) [周五, 13 10月 08:02]

Twitter activity can help predict the result of soccer matches when combined with betting market prices, new study shows. The tone of Twitter posts can predict when a team is more likely to win and soccer bets are mispriced, the study found.

• [Fighting racism: Teaching kids to identify individual black people can reduce racial bias](#) [周五, 13 10月 04:39]

Many times, those who hold racially biased views of other people see them as all the same. Instead of thinking of them as specific individuals, they lump them into a group -- seeing them as 'those people.' Now an international team of researchers suggests one way to reduce racial bias in kids is by teaching them to identify individual faces of those of other races.

• [Warming seas could lead to 70 percent increase in hurricane-related financial loss](#) [周五, 13 10月 03:18]

Hurricane-related financial loss could increase more than 70 percent by 2100 if oceans warm at the worst-case-scenario rate predicted by the Intergovernmental Panel on Climate Change, according to a new study. The study used a combination of hurricane modeling and information in FEMA's HAZUS database to reach its conclusions.

• [Using Facebook data as a real-time census](#) [周五, 13 10月 00:30]

A new study is believed to be the first to demonstrate how present-day migration statistics can be obtained by compiling the same data that advertisers use to target their audience on Facebook, and by combining that source with information from the Census Bureau.

• [Climate change may accelerate infectious disease outbreaks, say researchers](#) [周五, 13 10月 00:28]

Aside from inflicting devastating natural disasters on often vulnerable communities, climate change can also spur outbreaks of infectious diseases like Zika , malaria and dengue fever, according to a new study.

• [Scientists begin bold conservation effort to save](#)

[the vaquita porpoise from extinction](#) [周四, 12 10月 22:37]

An international team of experts has gathered in San Felipe, Mexico at the request of the Mexican government (SEMARNAT) and has begun a bold, compassionate plan known as VaquitaCPR to save the endangered vaquita porpoise from extinction.

• **[New threat to the ozone layer](#)** [周四, 12 10月 21:10]

'Ozone depletion is a well-known phenomenon and, thanks to the success of the Montreal Protocol, is widely perceived as a problem solved,' say some. But an international team of researchers, has now found an unexpected, growing danger to the ozone layer from substances not regulated by the treaty.

• **[Reducing racial bias in children](#)** [周四, 12 10月 21:10]

An international team of researchers suggests that one way to reduce implicit racial bias in young children is by teaching them to distinguish among faces of a different race and identify them as individuals.

• **[Electric cars can become more eco-friendly through life cycle assessment](#)** [周四, 12 10月 21:09]

It is time to stop discussing whether electric cars are good or bad. Instead industry, authorities and policy-makers need to work together to make them as eco-friendly as possible. One researcher now provides concrete advice and tools showing how life cycle assessment can assist in the development of electric cars.

• **[Lost in translation: When humor kills the message](#)** [周四, 12 10月 21:09]

Getting a laugh may not help get the road safety message across, with a new study showing humorous driver sleepiness advertisements via social media and other means can get lost in translation.

• **[Autism prevalence and socioeconomic status: What's the connection?](#)** [周四, 12 10月 06:05]

Children living in neighborhoods where incomes are low and fewer adults have bachelor's degrees are less likely to be diagnosed with

autism spectrum disorder compared to kids from more affluent neighborhoods.

- [**'Killer' toothaches likely cause misery for captive orca: Whales chew concrete and steel tank surfaces**](#) [周四, 12 10月 06:05]

An international research team has undertaken the first in-depth investigation of the teeth of captive orca (killer whales) and have found them a sorry state, which raises serious concerns for these majestic mammals' overall health and welfare.

- [**New conservation method empowers indigenous peoples**](#) [周四, 12 10月 03:14]

Environmental social scientists worked with indigenous people in the rural Peruvian Amazon and determined that local people meet their basic needs through diverse subsistence activities, such as hunting, fishing, and farming, and over centuries they have developed sophisticated natural resource management systems that protect the robust rainforest ecosystem. Through the study, the scientists hope to overturn traditional notions about development and industrialization.

- [**Risk of tsunamis in Mediterranean Sea has been overstated, say experts**](#) [周四, 12 10月 02:48]

A review of geological evidence for tsunamis during the past 4500 years in the Mediterranean Sea has revealed that as many as 90 per cent of these inundation events may have been misinterpreted by scientists and were due to storm activity instead.

- [**Beyond EPA's Clean Power decision: Climate action window could close as early as 2023**](#) [周四, 12 10月 00:38]

As the Trump administration repeals the US Clean Power Plan, a new study underscores the urgency of reducing greenhouse gas emissions -- from both environmental and economic perspectives.

- [**Study shows untapped creativity in workforce**](#) [周四, 12 10月 00:04]

With the U.S. economy less reliant on manufacturing, creativity and innovation are of increasing value. Arts graduates, and others who have developed and honed their creative skills, can be critical assets.

- [**Experts express concerns over infant mental health assessment**](#) [周四, 12 10月 00:03]

Forty world experts on child development and mental health have released a joint statement calling for caution when applying an influential classification for assessing infant mental health and potential cases of abuse.

- [**Criminal offenders with genetic mental disorders judged more negatively**](#) [周四, 12 10月 00:03]

Popular literature and crime dramas imply that defense attorneys who portray their clients as victims may have better outcomes. The belief is that jurors assign less blame to defendants they feel have been wronged. New research has shown that offenders with genetic mental disorders that predispose them to criminal behavior are judged more negatively than mentally disordered offenders whose criminal behavior may have been caused by environmental factors.

- [**Drivers are less cautious at railway crossings**](#) [周三, 11 10月 22:07]

Drivers aren't as cautious approaching a railway level crossing compared to a road intersection despite the greater risk of fatality if a collision occurs, a new study has found.

- [**World's 'better' countries have higher rates of cancer**](#) [周三, 11 10月 22:07]

The world's 'better' countries, with greater access to healthcare, experience much higher rates of cancer incidence than the world's 'worse off' countries, according to new research.

- [**What is a safe following distance?**](#) [周三, 11 10月 22:07]

Confusion over what is a 'safe following distance' has road safety researchers calling for a standardized definition to prevent tailgating.

- [**Average wages for all workers, men and women,**](#)

have increased as a result of women joining the workforce

[周三, 11 10月 21:17]

Economists are continually examining the effect of the economy on women, but this male-dominated field seems to be failing to ask what impact women in turn have on the economy? Researchers have examined how women's participation in the workforce has affected economic growth and productivity in cities across the US. They estimate that every 10% increase in female labor force participation rates increases average real wage growth in cities by approximately 5%.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- [Flexible 'skin' can help robots, prosthetics perform everyday tasks by sensing shear force](#) [周三, 18 10月 00:43]

Engineers have developed a flexible sensor 'skin' that can be stretched over any part of a robot's body or prosthetic to accurately convey information about shear forces and vibration, which are critical to tasks ranging from cooking an egg to dismantling a bomb.

- [Bite on this: Alligators caught eating sharks](#) [周二, 17 10月 00:21]

Jaws, beware! Alligators may be coming for you. A new study documents American alligators on the Atlantic and Gulf coasts are eating small sharks and stingrays. This is the first scientific documentation of a widespread interaction between the two predators.

- [Fanged kangaroo research could shed light on extinction](#) [周一, 16 10月 21:27]

Fanged kangaroos -- an extinct family of small fanged Australian kangaroos -- might have survived at least five million years longer than previously thought. A new study has found the species might have competed for resources with ancestors of modern kangaroos.

- [Gutters teem with inconspicuous life](#) [周六, 14 10月 01:22]

Scientists have shown that Parisian street gutters are oases of microscopic life, home to microalgae, fungi, sponges, and mollusks. Grouped into communities, these microorganisms may help clean rainwater and urban waste by decomposing solid debris and pollutants. A deeper understanding of the role and composition of these

communities could help elucidate the services rendered by gutter ecosystems. The researchers' findings are the first to reveal the unsuspected biodiversity of microscopic life i...

- [**New insight into the limits of possible life on Mars**](#) [周五, 13 10月 21:10]

Researchers investigating whether liquid water could exist on Mars have provided new insight into the limits of life on the red planet.

- [**In a first for wearable optics, researchers develop stretchy fiber to capture body motion**](#) [周五, 13 10月 02:33]

New research offers the first demonstration of optical fibers sturdy enough to sense a wide range of human motion.

- [**Engineers develop a programmable 'camouflaging' material inspired by octopus skin**](#) [周五, 13 10月 02:33]

Engineers have invented stretchable surfaces with programmable 3-D texture morphing, a synthetic 'camouflaging skin' inspired by studying and modeling the real thing in octopus and cuttlefish.

- [**Paleogenomic analysis sheds light on Easter Island mysteries**](#) [周五, 13 10月 00:30]

New paleogenomic research appears to rule out the likelihood that inhabitants of Easter Island intermixed with South Americans prior to the arrival of Europeans on the island in 1722.

- [**Devourer of planets? Astronomers dub star 'Kronos'**](#) [周五, 13 10月 00:28]

'Kronos' is enhanced in metals and other rock-forming elements but not in volatiles, prompting a team of researchers to conclude that it absorbed as much as 15 Earth masses worth of rocky planets. Its twin, 'Krios,' does not show this unusual pattern of enhancement.

- [**Dangerous trend: The placenta is not suitable as a 'superfood'**](#) [周四, 12 10月 21:13]

More and more women want to take their own placenta with them after childbirth in order to eat it for "health reasons". This phenomenon is growing, especially in the USA, but also in Europe, although physicians are increasingly expressing concerns about it.

- [**Scorpions target their venom**](#) [周四, 12 10月 21:10]

In the first study of its kind, scientists have shown scorpions can fine-tune their venom to suit different predators and prey.

- [**Last common ancestor of humans and apes weighed about five kilograms**](#) [周四, 12 10月 21:09]

New research suggests that the last common ancestor of apes -- including great apes and humans -- was much smaller than previously thought, about the size of a gibbon. The findings, published today in the journal Nature Communications, are fundamental to understanding the evolution of the human family tree.

- [**Chemists use modified DNA nucleotides to create new materials**](#) [周四, 12 10月 06:01]

Chemists have demonstrate that they can repurpose DNA to create new substances with possible medical applications.

- [**'Obscure' stalked filter feeder lived in Utah some 500 million years ago**](#) [周四, 12 10月 00:04]

The only fossilized specimen of a species previously unknown to science -- an 'obscure' stalked filter feeder -- has just been detailed for the first time.

- [**Our brain omits grammatical elements when it has limited resources**](#) [周四, 12 10月 00:03]

A study of the use of pronouns by French speakers with agrammatic aphasia shows that grammatical pronouns are significantly more impaired in speech than lexical ones. The findings support a new theory of grammar which suggests that grammatical elements contain secondary information that speakers with limited cognitive resources can omit from their speech and still make sense.

• [**Kune Kune piglets possess social learning skills and have an astonishingly good memory**](#) [周四, 12 10月 00:03]

Pigs are socially competent and capable of learning. But the combination of these skills, learning by observing others, has been insufficiently studied so far. Exact copying and understanding of demonstrated actions -- highly developed learning abilities -- could not be proven. A new study with Kune Kune pigs, has now shown for the first time that pigs do learn from each other. The intelligent animals also possess remarkable long-term memory after internalizing a technique.

• [**The making of medieval bling**](#) [周四, 12 10月 00:03]

Gold has long been valued for its luxurious glitter and hue, and threads of the gleaming metal have graced clothing and tapestries for centuries. Determining how artisans accomplished these adornments in the distant past can help scientists restore, preserve and date artifacts, but solutions to these puzzles have been elusive. Now scientists have revealed that medieval artisans used a gilding technology that has endured for centuries.

• [**Some plants grow bigger -- and 'meaner' -- when clipped, study finds**](#) [周四, 12 10月 00:03]

Some plants behave like the mythical monster Hydra: Cut off their heads and they grow back, bigger and better than before. A new study finds that these 'overcompensators,' as they are called, also augment their defensive chemistry -- think plant venom -- when they are clipped. The discovery could lead to the development of new methods for boosting plant growth while reducing the need for insecticides, the researchers said.

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ScienceDaily

周三, 25 10月 2017

ScienceDaily

[周三, 25 10月 2017]

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- [**Earliest known marine navigation tool revealed with scanning technology**](#) [周三, 25 10月 02:39]

Details of the earliest known marine navigation tool, discovered in a shipwreck, have been revealed thanks to state-of-the-art scanning technology.

- [**Genetics may put a person at risk of high triglycerides, but adopting a healthy diet can help**](#) [周三, 25 10月 02:17]

Triglycerides, a type of fat in the blood, are important for good health. But having high triglycerides might increase a person's risk of heart disease, and may be a sign of metabolic syndrome.

- [**A quarter of problematic pot users have anxiety disorders, many since childhood**](#) [周三, 25 10月 02:17]

About a quarter of adults whose marijuana use is problematic in early adulthood have anxiety disorders in childhood and late adolescence, according to new data.

- [**Taste, not appearance, drives corals to eat plastics**](#) [周三, 25 10月 02:17]

Scientists have long known that marine animals mistakenly eat plastic

debris because tiny bits of floating plastic look like prey. But a new study of plastic ingestion by corals suggests there may be an additional reason for the potentially harmful behavior: The plastic simply tastes good. Chemical additives in the plastic may be acting as a feeding stimulant.

- [**Supercomputers help scientists improve seismic forecasts for California**](#) [周三, 25 10月 01:37]

Researchers have used the Stampede1 and 2 supercomputers to complete one of the world's largest earthquake simulation models: The Uniform California Earthquake Rupture Forecast (UCERF3). The simulations showed that in the week following a magnitude 7.0 earthquake, the likelihood of another magnitude 7.0 quake in California would be up to 300 times greater than the week before.

- [**Study investigates effects of domestic violence on workplaces, by asking perpetrators**](#) [周三, 25 10月 01:37]

A new study takes an unconventional approach to understanding the significant effects of domestic violence in the workplace. By seeking the views of the perpetrators of violence, the study found that domestic violence perpetration, like victimization, has costs to the workplace in terms of worker safety and productivity and that most employers lack adequate resources to help perpetrators deal with the issue.

- [**Electronic entropy enhances water splitting**](#) [周三, 25 10月 01:37]

An electron transitioning from state to state increases cerium's entropy, making it ideal for hydrogen production, researchers have found.

- [**Single-cell diagnostics for breast cancer**](#) [周三, 25 10月 01:06]

Women diagnosed with breast cancer may benefit from having the molecular subtype of different cells within their tumors identified, argue researchers. While breast cancer is often treated as a whole, they discuss the growing consensus that cancer cells within a tumor can have multiple origins and respond variably to treatment. The authors advocate for more accurate diagnostic tests to capture molecular irregularities between tumor cells.

- ['Wing prints' may identify individual bats as effectively as fingerprints identify people](#) [周三, 25 10月 01:06]

For decades, bats have defied scientists' best ideas for keeping track of individuals, a critical element in wildlife research. Biologists have now discovered a means of identifying individual bats that may be as universal, distinctive, permanent and collectable as fingerprints: bats' wings.

- [No magic wand required: Scientists propose way to turn any cell into any other cell type](#) [周三, 25 10月 01:06]

In fairy tales, all it takes to transform a frog into a prince or a mouse into a horse is the wave of a magic wand. But in the real world, transforming one living thing into another isn't so easy. A new paper grounded in both math and biology lays out a way to do it with individual cells. If it works, it could have applications from regenerating diseased or lost tissue to fighting cancer.

- [How Neanderthals influenced human genetics at the crossroads of Asia and Europe](#) [周三, 25 10月 01:06]

A new study explores the genetic legacy of ancient trysts between Neanderthals and the ancestors of modern humans, with a focus on Western Asia, the region where the first relations may have occurred.

- [There is no safe amount of alcohol during pregnancy, new study shows](#) [周三, 25 10月 01:06]

Any amount of alcohol exposure during pregnancy can cause extreme lasting effects on a child, according to new research.

- [The problem with being pretty](#) [周三, 25 10月 01:06]

While good-looking people are generally believed to receive more favorable treatment in the hiring process, when it comes to applying for less desirable jobs, such as those with low pay or uninteresting work, attractiveness may be a liability, according to research.

- [Spots on supergiant star drive spirals in stellar](#)

[wind](#) [周二, 24 10月 23:56]

Astronomers have recently discovered that spots on the surface of a supergiant star are driving huge spiral structures in its stellar wind.

• [Arsenic can cause cancer decades after exposure ends](#) [周二, 24 10月 23:56]

Arsenic in drinking water may have one of the longest dormancy periods of any carcinogen. By tracking the mortality rates of people exposed to arsenic-contaminated drinking water in a region in Chile, the researchers provide evidence of increases in lung, bladder, and kidney cancer even 40 years after high arsenic exposures ended.

• [Mysterious DNA modification seen in stress response](#) [周二, 24 10月 23:56]

Emory geneticists have been studying methylation of the DNA letter A (adenine). It appears more in the mouse brain under conditions of stress, and may have a role in neuropsychiatric disorders.

• [Pollutant emitted by forest fire causes DNA damage and lung cell death](#) [周二, 24 10月 23:56]

Scientists performed tests with particles from forest and crop fires in the Amazon. Not only did they induce inflammation, oxidative stress and genetic damage in human lung cells, but they also drove one-third of the cultured cells to death.

• [Daydreaming is good: It means you're smart](#) [周二, 24 10月 23:28]

A new study suggests that daydreaming during meetings isn't necessarily a bad thing. It might be a sign that you're really smart and creative. People with efficient brains may have too much brain capacity to stop their minds from wandering.

• [Genetic causes of children's food allergies](#) [周二, 24 10月 23:07]

What role do genes play in egg, milk, and nut allergies? Scientists have found five genetic risk loci that point to the importance of skin and mucous membrane barriers and the immune system in the development of food allergies.

- [**Comparison of outcomes for robotic-assisted vs. laparoscopic surgical procedures**](#) [周二, 24 10月 23:07]

Two studies compare certain outcomes of robotic-assisted vs. laparoscopic surgery for kidney removal or rectal cancer.

- [**Ice sheets may melt rapidly in response to distant volcanoes**](#) [周二, 24 10月 23:06]

Volcanic eruptions have been known to cool the global climate, but they can also exacerbate the melting of ice sheets, according to a new paper.

- [**Jumping nanoparticles**](#) [周二, 24 10月 23:06]

Transitions occurring in nanoscale systems, such as a chemical reaction or the folding of a protein, are strongly affected by friction and thermal noise. Almost 80 years ago, the Dutch physicist Hendrik Kramers predicted that such transitions occur most frequently at intermediate friction, an effect known as Kramers turnover. Now, a team of scientists have measured this effect for a laser-trapped particle, directly confirming Kramers' prediction in an experiment for the first time.

- [**How to predict high school dropouts**](#) [周二, 24 10月 22:57]

Teenagers who do not access healthcare when needed are at greater risk of dropping out of high school. Dropouts are more likely to have combinations of the following traits: low conscientiousness, neuroticism and introversion. The study examined data from the US National Longitudinal Study of Adolescents to Adult Health, a nationally representative sample of 90,000 students in grades 7 to 12 at 132 schools.

- [**Brain region that motivates behavior change discovered**](#) [周二, 24 10月 22:56]

Ever been stuck in a rut? Researchers found that stimulating a region of the brain called the posterior cingulate cortex can lead to changes in routine behavior. Neurons there ramp up their firing rates, then peak just before a pattern shifts. Knowing this could help businesses better understand how to spur employee innovation, exploration and creativity.

• [**Diabetes: New insulin sensitizers discovered**](#) [周二, 24 10月 22:56]

Researchers may have found a way to treat insulin resistance, a precursor to type 2 diabetes, while avoiding side effects such as weight gain.

• [**Using sound waves for biomedical breakthroughs**](#) [周二, 24 10月 22:49]

Sound waves could be the future of biomedical research, diagnosing and treatment, according to a chemistry professor. A data analyst is using an acoustic device to separate extracellular vesicles to get a deeper look at their properties.

• [**Microplastics in the Baltic have not risen for 30 years**](#) [周二, 24 10月 22:48]

The concentration of microplastics in water and fish from the Baltic Sea has been constant for the past 30 years, despite a substantial increase in plastic production during the same period, report investigators.

• [**Smart Ring: Mobile on-body devices can be precisely and discreetly controlled using a tiny sensor**](#) [周二, 24 10月 22:48]

Mobile end-user devices, such as the new version of the “Apple Watch”, have a drawback: their small screen size makes them difficult to use. Computer scientists have now developed an alternative, which they call “DeformWear”. A tiny switch, no larger than the head of a pin, is built into a ring for example, and worn on the body. It can be moved in all directions, pressed, pinched, and pushed toward the right, left, up, and down.

• [**Adhesives and composite materials made from Swiss tree bark**](#) [周二, 24 10月 22:36]

Studies show that tannins extracted from native tree bark can be used to produce adhesives and composite materials. An additional area of application might be 3D printing.

• [**Disaster makes people with depression less healthy**](#) [周二, 24 10月 22:33]

People who exhibit even a few depressive symptoms before a major life stressor, such as a disaster, may experience an increase in inflammation -- a major risk factor for heart disease and other negative health conditions -- after the event.

• [**New approach to studying concussion urged**](#) [周二, 24 10月 22:33]

Understanding the puzzling and complex nature of concussion and how to treat it will take a whole new way of approaching the problem, according to new research. The researchers advocate the use of systems science -- a discipline that analyzes complex problems as whole systems and integrates research findings from different disciplines.

• [**Many planned roads in the tropics shouldn't be built**](#) [周二, 24 10月 22:33]

We are living in the most dramatic era of road expansion in human history, but many planned roads should not be built, concludes a major study.

• [**Value of acknowledging adolescents' perspectives**](#) [周二, 24 10月 22:33]

Across very different cultures -- Ghana and the United States -- when parents acknowledge the perspectives of their adolescent children and encourage them to express themselves, the youths have a stronger sense of self-worth, intrinsic motivation, and engagement, and also have less depression. Yet having the latitude to make decisions appears to function differently in the two cultures, with positive outcomes for youths in the United States but not in Ghana.

• [**Starting at age 6, children spontaneously practice skills to prepare for the future**](#) [周二, 24 10月 22:33]

Deliberate practice is essential for improving a wide range of skills important for everyday life, from tying shoelaces to reading and writing. Yet despite its importance for developing basic skills, academic success,

and expertise, we know little about the development of deliberate practice. A new study from Australia found that children spontaneously practice skills to prepare for the future starting at the age of 6.

- [**Self-esteem mapped in the human brain**](#) [周二, 24 10月 22:33]

A team of researchers has devised a mathematical equation that can explain how our self-esteem is shaped by what other people think of us.

- [**Sacrificing one life to save others: Psychopaths' force for 'greater good'**](#) [周二, 24 10月 22:33]

New research shows that people would sacrifice one person to save a larger group of people -- and in addition, the force with which they carry out these actions could be predicted by psychopathic traits.

- [**First drug to prevent the onset of chemotherapy-induced neuropathy tested**](#) [周二, 24 10月 22:33]

Peripheral neuropathy is a very common side-effect of chemotherapy and may eventually lead to early discontinuation of treatment. New research has led to the identification and successful testing of a new molecule capable of preventing this neurological complication. This molecule could potentially become the first existing treatment to prevent this frequent adverse effect and improve the quality of life of cancer patients.

- [**New self-regulating nanoparticles could treat cancer**](#) [周二, 24 10月 22:33]

Scientists have developed 'intelligent' nanoparticles which heat up to a temperature high enough to kill cancerous cells -- but which then self-regulate and lose heat before they get hot enough to harm healthy tissue.

- [**What we call postdoctoral researchers matters, scientists say**](#) [周二, 24 10月 22:33]

Eight scientists and science policy experts make the case for standardizing how postdoctoral researchers are categorized by human resources offices and provide a framework that institutions can follow.

- [**Noninvasive brain imaging shows readiness of**](#)

[trainees to perform operations](#) [周二, 24 10月 22:33]

While simulation platforms have been used to train surgeons before they enter an actual operating room (OR), few studies have evaluated how well trainees transfer those skills from the simulator to the OR. Now, a study that used noninvasive brain imaging to evaluate brain activity has found that simulator-trained medical students successfully transferred those skills to operating on cadavers and were faster than peers who had no simulator training.

• [New research highlights worldwide risk of HIV, Hepatitis C epidemics](#) [周二, 24 10月 22:33]

Two reviews studied the global prevalence of injecting drug use and of interventions to prevent the spread of blood borne viruses among people who inject drugs.

• [A definitive method to detect wildfire tainted wine grapes](#) [周二, 24 10月 22:33]

Wine producers and grape growers have a new, powerful tool at their disposal to help manage the impact of grapes exposed to smoke from forest fires. Researchers have devised a new analytical test to precisely and accurately measure the amount of volatile phenols-compounds absorbed by grapes when exposed to smoke that can impact wine flavor -- that are present in the fruit prior to wine production.

• [Saguaro and other towering cacti have a scrambled history](#) [周二, 24 10月 22:31]

Biologists continue to debate the genealogy of the cactus family, even differing by a factor of 10 about how many different genera there are. A study based on new genome sequences of four columnar cacti, including saguaro and cardon, illustrates why this is. Because of the long lives of these columnar cacti, ancient genes drop out at random and give the impression of parallel evolution in those species that retain the genes.

• [Antibiotics from a 'molecular pencil sharpener'](#) [周二, 24 10月 22:31]

Scientists have discovered a 'molecular pencil sharpener' that chews

away its outer coating to release a powerful antibiotic. Their discovery opens the door to finding new antibacterial agents and drugs to fight toxins.

- [**A quantum spin liquid**](#) [周二, 24 10月 22:31]

Researchers report creating a metal oxide with a honeycomb lattice that scientists have sought to advance quantum computing research.

- [**Single nanoparticle mapping paves the way for better nanotechnology**](#) [周二, 24 10月 22:31]

Researchers have developed a method that makes it possible to map the individual responses of nanoparticles in different situations and contexts. The results pave the way for better nanomaterials and safer nanotechnology.

- [**'Gentle' dying -- or suicide?**](#) [周二, 24 10月 22:30]

When terminally ill patients wish to hasten death by fasting, should physicians assist them to do so? An ethicist argues that voluntary stopping of eating and drinking is often equivalent to assisted suicide, and that the practice should be regulated.

- [**High-speed locomotion neurons found in the brainstem**](#) [周二, 24 10月 22:30]

A clearly defined subpopulation of neurons in the brainstem is essential to execute locomotion at high speeds. Interestingly, these high-speed neurons are intermingled with others that can elicit immediate stopping.

- [**New combination therapy of registered drugs shortens anti-Wolbachia therapy**](#) [周二, 24 10月 22:30]

Researchers have found a way of significantly reducing the treatment required for lymphatic filariasis and onchocerciasis from several weeks to seven days. By targeting Wolbachia, a bacterial symbiont that the filarial parasites need to live, the team has discovered a drug synergy that enables effective treatment over a shorter time.

- [**Underwater sound waves help scientists locate ocean impacts**](#) [周二, 24 10月 22:30]

A new method to locate the precise time and location that objects fall into our oceans has now been developed.

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Earliest known marine navigation tool revealed with scanning technology -- ScienceDaily

Details of the earliest known marine navigation tool, discovered in a shipwreck, have been revealed thanks to state-of-the-art scanning technology at WMG, University of Warwick.

Professor Mark Williams from WMG was tasked with scanning the artefact -- an astrolabe from the late fifteenth century, used by mariners to measure the altitude of the sun during voyages -- which was excavated in 2014 by Blue Water Recovery.

When the team found the object, no markings were visible -- they believed it was an astrolabe, but they could not see any navigational markings on it.

They then approached Professor Williams, who conducts pioneering scanning analyses in his laboratory at WMG, to reveal the artefact's invisible details.

The scans showed etches around the edge of the object, each separated by five degrees -- proving that it is an astrolabe.

These markings would have allowed mariners to measure the height of the sun above the horizon at noon to determine their location so they could find their way on the high seas.

The technology was able to accurately scan the item to within 0.1mm and reproduce a high-resolution 3D model.

Professor Mark Williams commented:

"It was fantastic to apply our 3D scanning technology to such an exciting project and help with the identification of such a rare and fascinating item.

"Usually we are working on engineering-related challenges, so to be able to take our expertise and transfer that to something totally different and so historically significant was a really interesting opportunity."

The astrolabe is a bronze disc, which measures 17.5cm in diameter, and is engraved with the Portuguese coat

of arms and the personal emblem of Don Manuel I, the King of Portugal from 1495-1521.

It is believed to date from between 1495 and 1500, and was recovered from the wreck of a Portuguese explorer ship which sank during a storm in the Indian Ocean in 1503.

The boat was called the Esmeralda and was part of a fleet led by Portuguese explorer Vasco da Gama, the first person to sail directly from Europe to India.

David Mearns, from Blue Water Recovery, who led the excavation, commented:

"It's a great privilege to find something so rare, something so historically important, something that will be studied by the archaeological community and fills in a gap.

"It was like nothing else we had seen [...] it adds to the history, and hopefully astrolabes from this period can be found."

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Genetics may put a person at risk of high triglycerides, but adopting a healthy diet can help -- ScienceDaily

Triglycerides, a type of fat in the blood, are important for good health. But having high triglycerides might increase a person's risk of heart disease, and may be a sign of metabolic syndrome -- a combination of high blood pressure, high blood sugar, and too much fat accumulation at the waist. People with metabolic syndrome have increased risk for heart disease, diabetes, and stroke.

A new study from nutrition researchers at the University of Illinois shows that some individuals with variations of a "gene of interest" may be at an even higher risk of developing high triglycerides. Specifically, researchers looked at genetics and risk in a group of young Mexican adults.

Despite genetic predisposition, the study shows that maintaining a healthy body weight or changing diet can help reverse the risk.

Katie Robinson, a former doctoral student in the U of I Division of Nutritional Sciences and fellow of the I-TOPP program, explains that the study, published in the *Journal of Nutrigenetics and Nutrigenomics*, is a collaboration between the University of Illinois and the Autonomous University of San Luis Potosi in Mexico (UASLP), also known as UP AMIGOS.

"Obesity is a growing problem in the U.S. and Mexico. In the U.S., obesity affects over a third of our population. We're concerned because obesity is associated with other diseases such as diabetes, heart disease, and high triglycerides," Robinson explains. Compared to Caucasian groups, Hispanics in the U.S. have higher rates of type 2 diabetes and other obesity-related diseases. Of all Hispanic subgroups, those of Mexican heritage have one of the highest risks for obesity and associated diseases."

The UP AMIGOS project addresses genetic and environmental factors associated with obesity and related conditions among younger adults in Mexico. "A lot of existing data are from Caucasian cohorts, which means we needed to replicate and better understand those findings in groups with different ethnicities. That's the main goal of the UP AMIGOS project.

"It was a great opportunity that we were able to look at this rich data set from young Mexican adults because we know that this population has a greater likelihood of developing not only obesity but also high triglycerides and diabetes," Robinson adds.

For the current study, Robinson was interested in a protein made in the liver called fetuin-A (FetA). "It's an interesting marker connecting inflammation with obesity and its associated diseases," she says. "FetA is a protein that is released from adipose tissue and also the liver. We know FetA is integral to insulin sensitivity, and that's where most of the research has been done to look at its function.

"We also know that FetA is elevated in obesity and diabetes. Therefore, we were interested in looking at the genetic implication. If there are alterations or single nucleotide polymorphisms within the gene that codes for FetA, does that change somebody's risk for obesity or the associated diseases?"

To answer that, the researchers looked at bloodwork from 641 Mexican young adults to analyze biomarkers and genotypes. They also checked body mass index (BMI), took measurements of fasting glucose levels,

and had the participants report on their dietary habits.

From the genotyping, they were specifically looking for occurrences of two mutations of the gene, AHSB, a gene that influences the protein FetA. They were interested in the association of those gene mutations with dietary intake, weight, and also biological markers of health.

The AHSB polymorphisms were found to be associated with triglycerides. Robinson explains the most important finding is that one of these polymorphisms, or mutations, was associated with higher circulating triglycerides, but that correlation was very dependent on BMI and dietary intake -- the relationship was exaggerated in individuals who were overweight.

"So with an elevated BMI, we saw greater disorder within those carrying the risk genotype. But if these individuals who had the high-risk AHSB genotype had a lower BMI, their triglycerides were lower. It suggests that even if you carry the high-risk genotype, you don't have a greater risk of high triglycerides if you can maintain a normal BMI or a lower BMI, which I think is a positive finding when we look at genetics."

Robinson says diet also played a role in higher triglycerides. "Higher carbohydrate intake -- specifically sugar or sucrose intake -- was associated with elevated triglycerides. This association was mainly in one genotype group. The thought was perhaps these individuals are more sensitive to certain diets than the other genotype groups."

Regardless of genotype, elevated BMI was associated with higher triglycerides. Due to the relationship between FetA and diabetes, the researchers also wanted to see if there was an association with AHSB mutations and glucose, but surprisingly, they didn't find any.

While the study looked at relatively healthy young adults in a Mexican population, results were different than what has been observed in previous research from Caucasian groups. Robinson explains that they might have seen different results if they had looked at older Mexican adults with poorer health.

Some good news from the study's findings is that maintaining a healthy body weight often can overcome the effects of genes related to metabolic disease and type 2 diabetes.

"We know that genes aren't everything," Robinson says. "There are a lot of things we can do, behaviorally, to change our individual risk. It's a silver lining in our research. We can't modify our genetics, but we can modify our epigenomes and some behaviors. You can still have positive health outcomes."

The results are also important for the future of developing personalized nutrition as interventions for disease, Robinson says.

"In practical terms, it would be ideal to start by understanding someone's basic biology, which may influence how they're metabolizing and utilizing the nutrients they are eating. It would be great to bring people in, find out where their biology is at, and then tailor a diet for them, but we need a lot more research before we get to that point."

Margarita Teran-Garcia, assistant professor in the Division of Nutritional Sciences and the Department of Human Development and Family Studies at U of I adds, "In order to advance the full potential of precision medical and nutritional sciences, there is a need to invest and create new sustained resources -- financial and technological -- to build the evidence

base needed to guide clinical practice and strategic planning in public health."

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A quarter of problematic pot users have anxiety disorders, many since childhood: Regional data also suggest some teens who abuse pot outgrow habit in adulthood -- ScienceDaily

About a quarter of adults whose marijuana use is problematic in early adulthood have anxiety disorders in childhood and late adolescence, according to new data from Duke Health researchers.

The findings, publishing this week in the November issue of the *Journal of the American Academy of Child and Adolescent Psychiatry*, also shed light on an estimated 4 percent of adults who endured childhood maltreatment and peer bullying without resorting to chronic marijuana abuse, only to develop problems with the drug between the ages of 26 and 30.

"Given that more states may be moving towards legalization of cannabis for medicinal and recreational purposes, this study raises attention about what we anticipate will be the fastest growing demographic of

users -- adults," said lead author Sherika Hill, Ph.D., an adjunct faculty associate at the Duke University School of Medicine. "A lot of current interventions and policies in the U.S. are aimed at early adolescent users. We have to start thinking about how we are going to address problematic use that may arise in a growing population of older users."

The findings are based on data from 1,229 participants in the Great Smoky Mountains Study, a long-term study of residents in 11 counties near the Appalachian Mountains in western North Carolina, where Hispanics and Latinos are underrepresented and Native Americans are overrepresented compared to the rest of the U.S.

A cohort of children in the study were enrolled as young as age 9 and have now reached their 30s. From 1993 to 2015, researchers tracked data in numerous areas of interest, including mental health, education, work attainment, and use of drugs and alcohol.

The researchers defined problematic cannabis or marijuana use as daily consumption or a habit that meets diagnostic guidelines for addiction. They tracked participants' patterns of use from the college years

(ages 19-21) into adulthood (ages 26-30).

They found more than three-fourths (76.3 percent) of participants didn't use or develop a problem with marijuana during this period.

The remaining quarter developed problems that researchers grouped into three profiles -- those with limited problems, persistent problems and delayed problems.

Limited users (13 percent)

- Limited problematic users had trouble with marijuana either while in school before age 16 or in their late teens and early 20s, but their habits dropped off as they aged.
- Researchers were somewhat surprised that this group reported the highest levels of family conflict and instability during childhood as compared to others in the study; these factors are often associated with more drug use.
- "When this group of children left home, they seemed to do better," Hill said. "They didn't have as many children at a young age, and they went further in their education when they were 19 to 21

compared to those with persistent and delayed profiles."

Persistent users (7 percent)

- This group had trouble with marijuana beginning as young as 9 years old and their chronic use continued into their late 20s and early 30s, the data showed.
- Large portions of this group had anxiety disorders in both childhood (27 percent) and at ages 19-21 (23 percent).
- They had the highest rates of psychiatric disorders and involvement in the criminal justice system, and most said the majority of their friends were drug users, too.
- "This suggests that a focus on mental health and well-being could go a long way to prevent the most problematic use," Hill said.

Delayed users (4 percent)

- This was a small but unique group that made it through adolescence and early adulthood without problematic marijuana use, only to become habitual users between ages 26 and 30.

- Blacks were five times as likely as whites to be delayed problematic users in the late 20s and early 30s after not having trouble with the between the ages 19-21 -- a peak time for most marijuana users.
- More than half of delayed users were both bullied by peers and mistreated by caregivers as children, yet also had lower rates of anxiety, alcohol use, and other hard drug use compared to persistent users.
- "What we don't yet understand is how childhood maltreatment didn't prompt earlier problematic use of cannabis between ages 19 and 21 -- how individuals could be resilient to that kind of adverse experience for so long," Hill said. "One theory is that they were somewhat protected by having fewer peers in late adolescence who were substance users, but this is one of the questions we will continue to seek answers for."

Story Source:

[Materials](#) provided by [Duke University Medical Center](#). *Note: Content may be edited for style and length.*

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Taste, not appearance, drives corals to eat plastics: Sightless corals aren't making the mistake on appearance -- ScienceDaily

Scientists have long known that marine animals mistakenly eat plastic debris because the tiny bits of floating plastic might look like prey.

But a new Duke University study of plastic ingestion by corals suggests there may be an additional reason for the potentially harmful behavior. Visual cues, such as a resemblance to prey, don't factor into the appeal, the researchers noted, because corals have no eyes.

The plastic just plain tastes good.

"Corals in our experiments ate all types of plastics but preferred unfouled microplastics by a threefold difference over microplastics covered in bacteria," said Austin S. Allen, a PhD student at Duke's Nicholas School of the Environment. "This suggests the plastic itself contains something that makes it tasty."

"When plastic comes from the factory, it has hundreds of chemical additives on it. Any one of these chemicals or a combination of them could be acting as a stimulant that makes plastic appealing to corals," said Alexander C. Seymour, a geographic information systems analyst at Duke's Marine Robotics and Remote Sensing Center, who co-led the study with Allen.

Further research will be needed to identify the specific additives that make the plastic so tasty to corals and determine if the same chemicals act as feeding stimulants to other marine species.

Allen and Seymour's peer-reviewed study was published Oct. 23 in the online edition of journal *Marine Pollution Bulletin*.

Microplastics, tiny pieces of weathered plastic less than 5 millimeters in diameter, began accumulating in the oceans four decades ago and are now ubiquitous in the marine environment. They pose a major threat to foraging sea animals, including many species of birds, turtles, fish, marine mammals and invertebrates.

Because plastic is largely indigestible, it can lead to intestinal blockages, create a false sense of fullness or

reduce energy reserves in animals that consume it.

"About eight percent of the plastic that coral polyps in our study ingested was still stuck in their guts after 24 hours," said Allen.

It can also leach hundreds of chemical compounds into their bodies and the surrounding environment. The biological effects of most of these compounds are still unknown, but some, such as phthalates, are confirmed environmental estrogens and androgens -- hormones that affect sex determination.

Allen and Seymour conducted their two-part study using corals collected from waters off the North Carolina coast. In their first experiment, they offered small amounts of eight different types of microplastics to the corals to see if the animals would eat the bite-sized bits versus other similarly-sized items offered to them, such as clean sand.

"We found that the corals ate all of the plastic types we offered and mostly ignored sand," Allen said.

In the second experiment, they put groups of coral into separate feeding chambers. Each group was offered the same amount of "food" -- weathered plastics -- for a

30-minute period, but some groups got only particles of unfouled microplastics while others got only particles of weathered microplastics fouled with a bacterial biofilm. This experiment verified that the corals would eat both types of plastic, but preferred the clean type by a three-to-one margin.

The researchers hope their findings will encourage scientists to explore the role taste plays in determining why marine organisms ingest microplastics.

"Ultimately, the hope is that if we can manufacture plastic so it unintentionally tastes good to these animals, we might also be able to manufacture it so it intentionally tastes bad," Seymour said. "That could significantly help reduce the threat these microplastics pose."

Video: <https://www.youtube.com/watch?v=eAb7a41xCd8&feature=youtu.bezdadqbtv>

Story Source:

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Supercomputers help scientists improve seismic forecasts for California -- ScienceDaily

Southern California has the highest earthquake risk of any region in the U.S., but exactly how risky and where the greatest risks lie remains an open question.

Earthquakes occur infrequently and depend on complex geological factors deep underground, making them hard to reliably predict in advance. For that reason, forecasting earthquakes means relying on massive computer models and multifaceted simulations, which recreate the rock physics and regional geology and require big supercomputers to execute.

In June 2017, a team of researchers from the U.S. Geological Survey and the Southern California Earthquake Center (SCEC) released a major paper in *Seismological Research Letters* that summarized the scientific and hazard results of one of the world's biggest and most well-known earthquake simulation

projects: The Uniform California Earthquake Rupture Forecast (UCERF3).

The results relied on computations performed on the original Stampede supercomputer at the Texas Advanced Computing Center, resources at the University of Southern California Center for High-Performance Computing, as well as the newly deployed Stampede2 supercomputer, to which the research team had early access. (Stampede 1 and Stampede2 are supported by grants from the National Science Foundation.)

"High-performance computing on TACC's Stampede system, and during the early user period of Stampede2, allowed us to create what is, by all measures, the most advanced earthquake forecast in the world," said Thomas H. Jordan, director of the Southern California Earthquake Center and one of the lead authors on the paper.

The new forecast is the first fault-based model to provide self-consistent rupture probabilities from the very short-term -- over a period of less than an hour -- to the very long term -- up to more than a century. It is also the first model capable of evaluating the short-

term hazards that result from multi-event sequences of complex faulting.

To derive the model, the researchers ran 250,000 rupture scenarios of the state of California, vastly more than in the previous model, which simulated 8,000 ruptures.

Among its novel findings, the researchers' simulations showed that in the week following a magnitude 7.0 earthquake, the likelihood of another magnitude 7.0 quake would be up to 300 times greater than the week beforehand. This scenario of 'cascading' ruptures was demonstrated in the 2002 magnitude 7.9 Denali, Alaska, and the 2016 magnitude 7.8 Kaikoura, New Zealand earthquakes, according to David Jacobson and Ross Stein of Temblor.

The dramatic increase in the likelihood of powerful aftershocks is due to the inclusion of a new class of models that assess short-term changes in seismic hazard based on what is known about earthquake clustering and aftershock excitations. These factors have never been used in a comprehensive, statewide model like this one.

The current model also takes into account the likelihood of ruptures jumping from one fault to a nearby one, which has been observed in California's highly interconnected fault system.

Based on these and other new factors, the new model increases the likelihood of powerful aftershocks but downgrades the predicted frequency of earthquakes between magnitude 6.5 and 7.0, which did not match historical records.

Importantly, UCERF3 can be updated with observed seismicity -- real-time data based on earthquakes in action -- to capture the static or dynamic triggering effects that play out during a particular sequence of events. The framework is adaptable to many other continental fault systems, and the short-term component might be applicable to the forecasting of minor earthquakes and tremors that are caused by human activity.

The impact of such an improved model goes beyond the fundamental scientific improvement it represents. It has the potential to impact building codes, insurance rates, and the state's response to a powerful earthquake.

Said Jordan, "The U.S. Geological Survey has included UCERF3 as the California component of the National Seismic Hazard Model, and the model is being evaluated for use in operational earthquake forecasting on timescales from hours to decades."

Estimating the cost to rebuild

In addition to forecasting the likelihood of an earthquake, models like UCERF3 help predict the associated costs of earthquakes in the region. In recent months, the researchers used UCERF3 and Stampede2 to create a prototype operational loss model, which they described in a paper posted online to Earthquake Spectra in August.

The model estimates the statewide financial losses to the region (the costs to repair buildings and other damages) caused by an earthquake and its aftershocks. The risk metric is based on a vulnerability function and the total replacement cost of asset types in a given census tract.

The model found that the expected loss per year when averaged over many years would be \$4.0 billion statewide. More importantly, the model was able to

quantify how expected losses change with time due to recent seismic activity. For example, the expected losses in a year following an magnitude 7.1 main shock spike to \$24 billion due to potentially damaging aftershocks, a factor of six greater than during "normal" times.

Being able to quantify such fluctuations will enable financial institutions, such as earthquake insurance providers, to adjust their business decisions accordingly.

"It's all about providing tools that will help make society more resilient to damaging earthquake sequences," says Ned Field of the USGS, another lead author of the two studies.

Though there's a great deal of uncertainty in both the seismicity and the loss estimates, the model is an important step at quantifying earthquake risk and potentially devastation in the region, thereby helping decision-makers determine whether and how to respond.

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Study investigates effects of domestic violence on workplaces, by asking perpetrators: Abusers are 'our co-workers, our supervisors, those working under our supervision' -- ScienceDaily

Researchers at the Ontario Institute for Studies in Education (OISE) at the University of Toronto and Western University released a new study today, taking an unconventional approach to understanding the significant effects of domestic violence in the workplace. By seeking the views of the perpetrators of violence, the study found that domestic violence perpetration, like victimization, has costs to the workplace in terms of worker safety and productivity and that most employers lack adequate resources to help perpetrators deal with the issue.

The survey found that perpetration of domestic violence is associated with substantial negative effects on the productivity and safety of workers with close to

half of respondents (46%) reporting that violence issues negatively affected their job performance.

"These studies clearly document the effects of domestic violence on workplaces that fail to address the distress, distraction, anger, and preoccupation workers experience in association with these issues," said Dr. Katreena Scott, Canada Research Chair in Family Violence Prevention and Intervention at OISE at the University of Toronto.

"Our 2014 national study showed us the extent to which domestic violence follows victims to their workplaces. Our aim with this study was to ensure that policies, workplace education and interventions appropriately address both perpetrators and victims of violence in the workplace," said Barb MacQuarrie, Community Director of Western's Centre for Research & Education on Violence Against Women & Children (CREVAWC), "Now we better understand how domestic violence perpetration extends from the home to the workplace as well."

'Perpetrators are our co-workers, our supervisors, those working under our supervision'

Working together with 22 of Ontario's Partner Assault Response programs, researchers conducted a survey of 500 perpetrators of domestic violence. Respondents came from all parts of the province and represented all service regions. The vast majority were men in heterosexual relationships who were identified as having perpetrated domestic violence and referred to intervention by the criminal justice system.

One-third of respondents (33.9%) reported being in contact with their (ex)partner during work hours to engage in behaviours that were emotionally abusive or to monitor her actions or whereabouts. Of men who engaged in these behaviours, 25% used workplace time to drop by her home or workplace. About 20% indicated that their co-workers were aware of these behaviours.

Nearly a tenth (9%) of respondents reported that they caused or almost caused a work accident as a result of being distracted or preoccupied by these issues. About 25% of respondents indicated that violence issues led to difficulties getting to and staying at work and about 25% reported taking paid time off work to deal with domestic violence issues.

"We know that domestic violence is a prevalent social problem, so it only follows that those who perpetrate this violence are our co-workers, our supervisors, and those working under our supervision," said Tim Kelly, Executive Director of Changing Ways, the Partner Assault Response Program in London. "This means our prevention and our intervention plans must address those who perpetrate domestic violence as well as victims."

Workplaces a 'closed' climate

Results also suggest that workplaces are still often closed places for dealing with domestic violence perpetration.

Nearly half of men reported that the climate of their workplaces was closed, unsupportive, and unfair when it came to dealing with domestic violence issues and the majority of respondents indicated that they did not know or were unsure of any resources available to them in the workplace to help them deal with domestic violence issues.

Only a third of men reported talking about their domestic violence issues with people at their

workplace. When men did talk about their situation, they were most likely to talk to their co-workers or supervisors.

Men were often reluctant to talk about this issue due to concerns about losing their jobs. More than one-quarter of respondents (26.2%) reported losing their job as a direct or indirect result of domestic violence issues. Many commented that these issues have made it more difficult to seek new work.

Dr. Katreena Scott: Important to know what resources perpetrators think will help

"It is important to understand the experiences of the perpetrators of violence in sharing information with their workplaces and their opinions on the types of resources that should be available," said Scott.

"Education is needed and so too are resources to support workers who are using violence in their intimate partner and family relationships."

Researchers also noted that the impact of domestic violence perpetration was independent of involvement in the justice system. Men reported that the impact of their domestic violence issues on productivity and time

lost were just as great before the incident that brought them to the attention to the criminal justice system as after.

The report can be found online at:

http://dvatworknet.org/sites/dvatworknet.org/files/PAR_Oct-23-2017dl.pdf

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Electronic entropy enhances water splitting: Cerium's large entropy makes it ideal for hydrogen production -- ScienceDaily

Researchers have long known that cerium is the best element to use when splitting water into hydrogen and oxygen -- a key technique in creating hydrogen gas for fuel. But why, exactly, cerium is so successful has been far less understood.

Now a Northwestern University team led by Chris Wolverton has discovered that cerium's electronic entropy, which is created when an electron transitions among various states within an electron shell, is the underlying reason for its success. This finding could help researchers better exploit cerium's entropy for water-splitting technologies.

"In order for water splitting to be fast enough to be practical, you need a large amount of entropy," said Wolverton, professor of materials science and engineering in Northwestern's McCormick School of

Engineering. "It turns out that cerium is magic for entropy."

Supported by the US Department of Energy, the research was recently published in *Nature Communications*. Shahab Naghavi, a postdoctoral fellow in the Wolverton Research Group, served as the paper's first author.

Since the 1970s, researchers have touted the potential of a "hydrogen economy," in which hydrogen would replace gasoline to fuel ground transportation. When burned, hydrogen's only byproduct is water, making it environmentally cleaner and more energy efficient than its fossil-fuel alternatives. Pure hydrogen gas, however, is very rare within Earth's atmosphere.

"The problem is: how do you get the hydrogen in the first place?" Wolverton asked. "Currently, you have to burn hydrocarbons, but that produces carbon dioxide."

Water (or steam) splitting could cleanly and efficiently produce enough pure hydrogen to make the hydrogen economy a true possibility. To split hydrogen from oxygen, researchers use heat generated by solar radiation and cerium oxide, or ceria. Using sunlight to

heat ceria to 1,000- to 1,500-degrees Celsius drives a series of reactions that cause hydrogen to split off.

Wolverton and others previously knew that entropy was key to making this reaction possible, but they were unable to find the source of cerium's entropy. "Most people thought entropy was caused by mixing oxygen or vibrations from the heat," Wolverton said. "But we found that it's a different source, and it's not what you might think."

In order for the chemical reaction that drives water splitting to be successful, cerium in the oxide must gain an electron. And that single electron gives rise to whole lot of entropy.

"If there are multiple places for the electron, that gives rise to electronic entropy," Wolverton explained. "The electron can transition from one state to another to another and creates disorder on the electronic scale, and hence, entropy."

Cerium's family of elements -- known as rare earths -- naturally have more electron states around which the electron can move. Wolverton's team computed the electronic entropy of all 17 rare earths and discovered

that cerium demonstrated the largest amount.

"For a long time, we've known that cerium is good for water splitting, but we didn't quite know why," Wolverton said. "Now we partially know why, and that opens up possibilities for future work."

Story Source:

[Materials](#) provided by [Northwestern University](#).

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Single-cell diagnostics for breast cancer -- ScienceDaily

Women diagnosed with breast cancer may benefit from having the molecular subtype of different cells within their tumors identified, argue two researchers in an opinion article published October 24 in the journal *Trends in Cancer*. While breast cancer is often treated as a whole, they discuss the growing consensus that cancer cells within a tumor can have multiple origins and respond variably to treatment. The authors advocate for the development of more accurate diagnostic tests to capture molecular irregularities between tumor cells.

"Breast tumors are moving targets because they are really versatile," says Jun-Lin Guan, Francis Brunning Professor and Chair of the Department of Cancer at the University of Cincinnati College of Medicine and member of the Cincinnati Cancer Center and UC Cancer Institute, who co-authored the paper with postdoctoral fellow Syn Kok Yeo. "If you use a treatment that's targeting one subtype, which kills one

type of breast cancer, often the other kind will actually expand. That defeats the purpose of treatment."

Breast cancer cells differ by the types of molecular markers, some of which are found on their surface, which physicians can test to understand the characteristics of a patient's cancer and devise the best treatment strategy. For example, women with the HER2+ breast cancer subtype generally have a poorer prognosis than those with the luminal A tumors because of how quickly the cells multiply. Often tumor samples are taken and screened for the most common markers present, but Guan and Yeo's analysis of human and rodent studies raises the possibility that overlapping subtypes are being missed.

They advocate for diagnostic testing to be combined with single-cell technologies, in which individual cells, rather than a collection, are screened for molecular markers. However, as they currently exist, single-cell approaches are expensive and require specialized expertise, so they would not be realistic for regular patient screenings.

"What we're talking about is still not widely used in practice -- there's a gap between basic cancer research

and the clinics that do the diagnoses," Guan says.
"However, single-cell technologies are advancing very quickly, so it's possible that we can see them being used in the near future."

The researchers put forward that the co-existence of distinct breast cancer subtypes within tumors happens because a fraction of breast cancer cells retain many stem cell-like qualities and thus reserve the capability to easily change. This has been observed in human cancer cells and in rodent studies but has yet to be confirmed in patients. Single-cell analysis could assess whether this problem is common or rare in humans.

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- [**Earliest known marine navigation tool revealed with scanning technology**](#) [周三, 25 10月 02:39]

Details of the earliest known marine navigation tool, discovered in a shipwreck, have been revealed thanks to state-of-the-art scanning technology.

- [**Taste, not appearance, drives corals to eat plastics**](#) [周三, 25 10月 02:17]

Scientists have long known that marine animals mistakenly eat plastic debris because tiny bits of floating plastic look like prey. But a new study of plastic ingestion by corals suggests there may be an additional reason for the potentially harmful behavior: The plastic simply tastes good. Chemical additives in the plastic may be acting as a feeding stimulant.

- [**How Neanderthals influenced human genetics at the crossroads of Asia and Europe**](#) [周三, 25 10月 01:06]

A new study explores the genetic legacy of ancient trysts between Neanderthals and the ancestors of modern humans, with a focus on Western Asia, the region where the first relations may have occurred.

- [**Spots on supergiant star drive spirals in stellar wind**](#) [周二, 24 10月 23:56]

Astronomers have recently discovered that spots on the surface of a supergiant star are driving huge spiral structures in its stellar wind.

- [**Daydreaming is good: It means you're smart**](#) [周二, 24 10月 23:28]

A new study suggests that daydreaming during meetings isn't necessarily

a bad thing. It might be a sign that you're really smart and creative. People with efficient brains may have too much brain capacity to stop their minds from wandering.

- [**Fossils from the world's oldest trees reveal complex anatomy never seen before**](#) [周二, 24 10月 06:26]

The first trees to have ever grown on Earth were also the most complex, new research has revealed.

- [**Sea-level rise, not stronger storm surge, will cause future NYC flooding**](#) [周二, 24 10月 06:25]

Rising sea levels caused by a warming climate threaten greater future storm damage to New York City, but the paths of stronger future storms may shift offshore, changing the coastal risk for the city, according to a team of climate scientists.

- [**Older Neanderthal survived with a little help from his friends**](#) [周二, 24 10月 06:15]

An older Neanderthal from about 50,000 years ago, who had suffered multiple injuries and other degenerations, became deaf and must have relied on the help of others to avoid prey and survive well into his 40s, indicates a new analysis.

- [**Archaeologists uncover cuneiform archive in Iraq's Kurdish region**](#) [周二, 24 10月 06:03]

Archaeologists have made sensational finds in the Kurdistan region of northern Iraq. The researchers found a cuneiform archive of 93 clay tablets dating from 1250 BCE -- the period of the Middle Assyrian Empire. What the tablets record remains a mystery for the time being. The researchers will have to decipher them -- a long and difficult task.

- [**'Mind-reading' brain-decoding tech**](#) [周二, 24 10月 01:20]

Researchers have demonstrated how to decode what the human brain is seeing by using artificial intelligence to interpret fMRI scans from people watching videos, representing a sort of mind-reading technology.

- [**Smart birds: Canada geese give hunters the slip**](#)

[by hiding out in Chicago](#) [周二, 24 10月 01:20]

It's open season for Canada geese in Illinois from mid-October to mid-January. Unfortunately for hunters, Canada geese are finding a new way to stay out of the line of fire. Rather than being 'sitting ducks' in a rural pond, they're setting up residence in the city. Ornithologists conducted a recent study to try to find out why there were so many Canada geese in Chicago in the winter.

• [Drug can dramatically reduce weight of people with obesity](#) [周二, 24 10月 01:19]

A drug that targets the appetite control system in the brain could bring about significant weight loss in people with clinical obesity, according to new research.

• [Scientists warn that saline lakes in dire situation worldwide](#) [周二, 24 10月 00:35]

Saline lakes around the world are shrinking in size at alarming rates. But what -- or who -- is to blame? Lakes like Utah's Great Salt Lake, Asia's Aral Sea, the Dead Sea in Jordan and Israel, China's huge Lop Nur and Bolivia's Lake Popo are just a few that are in peril. These lakes and others like them are suffering massive environmental problems according to a group of scientists and water managers.

• [Mongolian microfossils point to the rise of animals on Earth](#) [周二, 24 10月 00:35]

A cache of embryo-like microfossils has been discovered in northern Mongolia that may shed light on questions about the long-ago shift from microbes to animals on Earth.

• [Transparent solar technology represents 'wave of the future'](#) [周二, 24 10月 00:35]

See-through solar materials that can be applied to windows represent a massive source of untapped energy and could harvest as much power as bigger, bulkier rooftop solar units, scientists report.

• [Western US Quake? Fifty simulations of the](#)

'Really Big One' show how a 9.0 Cascadia earthquake could play out [周一, 23 10月 22:18]

The largest number yet of detailed simulations for how a Cascadia Subduction Zone earthquake might play out provides a clearer picture of what the region can expect when the fault unleashes a 9.0 earthquake.

Crops evolving ten millennia before experts thought [周一, 23 10月 21:49]

Ancient hunter-gatherers began to systemically affect the evolution of crops up to thirty thousand years ago -- around ten millennia before experts previously thought -- according to new research.

Taming 'wild' electrons in graphene [周一, 23 10月 21:44]

Graphene -- a one-atom-thick layer of carbon -- is a better conductor than copper and is very promising for electronic devices, but with one catch: Electrons that move through it can't be stopped. Until now, that is. Scientists have learned how to tame the unruly electrons in graphene, paving the way for the ultra-fast transport of electrons with low loss of energy in novel systems.

Pollution responsible for 16 percent of early deaths globally [周六, 21 10月 06:25]

Diseases caused by pollution were responsible in 2015 for an estimated 9 million premature deaths -- 16 percent of all deaths worldwide, according to a report.

Mountain glaciers shrinking across Western U.S. [周六, 21 10月 06:25]

A technique using satellites to create twice-yearly elevation maps of US mountain glaciers provides new insight into thinning of glaciers in the lower 48 states.

Life goes on for marine ecosystems after cataclysmic mass extinction [周五, 20 10月 21:22]

One of the largest global mass extinctions did not fundamentally change marine ecosystems, scientists have found.

- [**NASA's MAVEN mission finds Mars has a twisted magnetic tail**](#) [周五, 20 10月 06:18]

Mars has an invisible magnetic 'tail' that is twisted by interaction with the solar wind, according to new research using data from NASA's MAVEN spacecraft.

- [**New NASA study improves search for habitable worlds**](#) [周五, 20 10月 06:18]

New NASA research is helping to refine our understanding of candidate planets beyond our solar system that might support life.

- [**Climate shifts shorten marine food chain off California**](#) [周五, 20 10月 05:16]

Environmental disturbances such as El Niño shake up the marine food web off Southern California, new research shows, countering conventional thinking that the hierarchy of who-eats-who in the ocean remains largely constant over time.

- [**Field trips of the future?**](#) [周五, 20 10月 04:42]

A biologist examines the benefits and drawbacks of virtual and augmented reality in teaching environmental science.

- [**DNA damage found in veterans with Gulf War illness**](#) [周五, 20 10月 04:41]

Researchers say they have found the 'first direct biological evidence' of damage in veterans with Gulf War illness to DNA within cellular structures that produce energy in the body.

- [**New tyrannosaur fossil is most complete found in Southwestern US**](#) [周五, 20 10月 02:30]

A fossilized skeleton of a tyrannosaur discovered in Utah's Grand Staircase-Escalante National Monument was airlifted by helicopter Oct 15, and delivered to the Natural History Museum of Utah where it will be uncovered, prepared, and studied. The fossil is approximately 76 million years old and is likely an individual of the species

Teratophoneus curriei.

- [**Ancient DNA offers new view on saber-toothed cats' past**](#) [周五, 20 10月 02:30]

Researchers who've analyzed the complete mitochondrial genomes from ancient samples representing two species of saber-toothed cats have a new take on the animals' history over the last 50,000 years. The data suggest that the saber-toothed cats shared a common ancestor with all living cat-like species about 20 million years ago. The two saber-toothed cat species under study diverged from each other about 18 million years ago.

- [**Evolution in your back garden: Great tits may be adapting their beaks to birdfeeders**](#) [周五, 20 10月 02:30]

A British enthusiasm for feeding birds may have caused UK great tits to have evolved longer beaks than their European counterparts, according to new research. The findings identify for the first time the genetic differences between UK and Dutch great tits which researchers were then able to link to longer beaks in UK birds.

- [**H7N9 influenza is both lethal and transmissible in animal model for flu**](#) [周五, 20 10月 02:30]

In 2013, an influenza virus began circulating among poultry in China. It caused several waves of human infection and as of late July 2017, nearly 1,600 people had tested positive for avian H7N9. Nearly 40 percent of those infected had died. In 2017, a medical researcher received a sample of H7N9 virus isolated from a patient in China who had died of the flu. He and his research team subsequently began work to characterize and understand it.

- [**Liquid metal discovery ushers in new wave of chemistry and electronics**](#) [周五, 20 10月 02:30]

Researchers use liquid metal to create atom-thick 2-D never before seen in nature. The research could transform how we do chemistry and could also be applied to enhance data storage and make faster electronics.

- [**Six degrees of separation: Why it is a small world after all**](#) [周四, 19 10月 23:10]

This study examines how small-world networks occur within bigger and more complex structures.

- [**Itsy bitsy spider: Fear of spiders and snakes is deeply embedded in us**](#) [周四, 19 10月 23:09]

Snakes and spiders evoke fear and disgust in many people, even in developed countries where hardly anybody comes into contact with them. Until now, there has been debate about whether this aversion is innate or learnt. Scientists have recently discovered that it is hereditary: Even babies feel stressed when seeing these creatures - long before they could have learnt this reaction.

- [**A mosquito's secret weapon: a light touch and strong wings**](#) [周四, 19 10月 22:10]

How do mosquitoes land and take off without our noticing? Using high-speed video cameras, researchers have found part of the answer: mosquitoes' long legs allow them to slowly and gently push off, but their wings provide the majority of the lift, even when fully laden with a blood meal. For comparison, mosquitoes push off with forces much less than those of an escaping fruit fly.

- [**Noxious ice cloud on Saturn's moon Titan**](#) [周四, 19 10月 22:10]

Researchers with NASA's Cassini mission found evidence of a toxic hybrid ice in a wispy cloud high above the south pole of Saturn's largest moon, Titan.

- [**Scientists see order in complex patterns of river deltas**](#) [周四, 19 10月 22:10]

River deltas, with their intricate networks of waterways, coastal barrier islands, wetlands and estuaries, often appear to have been formed by random processes, but scientists see order in the apparent chaos.

- [**Scientists pinpoint jealousy in the monogamous**](#)

[mind](#) [周四, 19 10月 22:10]

Scientists find that in male titi monkeys, jealousy is associated with heightened activity in the cingulate cortex, an area of the brain associated with social pain in humans, and the lateral septum, associated with pair bond formation in primates. A better understanding of jealousy may provide important clues on how to approach health and welfare problems such as addiction and domestic violence, as well as autism.

• [Slow Internet? New technology to speed up home broadband dramatically](#) [周四, 19 10月 22:10]

Slow internet speeds and the Internet 'rush hour' -- the peak time when data speeds drop by up to 30 percent -- could be history with new hardware that provides consistently high-speed broadband connectivity.

• [Fossil coral reefs show sea level rose in bursts during last warming](#) [周四, 19 10月 22:09]

Scientists have discovered that Earth's sea level did not rise steadily when the planet's glaciers last melted during a period of global warming; rather, sea level rose sharply in punctuated bursts.

• [Dogs are more expressive when someone is looking](#) [周四, 19 10月 22:09]

Dogs produce more facial expressions when humans are looking at them, according to new research.

• [More than 75 percent decrease in total flying insect biomass over 27 years across Germany](#) [周四, 19 10月 22:09]

The total flying insect biomass decreased by more than 75 percent over 27 years in protected areas in Germany, according to a new study.

• [Salmon sex linked to geological change](#) [周四, 19 10月 22:08]

It turns out that sex can move mountains. Researchers have found that the mating habits of salmon can alter the profile of stream beds, affecting the evolution of an entire watershed. The study is one of the first to quantitatively show that salmon can influence the shape of the land.

• [**Want to control your dreams? Here's how you can**](#) [周四, 19 10月 22:08]

New research has found that a specific combination of techniques will increase people's chances of having lucid dreams, in which the dreamer is aware they're dreaming while it's still happening and can control the experience.

• [**More teens than ever aren't getting enough sleep**](#) [周四, 19 10月 22:04]

Researchers found that about 40 percent of adolescents in 2015 slept less than 7 hours a night, which is 58 percent more than in 1991 and 17 percent more than in 2009. They further learned that the more time young people reported spending online, the less sleep they got. Teens who spent 5 hours a day online were 50 percent more likely to not sleep enough than their peers who only spent an hour online each day.

• [**Worldwide change in shallow reef ecosystems predicted as waters warm**](#) [周四, 19 10月 03:18]

A new study based on the first global survey of marine life by scuba divers has provided fresh insights into how climate change is affecting the distribution of marine life. The research predicts that as the oceans warm fish -- which appear to be superior predators in warm water -- will extend their ranges away from the equator and cause a decline in the diversity of invertebrates such as crabs, lobsters, sea urchins and whelks.

• [**Scientists dig into the origin of organics on dwarf planet Ceres**](#) [周四, 19 10月 03:18]

Since NASA's Dawn spacecraft detected localized organic-rich material on Ceres, scientists have been digging into the data to explore different scenarios for its origin. After considering the viability of comet or asteroid delivery, the preponderance of evidence suggests the organics are most likely native to Ceres.

• [**Understanding the coevolving web of life as a network**](#) [周四, 19 10月 01:32]

Coevolution, which occurs when species interact and adapt to each

other, is often studied in the context of pair-wise interactions between mutually beneficial symbiotic partners. But many species have mutualistic interactions with multiple partners, leading to complex networks of interacting species.

- [**Nature or nurture? Innate social behaviors in the mouse brain**](#) [周四, 19 10月 01:29]

The brain circuitry that controls innate, or instinctive, behaviors such as mating and fighting was thought to be genetically hardwired. Not so, neuroscientists now say.

- [**Inflammation trains the skin to heal faster**](#) [周四, 19 10月 01:28]

Stem cells in the skin remember an injury, helping them close recurring wounds faster, researchers have found. The discovery could advance research and treatment of psoriasis and other inflammatory diseases.

- [**Petals produce a 'blue halo' that helps bees find flowers**](#) [周四, 19 10月 01:28]

Latest research has found that several common flower species have nanoscale ridges on the surface of their petals that meddle with light when viewed from certain angles.

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Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [**Earliest known marine navigation tool revealed with scanning technology**](#) [周三, 25 10月 02:39]

Details of the earliest known marine navigation tool, discovered in a shipwreck, have been revealed thanks to state-of-the-art scanning technology.

- [**Supercomputers help scientists improve seismic forecasts for California**](#) [周三, 25 10月 01:37]

Researchers have used the Stampede1 and 2 supercomputers to complete one of the world's largest earthquake simulation models: The Uniform California Earthquake Rupture Forecast (UCERF3). The simulations showed that in the week following a magnitude 7.0 earthquake, the likelihood of another magnitude 7.0 quake in California would be up to 300 times greater than the week before.

- [**Electronic entropy enhances water splitting**](#) [周三, 25 10月 01:37]

An electron transitioning from state to state increases cerium's entropy, making it ideal for hydrogen production, researchers have found.

- [**Spots on supergiant star drive spirals in stellar wind**](#) [周二, 24 10月 23:56]

Astronomers have recently discovered that spots on the surface of a supergiant star are driving huge spiral structures in its stellar wind.

- [**Comparison of outcomes for robotic-assisted vs. laparoscopic surgical procedures**](#) [周二, 24 10月 23:07]

Two studies compare certain outcomes of robotic-assisted vs. laparoscopic surgery for kidney removal or rectal cancer.

- **[Jumping nanoparticles](#)** [周二, 24 10月 23:06]

Transitions occurring in nanoscale systems, such as a chemical reaction or the folding of a protein, are strongly affected by friction and thermal noise. Almost 80 years ago, the Dutch physicist Hendrik Kramers predicted that such transitions occur most frequently at intermediate friction, an effect known as Kramers turnover. Now, a team of scientists have measured this effect for a laser-trapped particle, directly confirming Kramers' prediction in an experiment for the first time.

- **[Using sound waves for biomedical breakthroughs](#)** [周二, 24 10月 22:49]

Sound waves could be the future of biomedical research, diagnosing and treatment, according to a chemistry professor. A data analyst is using an acoustic device to separate extracellular vesicles to get a deeper look at their properties.

- **[Smart Ring: Mobile on-body devices can be precisely and discreetly controlled using a tiny sensor](#)** [周二, 24 10月 22:48]

Mobile end-user devices, such as the new version of the “Apple Watch”, have a drawback: their small screen size makes them difficult to use. Computer scientists have now developed an alternative, which they call “DeformWear”. A tiny switch, no larger than the head of a pin, is built into a ring for example, and worn on the body. It can be moved in all directions, pressed, pinched, and pushed toward the right, left, up, and down.

- **[Adhesives and composite materials made from Swiss tree bark](#)** [周二, 24 10月 22:36]

Studies show that tannins extracted from native tree bark can be used to produce adhesives and composite materials. An additional area of application might be 3D printing.

- **[Many planned roads in the tropics shouldn't be built](#)** [周二, 24 10月 22:33]

We are living in the most dramatic era of road expansion in human history, but many planned roads should not be built, concludes a major study.

- **[Self-esteem mapped in the human brain](#)** [周二, 24 10月 22:33]

A team of researchers has devised a mathematical equation that can explain how our self-esteem is shaped by what other people think of us.

- **[New self-regulating nanoparticles could treat cancer](#)** [周二, 24 10月 22:33]

Scientists have developed 'intelligent' nanoparticles which heat up to a temperature high enough to kill cancerous cells -- but which then self-regulate and lose heat before they get hot enough to harm healthy tissue.

- **[Noninvasive brain imaging shows readiness of trainees to perform operations](#)** [周二, 24 10月 22:33]

While simulation platforms have been used to train surgeons before they enter an actual operating room (OR), few studies have evaluated how well trainees transfer those skills from the simulator to the OR. Now, a study that used noninvasive brain imaging to evaluate brain activity has found that simulator-trained medical students successfully transferred those skills to operating on cadavers and were faster than peers who had no simulator training.

- **[A quantum spin liquid](#)** [周二, 24 10月 22:31]

Researchers report creating a metal oxide with a honeycomb lattice that scientists have sought to advance quantum computing research.

- **[Single nanoparticle mapping paves the way for better nanotechnology](#)** [周二, 24 10月 22:31]

Researchers have developed a method that makes it possible to map the individual responses of nanoparticles in different situations and contexts. The results pave the way for better nanomaterials and safer nanotechnology.

- [**Underwater sound waves help scientists locate ocean impacts**](#) [周二, 24 10月 22:30]

A new method to locate the precise time and location that objects fall into our oceans has now been developed.

- [**Gun deaths, injuries in California spike following Nevada gun shows**](#) [周二, 24 10月 06:27]

When gun shows are held in Nevada, gun-related deaths and injuries spike across the state line in California for at least the next two weeks. A new study examined gun deaths and injuries in California before and after gun shows in California and Nevada, and their results show a nearly 70 percent increase in deaths and injuries from firearms in California communities within convenient driving distance of Nevada gun shows.

- [**Nanodiamonds show promise for aiding recovery from root canal**](#) [周二, 24 10月 06:26]

People who undergo root canals may soon have a tiny but powerful ally that could prevent infection after treatment. In a new paper, researchers write that combining nanodiamonds with gutta percha, a material used to fill disinfected root canals, may enhance the gutta percha's protective properties.

- [**Air pollution cuts solar energy potential in China**](#) [周二, 24 10月 06:26]

Severe air pollution in northern and eastern China blocks about 20 percent of sunlight from reaching solar panel arrays in winter, according to a new study.

- [**Researchers tackle long-standing problem of few-femtosecond internal conversion**](#) [周二, 24 10月 06:13]

Observing the crucial first few femtoseconds of photochemical reactions requires tools typically not available in the femtochemistry toolkit. Such dynamics are now within reach with the instruments provided by attosecond science. In a new study, researchers characterize one of the

fastest internal conversion processes in a molecule studied to date.

- [**Scientists discover superconductor with bounce**](#) [周二, 24 10月 02:09]

Scientists have discovered extreme 'bounce,' or super-elastic shape-memory properties in a material that could be applied for use as an actuator in the harshest of conditions, such as outer space, and might be the first in a whole new class of shape memory materials.

- [**Nanotube fiber antennas as capable as copper**](#) [周二, 24 10月 01:20]

Thin fibers made of carbon nanotubes can be formed into antennas that are just as capable as copper antennas, according to researchers.

- [**'Mind-reading' brain-decoding tech**](#) [周二, 24 10月 01:20]

Researchers have demonstrated how to decode what the human brain is seeing by using artificial intelligence to interpret fMRI scans from people watching videos, representing a sort of mind-reading technology.

- [**Scientists update four key fundamental constants**](#) [周二, 24 10月 01:20]

Paving the way for transforming the world's measurement system, an international task force has determined updated values for four fundamental constants of nature.

- [**Scheme would make new high-capacity data caches 33 to 50 percent more efficient**](#) [周二, 24 10月 01:19]

A memory management scheme would increase by 33 to 50 percent the efficiency of data caches that use the massive new memory banks known as 'in-package DRAM.'

- [**Optical communication coming to silicon chips**](#) [周二, 24 10月 00:38]

Ultrathin films of a semiconductor that emits and detects light can be stacked on top of silicon wafers, researchers report in a study that could help bring optical communication onto silicon chips.

- [**More iron in lakes is making them brown, study shows**](#) [周二, 24 10月 00:37]

The iron concentration in lakes is increasing in many parts of northern Europe. This has been shown in a study in which researchers in Sweden examined 23 years of data from 10 countries. High iron levels contribute to browner water; furthermore, iron binds environmental toxins such as lead and arsenic.

- [**Resistive memory components the computer industry can't resist**](#) [周二, 24 10月 00:36]

For years, the computer industry has sought memory technologies with higher endurance, lower cost, and better energy efficiency than commercial flash memories. Now, an international collaboration of scientists may have solved many of those challenges with the discovery of thin, molecular films that can store information.

- [**IBD: Synthetic hydrogels deliver cells to repair intestinal injuries**](#) [周二, 24 10月 00:36]

By combining engineered polymeric materials known as hydrogels with complex intestinal tissue known as organoids -- made from human pluripotent stem cells -- researchers have taken an important step toward creating a new technology for controlling the growth of these organoids and using them for treating wounds in the gut that can be caused by disorders such as inflammatory bowel disease (IBD).

- [**Wriggling microtubules help understand coupling of 'active' defects and curvature**](#) [周二, 24 10月 00:35]

Imagine a tiny doughnut-shaped droplet, covered with wriggling worms. The worms are packed so tightly together that they locally line up, forming a nematic liquid crystal similar to those found in flat panel displays. Scientists are now reporting on an examination of such an active nematic -- but with flexible filaments and microscopic engines rather than worms.

- [**Transparent solar technology represents 'wave of the future'**](#) [周二, 24 10月 00:35]

See-through solar materials that can be applied to windows represent a

massive source of untapped energy and could harvest as much power as bigger, bulkier rooftop solar units, scientists report.

- [**Experiment provides deeper look into the nature of neutrinos**](#) [周二, 24 10月 00:35]

The first glimpse of data from the full array of a deeply chilled particle detector operating beneath a mountain in Italy sets the most precise limits yet on where scientists might find a theorized process to help explain why there is more matter than antimatter in the universe.

- [**Expanding Brazilian sugarcane could dent global CO2 emissions**](#) [周一, 23 10月 23:05]

Vastly expanding sugarcane production in Brazil for conversion to ethanol could reduce current global carbon dioxide emissions by as much as 5.6 percent, researchers report. This can be accomplished without impinging on environmentally sensitive areas in Brazil and while allowing for the expansion of other agricultural crops and human needs, the researchers report.

- [**Understanding how electrons turn to glass**](#) [周一, 23 10月 22:47]

Researchers have gained new insight into the electronic processes that guide the transformation of liquids into a solid crystalline or glassy state.

- [**Personalizing human-robot interaction may increase patient use**](#) [周一, 23 10月 22:17]

Determining the elements in the human-robot interaction that make users more motivated to continue is important in designing future robots that will interact with humans on a daily basis, say investigators looking into their use in healthcare.

- [**Zircon as Earth's timekeeper: Are we reading the clock right?**](#) [周一, 23 10月 21:44]

Zircon crystals in igneous rocks must be carefully examined and not relied upon solely to predict future volcanic eruptions and other tectonic events, researchers have shown.

• [**Taming 'wild' electrons in graphene**](#) [周一, 23 10月 21:44]

Graphene -- a one-atom-thick layer of carbon -- is a better conductor than copper and is very promising for electronic devices, but with one catch: Electrons that move through it can't be stopped. Until now, that is. Scientists have learned how to tame the unruly electrons in graphene, paving the way for the ultra-fast transport of electrons with low loss of energy in novel systems.

• [**Solution to mysterious behavior of supercooled water**](#) [周一, 23 10月 21:43]

Researchers have developed a model to explain mysterious breakdown of Stokes-Einstein relationship in supercooled water. They revealed that intermittent hydrogen bond breakage between water molecules led to non-conformity with the Stokes-Einstein relationship.

• [**Microfluidics probe 'cholesterol' of the oil industry**](#) [周六, 21 10月 00:58]

Researchers employ microfluidic devices to show how and why dispersants are able to break up deposits of asphaltene that hinder the flow of crude oil in wellheads and pipelines.

• [**Creation of coherent states in molecules by incoherent electrons**](#) [周六, 21 10月 00:57]

Coherent states of negative ion resonances in electron-molecule interaction are observed in experiments on e^- -H₂ and e^- -D₂ reactions. A forward-backward asymmetry is observed in the ejection of H⁻ ions from H₂ in this reaction, whereas the asymmetry in D⁻ from D₂ is weaker, but changes direction with electron energy. These results arise from attachment of a single electron to a molecule forming coherent superposition of odd and even parity states of negative ions.

• [**New quantum simulation protocol developed**](#) [周五, 20 10月 22:53]

Researchers are a step closer to understanding quantum mechanics after developing a new quantum simulation protocol.

• [**Innovative smart watch and smart ring**](#) [周五, 20 10月 22:17]

Researchers have developed a smart watch that takes the user to another dimension and a smart ring that provides powerful feedback.

• [Gamma rays will reach beyond the limits of light](#)

[周五, 20 10月 22:16]

Researchers have discovered a new way to produce high energy photon beams. The new method makes it possible to produce these gamma rays in a highly efficient way, compared with today's technique. The obtained energy is a billion times higher than the energy of photons in visible light. These high intensity gamma rays significantly exceed all known limits, and pave the way towards new fundamental studies.

• [Novel 'converter' heralds breakthrough in ultra-fast data processing at nanoscale](#)

[周五, 20 10月 21:22]

Scientists have recently invented a novel 'converter' that can harness the speed and small size of plasmons for high frequency data processing and transmission in nanoelectronics.

• [Insight into a hidden order seen with high field magnet](#)

[周五, 20 10月 21:22]

A specific uranium compound has puzzled researchers for thirty years. Although the crystal structure is simple, no one understands exactly what is happening once it is cooled below a certain temperature. Apparently, a 'hidden order' emerges, whose nature is completely unknown. Now physicists have characterized this hidden order state more precisely and studied it on a microscopic scale. To accomplish this, they utilized a high-field magnet that permits neutron experiments to be conducted under co...

• [Cool roofs have water saving benefits too](#)

[周五, 20 10月 21:22]

The energy and climate benefits of cool roofs have been well established: By reflecting rather than absorbing the sun's energy, light-colored roofs keep buildings, cities, and even the entire planet cooler. Now a new study has found that cool roofs can also save water by reducing how much is needed for urban irrigation.

• [NASA's MAVEN mission finds Mars has a](#)

[**twisted magnetic tail**](#) [周五, 20 10月 06:18]

Mars has an invisible magnetic 'tail' that is twisted by interaction with the solar wind, according to new research using data from NASA's MAVEN spacecraft.

. [**New NASA study improves search for habitable worlds**](#) [周五, 20 10月 06:18]

New NASA research is helping to refine our understanding of candidate planets beyond our solar system that might support life.

. [**Be concerned about how apps collect, share health data, expert says**](#) [周五, 20 10月 05:16]

Americans should be concerned about how health and wellness apps collect, save and share their personal health data, a medical media expert says.

. [**Two-dimensional materials gets a new theory for control of properties**](#) [周五, 20 10月 05:16]

Desirable properties including increased electrical conductivity, improved mechanical properties, or magnetism for memory storage or information processing may be possible because of a theoretical method to control grain boundaries in two-dimensional materials, according to materials scientists.

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [**Earliest known marine navigation tool revealed with scanning technology**](#) [周三, 25 10月 02:39]

Details of the earliest known marine navigation tool, discovered in a shipwreck, have been revealed thanks to state-of-the-art scanning technology.

- [**A quarter of problematic pot users have anxiety disorders, many since childhood**](#) [周三, 25 10月 02:17]

About a quarter of adults whose marijuana use is problematic in early adulthood have anxiety disorders in childhood and late adolescence, according to new data.

- [**Taste, not appearance, drives corals to eat plastics**](#) [周三, 25 10月 02:17]

Scientists have long known that marine animals mistakenly eat plastic debris because tiny bits of floating plastic look like prey. But a new study of plastic ingestion by corals suggests there may be an additional reason for the potentially harmful behavior: The plastic simply tastes good. Chemical additives in the plastic may be acting as a feeding stimulant.

- [**Supercomputers help scientists improve seismic forecasts for California**](#) [周三, 25 10月 01:37]

Researchers have used the Stampede1 and 2 supercomputers to complete one of the world's largest earthquake simulation models: The Uniform California Earthquake Rupture Forecast (UCERF3). The simulations

showed that in the week following a magnitude 7.0 earthquake, the likelihood of another magnitude 7.0 quake in California would be up to 300 times greater than the week before.

- [**'Wing prints' may identify individual bats as effectively as fingerprints identify people**](#) [周三, 25 10月 01:06]

For decades, bats have defied scientists' best ideas for keeping track of individuals, a critical element in wildlife research. Biologists have now discovered a means of identifying individual bats that may be as universal, distinctive, permanent and collectable as fingerprints: bats' wings.

- [**No magic wand required: Scientists propose way to turn any cell into any other cell type**](#) [周三, 25 10月 01:06]

In fairy tales, all it takes to transform a frog into a prince or a mouse into a horse is the wave of a magic wand. But in the real world, transforming one living thing into another isn't so easy. A new paper grounded in both math and biology lays out a way to do it with individual cells. If it works, it could have applications from regenerating diseased or lost tissue to fighting cancer.

- [**How Neanderthals influenced human genetics at the crossroads of Asia and Europe**](#) [周三, 25 10月 01:06]

A new study explores the genetic legacy of ancient trysts between Neanderthals and the ancestors of modern humans, with a focus on Western Asia, the region where the first relations may have occurred.

- [**Arsenic can cause cancer decades after exposure ends**](#) [周二, 24 10月 23:56]

Arsenic in drinking water may have one of the longest dormancy periods of any carcinogen. By tracking the mortality rates of people exposed to arsenic-contaminated drinking water in a region in Chile, the researchers provide evidence of increases in lung, bladder, and kidney cancer even 40 years after high arsenic exposures ended.

- [**Pollutant emitted by forest fire causes DNA**](#)

[damage and lung cell death](#) [周二, 24 10月 23:56]

Scientists performed tests with particles from forest and crop fires in the Amazon. Not only did they induce inflammation, oxidative stress and genetic damage in human lung cells, but they also drove one-third of the cultured cells to death.

• **[Ice sheets may melt rapidly in response to distant volcanoes](#)** [周二, 24 10月 23:06]

Volcanic eruptions have been known to cool the global climate, but they can also exacerbate the melting of ice sheets, according to a new paper.

• **[Microplastics in the Baltic have not risen for 30 years](#)** [周二, 24 10月 22:48]

The concentration of microplastics in water and fish from the Baltic Sea has been constant for the past 30 years, despite a substantial increase in plastic production during the same period, report investigators.

• **[Adhesives and composite materials made from Swiss tree bark](#)** [周二, 24 10月 22:36]

Studies show that tannins extracted from native tree bark can be used to produce adhesives and composite materials. An additional area of application might be 3D printing.

• **[Many planned roads in the tropics shouldn't be built](#)** [周二, 24 10月 22:33]

We are living in the most dramatic era of road expansion in human history, but many planned roads should not be built, concludes a major study.

• **[A definitive method to detect wildfire tainted wine grapes](#)** [周二, 24 10月 22:33]

Wine producers and grape growers have a new, powerful tool at their disposal to help manage the impact of grapes exposed to smoke from forest fires. Researchers have devised a new analytical test to precisely and accurately measure the amount of volatile phenols-compounds absorbed by grapes when exposed to smoke that can impact wine flavor

-- that are present in the fruit prior to wine production.

- [**Saguaro and other towering cacti have a scrambled history**](#) [周二, 24 10月 22:31]

Biologists continue to debate the genealogy of the cactus family, even differing by a factor of 10 about how many different genera there are. A study based on new genome sequences of four columnar cacti, including saguaro and cardon, illustrates why this is. Because of the long lives of these columnar cacti, ancient genes drop out at random and give the impression of parallel evolution in those species that retain the genes.

- [**New combination therapy of registered drugs shortens anti-Wolbachia therapy**](#) [周二, 24 10月 22:30]

Researchers have found a way of significantly reducing the treatment required for lymphatic filariasis and onchocerciasis from several weeks to seven days. By targeting Wolbachia, a bacterial symbiont that the filarial parasites need to live, the team has discovered a drug synergy that enables effective treatment over a shorter time.

- [**Underwater sound waves help scientists locate ocean impacts**](#) [周二, 24 10月 22:30]

A new method to locate the precise time and location that objects fall into our oceans has now been developed.

- [**To grasp water scarcity, researchers probe links between human and natural systems**](#) [周二, 24 10月 06:26]

Understanding the fine-level interactions between nature and people is essential in determining whether a region will suffer water scarcity in the future.

- [**Fossils from the world's oldest trees reveal complex anatomy never seen before**](#) [周二, 24 10月 06:26]

The first trees to have ever grown on Earth were also the most complex, new research has revealed.

- [**Five new malaria targets that could lead to an**](#)

[effective vaccine](#) [周二, 24 10月 06:26]

In the largest study of its kind, five new malaria vaccine targets have been discovered. Researchers studied the malaria parasite at its most vulnerable stage -- when invading human red blood cells -- and identified five targets that lead to a reduction in the parasite's ability to enter red blood cells.

[Air pollution cuts solar energy potential in China](#) [周二, 24 10月 06:26]

Severe air pollution in northern and eastern China blocks about 20 percent of sunlight from reaching solar panel arrays in winter, according to a new study.

[Sea-level rise, not stronger storm surge, will cause future NYC flooding](#) [周二, 24 10月 06:25]

Rising sea levels caused by a warming climate threaten greater future storm damage to New York City, but the paths of stronger future storms may shift offshore, changing the coastal risk for the city, according to a team of climate scientists.

[Cryo-EM imaging suggests how the double helix separates during replication](#) [周二, 24 10月 06:25]

Figuring out how accurate replication works at the level of individual molecules and atoms is one of the great achievements of modern science. The journey of investigators is not yet done, however. A major unsolved part of the puzzle is understanding how the entire process of copying the genome begins. In new research, insight into how the two strands of the double helix separate in the earliest stages of replication is becoming clear.

[Why did the 2014 Oso, WA, landslide travel so far?](#) [周二, 24 10月 06:25]

On Saturday, 22 March 2014, a devastating landslide roared across the North Fork of the Stillaguamish River, near Oso, Washington. The landslide killed 43 people as it plowed through the Steelhead Haven

neighborhood. When it stopped, after crossing the river, the neighborhood, and State Route 530, the Oso landslide had traveled 1.4 kilometers.

- [**Florida needs more pet-friendly shelters**](#) [周二, 24 10月 06:25]

Florida needs more pet-friendly shelters, especially for older adults who represent 50 to 75 percent of deaths following disasters like hurricanes, according to a recent study.

- [**New asthma biomarkers identified from lung bacteria**](#) [周二, 24 10月 06:25]

New research suggests that the lung microbiome plays a significant role in asthma severity and response to treatment.

- [**Fresh look at fresh water: Researchers create a 50,000-lake database**](#) [周二, 24 10月 06:25]

Countless numbers of vacationers spent this summer enjoying lakes for swimming, fishing and boating. But are they loving these lakes to death?

- [**Older Neanderthal survived with a little help from his friends**](#) [周二, 24 10月 06:15]

An older Neanderthal from about 50,000 years ago, who had suffered multiple injuries and other degenerations, became deaf and must have relied on the help of others to avoid prey and survive well into his 40s, indicates a new analysis.

- [**New mapping tool tracks elk migration to reduce brucellosis risk**](#) [周二, 24 10月 06:08]

Elk and cattle commingle on a hay line in western Wyoming. New research has created a mapping tool for reducing the risk of transmitting brucellosis from elk to cattle.

- [**Shallow soils promote savannas in South America**](#) [周二, 24 10月 06:07]

The boundary between South American tropical rainforests and savannas is influenced by the depth to which plants can root, research

indicates. Shallow rooting depth promotes the establishment of savannas. Previous research has shown that precipitation and fire mediate tropical forest and savanna distributions. The study shows that below ground conditions need to be considered to understand the distribution of terrestrial vegetation both historically and in the face of future climate change. The s...

• [**Archaeologists uncover cuneiform archive in Iraq's Kurdish region**](#) [周二, 24 10月 06:03]

Archaeologists have made sensational finds in the Kurdistan region of northern Iraq. The researchers found a cuneiform archive of 93 clay tablets dating from 1250 BCE -- the period of the Middle Assyrian Empire. What the tablets record remains a mystery for the time being. The researchers will have to decipher them -- a long and difficult task.

• [**Fruit-eating increases biodiversity**](#) [周二, 24 10月 03:05]

By dispersing the seeds of plants, fruit-eating animals contribute to the possibility of increased plant speciation and thus biodiversity, investigators have discovered.

• [**New magma pathways after giant lateral volcano collapses**](#) [周二, 24 10月 02:55]

Giant lateral collapses are huge landslides occurring at the flanks of a volcano. Such collapses are rather common events during the evolution of a large volcanic edifice, often with dramatic consequences such as tsunami and volcano explosions. These catastrophic events interact with the magmatic activity of the volcano, as new research suggests.

• [**Moment of impact: A journey into the Chicxulub Crater**](#) [周二, 24 10月 02:09]

When the Chicxulub asteroid slammed into Earth about 66 million years ago, it obliterated 80 percent of Earth's species, blasted out a crater 200 kilometers across, and signaled an abrupt end to the Cretaceous Period. The impact, its catastrophic effects, and its aftermath have engrossed scientists and the public alike since it was first discovered.

• [**New Peruvian bird species discovered by its song**](#)

[周二, 24 10月 02:09]

A new species of bird from the heart of Peru remained undetected for years until researchers identified it by its unique song.

• [**Possible new anti-TB treatment path**](#) [周二, 24 10月 02:09]

As part of the long effort to improve treatment of tuberculosis (TB), microbiologists report that they have for the first time characterized a protein involved in making a glycolipid compound found in the TB cell wall, which is critical for the disease-causing Mycobacterium to become infectious.

• [**Herbicide's link to Parkinson's disease**](#) [周二, 24 10月 02:07]

Scientists have revealed how oxidative stress explains a common herbicide's link to risk of Parkinson's disease.

• [**Rethinking well-being and sustainability measurements from local to global scales**](#) [周二, 24 10月 01:20]

A new study suggests that standard ways of measuring well-being and sustainability in communities used by global organizations may be missing critical information and could lead to missteps in management actions. The article suggests alternative and complementary approaches that use indicators grounded in the values of a particular community.

• [**Smart birds: Canada geese give hunters the slip by hiding out in Chicago**](#) [周二, 24 10月 01:20]

It's open season for Canada geese in Illinois from mid-October to mid-January. Unfortunately for hunters, Canada geese are finding a new way to stay out of the line of fire. Rather than being 'sitting ducks' in a rural pond, they're setting up residence in the city. Ornithologists conducted a recent study to try to find out why there were so many Canada geese in Chicago in the winter.

• [**Rising sea levels creating first Native American climate refugees**](#) [周二, 24 10月 01:20]

Rising sea levels and human activities are fast creating a 'worst case scenario' for Native Americans of the Mississippi Delta who stand to lose not just their homes, but their irreplaceable heritage, to climate

change.

- [**Scientists develop new theory of molecular evolution**](#) [周二, 24 10月 00:38]

Researchers have developed a new theory of molecular evolution, offering insights into how genes function, how the rates of evolutionary divergence can be predicted, and how harmful mutations arise at a basic level.

- [**These shrews have heads that shrink with the season**](#) [周二, 24 10月 00:36]

If any part of the body would seem ill equipped to shrink, it would probably be the head and skull. And, yet, researchers have found that the skulls of red-toothed shrews do shrink in anticipation of winter, by up to 20 percent. As spring approaches, their heads grow again to approach their previous size.

- [**Discovered in plants a mechanism that corrects defects in protein folding**](#) [周二, 24 10月 00:35]

Discovered in plants a mechanism that corrects defects in proteins such as those that cause Alzheimer's and Parkinson's Diseases in humans. Defective protein folding causes nervous system diseases in humans and hinders the proper functioning of the chloroplasts in plants. The aggregation of misfolded proteins in the chloroplasts sends a SOS signal to the nucleus to repair them in few hours. This newly described mechanism uses molecular components that also protect plants against excess heat.

- [**Reduced impact logging still harms biodiversity in tropical rainforests**](#) [周二, 24 10月 00:35]

Even low levels of logging in the Amazon rainforest may lead to great losses in biodiversity, new research has found. The research looked at 34 different plots in the state of Pará -- a focal point for Amazon protection efforts in the last decades. They found that even low levels of logging led to negative effects on dung beetle diversity and rates of dung beetle-mediated

- [**Scientists warn that saline lakes in dire situation worldwide**](#) [周二, 24 10月 00:35]

Saline lakes around the world are shrinking in size at alarming rates. But what -- or who -- is to blame? Lakes like Utah's Great Salt Lake, Asia's Aral Sea, the Dead Sea in Jordan and Israel, China's huge Lop Nur and Bolivia's Lake Popo are just a few that are in peril. These lakes and others like them are suffering massive environmental problems according to a group of scientists and water managers.

- [**Mongolian microfossils point to the rise of animals on Earth**](#) [周二, 24 10月 00:35]

A cache of embryo-like microfossils has been discovered in northern Mongolia that may shed light on questions about the long-ago shift from microbes to animals on Earth.

- [**Transparent solar technology represents 'wave of the future'**](#) [周二, 24 10月 00:35]

See-through solar materials that can be applied to windows represent a massive source of untapped energy and could harvest as much power as bigger, bulkier rooftop solar units, scientists report.

- [**Sumatran tigers on path to recovery in 'in danger' UNESCO World Heritage site**](#) [周二, 24 10月 00:29]

New research looks at the effectiveness of the park's protection zone and finds that the density of Sumatran tigers has increased despite the continued threat of living in an 'In Danger' World Heritage Site.

- [**Expanding Brazilian sugarcane could dent global CO2 emissions**](#) [周一, 23 10月 23:05]

Vastly expanding sugarcane production in Brazil for conversion to ethanol could reduce current global carbon dioxide emissions by as much as 5.6 percent, researchers report. This can be accomplished without impinging on environmentally sensitive areas in Brazil and while allowing for the expansion of other agricultural crops and human needs, the researchers report.

[Immune response: Scientists identify 'first responders' to bacterial invasion](#) [周一, 23 10月 22:47]

When bacteria enter our body, they kick-start a powerful immune response. But this chain of reactions doesn't fully account for our immediate responses. Researchers show that so-called ion channels play a key role as 'first responders'.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [The problem with being pretty](#) [周三, 25 10月 01:06]

While good-looking people are generally believed to receive more favorable treatment in the hiring process, when it comes to applying for less desirable jobs, such as those with low pay or uninteresting work, attractiveness may be a liability, according to research.

- [Daydreaming is good: It means you're smart](#) [周二, 24 10月 23:28]

A new study suggests that daydreaming during meetings isn't necessarily a bad thing. It might be a sign that you're really smart and creative. People with efficient brains may have too much brain capacity to stop their minds from wandering.

- [How to predict high school dropouts](#) [周二, 24 10月 22:57]

Teenagers who do not access healthcare when needed are at greater risk of dropping out of high school. Dropouts are more likely to have combinations of the following traits: low conscientiousness, neuroticism and introversion. The study examined data from the US National Longitudinal Study of Adolescents to Adult Health, a nationally representative sample of 90,000 students in grades 7 to 12 at 132 schools.

- [Brain region that motivates behavior change discovered](#) [周二, 24 10月 22:56]

Ever been stuck in a rut? Researchers found that stimulating a region of the brain called the posterior cingulate cortex can lead to changes in routine behavior. Neurons there ramp up their firing rates, then peak just before a pattern shifts. Knowing this could help businesses better

understand how to spur employee innovation, exploration and creativity.

- **[Disaster makes people with depression less healthy](#)** [周二, 24 10月 22:33]

People who exhibit even a few depressive symptoms before a major life stressor, such as a disaster, may experience an increase in inflammation -- a major risk factor for heart disease and other negative health conditions -- after the event.

- **[Value of acknowledging adolescents' perspectives](#)** [周二, 24 10月 22:33]

Across very different cultures -- Ghana and the United States -- when parents acknowledge the perspectives of their adolescent children and encourage them to express themselves, the youths have a stronger sense of self-worth, intrinsic motivation, and engagement, and also have less depression. Yet having the latitude to make decisions appears to function differently in the two cultures, with positive outcomes for youths in the United States but not in Ghana.

- **[Starting at age 6, children spontaneously practice skills to prepare for the future](#)** [周二, 24 10月 22:33]

Deliberate practice is essential for improving a wide range of skills important for everyday life, from tying shoelaces to reading and writing. Yet despite its importance for developing basic skills, academic success, and expertise, we know little about the development of deliberate practice. A new study from Australia found that children spontaneously practice skills to prepare for the future starting at the age of 6.

- **[Self-esteem mapped in the human brain](#)** [周二, 24 10月 22:33]

A team of researchers has devised a mathematical equation that can explain how our self-esteem is shaped by what other people think of us.

- **[Sacrificing one life to save others: Psychopaths' force for 'greater good'](#)** [周二, 24 10月 22:33]

New research shows that people would sacrifice one person to save a larger group of people -- and in addition, the force with which they carry

out these actions could be predicted by psychopathic traits.

- [**What we call postdoctoral researchers matters, scientists say**](#) [周二, 24 10月 22:33]

Eight scientists and science policy experts make the case for standardizing how postdoctoral researchers are categorized by human resources offices and provide a framework that institutions can follow.

- [**New research highlights worldwide risk of HIV, Hepatitis C epidemics**](#) [周二, 24 10月 22:33]

Two reviews studied the global prevalence of injecting drug use and of interventions to prevent the spread of blood borne viruses among people who inject drugs.

- [**Gun deaths, injuries in California spike following Nevada gun shows**](#) [周二, 24 10月 06:27]

When gun shows are held in Nevada, gun-related deaths and injuries spike across the state line in California for at least the next two weeks. A new study examined gun deaths and injuries in California before and after gun shows in California and Nevada, and their results show a nearly 70 percent increase in deaths and injuries from firearms in California communities within convenient driving distance of Nevada gun shows.

- [**To grasp water scarcity, researchers probe links between human and natural systems**](#) [周二, 24 10月 06:26]

Understanding the fine-level interactions between nature and people is essential in determining whether a region will suffer water scarcity in the future.

- [**Air pollution cuts solar energy potential in China**](#) [周二, 24 10月 06:26]

Severe air pollution in northern and eastern China blocks about 20 percent of sunlight from reaching solar panel arrays in winter, according to a new study.

- [**Sea-level rise, not stronger storm surge, will cause future NYC flooding**](#) [周二, 24 10月 06:25]

Rising sea levels caused by a warming climate threaten greater future storm damage to New York City, but the paths of stronger future storms may shift offshore, changing the coastal risk for the city, according to a team of climate scientists.

- [**Fresh look at fresh water: Researchers create a 50,000-lake database**](#) [周二, 24 10月 06:25]

Countless numbers of vacationers spent this summer enjoying lakes for swimming, fishing and boating. But are they loving these lakes to death?

- [**The many reverberations of colonialism: A Native American language facing extinction**](#) [周二, 24 10月 06:13]

We tend to view colonialism in the past tense and to see it as an unfortunate precursor to our modern world. However, for many, colonialism is not something that died and went away, but something that shapes their entire world, especially when it comes to language.

- [**Shallow soils promote savannas in South America**](#) [周二, 24 10月 06:07]

The boundary between South American tropical rainforests and savannas is influenced by the depth to which plants can root, research indicates. Shallow rooting depth promotes the establishment of savannas. Previous research has shown that precipitation and fire mediate tropical forest and savanna distributions. The study shows that below ground conditions need to be considered to understand the distribution of terrestrial vegetation both historically and in the face of future climate change. The s...

- [**EPA regulation on arsenic in US public water systems likely prevented over 200 cancer cases per year**](#) [周二, 24 10月 06:05]

A new study highlights the critical role of federal drinking water

regulations in reducing toxic exposure and protecting human health.

- [**Rethinking well-being and sustainability measurements from local to global scales**](#) [周二, 24 10月 01:20]

A new study suggests that standard ways of measuring well-being and sustainability in communities used by global organizations may be missing critical information and could lead to missteps in management actions. The article suggests alternative and complementary approaches that use indicators grounded in the values of a particular community.

- [**Support for populist ideologies linked to feelings of disadvantage and national narcissism**](#) [周二, 24 10月 01:19]

People who perceive they are part of a disadvantaged group are more likely to have an unrealistic belief in the greatness of their nation and support populist ideologies, new research shows.

- [**Reduced impact logging still harms biodiversity in tropical rainforests**](#) [周二, 24 10月 00:35]

Even low levels of logging in the Amazon rainforest may lead to great losses in biodiversity, new research has found. The research looked at 34 different plots in the state of Pará -- a focal point for Amazon protection efforts in the last decades. They found that even low levels of logging led to negative effects on dung beetle diversity and rates of dung beetle-mediated

- [**Transparent solar technology represents 'wave of the future'**](#) [周二, 24 10月 00:35]

See-through solar materials that can be applied to windows represent a massive source of untapped energy and could harvest as much power as bigger, bulkier rooftop solar units, scientists report.

- [**College labor market remains strong**](#) [周二, 24 10月 00:29]

Employers will face tough competition for talent in the 2017-18 job market, thanks to a seven-year growth streak in the college labor market.

- [**Consumers see 'organic' and 'non-GM' food**](#)

[Labels as synonymous](#) [周一, 23 10月 22:22]

What are the best ways to communicate whether a food has GM ingredients? To gauge consumers' willingness to pay for food labeled as GM vs. non-GM, researchers conducted a national survey of 1,132 respondents.

• [Teams work better with a little help from your friends](#) [周一, 23 10月 21:50]

Here's something both you and your boss can agree on: Workplace teams are better when they include your friends. Researchers analyzed the results of 26 different studies (called a meta-analysis) and found that teams composed of friends performed better on some tasks than groups of acquaintances or strangers.

• [Geophysicist finds teaching opportunities in movie mistakes](#) [周一, 23 10月 21:46]

Few scientists regard the 1997 movie Volcano, in which flaming magma suddenly spews from the La Brea tar pits and incinerates much of Los Angeles, as a means to foster scientific literacy. After all, Southern California has no magma to spew. But one geophysicist sees it differently.

• [Biosimilar drugs could cut US health spending by \\$54 billion over next decade](#) [周一, 23 10月 21:46]

Biosimilar drugs have been touted as one strategy to help curb the runaway costs of biologics that have advanced the treatment of illness such as rheumatoid arthritis and many cancers. A new study finds biosimilars could cut health care spending in the United States by \$54 billion over the next decade. The savings are about 20 percent larger than a similar, widely cited analysis done three years ago by the same researchers.

• [Electricity from shale gas vs. coal: Lifetime toxic releases from coal much higher](#) [周一, 23 10月 21:43]

Despite widespread concern about potential human health impacts from

hydraulic fracturing, the lifetime toxic chemical releases associated with coal-generated electricity are 10 to 100 times greater than those from electricity generated with natural gas obtained via fracking, according to a new study.

- [**After skyrocketing, opioid abuse plateaus but remains too high, national U.S. analysis shows**](#) [周一, 23 10月 05:49]

While the breakneck upswing in opioid abuse has leveled off, it remains disturbingly high and does not appear to continue its decline, according to an analysis of national data.

- [**Pollution responsible for 16 percent of early deaths globally**](#) [周六, 21 10月 06:25]

Diseases caused by pollution were responsible in 2015 for an estimated 9 million premature deaths -- 16 percent of all deaths worldwide, according to a report.

- [**The end of pneumonia? New vaccine offers hope**](#) [周六, 21 10月 02:38]

A new vaccine under development provoked an immune response to 72 forms of the bacteria that's responsible for pneumonia, sepsis and meningitis. That's up from the 23 forms of bacteria covered by current immunizations. The new vaccine, which represents the 'most comprehensive' coverage of pneumococcal disease to date, could greatly reduce the number of deaths from the disease.

- [**US ocean observation critical to understanding climate change, but lacks long-term national planning**](#) [周六, 21 10月 00:57]

Ocean observing systems are important as they provide information essential for monitoring and forecasting changes in Earth's climate on timescales ranging from days to centuries. A new report finds that continuity of ocean observations is vital to gain an accurate understanding of the climate, and calls for a decadal, national plan that is adequately resourced and implemented to ensure critical ocean information is available to understand and predict future changes.

- [**Metacognition training boosts gen chem exam scores**](#) [周六, 21 10月 00:56]

Students, and people in general, can tend to overestimate their own abilities. But new research shows that students who overcome this tendency score better on final exams. The boost is strongest for students in the lower 25 percent of the class. By thinking about their thinking, a practice called metacognition, these students raised their final exam scores by 10 percent on average -- a full letter grade.

- [**Audit uncovers concerns about the use of electroconvulsive therapy in England**](#) [周五, 20 10月 22:53]

Electroconvulsive therapy (ECT) continues to be used in England without comprehensive national auditing.

- [**Waterside lighting drastically disrupts wildlife in the surrounding ecosystem**](#) [周五, 20 10月 21:22]

Streetlights near waterways attract flying insects from the water and change the predator community living in the grass beneath the lights, new research has found. The findings show that artificial night-time lighting could have implications for the surrounding ecosystem and biodiversity, which should be considered when designing new lighting concepts.

- [**Be concerned about how apps collect, share health data, expert says**](#) [周五, 20 10月 05:16]

Americans should be concerned about how health and wellness apps collect, save and share their personal health data, a medical media expert says.

- [**Eye-catching labels stigmatize many healthy foods**](#) [周五, 20 10月 05:16]

Labels such as organic, fair-trade and cage free may be eye-catching but are often free of any scientific basis and stigmatize many healthy foods, a new study found.

- [**Three million Americans carry loaded handguns**](#)

[daily, study finds](#) [周五, 20 10月 04:42]

An estimated 3 million adult American handgun owners carry a firearm loaded and on their person on a daily basis, and 9 million do so on a monthly basis, new research indicates. The vast majority cited protection as their primary reason for carrying a firearm. It is the first research in more than 20 years to scrutinize why, how often, and in what manner US adults carry loaded handguns.

• [TBI laws effective at reducing rate of recurrent concussions, new study shows](#) [周五, 20 10月 04:42]

A recent study from the Center for Injury Research and Policy at Nationwide Children's Hospital done in conjunction with researchers from Colorado School of Public Health at the University at Colorado and Temple University used data from a large, national sports injury surveillance system to determine the effect of state-level TBI laws on trends of new and recurrent concussions among US high school athletes.

• [More permissive concealed-carry laws linked to higher homicide rates](#) [周五, 20 10月 04:42]

Easier access to concealed firearms is associated with significantly higher rates of handgun-related homicide, according to a new study.

• [Field trips of the future?](#) [周五, 20 10月 04:42]

A biologist examines the benefits and drawbacks of virtual and augmented reality in teaching environmental science.

• [Three-quarters of the total insect population lost in protected nature reserves](#) [周五, 20 10月 00:18]

Since 1989, in 63 nature reserves in Germany the total biomass of flying insects has decreased by more than 75 percent. This decrease has long been suspected but has turned out to be more severe than previously thought.

• [Six degrees of separation: Why it is a small world after all](#) [周四, 19 10月 23:10]

This study examines how small-world networks occur within bigger and

more complex structures.

- [**The best hedge fund managers are not psychopaths or narcissists, according to new study**](#) [周四, 19 10月 22:10]

When it comes to financial investments, hedge fund managers higher in 'dark triad' personality traits -- psychopathy, narcissism, and Machiavellianism -- perform more poorly than their peers, according to new personality psychology research. The difference is a little less than 1 percent annually compared to their peers, but with large investments over several years that slight underperformance can add up.

- [**Parents have an even greater impact on the well-being of young people than expected**](#) [周四, 19 10月 22:09]

According to a recent study, parental support for the autonomy of young people promotes the well-being of the latter in all major educational transitions: from primary to lower secondary school, from basic education to upper secondary school, and from upper secondary school to university.

- [**Phones keeping students from concentrating during lectures**](#) [周四, 19 10月 22:08]

Daily, people spend over three hours on their phones. While ever-smarter digital devices have made many aspects of our lives more efficient, a growing body of evidence suggests that, by continuously distracting us, they are harming our ability to concentrate. Studies across the world show that students constantly use their phones when they are in class. A strong body of evidence suggests that media use during lectures is associated with lower academic performance.

- [**What characteristics do school shooters share?**](#) [周四, 19 10月 22:07]

Boys involved in school shootings often struggle to live up to what they perceive as their school's ideals surrounding masculinity. When socially shunned at school, they develop deep-set grudges against their classmates and teachers. The shooters become increasingly angry,

depressed, and more violent in their gendered practice. A shooting rampage is their ultimate performance, according to experts.

• [**New light shed on early turquoise mining in Southwest**](#) [周四, 19 10月 03:18]

Researchers are blending archaeology and geochemistry to get a more complete picture of turquoise's mining and distribution in the pre-Hispanic Southwest.

• [**For \\$1000, anyone can purchase online ads to track your location and app use**](#) [周四, 19 10月 00:41]

New research finds that for a budget of roughly \$1000, it is possible for someone to track your location and app use by purchasing and targeting mobile ads. The team hopes to raise industry awareness about the potential privacy threat.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- [Taste, not appearance, drives corals to eat plastics](#) [周三, 25 10月 02:17]

Scientists have long known that marine animals mistakenly eat plastic debris because tiny bits of floating plastic look like prey. But a new study of plastic ingestion by corals suggests there may be an additional reason for the potentially harmful behavior: The plastic simply tastes good. Chemical additives in the plastic may be acting as a feeding stimulant.

- ['Wing prints' may identify individual bats as effectively as fingerprints identify people](#) [周三, 25 10月 01:06]

For decades, bats have defied scientists' best ideas for keeping track of individuals, a critical element in wildlife research. Biologists have now discovered a means of identifying individual bats that may be as universal, distinctive, permanent and collectable as fingerprints: bats' wings.

- [Spots on supergiant star drive spirals in stellar wind](#) [周二, 24 10月 23:56]

Astronomers have recently discovered that spots on the surface of a supergiant star are driving huge spiral structures in its stellar wind.

- ['Mind-reading' brain-decoding tech](#) [周二, 24 10月 01:20]

Researchers have demonstrated how to decode what the human brain is seeing by using artificial intelligence to interpret fMRI scans from people watching videos, representing a sort of mind-reading technology.

• [**Smart birds: Canada geese give hunters the slip by hiding out in Chicago**](#) [周二, 24 10月 01:20]

It's open season for Canada geese in Illinois from mid-October to mid-January. Unfortunately for hunters, Canada geese are finding a new way to stay out of the line of fire. Rather than being 'sitting ducks' in a rural pond, they're setting up residence in the city. Ornithologists conducted a recent study to try to find out why there were so many Canada geese in Chicago in the winter.

• [**These shrews have heads that shrink with the season**](#) [周二, 24 10月 00:36]

If any part of the body would seem ill equipped to shrink, it would probably be the head and skull. And, yet, researchers have found that the skulls of red-toothed shrews do shrink in anticipation of winter, by up to 20 percent. As spring approaches, their heads grow again to approach their previous size.

• [**Psychedelic drugs may reduce criminal behavior**](#) [周一, 23 10月 22:17]

Newly published research suggests that common psychedelic drugs -- such as 'magic mushrooms', LSD and mescaline (a substance derived from the peyote cactus) -- may reduce criminal offenses. The new study found that psychedelic drugs are associated with a decreased likelihood of antisocial criminal behavior.

• [**Prozac in ocean water a possible threat to sea life**](#) [周六, 21 10月 00:58]

Oregon shore crabs exhibit risky behavior when they're exposed to the antidepressant Prozac, making it easier for predators to catch them, according to a new study.

• [**NASA's MAVEN mission finds Mars has a twisted magnetic tail**](#) [周五, 20 10月 06:18]

Mars has an invisible magnetic 'tail' that is twisted by interaction with the solar wind, according to new research using data from NASA's MAVEN spacecraft.

• [**The blob that ate the tokamak: Physicists gain understanding of bubbles at edge of plasmas**](#) [周五, 20 10月 03:05]

Scientists have completed new simulations that could provide insight into how blobs at the plasma edge behave. The simulations performed kinetic simulations of two different regions of the plasma edge simultaneously.

• [**Using optical chaos to control the momentum of light**](#) [周五, 20 10月 03:05]

Controlling and moving light poses serious challenges. One major hurdle is that light travels at different speeds and in different phases in different components of an integrated circuit. For light to couple between optical components, it needs to be moving at the same momentum. Now, a team of researchers has demonstrated a new way to control the momentum of broadband light in a widely-used optical component known as a whispering gallery microcavity (WGM).

• [**Studying insect behavior? Make yourself an ethoscope!**](#) [周五, 20 10月 02:30]

Fruit flies have surprising similarities to humans. The mysteries of a broad range of human conditions can be studied in detail in these organisms, however this often requires the use of expensive custom equipment. team of scientists now present the ethoscope -- a cheap, easy-to-use and self-made customizable piece of equipment of their invention that can be used to study flies' behavior.

• [**Evolution in your back garden: Great tits may be adapting their beaks to birdfeeders**](#) [周五, 20 10月 02:30]

A British enthusiasm for feeding birds may have caused UK great tits to have evolved longer beaks than their European counterparts, according to new research. The findings identify for the first time the genetic differences between UK and Dutch great tits which researchers were then able to link to longer beaks in UK birds.

• [**Liquid metal discovery ushers in new wave of**](#)

[**chemistry and electronics**](#) [周五, 20 10月 02:30]

Researchers use liquid metal to create atom-thick 2-D never before seen in nature. The research could transform how we do chemistry and could also be applied to enhance data storage and make faster electronics.

• [**Gut bacterium indirectly causes symptoms by altering fruit fly microbiome**](#) [周五, 20 10月 02:27]

CagA, a protein produced by the bacterium *Helicobacter pylori*, can alter the population of microbes living in the fruit fly gut, leading to disease symptoms, according to new research.

• [**Extreme light trapping**](#) [周五, 20 10月 00:38]

Physicists have built a nanostructure whose crystal lattice bends light as it enters the material and directs it in a path parallel to the surface, known as "parallel to interface refraction."

• [**Strange but true: Turning a material upside down can sometimes make it softer**](#) [周四, 19 10月 23:10]

Through the combined effect of flexoelectricity and piezoelectricity, researchers have found that polar materials can be made more or less resistant to dents when they are turned upside down... or when a voltage is applied to switch their polarization. This research points to the future development of 'smart mechanical materials' for use in smart coatings and ferroelectric memories.

• [**Six degrees of separation: Why it is a small world after all**](#) [周四, 19 10月 23:10]

This study examines how small-world networks occur within bigger and more complex structures.

• [**Itsy bitsy spider: Fear of spiders and snakes is deeply embedded in us**](#) [周四, 19 10月 23:09]

Snakes and spiders evoke fear and disgust in many people, even in developed countries where hardly anybody comes into contact with them. Until now, there has been debate about whether this aversion is innate or learnt. Scientists have recently discovered that it is hereditary:

Even babies feel stressed when seeing these creatures - long before they could have learnt this reaction.

- [**A mosquito's secret weapon: a light touch and strong wings**](#) [周四, 19 10月 22:10]

How do mosquitoes land and take off without our noticing? Using high-speed video cameras, researchers have found part of the answer: mosquitoes' long legs allow them to slowly and gently push off, but their wings provide the majority of the lift, even when fully laden with a blood meal. For comparison, mosquitoes push off with forces much less than those of an escaping fruit fly.

- [**Scientists pinpoint jealousy in the monogamous mind**](#) [周四, 19 10月 22:10]

Scientists find that in male titi monkeys, jealousy is associated with heightened activity in the cingulate cortex, an area of the brain associated with social pain in humans, and the lateral septum, associated with pair bond formation in primates. A better understanding of jealousy may provide important clues on how to approach health and welfare problems such as addiction and domestic violence, as well as autism.

- [**The best hedge fund managers are not psychopaths or narcissists, according to new study**](#) [周四, 19 10月 22:10]

When it comes to financial investments, hedge fund managers higher in 'dark triad' personality traits -- psychopathy, narcissism, and Machiavellianism -- perform more poorly than their peers, according to new personality psychology research. The difference is a little less than 1 percent annually compared to their peers, but with large investments over several years that slight underperformance can add up.

- [**Salmon sex linked to geological change**](#) [周四, 19 10月 22:08]

It turns out that sex can move mountains. Researchers have found that the mating habits of salmon can alter the profile of stream beds, affecting the evolution of an entire watershed. The study is one of the first to quantitatively show that salmon can influence the shape of the

land.

- [**Want to control your dreams? Here's how you can**](#) [周四, 19 10月 22:08]

New research has found that a specific combination of techniques will increase people's chances of having lucid dreams, in which the dreamer is aware they're dreaming while it's still happening and can control the experience.

- [**Scientists dig into the origin of organics on dwarf planet Ceres**](#) [周四, 19 10月 03:18]

Since NASA's Dawn spacecraft detected localized organic-rich material on Ceres, scientists have been digging into the data to explore different scenarios for its origin. After considering the viability of comet or asteroid delivery, the preponderance of evidence suggests the organics are most likely native to Ceres.

- [**Petals produce a 'blue halo' that helps bees find flowers**](#) [周四, 19 10月 01:28]

Latest research has found that several common flower species have nanoscale ridges on the surface of their petals that meddle with light when viewed from certain angles.

- [**Solar eruptions could electrify Martian moons**](#) [周四, 19 10月 00:41]

Powerful solar eruptions could electrically charge areas of the Martian moon Phobos to hundreds of volts, presenting a complex electrical environment that could possibly affect sensitive electronics carried by future robotic explorers, according to a new NASA study. The study also considered electrical charges that could develop as astronauts transit the surface on potential human missions to Phobos.

- [**Stiff fibers spun from slime**](#) [周三, 18 10月 23:35]

Nanoparticles from the secretion of velvet worms form recyclable polymer fibers.

- [**Potential human habitat located on the moon**](#) [周三, 18 10月 22:43]

A new study confirms the existence of a large open lava tube in the Marius Hills region of the moon, which could be used to protect astronauts from hazardous conditions on the surface.

• [**When teeth grow on the body**](#) [周三, 18 10月 21:12]

Today, certain species of catfish are covered with bony plates bristling with thin teeth, like some extinct vertebrate lineages. These teeth, which regularly fall out and then grow back, are used for defense and, in males, also to seduce the females. Researchers wanted to understand how these teeth capable of regeneration can develop outside of the mouth. They discovered that the extra-oral teeth always grow on a bone, regardless of its type, even in the absence of a bony plate. This suggests a r...

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ScienceDaily

周四, 05 10月 2017

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Latest Science News

Breaking science news and articles on global warming, extrasolar planets, stem cells, bird flu, autism, nanotechnology, dinosaurs, evolution -- the latest discoveries in astronomy, anthropology, biology, chemistry, climate and environment, computers, engineering, health and medicine, math, physics, psychology, technology, and more -- from the world's leading universities and research organizations.

- [**Sunlight and 'right' microbes convert Arctic carbon into carbon dioxide**](#) [周四, 05 10月 04:38]

A new study outlines the mechanisms and points to the importance of both sunlight and the right microbial community as keys to converting permafrost carbon to CO₂.

- [**Are we at a tipping point with weed control?**](#) [周四, 05 10月 04:20]

Imagine walking the cereal aisle at your favorite grocery store. Are you reading labels? Scanning prices? Thinking about weeds? If you're like most American consumers, weeds probably aren't at the forefront of your mind when buying food. But if farmers could no longer control weeds with existing herbicides, Americans would take notice pretty quickly.

- [**New nanomaterial can extract hydrogen fuel from seawater**](#) [周四, 05 10月 04:20]

A new hybrid nanomaterial harvests solar energy and uses it to extract hydrogen from seawater, cheaply and efficiently. Future commercialization could mean a new source of environmentally friendly fuel and less dependence on fossil fuels.

- [**Ancient humans left Africa to escape drying**](#)

[climate](#) [周四, 05 10月 03:12]

Humans migrated out of Africa as the climate shifted from wet to dry about 60,000 years ago, according to new paleoclimate research. What the northeast Africa climate was like when people migrated from Africa into Eurasia between 70,000 and 55,000 years ago is still uncertain. The new research shows around 70,000 years ago, the Horn of Africa climate shifted from a wet phase called 'Green Sahara' to even drier than the region is now.

• [The super-Earth that came home for dinner](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire solar system to one side. It is a possible "Planet Nine" -- a world perhaps 10 times the mass of Earth and 20 times farther from the sun than Neptune.

• [Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

• [Parole violations, not new crimes, help drive prison's revolving door](#) [周四, 05 10月 02:27]

Failing a drug test, associating with felons and other technical parole violations are among the key drivers of prison's 'revolving door,' according to new American research.

• [Problems with senses may predict older adults' overall health, ability to function](#) [周四, 05 10月 02:27]

Researchers have mainly focused on what happens after people lose one or two of their senses. However, we know that losing more than two

senses occurs frequently for older adults. Until now, no studies have examined how losing multiple senses affects older adults. To learn more, a team of researchers designed a study to focus on just that.

- [**Test reveals antibiotic-resistant bacteria in a half hour**](#) [周四, 05 10月 02:26]

A new test can identify whether bacteria are resistant to antibiotics in a mere half hour, giving medical professionals a new tool for fighting infections and superbug bacteria.

- [**Ornamented artifact may indicate long-distance exchange between Mesolithic communities**](#) [周四, 05 10月 02:26]

An ornamented bâton percé found in Central Poland may provide evidence of exchange between Mesolithic communities, according to a study.

- [**Mental training changes brain structure and reduces social stress**](#) [周四, 05 10月 02:26]

Meditation can have positive effects on our health and well-being. However it has been unclear which mental practice has which effect, and what the underlying processes are. Researchers have discovered that different trainings affect either our attention or our social competencies and modify different brain networks. One mental technique was able to reduce the stress hormone cortisol. These results may influence the adaptation of mental trainings in clinics and education.

- [**Light-activated nanoparticles can supercharge current antibiotics**](#) [周四, 05 10月 02:26]

Light-activated nanoparticles, also known as quantum dots, can provide a crucial boost in effectiveness for antibiotic treatments used to combat drug-resistant superbugs such as E. coli and Salmonella, new research shows.

- [**Dutch children bereaved by domestic homicides 'more burdened than expected'**](#) [周四, 05 10月 02:26]

The majority of Dutch children who lost a parent to intimate partner

homicide had already experienced violence, often without professional support.

- [**Meet Madagascar's oldest animal lineage, a whirligig beetle with 206-million-year-old origins**](#) [周四, 05 10月 02:01]

A new study suggests the Malagasy striped whirligig beetle *Heterogyrus milloti* boasts a genetic pedigree stretching back to the late Triassic period.

- [**Win-win for spotted owls and forest management**](#) [周四, 05 10月 02:01]

Remote sensing technology has detected what could be a win for both spotted owls and forestry management, according to a study.

- [**A new way to produce clean hydrogen fuel from water using sunlight**](#) [周四, 05 10月 02:01]

Researchers combined graphitic carbon nitride and black phosphorous to make a new metal-free composite photocatalyst capable of producing hydrogen from water. The photocatalyst featured good photocatalytic production of hydrogen, even when powered by low-energy near infrared light.

- [**Advanced heart failure reversed in an animal model**](#) [周四, 05 10月 02:01]

Researchers have discovered a previously unrecognized healing capacity of the heart. In a mouse model, they were able to reverse severe heart failure by silencing the activity of Hippo, a signaling pathway that can prevent the regeneration of heart muscle.

- [**Surface helium detonation spells end for white dwarf**](#) [周四, 05 10月 02:01]

Researchers have found evidence that the brightest stellar explosions in our Universe could be triggered by helium nuclear detonation near the surface of a white dwarf star.

- [**Accurately transcribing DNA overrides DNA repair, researchers find**](#) [周四, 05 10月 01:36]

Researchers found that in the model organism E. coli, the fidelity of transcribing DNA comes at the expense of DNA repair.

- [**Cell stress response sheds light on treating inflammation-related cancer, aging**](#) [周四, 05 10月 01:35]

Stress -- defined broadly -- can have a profoundly deleterious effect on the human body. Even individual cells have their own way of dealing with environmental strains such as ultraviolet radiation from the sun or germs. One response to stress -- called senescence -- can trigger cells to stop dividing in cases of cancer and aging. This may hold promise for treating inflammation-related disorders.

- [**In warmer climates, Greenlandic deltas have grown**](#) [周四, 05 10月 01:35]

Unlike most other deltas worldwide, Greenland's are growing -- a trend with major consequences for both fishing and tourism.

- [**BRCA1: Mystery of breast cancer risk gene solved, 20 years after its discovery**](#) [周四, 05 10月 01:35]

More than 20 years after scientists revealed that mutations in the BRCA1 gene predispose women to breast cancer, scientists have pinpointed the molecular mechanism that allows those mutations to wreak their havoc.

- [**A tubular structure to stop cell growth**](#) [周四, 05 10月 01:35]

TORC1 is an enzyme complex that controls the normal growth of our cells; but, when too active, it can promote diseases such as cancer. A new study describes how sugar regulates the activity of TORC1, through a surprising mechanism. In the absence of sugar, TORC1s assemble into a tubular structure, rendering them inactive and thus cell growth stops.

- [**Fish shrinking as ocean temperatures rise**](#) [周四, 05 10月 01:35]

One of the most economically important fish is shrinking in body weight, length and overall physical size as ocean temperatures rise,

according to new research by LSU Boyd Professor R. Eugene Turner published today. The average body size of Menhaden -- a small, silver fish -- caught off the coasts from Maine to Texas -- has shrunk by about 15 percent over the past 65 years.

- [**High BMI and blood pressure create a heavy heart**](#) [周四, 05 10月 01:32]

New research uses UK Biobank data to reveal -- for the first time -- the direct damage that carrying extra weight has on the heart's weight and size, and implicates a range of other modifiable risk factors including high blood pressure.

- [**Bumblebees shed light on why some individuals are smarter than others**](#) [周四, 05 10月 01:28]

By examining the brains of bees trained to different tasks, the researchers found that the number of connections between nerve cells may hold the answer to questions about individual cognitive differences. Bees with a greater density of nerve connections (known as synaptic complexes) in a specific part of their brains had better memories and learned faster than bees with fewer connections in these areas.

- [**In Iceland stream, possible glimpse of warming future**](#) [周四, 05 10月 01:26]

When a normally cold stream in Iceland was warmed, the make-up of life inside changed as larger organisms thrived while smaller ones struggled. The findings carry implications for life in a warming climate.

- [**Dentists get cracking on the stem cell front**](#) [周四, 05 10月 01:26]

Researchers have developed a new method for extracting tooth root pulp that quadruples the number of stem cells that can be harvested and replicated to treat a variety of medical conditions.

- [**Antidote to synthetic cannabis 'Spice' intoxication could be found in slimming drug**](#) [周四, 05 10月 01:25]

Early research has potentially found an antidote that can rapidly stop the intoxicating effects of cannabis and synthetic cannabinoids.

[**New fundamental insight into the battle against bacteria**](#) [周四, 05 10月 01:25]

The intestinal bacterium *E. coli* can adapt to changes in its surroundings. Scientists have discovered how the H-NS protein makes this possible. This new knowledge can be an important starting point in combating bacteria and diseases such as peritonitis.

[**Zika-affected pregnancies from near and far: Lessons learned**](#) [周四, 05 10月 00:49]

The multidisciplinary team at Children's National Health System has consulted on 90 dyads (mothers and their Zika-affected fetuses/infants). The lessons learned about when and how these women were infected and how their offspring were affected by Zika may be instructive to institutions.

[**Study pokes holes in fetal alcohol hypothesis**](#) [周四, 05 10月 00:23]

A new study appears to challenge the theory that cells in the brain's immune system are the culprit behind the neurological damage that occurs in children exposed to alcohol while in the womb.

[**Nanoscale islands dot light-driven catalyst**](#) [周四, 05 10月 00:22]

Scientists have combined aluminum nanoparticles and smaller metal particles to create a versatile nanostructure that could lead to new applications for plasmonics. The technique allows for customizable surface chemistry and reactivity in one material.

[**Why Zika became more dangerous: Discovery offers clues**](#) [周四, 05 10月 00:22]

Virus with a certain sugar in its protein envelope more readily passes to the brain in infected mice, causing inflammation and death.

[**The vitamin ergothioneine: an antioxidant for oxygen-free areas?**](#) [周四, 05 10月 00:05]

Chemists have been able to show for the first time that anaerobic bacteria can produce the vitamin ergothioneine in the absence of

oxygen. This suggests that bacteria were forming this compound even before there was oxygen in the Earth's atmosphere. The vitamin's function therefore remains a mystery, as it was previously ascribed a role in oxygen-dependent processes.

- [**Anxiety and depression caused by childhood bullying decline over time**](#) [周四, 05 10月 00:05]

A new study has provided the strongest evidence to date that exposure to bullying causes mental health issues such as anxiety years later.

- [**Research rethinks the evolutionary importance of variability in a population**](#) [周四, 05 10月 00:05]

It's been long thought that variability within a population is key to population's growth and survival but new research questions that assumption. Researchers found that variability can actually lower population growth in single-cell organisms. This insight is important for characterizing the fitness of a population, which is useful, for instance, in understanding how bacteria respond to antibiotics.

- [**Antifungals and probiotics may play a key role in the development of treatment for Crohn's disease**](#) [周四, 05 10月 00:05]

Scientists have determined that fungus may play a key role in chronic intestinal inflammation disorders. They found that patients with Crohn's disease tend to have much higher levels of the fungus *Candida tropicalis* compared to their healthy family members. A new review looks at these findings and provides insights into potential new therapeutic approaches using antifungals and probiotics in the treatment of inflammatory bowel diseases (IBD) such as Crohn's disease (CD).

- [**Assessing regional earthquake risk and hazards in the age of exascale**](#) [周四, 05 10月 00:05]

Researchers are building the first-ever end-to-end simulation code to precisely capture the geology and physics of regional earthquakes, and how the shaking impacts buildings.

- [**Female fish like males who sing**](#) [周四, 05 10月 00:05]

Noisier seas seem to hamper fish reproduction. New research shows that noise pollution impedes reproduction in sand and common gobies, both of which are important food sources for juvenile cod.

- [**Resistance training prevents age-related tendon damage**](#) [周四, 05 10月 00:05]

A new study suggests that resistance training may prevent age-related tendon problems, such as ruptures and tendinopathies.

- [**New approach may hold the key to treating antibiotic-resistant bacteria**](#) [周四, 05 10月 00:05]

A new study highlights the therapeutic potential of a simple chemical mimic of host defense peptides (C10OOc12O) to cure bacterial infections both on its own, as well as in combination with otherwise inefficient antibiotics.

- [**NASA's Webb Telescope to witness galactic infancy**](#) [周四, 05 10月 00:04]

Scientists will use NASA's James Webb Space Telescope to study sections of the sky previously observed by NASA's Great Observatories, including the Hubble Space Telescope and the Spitzer Space Telescope, to understand the creation of the universe's first galaxies and stars.

- [**Flights worldwide face increased risk of severe turbulence due to climate change**](#) [周四, 05 10月 00:04]

Flights all around the world could be encountering lots more turbulence in the future, according to the first ever global projections of in-flight bumpiness.

- [**Albatross feces show diet of fishery discards**](#) [周四, 05 10月 00:04]

The first-ever analysis of fish DNA in albatross scat indicates a high level of interaction between seabirds and commercial fisheries. This non-invasive method could be used to assess whether fisheries are complying with discard policies. Extending the analysis to other marine predators could help monitor marine biodiversity and broader marine

ecosystem changes.

- [**Safe motherhood campaign associated with more prenatal visits, birth planning, study finds**](#)

[周四, 05 10月 00:04]

In Tanzania, pregnant women who were exposed to a national safe motherhood campaign designed to get them to visit health facilities for prenatal care and delivery were more likely to create birth plans and to attend more prenatal appointments.

- [**Hurricane exposes and washes away thousands of sea turtle nests**](#)

[周四, 05 10月 00:04]

Marine biologists have released estimates of sea turtle nests lost to Hurricane Irma, finding that 56 percent of green turtle nests and 24 percent of loggerhead nests were lost within Archie Carr National Wildlife Refuge. Both are endangered species. The losses put a damper on what had been a record year for green turtle nesting.

- [**Possible therapeutic target for regulating body weight**](#)

[周三, 04 10月 22:14]

A new study reveals a novel gene involved in maintaining body weight.

- [**Rampant consumption of hippo teeth**](#)

[周三, 04 10月 22:14]

Investigators have examined the case of hippo teeth and revealed discordance in trade volumes declared between importers and exporters -- a scenario that could threaten the survival of the species.

Sunlight and 'right' microbes convert Arctic carbon into carbon dioxide -- ScienceDaily

Nearly half of the organic carbon stored in soil around the world is contained in Arctic permafrost, which has experienced rapid melting, and that organic material could be converted to greenhouse gases that would exacerbate global warming.

When permafrost thaws, microbial consumption of those carbon reserves produces carbon dioxide -- much of which eventually winds up in the atmosphere, but scientists have been unsure of just how the system works.

A new study published this week in *Nature Communications* outlines the mechanisms and points to the importance of both sunlight and the right microbial community as keys to converting permafrost carbon to CO₂. The research was supported by the U.S. National Science Foundation and the Department of Energy.

"We've long known that microbes convert the carbon into CO₂, but previous attempts to replicate the Arctic system in laboratory settings have failed," noted Byron Crump, an Oregon State University biogeochemist and co-author on the study. "As it turns out, that is because the laboratory experiments did not include a very important element -- sunlight.

"When the permafrost melts and stored carbon is released into streams and lakes in the Arctic, it gets exposed to sunlight, which enhances decay by some microbial communities, and destroys the activity for other communities. Different microbes react differently, but there are hundreds, even thousands of different microbes out there and it turns out that the microbes in soils are well-equipped to eat sunlight-exposed permafrost carbon."

The research team from Oregon State and the University of Michigan was able to identify compounds that the microbes prefer using high-resolution chemistry and genetic approaches. They found that sunlight makes permafrost soils tastier for microbes because it converts it to the same kinds of carbon they already like to eat -- the carbon they are adapted to metabolize.

"The carbon we're talking about moves from the soil into rivers and lakes, where it is completely exposed to sunlight," Crump said. "There are no trees and no shade, and in the summer, there are 24 hours a day of sunlight. That makes sunlight potentially more important in converting carbon into CO₂ in the Arctic than in a tropical forest, for example."

As the climate continues to warm, there are interesting ramifications for the Arctic, said Crump, who is a faculty member in OSU's College of Earth, Ocean, and Atmospheric Sciences.

"The long-term forecast for the Arctic tundra ecosystem is for the warming to lead to shrubs and bigger plants replacing the tundra, which will provide shade from the sunlight," Crump said. "That is considered a negative feedback. But there also is a positive feedback, in that seasons are projected to expand. Spring will arrive earlier, and fall will be later, and more water and carbon will enter lakes and streams with more rapid degradation of carbon.

"Which feedback will be stronger? No one can say for sure."

The stakes are high, Crump said. There is more carbon stored in the frozen permafrost than in the atmosphere. It has accumulated over millions of years by plants growing and dying, with a very slow decaying process because of the freezing weather.

"Some of the organic matter is less tasty to microbes than others," Crump said, "but bacterial communities are diverse, so there will be something out there that wants that energy and will use it."

Story Source:

[Materials](#) provided by [Oregon State University](#). *Note: Content may be edited for style and length.*

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Are we at a tipping point with weed control? -- ScienceDaily

Imagine walking the cereal aisle at your favorite grocery store. Are you reading labels? Scanning prices? Thinking about weeds? If you're like most American consumers, weeds probably aren't at the forefront of your mind when buying food. But if farmers could no longer control weeds with existing herbicides, Americans would take notice pretty quickly.

"I think the future of cheap food is strongly related to the availability and effectiveness of existing herbicides," says Adam Davis, ecologist in the Department of Crop Sciences at the University of Illinois and USDA Agricultural Research Service. That is, without working herbicides, food could get a lot more expensive.

Davis and George Frisvold, an economist at the University of Arizona, recently teamed up to consider the possibility that we've reached a critical tipping point in our ability to control agricultural weeds with

the herbicides currently on the market. They published their analysis in the journal *Pest Management Science*.

"I believe if we fully lost chemical control of certain weeds, and if farmers continued with the corn-soybean rotation, they'd be forced to reduce their acreages as they spend more time and money managing weeds. And the cost of the end product, our food, would go up as well," Davis says.

If you're not in the farming industry, you might not be aware that weeds like common waterhemp and Palmer amaranth can reduce corn and soybean yields anywhere from 30 to 80 percent, and that those weeds are developing resistance to available herbicides. Like antibiotic-resistant "superbugs," resistant weeds simply can't be killed by herbicides.

There are lots of herbicides on the market, but they all fall into one of 16 categories describing their mode of action (MOA), or specific target in the plant that the chemical attacks. Because of various regulations and biological realities, a smaller number of herbicide MOAs can be used on any given crop and the suite of weeds that goes along with it. At this point, many weeds are now resistant to multiple MOAs.

"In some areas, we're one or two MOAs away from completely losing chemical control for certain weeds. For example, in east central Illinois, we have common waterhemp that is resistant to five out of the six relevant MOAs in a corn-soybean rotation," he says. "And there are no new herbicide MOAs coming out. There haven't been for 30 years."

The lack of new herbicides is only one factor that led us where we are today. Davis and Frisvold suggest that herbicide susceptibility in weeds should have been viewed as a finite resource all along, like the global oil supply. As resources start to dwindle, prices should theoretically go up as a way to prevent overuse and total resource exhaustion. But unlike oil, herbicide prices have actually decreased over the past 30 to 40 years.

"The assumption is that, in a rational market, people will use less of a dwindling resource because it gets more expensive or they notice a problem. It's not happening for herbicides," Davis says.

The rollout of crops engineered to tolerate herbicides like glyphosate (RoundUp) may have added to the problem. Davis believes their availability led to greater

reliance on chemical solutions to weed control, rather than the diverse mix of weed management practices that used to be the norm. And that meant farmers were spraying herbicide more frequently.

But weeds are wily. Like all organisms, they evolve in response to their environment. With more exposure to a certain environmental pressure (in this case, the herbicide), the more opportunity there is for adaptation. Over time, random genetic mutations allowed some weeds to withstand herbicides. Offspring from those plants grew, survived, and reproduced. And so on, until the majority of plants were left with the mutation.

It sounds dire, but Davis remains optimistic. "I believe there's hope," he says, "but it requires that we take action to diversify weed management now."

Just what would it take to bring us back from the brink of total weed domination? Davis has a lot of ideas, but one of the big ones is something he calls the "middle way," which bridges the gap between the traditional corn-soy rotation with its heavy herbicide inputs and a diversified organic system.

"Right now we have a dominant system where we have

two summer annuals following each other. Because we don't have any change of phenology (timing of development) of the main crop, we have the same weed spectrum in both crops. We never destabilize it. But if you introduce a small winter grain or a forage legume into that system, you begin to make it difficult for summer annual weeds like waterhemp to become dominant. So you can get about 90 percent there just with a good crop rotation.

"Then you build in things like weed suppressive cultivars, banded herbicides, row spacing, cultivation, harvest weed seed control, and all these tactics together can add up to really effective weed management systems. We've shown you can reduce herbicide use by 90 percent in diversified systems and get the same amount of weed control. Same profit, same productivity, but two orders of magnitude reduction in environmental pollution, and a 90 percent reduction in fertilizer use. It's not hard to do for the grower," he says.

The hard part, he notes, is thinking about economic and regulatory incentives that will help growers diversify their management practices. But he hopes the new article will generate discussion, bring awareness to the

issue, and facilitate the stewardship of existing herbicides into the future.

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New nanomaterial can extract hydrogen fuel from seawater: Hybrid material converts more sunlight and can weather seawater's harsh conditions -- ScienceDaily

It's possible to produce hydrogen to power fuel cells by extracting the gas from seawater, but the electricity required to do it makes the process costly. UCF researcher Yang Yang has come up with a new hybrid nanomaterial that harnesses solar energy and uses it to generate hydrogen from seawater more cheaply and efficiently than current materials.

The breakthrough could someday lead to a new source of the clean-burning fuel, ease demand for fossil fuels and boost the economy of Florida, where sunshine and seawater are abundant.

Yang, an assistant professor with joint appointments in the University of Central Florida's NanoScience Technology Center and the Department of Materials Science and Engineering, has been working on solar

hydrogen splitting for nearly 10 years.

It's done using a photocatalyst -- a material that spurs a chemical reaction using energy from light. When he began his research, Yang focused on using solar energy to extract hydrogen from purified water. It's a much more difficult task with seawater; the photocatalysts needed aren't durable enough to handle its biomass and corrosive salt.

As reported in the journal *Energy & Environmental Science*, Yang and his research team have developed a new catalyst that's able to not only harvest a much broader spectrum of light than other materials, but also stand up to the harsh conditions found in seawater.

"We've opened a new window to splitting real water, not just purified water in a lab," Yang said. "This really works well in seawater."

Yang developed a method of fabricating a photocatalyst composed of a hybrid material. Tiny nanocavities were chemically etched onto the surface of an ultrathin film of titanium dioxide, the most common photocatalyst. Those nanocavity indentations were coated with nanoflakes of molybdenum disulfide,

a two-dimensional material with the thickness of a single atom.

Typical catalysts are able to convert only a limited bandwidth of light to energy. With its new material, Yang's team is able to significantly boost the bandwidth of light that can be harvested. By controlling the density of sulfur vacancy within the nanoflakes, they can produce energy from ultraviolet-visible to near-infrared light wavelengths, making it at least twice as efficient as current photocatalysts.

"We can absorb much more solar energy from the light than the conventional material," Yang said.

"Eventually, if it is commercialized, it would be good for Florida's economy. We have a lot of seawater around Florida and a lot of really good sunshine."

In many situations, producing a chemical fuel from solar energy is a better solution than producing electricity from solar panels, he said. That electricity must be used or stored in batteries, which degrade, while hydrogen gas is easily stored and transported.

Fabricating the catalyst is relatively easy and inexpensive. Yang's team is continuing its research by

focusing on the best way to scale up the fabrication, and further improve its performance so it's possible to split hydrogen from wastewater.

Story Source:

[Materials](#) provided by [University of Central Florida](#).

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Ancient humans left Africa to escape drying climate -- ScienceDaily

Humans migrated out of Africa as the climate shifted from wet to very dry about 60,000 years ago, according to research led by a University of Arizona geoscientist.

Genetic research indicates people migrated from Africa into Eurasia between 70,000 and 55,000 years ago. Previous researchers suggested the climate must have been wetter than it is now for people to migrate to Eurasia by crossing the Horn of Africa and the Middle East.

"There's always been a question about whether climate change had any influence on when our species left Africa," said Jessica Tierney, UA associate professor of geosciences. "Our data suggest that when most of our species left Africa, it was dry and not wet in northeast Africa."

Tierney and her colleagues found that around 70,000 years ago, climate in the Horn of Africa shifted from a wet phase called "Green Sahara" to even drier than the

region is now. The region also became colder.

The researchers traced the Horn of Africa's climate 200,000 years into the past by analyzing a core of ocean sediment taken in the western end of the Gulf of Aden. Tierney said before this research there was no record of the climate of northeast Africa back to the time of human migration out of Africa.

"Our data say the migration comes after a big environmental change. Perhaps people left because the environment was deteriorating," she said. "There was a big shift to dry and that could have been a motivating force for migration."

"It's interesting to think about how our ancestors interacted with climate," she said.

The team's paper, "A climatic context for the out-of-Africa migration," is published online in *Geology* this week. Tierney's co-authors are Peter deMenocal of the Lamont-Doherty Earth Observatory in Palisades, New York, and Paul Zander of the UA.

The National Science Foundation and the David and Lucile Packard Foundation funded the research.

Tierney and her colleagues had successfully revealed the Horn of Africa's climate back to 40,000 years ago by studying cores of marine sediment. The team hoped to use the same means to reconstruct the region's climate back to the time 55,000 to 70,000 years ago when our ancestors left Africa.

The first challenge was finding a core from that region with sediments that old. The researchers enlisted the help of the curators of the Lamont-Doherty Core Repository, which has sediment cores from every major ocean and sea. The curators found a core collected off the Horn of Africa in 1965 from the *R/V Robert D. Conrad* that might be suitable.

Co-author deMenocal studied and dated the layers of the 1965 core and found it had sediments going back as far as 200,000 years.

At the UA, Tierney and Paul Zander teased out temperature and rainfall records from the organic matter preserved in the sediment layers. The scientists took samples from the core about every four inches (10 cm), a distance that represented about every 1,600 years.

To construct a long-term temperature record for the Horn of Africa, the researchers analyzed the sediment layers for chemicals called alkenones made by a particular kind of marine algae. The algae change the composition of the alkenones depending on the water temperature. The ratio of the different alkenones indicates the sea surface temperature when the algae were alive and also reflects regional temperatures, Tierney said.

To figure out the region's ancient rainfall patterns from the sediment core, the researchers analyzed the ancient leaf wax that had blown into the ocean from terrestrial plants. Because plants alter the chemical composition of the wax on their leaves depending on how dry or wet the climate is, the leaf wax from the sediment core's layers provides a record of past fluctuations in rainfall.

The analyses showed that the time people migrated out of Africa coincided with a big shift to a much drier and colder climate, Tierney said.

The team's findings are corroborated by research from other investigators who reconstructed past regional climate by using data gathered from a cave formation

in Israel and a sediment core from the eastern Mediterranean. Those findings suggest that it was dry everywhere in northeast Africa, she said.

"Our main point is kind of simple," Tierney said. "We think it was dry when people left Africa and went on to other parts of the world, and that the transition from a Green Sahara to dry was a motivating force for people to leave."

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- [**Sunlight and 'right' microbes convert Arctic carbon into carbon dioxide**](#) [周四, 05 10月 04:38]

A new study outlines the mechanisms and points to the importance of both sunlight and the right microbial community as keys to converting permafrost carbon to CO₂.

- [**New nanomaterial can extract hydrogen fuel from seawater**](#) [周四, 05 10月 04:20]

A new hybrid nanomaterial harvests solar energy and uses it to extract hydrogen from seawater, cheaply and efficiently. Future commercialization could mean a new source of environmentally friendly fuel and less dependence on fossil fuels.

- [**Ancient humans left Africa to escape drying climate**](#) [周四, 05 10月 03:12]

Humans migrated out of Africa as the climate shifted from wet to dry about 60,000 years ago, according to new paleoclimate research. What the northeast Africa climate was like when people migrated from Africa into Eurasia between 70,000 and 55,000 years ago is still uncertain. The new research shows around 70,000 years ago, the Horn of Africa climate shifted from a wet phase called 'Green Sahara' to even drier than the region is now.

- [**The super-Earth that came home for dinner**](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire

solar system to one side. It is a possible "Planet Nine" -- a world perhaps 10 times the mass of Earth and 20 times farther from the sun than Neptune.

- [**Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

- [**Bumblebees shed light on why some individuals are smarter than others**](#) [周四, 05 10月 01:28]

By examining the brains of bees trained to different tasks, the researchers found that the number of connections between nerve cells may hold the answer to questions about individual cognitive differences. Bees with a greater density of nerve connections (known as synaptic complexes) in a specific part of their brains had better memories and learned faster than bees with fewer connections in these areas.

- [**In Iceland stream, possible glimpse of warming future**](#) [周四, 05 10月 01:26]

When a normally cold stream in Iceland was warmed, the make-up of life inside changed as larger organisms thrived while smaller ones struggled. The findings carry implications for life in a warming climate.

- [**Anxiety and depression caused by childhood bullying decline over time**](#) [周四, 05 10月 00:05]

A new study has provided the strongest evidence to date that exposure to bullying causes mental health issues such as anxiety years later.

- [**Flights worldwide face increased risk of severe turbulence due to climate change**](#) [周四, 05 10月 00:04]

Flights all around the world could be encountering lots more turbulence in the future, according to the first ever global projections of in-flight

bumpiness.

- [**Hurricane exposes and washes away thousands of sea turtle nests**](#) [周四, 05 10月 00:04]

Marine biologists have released estimates of sea turtle nests lost to Hurricane Irma, finding that 56 percent of green turtle nests and 24 percent of loggerhead nests were lost within Archie Carr National Wildlife Refuge. Both are endangered species. The losses put a damper on what had been a record year for green turtle nesting.

- [**Nobel Prize in Chemistry 2017: Cryo-electron microscopy**](#) [周三, 04 10月 21:02]

The Nobel Prize in Chemistry 2017 goes to Jacques Dubochet, Joachim Frank, and Richard Henderson "for developing cryo-electron microscopy for the high-resolution structure determination of biomolecules in solution."

- [**'CRISPR-Gold' fixes Duchenne muscular dystrophy mutation in mice**](#) [周三, 04 10月 08:29]

Scientists have engineered a new way to deliver CRISPR-Cas9 gene-editing technology inside cells and have demonstrated in mice that the technology can repair the mutation that causes Duchenne muscular dystrophy, a severe muscle-wasting disease.

- [**Livestock grazing harming giant panda habitat**](#) [周三, 04 10月 00:54]

One third of the giant panda habitat in China's Wanglang National Nature Reserve has been degraded and lost to livestock grazing, a new study finds. Livestock numbers in the park have increased ninefold in the last 15 years.

- [**First evidence of the body's waste system in the human brain discovered**](#) [周二, 03 10月 23:11]

By scanning the brains of healthy volunteers, researchers saw the first, long-sought evidence that our brains may drain some waste out through lymphatic vessels, the body's sewer system. The results further suggest the vessels could act as a pipeline between the brain and the immune

system.

- [**Large volcanic eruptions in Tropics can trigger El Niño events**](#) [周二, 03 10月 23:11]

Explosive volcanic eruptions in the tropics can lead to El Niño events, those notorious warming periods in the Pacific Ocean with dramatic global impacts on the climate, according to a new study.

- [**House sparrow decline linked to air pollution and poor diet**](#) [周二, 03 10月 23:10]

House sparrows are well-adapted to living in urban areas, so it is surprising their numbers have fallen significantly over the past decades. An investigation into this worrying trend finds that sparrows living in urban areas are adversely affected by pollution and poor nutrition. The study also finds the birds suffer more during the breeding season, when resources are needed to produce healthy eggs.

- [**To breed or not to breed? Migratory female butterflies face a monsoonal dilemma**](#) [周二, 03 10月 23:10]

Female butterflies make smart investments, finds a new study.

- [**Astronomers reveal evidence of dynamical dark energy**](#) [周二, 03 10月 23:10]

Astronomers found that the nature of dark energy may not be the cosmological constant introduced by Albert Einstein 100 years ago. This is crucial for the study of dark energy.

- [**Nobel Prize in Physics 2017: Gravitational waves**](#) [周二, 03 10月 21:58]

The Nobel Prize in Physics 2017 goes to Rainer Weiss, Barry C. Barish, and Kip S. Thorne "for decisive contributions to the LIGO detector and the observation of gravitational waves."

- [**Earth's tectonic plates are weaker than once thought**](#) [周二, 03 10月 21:40]

A long-standing question regarding the strength of olivine, the primary

component of Earth's mantle, has now been answered. This study has implications for how we understand how tectonic plates form and move.

- [**An algorithm that explains how ants create and repair trail networks**](#) [周二, 03 10月 21:40]

Observing ants in the trees of a tropical forest, researchers recorded how, without a plan, the ants make and maintain their networks -- and how they repair the network when it is ruptured.

- [**Prehistoric squid was last meal of newborn ichthyosaur 200 million years ago**](#) [周二, 03 10月 21:39]

Scientists have identified the smallest and youngest specimen of *Ichthyosaurus communis* on record and found an additional surprise preserved in its stomach.

- [**Ancient petrified salamander reveals its last meal**](#) [周二, 03 10月 21:39]

A new study on an exceptionally preserved salamander from the Eocene of France reveals that its soft organs are conserved under its skin and bones. Organs preserved in three dimensions include the lung, nerves, gut, and within it, the last meal of the animal, according to a new study.

- [**Monstrous crocodile fossil points to early rise of ancient reptiles**](#) [周二, 03 10月 08:22]

A newly identified prehistoric marine predator has shed light on the origins of the distant relatives of modern crocodiles.

- [**New source of radioactivity from Fukushima disaster**](#) [周二, 03 10月 04:12]

Scientists have found a previously unsuspected place where radioactive material from the Fukushima Dai-ichi nuclear power plant disaster has accumulated -- in sands and brackish groundwater beneath beaches up to 60 miles away. The sands took up and retained radioactive cesium originating from the disaster in 2011 and have been slowly releasing it back to the ocean.

- **[Did life on Earth start due to meteorites splashing into warm little ponds?](#)** [周二, 03 10月 04:12]

Life on Earth began somewhere between 3.7 and 4.5 billion years ago, after meteorites splashed down and leached essential elements into warm little ponds, say scientists. Their calculations suggest that wet and dry cycles bonded basic molecular building blocks in the ponds' nutrient-rich broth into self-replicating RNA molecules that constituted the first genetic code for life on the planet.

- **[Meteorite tells us that Mars had a dense atmosphere 4 billion years ago](#)** [周一, 02 10月 23:42]

Exploration missions have suggested that Mars once had a warm climate, which sustained oceans on its surface. To keep Mars warm requires a dense atmosphere with a sufficient greenhouse effect, while the present-day Mars has a thin atmosphere whose surface pressure is only 0.006 bar, resulting in the cold climate it has today. It has been a big mystery as to when and how Mars lost its dense atmosphere.

- **[ALMA and Rosetta detect Freon-40 in space dashing hopes that molecule may be marker of life](#)** [周一, 02 10月 23:28]

Observations made with the Atacama Large Millimeter/submillimeter Array (ALMA) and ESA's Rosetta mission, have revealed the presence of the organohalogen Freon-40 in gas around both an infant star and a comet. Organohalogens are formed by organic processes on Earth, but this is the first ever detection of them in interstellar space. This discovery suggests that organohalogens may not be as good markers of life as had been hoped, but that they may be significant components of the material from whi...

- **[First look at electrons escaping atoms](#)** [周一, 02 10月 23:27]

Researchers have taken a first step toward controlling electrons' behavior inside matter -- and thus the first step down a long and complicated road that could eventually lead to the ability to create new states of matter at will.

• [**Mini-kidneys grown in lab reveal renal disease secrets**](#) [周一, 02 10月 23:27]

By creating and manipulating mini-kidney organoids that contain a realistic micro-anatomy, researchers can now track the early stages of polycystic kidney disease. The organoids are grown from human stem cells.

• [**Siberian volcanic eruptions caused extinction 250 million years ago, new evidence shows**](#) [周一, 02 10月 22:52]

The Great Permian Extinction, which occurred approximately 250 million years ago, was caused by massive volcanic eruptions that led to significant environmental changes, new evidence shows.

• [**DNA: The next hot material in photonics?**](#) [周一, 02 10月 22:52]

Using DNA from salmon, researchers in South Korea hope to make better biomedical and other photonic devices based on organic thin films.

• [**Animals that play with objects learn how to use them as tools**](#) [周一, 02 10月 22:52]

New Caledonian crows and kea parrots can learn about the usefulness of objects by playing with them -- similar to human baby behavior.

• [**New approach for AIDS: Lock HIV in reservoir cells, to die through apoptosis**](#) [周一, 02 10月 21:34]

With the successful suppression of the AIDS virus (HIV) through medication, the focus turns toward its eradication. Researchers have developed a new compound that is key to the destruction of HIV. When the compound is introduced into infected cells, viral budding is suppressed thereby confining it within the host cells. The cell then dies naturally through apoptosis. This treatment is hoped to lead to the complete recovery from AIDS in the near future.

• [**2017 Nobel Prize in Physiology or Medicine: Molecular mechanisms controlling the circadian**](#)

[rhythm](#) [周一, 02 10月 21:26]

The 2017 Nobel Prize in Physiology or Medicine is being awarded jointly to Jeffrey C. Hall, Michael Rosbash and Michael W. Young for their discoveries of molecular mechanisms controlling the circadian rhythm.

• [Body energy as a power source](#) [周一, 02 10月 20:56]

Smartphones, MP3 players, sports electronics devices such as pulse meters or trackers, medical equipment such as tonometers, pacemakers of the heart, or insulin pumps: An increasing number of electronic companions make daily life easier for us. But as useful these smart helpers may be: Their constant hunger for electricity is a problem. The solution: power supply by means of energy produced by body movements.

• ['Revolutionary' new gesture control tech turns any object into a TV remote](#) [周一, 02 10月 10:53]

Imagine changing the channel of your TV simply by moving your cup of tea, adjusting the volume on a music player by rolling a toy car, or rotating a spatula to pause a cookery video on your tablet. New gesture control technology that can turn everyday objects into remote controls could revolutionize how we interact with televisions, and other screens - ending frustrating searches for remotes that have slipped down the side of sofa cushions.

• [Meet the hominin species that gave us genital herpes](#) [周一, 02 10月 10:53]

New research uses innovative data modeling to predict which species acted as an intermediary between our ancestors and those of chimpanzees to carry HSV2 -- the genital herpes virus -- across the species barrier.

• [Genes that separate humans from fruit flies found](#) [周六, 30 9月 10:59]

Genes which determine animal complexity -- or what makes humans so much more complex than a fruit fly or a sea urchin -- have been

identified for the first time.

- [**Physical abuse and punishment impact children's academic performance**](#) [周六, 30 9月 03:22]

Scientists have found that physical abuse was associated with decreases in children's cognitive performance, while non-abusive forms of physical punishment were independently associated with reduced school engagement and increased peer isolation.

- [**Video gamers have an advantage in learning**](#) [周六, 30 9月 00:51]

Neuropsychologists let video gamers compete against non-gamers in a learning competition. During the test, the video gamers performed significantly better and showed an increased brain activity in the brain areas that are relevant for learning.

- [**Raccoons solve an ancient puzzle, but do they really understand it?**](#) [周六, 30 9月 00:51]

Scientists have been using an ancient Greek fable written by Aesop as inspiration to test whether birds and small children understand cause and effect relationships. A group of scientists have now extended this body of work to study raccoon intelligence. Their research uses the Aesop's Fable paradigm to assess if mammalian carnivores understand the principles of water displacement.

- [**New study changes our view on flying insects**](#) [周五, 29 9月 23:49]

For the first time, researchers are able to prove that there is an optimal speed for certain insects when they fly. At this speed, they are the most efficient and consume the least amount of energy. Corresponding phenomena have previously been demonstrated in birds, but never among insects.

- [**Small collisions make big impact on Mercury's thin atmosphere**](#) [周五, 29 9月 23:29]

Mercury, our smallest planetary neighbor, has very little to call an atmosphere, but it does have a strange weather pattern: morning micro-meteor showers.

- [**A stinging report: Climate change a major threat to bumble bees**](#) [周五, 29 9月 21:33]

New research is helping to explain the link between a changing global climate and a dramatic decline in bumble bee populations worldwide.

- [**Antarctica: Return of the Weddell polynya supports Kiel climate model**](#) [周五, 29 9月 21:33]

Currently, winter has still a firm grip on Antarctica. At this time of the year, the Weddell Sea usually is covered with a thick layer of sea ice. In spite of the icy temperatures in the region, satellite images depict a large ice-free area in the middle of the ice cover.

- [**Electrically heated textiles now possible via UMass Amherst research**](#) [周五, 29 9月 21:33]

Skiers, crossing guards and others who endure frozen fingers in cold weather may look forward to future relief as manufacturers are poised to take advantage of a new technique for creating electrically heated cloth. Researchers have made gloves that keep fingers as warm as the palm of the hand.

- [**Sharks and rays live a lot longer than we thought**](#) [周五, 29 9月 21:32]

Sharks and rays live a lot longer than we thought -- some twice as long as previously estimated.

- [**Solving the mystery of Pluto's giant blades of ice**](#) [周五, 29 9月 03:24]

NASA's New Horizons mission revolutionized our knowledge of Pluto when it flew past that distant world in July 2015. Among its many discoveries were images of strange formations resembling giant knife blades of ice, whose origin had remained a mystery. Now, scientists have turned up a fascinating explanation for this "bladed terrain": the structures are made almost entirely of methane ice, and likely formed as a specific kind of erosion wore away their surfaces.

- [**Farthest active inbound comet yet seen**](#) [周五, 29 9月 03:23]

NASA's Hubble Space Telescope has photographed the farthest active

inbound comet ever seen, at a whopping distance of 1.5 billion miles from the Sun (beyond Saturn's orbit). Slightly warmed by the remote Sun, it has already begun to develop an 80,000-mile-wide fuzzy cloud of dust, called a coma, enveloping a tiny, solid nucleus of frozen gas and dust. These observations represent the earliest signs of activity ever seen from a comet entering the solar system's planetary zone for the first time.

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Health News

Top stories featured on ScienceDaily's Health & Medicine, Mind & Brain, and Living Well sections.

- [**Problems with senses may predict older adults' overall health, ability to function**](#) [周四, 05 10月 02:27]

Researchers have mainly focused on what happens after people lose one or two of their senses. However, we know that losing more than two senses occurs frequently for older adults. Until now, no studies have examined how losing multiple senses affects older adults. To learn more, a team of researchers designed a study to focus on just that.

- [**Test reveals antibiotic-resistant bacteria in a half hour**](#) [周四, 05 10月 02:26]

A new test can identify whether bacteria are resistant to antibiotics in a mere half hour, giving medical professionals a new tool for fighting infections and superbug bacteria.

- [**Mental training changes brain structure and reduces social stress**](#) [周四, 05 10月 02:26]

Meditation can have positive effects on our health and well-being. However it has been unclear which mental practice has which effect, and what the underlying processes are. Researchers have discovered that different trainings affect either our attention or our social competencies and modify different brain networks. One mental technique was able to reduce the stress hormone cortisol. These results may influence the adaptation of mental trainings in clinics and education.

- [**Light-activated nanoparticles can supercharge current antibiotics**](#) [周四, 05 10月 02:26]

Light-activated nanoparticles, also known as quantum dots, can provide a crucial boost in effectiveness for antibiotic treatments used to combat drug-resistant superbugs such as E. coli and Salmonella, new research shows.

- [**Dutch children bereaved by domestic homicides 'more burdened than expected'**](#) [周四, 05 10月 02:26]

The majority of Dutch children who lost a parent to intimate partner homicide had already experienced violence, often without professional support.

- [**Advanced heart failure reversed in an animal model**](#) [周四, 05 10月 02:01]

Researchers have discovered a previously unrecognized healing capacity of the heart. In a mouse model, they were able to reverse severe heart failure by silencing the activity of Hippo, a signaling pathway that can prevent the regeneration of heart muscle.

- [**Accurately transcribing DNA overrides DNA repair, researchers find**](#) [周四, 05 10月 01:36]

Researchers found that in the model organism E. coli, the fidelity of transcribing DNA comes at the expense of DNA repair.

- [**Cell stress response sheds light on treating inflammation-related cancer, aging**](#) [周四, 05 10月 01:35]

Stress -- defined broadly -- can have a profoundly deleterious effect on the human body. Even individual cells have their own way of dealing with environmental strains such as ultraviolet radiation from the sun or germs. One response to stress -- called senescence -- can trigger cells to stop dividing in cases of cancer and aging. This may hold promise for treating inflammation-related disorders.

- [**BRCA1: Mystery of breast cancer risk gene solved, 20 years after its discovery**](#) [周四, 05 10月 01:35]

More than 20 years after scientists revealed that mutations in the BRCA1 gene predispose women to breast cancer, scientists have

pinpointed the molecular mechanism that allows those mutations to wreak their havoc.

• [**A tubular structure to stop cell growth**](#) [周四, 05 10月 01:35]

TORC1 is an enzyme complex that controls the normal growth of our cells; but, when too active, it can promote diseases such as cancer. A new study describes how sugar regulates the activity of TORC1, through a surprising mechanism. In the absence of sugar, TORC1s assemble into a tubular structure, rendering them inactive and thus cell growth stops.

• [**High BMI and blood pressure create a heavy heart**](#) [周四, 05 10月 01:32]

New research uses UK Biobank data to reveal -- for the first time -- the direct damage that carrying extra weight has on the heart's weight and size, and implicates a range of other modifiable risk factors including high blood pressure.

• [**Antidote to synthetic cannabis 'Spice' intoxication could be found in slimming drug**](#) [周四, 05 10月 01:25]

Early research has potentially found an antidote that can rapidly stop the intoxicating effects of cannabis and synthetic cannabinoids.

• [**New fundamental insight into the battle against bacteria**](#) [周四, 05 10月 01:25]

The intestinal bacterium *E. coli* can adapt to changes in its surroundings. Scientists have discovered how the H-NS protein makes this possible. This new knowledge can be an important starting point in combating bacteria and diseases such as peritonitis.

• [**Zika-affected pregnancies from near and far: Lessons learned**](#) [周四, 05 10月 00:49]

The multidisciplinary team at Children's National Health System has consulted on 90 dyads (mothers and their Zika-affected fetuses/infants). The lessons learned about when and how these women were infected and how their offspring were affected by Zika may be instructive to institutions.

• [**Study pokes holes in fetal alcohol hypothesis**](#) [周四, 05 10月 00:23]

A new study appears to challenge the theory that cells in the brain's immune system are the culprit behind the neurological damage that occurs in children exposed to alcohol while in the womb.

• [**Why Zika became more dangerous: Discovery offers clues**](#) [周四, 05 10月 00:22]

Virus with a certain sugar in its protein envelope more readily passes to the brain in infected mice, causing inflammation and death.

• [**Anxiety and depression caused by childhood bullying decline over time**](#) [周四, 05 10月 00:05]

A new study has provided the strongest evidence to date that exposure to bullying causes mental health issues such as anxiety years later.

• [**Research rethinks the evolutionary importance of variability in a population**](#) [周四, 05 10月 00:05]

It's been long thought that variability within a population is key to population's growth and survival but new research questions that assumption. Researchers found that variability can actually lower population growth in single-cell organisms. This insight is important for characterizing the fitness of a population, which is useful, for instance, in understanding how bacteria respond to antibiotics.

• [**Resistance training prevents age-related tendon damage**](#) [周四, 05 10月 00:05]

A new study suggests that resistance training may prevent age-related tendon problems, such as ruptures and tendinopathies.

• [**New approach may hold the key to treating antibiotic-resistant bacteria**](#) [周四, 05 10月 00:05]

A new study highlights the therapeutic potential of a simple chemical mimic of host defense peptides (C10OOc12O) to cure bacterial infections both on its own, as well as in combination with otherwise inefficient antibiotics.

- [**Safe motherhood campaign associated with more prenatal visits, birth planning, study finds**](#)

[周四, 05 10月 00:04]

In Tanzania, pregnant women who were exposed to a national safe motherhood campaign designed to get them to visit health facilities for prenatal care and delivery were more likely to create birth plans and to attend more prenatal appointments.

- [**Possible therapeutic target for regulating body weight**](#)

[周三, 04 10月 22:14]

A new study reveals a novel gene involved in maintaining body weight.

- [**Healing molecule discovery could reduce limb amputations for diabetes patients**](#)

[周三, 04 10月 22:14]

Scientists have discovered new insights into a molecule that is part of the body's tissue repair system, in a finding that could help treat non-healing wounds and injuries, such as diabetic foot.

- [**How disliked classes affect college student cheating**](#)

[周三, 04 10月 22:14]

One of the tactics that discourages student cheating may not work as well in courses that college students particularly dislike, a new study has found.

- [**Doing homework is associated with change in students' personality**](#)

[周三, 04 10月 22:07]

Homework may have a positive influence on students' conscientiousness. Students who do more homework than their peers show positive changes in conscientiousness, according to new research. Thus, schools may be doing more than contributing to students' learning, but they may also be effecting changes of their students' personality.

- [**Smart pump: small but powerful**](#)

[周三, 04 10月 21:53]

Particulate matter harms the heart and lungs. In the future, a smartphone with an inbuilt gas sensor could be used to warn of heavy exposure. To

help the sensor respond quickly and provide accurate measurements, researchers have developed a powerful micro diaphragm pump for delivering ambient air to the sensor.

- **[Membrane for islets of Langerhans transplantations](#)** [周三, 04 10月 21:53]

Researchers have developed a membrane with which individual islets of Langerhans – insulin-producing cell clusters – can be encapsulated. The idea behind the system is that these islets could eventually be safely transplanted to cure type 1 diabetes patients.

- **[Women use gossip to compete for a man's attention](#)** [周三, 04 10月 21:50]

Although both men and women gossip, women may be more likely to use gossiping and rumour-mongering as tactics to badmouth a potential rival who is competing for a man's attention. Women also gossip more about other women's looks, whereas men talk about cues to resource holding (e.g., wealth) and the athleticism of their competitors.

- **[Too little is known about wildfire smoke](#)** [周三, 04 10月 21:29]

How do fire-suppression chemicals and pesticides affect wildfire smoke and the health of those who breathe it? New research has discovered that this question cannot be answered based on current scientific evidence, say investigators.

- **[Excessive social interaction reduced collective response](#)** [周三, 04 10月 21:29]

Researchers have uncovered the detrimental effects of excessive interaction and network connections in a wide range of living and engineered systems.

- **[Gene therapy shows promise for reversing blindness](#)** [周三, 04 10月 20:49]

Most causes of untreatable blindness occur due to loss of the millions of light sensitive photoreceptor cells that line the retina, similar to the pixels in a digital camera. In a laboratory study, researchers have shown

how it might be possible to reverse blindness using gene therapy to reprogram cells at the back of the eye to become light sensitive

- [**One in four people leave work a year after a heart attack**](#) [周三, 04 10月 20:49]

One in four people in Denmark who suffer a heart attack leave their jobs within a year of returning to work. Heart attack survivors with diabetes, heart failure, depression and lower educational and income levels were the most likely to not be working a year after their heart attack.

- [**Avoiding meat during pregnancy linked with later substance misuse by children**](#) [周三, 04 10月 20:49]

Lower meat consumption by women during pregnancy was linked with an increased risk of substance misuse by their children during adolescence.

- [**Intense strength training benefits postmenopausal women with low bone mass**](#) [周三, 04 10月 20:49]

Exercise is known to be beneficial to bone health but there is reluctance to use high intensity programs in older women with low bone mass because of the risk of fracture or other injury.

- [**Night shift work linked to an increased risk of obesity**](#) [周三, 04 10月 20:49]

In an analysis of 28 published studies, night shift work was associated with a 29 percent increased risk of becoming obese or overweight.

- [**Virtual reality videos may help alleviate pre-surgical anxiety in children**](#) [周三, 04 10月 20:49]

A virtual reality tour of the operating room prior to anesthesia helped reduce preoperative anxiety in children scheduled to undergo surgery.

- [**Febuxostat prevents gout flares in recent clinical trial**](#) [周三, 04 10月 20:49]

The drug febuxostat reduced gout flares in a double-blind, placebo-controlled study of 314 adults with early gout.

- **[Brain damage caused by Zika exposure in utero can be detected by both fetal MRI and ultrasound](#)** [周三, 04 10月 20:49]

Magnetic resonance imaging and ultrasound provide complementary data needed to assess ongoing changes to the brains of fetuses exposed to Zika in utero.

- **[Black tea may help with weight loss, too](#)** [周三, 04 10月 20:49]

Black tea may promote weight loss and other health benefits by changing bacteria in the gut, research indicates for the first time.

- **[New insights into heritability of HIV infection severity](#)** [周三, 04 10月 08:29]

Using a population of HIV-1 infected individuals (the 2014 Swiss HIV Cohort Study data), an international research team of 17 institutions has now examined all aspects of HIV virulence, with a particular focus on how it ravages the human immune system.

- **[Vitamin D protects against severe asthma attacks](#)** [周三, 04 10月 08:29]

Taking oral vitamin D supplements in addition to standard asthma medication could halve the risk of asthma attacks requiring hospital attendance, according to new research.

- **[Monitoring microbes to keep Marsonauts healthy](#)** [周三, 04 10月 08:29]

To guarantee a safe environment for astronauts on long-duration space missions such as a journey to Mars, it is important to monitor how microorganisms such as bacteria adapt to the confined conditions onboard spacecraft, according to a study.

- **[Got a picky eater? How 'nature and nurture' may be influencing eating behavior in young children](#)** [周三, 04 10月 08:29]

Scientists have been working to define characteristics of picky eaters

and to identify possible correlations of the behavior. In a new study, they wanted to see if chemosensory genes might have a possible relationship to picky eating behavior in young children. They found that certain genes related to taste perception may be behind some of these picky eating habits.

- [**'CRISPR-Gold' fixes Duchenne muscular dystrophy mutation in mice**](#) [周三, 04 10月 08:29]

Scientists have engineered a new way to deliver CRISPR-Cas9 gene-editing technology inside cells and have demonstrated in mice that the technology can repair the mutation that causes Duchenne muscular dystrophy, a severe muscle-wasting disease.

- [**Do mothers favor daughters and fathers favor sons?**](#) [周三, 04 10月 08:29]

Mothers are more likely to spend money on daughters and fathers are more likely to spend on sons -- despite the fact that parents think they are spending equally -- new research indicates.

- [**Neighborhood affluence linked to positive birth outcomes**](#) [周三, 04 10月 02:48]

It's not uncommon for new parents to relocate in search of neighborhoods with better schools, safer streets and healthier, more kid-friendly activities. But a new study has found that living in such neighborhoods before a baby is born protects against the risks of poor birth outcomes.

- [**Two agents deliver knockout punches to Ewing sarcoma**](#) [周三, 04 10月 02:45]

When combined with an already FDA-approved chemotherapy, a novel agent appears to halt the ability of Ewing sarcoma to grow and progress.

- [**Pesticide use during pregnancy linked to increased risk of childhood brain tumors**](#) [周三, 04 10月 02:45]

Previous epidemiological studies have suggested that exposure to pesticides during pregnancy may have a possible role in the

development of childhood brain tumors.

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [**New nanomaterial can extract hydrogen fuel from seawater**](#) [周四, 05 10月 04:20]

A new hybrid nanomaterial harvests solar energy and uses it to extract hydrogen from seawater, cheaply and efficiently. Future commercialization could mean a new source of environmentally friendly fuel and less dependence on fossil fuels.

- [**The super-Earth that came home for dinner**](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire solar system to one side. It is a possible "Planet Nine" -- a world perhaps 10 times the mass of Earth and 20 times farther from the sun than Neptune.

- [**Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

- [**Light-activated nanoparticles can supercharge current antibiotics**](#) [周四, 05 10月 02:26]

Light-activated nanoparticles, also known as quantum dots, can provide

a crucial boost in effectiveness for antibiotic treatments used to combat drug-resistant superbugs such as E. coli and Salmonella, new research shows.

- [**A new way to produce clean hydrogen fuel from water using sunlight**](#) [周四, 05 10月 02:01]

Researchers combined graphitic carbon nitride and black phosphorous to make a new metal-free composite photocatalyst capable of producing hydrogen from water. The photocatalyst featured good photocatalytic production of hydrogen, even when powered by low-energy near infrared light.

- [**Surface helium detonation spells end for white dwarf**](#) [周四, 05 10月 02:01]

Researchers have found evidence that the brightest stellar explosions in our Universe could be triggered by helium nuclear detonation near the surface of a white dwarf star.

- [**Nanoscale islands dot light-driven catalyst**](#) [周四, 05 10月 00:22]

Scientists have combined aluminum nanoparticles and smaller metal particles to create a versatile nanostructure that could lead to new applications for plasmonics. The technique allows for customizable surface chemistry and reactivity in one material.

- [**NASA's Webb Telescope to witness galactic infancy**](#) [周四, 05 10月 00:04]

Scientists will use NASA's James Webb Space Telescope to study sections of the sky previously observed by NASA's Great Observatories, including the Hubble Space Telescope and the Spitzer Space Telescope, to understand the creation of the universe's first galaxies and stars.

- [**Flights worldwide face increased risk of severe turbulence due to climate change**](#) [周四, 05 10月 00:04]

Flights all around the world could be encountering lots more turbulence in the future, according to the first ever global projections of in-flight bumpiness.

[**Tungsten offers nano-interconnects a path of least resistance**](#) [周三, 04 10月 22:14]

As microchips become smaller, the shrinking size of their copper interconnects leads to increased electrical resistivity at the nanoscale. Finding a solution to this technical bottleneck is a problem for the semiconductor industry; one possibility involves reducing the resistivity size effect by altering the crystalline orientation of interconnect materials. Researchers conducted electron transport measurements in epitaxial single-crystal layers of tungsten as one potential solution.

[**Smart pump: small but powerful**](#) [周三, 04 10月 21:53]

Particulate matter harms the heart and lungs. In the future, a smartphone with an inbuilt gas sensor could be used to warn of heavy exposure. To help the sensor respond quickly and provide accurate measurements, researchers have developed a powerful micro diaphragm pump for delivering ambient air to the sensor.

[**What is STEM education?**](#) [周三, 04 10月 21:51]

Everyone needs a good teacher -- including teachers. Two new studies show how digging deeper into what STEM education means and strategically designing online classrooms can enhance teaching science, technology, engineering, and math.

[**Nobel Prize in Chemistry 2017: Cryo-electron microscopy**](#) [周三, 04 10月 21:02]

The Nobel Prize in Chemistry 2017 goes to Jacques Dubochet, Joachim Frank, and Richard Henderson "for developing cryo-electron microscopy for the high-resolution structure determination of biomolecules in solution."

[**Two intelligent vehicles are better than one**](#) [周三, 04 10月 20:49]

Researchers are working to improve the reliability and fault tolerance of intelligent vehicle systems by combining the data they gather with that from other vehicles. This can, for example, extend the field of view of a car that is behind another car. Using simulators and road tests, the team has developed a flexible software framework for networking intelligent

vehicles so that they can interact.

- [**Monitoring microbes to keep Marsonauts healthy**](#) [周三, 04 10月 08:29]

To guarantee a safe environment for astronauts on long-duration space missions such as a journey to Mars, it is important to monitor how microorganisms such as bacteria adapt to the confined conditions onboard spacecraft, according to a study.

- [**Surrounded by potential: New science in converting biomass**](#) [周三, 04 10月 08:29]

To take full advantage of biomass, lignin needs to be processed into usable components along with the plant cellulose. Currently, that process requires an acid plus high heat, or pyrolysis -- treating with high heat in the absence of oxygen. Besides being energy-consuming processing methods, the results are less than optimal. Scientists are now working to develop a method to deconstruct lignin in a way that is economically feasible and into stable, readily useful components.

- [**Visualizing life in silico**](#) [周三, 04 10月 02:45]

Programming a molecular biology experiment can be similar to playing Sudoku; both are simple if you're working with only a few molecules or a small grid, but explode in complexity as they grow. Now, researchers have made it far easier for molecular biologists to make complex biological models.

- [**New cardiac catheter combines light and ultrasound to measure plaques**](#) [周三, 04 10月 02:45]

Biomedical engineers have combined intravascular ultrasound with fluorescence lifetime imaging in a single catheter probe that can image the tiny arteries of a living heart. The new catheter can simultaneously retrieve structural and biochemical information about arterial plaque that could more reliably predict heart attacks.

- [**Designer biosensor can detect antibiotic production by microbes**](#) [周三, 04 10月 02:45]

Researchers from North Carolina State University have engineered designer biosensors that can detect antibiotic molecules of interest. The biosensors are a first step toward creating antibiotic-producing 'factories' within microbes such as E. coli.

- [**New portable blood analyzer could improve anemia detection worldwide**](#) [周三, 04 10月 01:32]

To reduce the burden of anemia, health officials need a better picture of the disease's global impact, an understanding made viable by a portable and affordable way to analyze blood. Researchers have now developed a device smaller than a toaster that can detect the level of hemoglobin in whole blood samples using optical absorbance.

- [**Heat-tempered magnesium alloy a strong choice for implants**](#) [周三, 04 10月 00:51]

Through in vivo testing, researchers have found that T-5 heat treatment of magnesium alloy confers titanium-like strength and resistance to degradation and resorption.

- [**Mold contamination in sea salts could potentially spoil food**](#) [周三, 04 10月 00:51]

Research from mycologists reveals varying levels of mold contamination in commercial sea salts. Among those molds were important food spoilage molds like Aspergillus and Penicillium, and even some notorious producers of mycotoxins.

- [**Free-flowing aerosol particles identified using holograms, lasers**](#) [周三, 04 10月 00:50]

Holographic images of free-flowing air particles may help climate change and biological weapons watchdogs better monitor the atmosphere, according to a recent study. The images are made by two overlapping lasers that could be mounted on an unmanned aircraft to monitor the atmosphere.

- [**New efficient catalyst for key step in artificial photosynthesis**](#) [周二, 03 10月 23:11]

Chemists have designed a new 'single-site' catalyst that speeds up the rate of a key step in artificial photosynthesis. It's the first to match the efficiency of the catalytic sites that drive this reaction in nature and could greatly improve the potential for making efficient solar-to-fuel conversion devices.

- [**Studies of 'amorphous ice' reveal hidden order in glass**](#) [周二, 03 10月 23:11]

'Amorphous ice' forms when water is rapidly cooled to form a disordered glass-like solid rather than the common form of ice, which is crystalline. Now researchers have found a surprising degree of order in this supposedly amorphous material.

- [**Breaking the rules: Heavy chemical elements alter theory of quantum mechanics**](#) [周二, 03 10月 23:11]

The theory of quantum mechanics does not adequately explain how the heaviest and rarest elements found at the end of the table function, say scientists. Instead, another well-known scientific theory -- Albert Einstein's famous Theory of Relativity -- helps govern the behavior of the last 21 elements of the Periodic Table.

- [**New method to quantify life cycle land use of natural gas**](#) [周二, 03 10月 23:10]

A case study of the Barnett Shale region in Texas, where hydraulic fracturing was first implemented, for the first time provides quantifiable information on the life cycle land use of generating electricity from natural gas based on physical measurements instead of using assumptions and averages that were previously used for evaluation.

- [**Extreme magnetic storm: Red aurora over Kyoto in 1770**](#) [周二, 03 10月 23:10]

Researchers used historic accounts of a rare red aurora over Kyoto, Japan, in the 18th century to support calculations of the strength of the associated magnetic storm. The September 1770 storm could be 3-10% stronger than the September 1859 storm, the greatest storm in the past 200 years. The research provides insights that could assist preparation

for an unlikely, but possible, future intense magnetic storm.

- [**Astronomers reveal evidence of dynamical dark energy**](#) [周二, 03 10月 23:10]

Astronomers found that the nature of dark energy may not be the cosmological constant introduced by Albert Einstein 100 years ago. This is crucial for the study of dark energy.

- [**Nobel Prize in Physics 2017: Gravitational waves**](#) [周二, 03 10月 21:58]

The Nobel Prize in Physics 2017 goes to Rainer Weiss, Barry C. Barish, and Kip S. Thorne "for decisive contributions to the LIGO detector and the observation of gravitational waves."

- [**3D microscopy gives more accurate cancer diagnosis**](#) [周二, 03 10月 21:48]

A novel microscopy technique to examine tumor tissue in three dimensions can more accurately diagnose cancer than current two-dimensional methods, according to a study.

- [**Ultra-energy-efficient magnetic memory by controlling the shapes of atoms**](#) [周二, 03 10月 21:46]

A new principle has been discovered to realize ultra-energy-efficient magnetic memory by electrically controlling the shapes of atoms.

- [**European sea bass show chronic impairment after exposure to crude oil**](#) [周二, 03 10月 21:46]

We may be underestimating the long-term impact of oil spills on fish, particularly their ability to tolerate low oxygen environments, according to research.

- [**Novel platform for investigating quiescence in dormancy-capable cancer cells**](#) [周二, 03 10月 21:40]

A team of researchers has reported a novel encapsulation approach to identify dormant cancer cells and maintain them in a quiescent state.

- [**An algorithm that explains how ants create and repair trail networks**](#) [周二, 03 10月 21:40]

Observing ants in the trees of a tropical forest, researchers recorded how, without a plan, the ants make and maintain their networks -- and how they repair the network when it is ruptured.

- [**Genre may impact cognitive training using video games**](#) [周二, 03 10月 21:39]

Video games are quickly becoming a hot topic in cognitive training. Many see them as a potential tool to help patients improve their performance and memory, yet little is known about how different types of video games may affect white matter in the brain and cognition.

- [**Scientists pinpoint the singularity for quantum computers**](#) [周二, 03 10月 21:39]

Super-powerful quantum computers, which scientists and engineers across the world are racing to build, need to be even more powerful than previously thought before they can beat today's ordinary PCs, researchers have discovered.

- [**New source of radioactivity from Fukushima disaster**](#) [周二, 03 10月 04:12]

Scientists have found a previously unsuspected place where radioactive material from the Fukushima Dai-ichi nuclear power plant disaster has accumulated -- in sands and brackish groundwater beneath beaches up to 60 miles away. The sands took up and retained radioactive cesium originating from the disaster in 2011 and have been slowly releasing it back to the ocean.

- [**Fast-moving magnetic particles could enable new form of data storage**](#) [周二, 03 10月 02:50]

Researchers have shown that virtual particles known as skyrmions, discovered just a few years ago, hold promise as a new way of storing data -- one that could overcome fundamental limits that might otherwise be signaling the end of 'Moore's Law.'

- [**Solar observer created key sunspot record**](#) [周二, 03 10月 02:49]

Few people have heard of Hisako Koyama, but the dedicated female solar observer, born in Tokyo in 1916, created one of the most important sunspot records of the past 400 years.

- [**Meteorite tells us that Mars had a dense atmosphere 4 billion years ago**](#) [周一, 02 10月 23:42]

Exploration missions have suggested that Mars once had a warm climate, which sustained oceans on its surface. To keep Mars warm requires a dense atmosphere with a sufficient greenhouse effect, while the present-day Mars has a thin atmosphere whose surface pressure is only 0.006 bar, resulting in the cold climate it has today. It has been a big mystery as to when and how Mars lost its dense atmosphere.

- [**ALMA and Rosetta detect Freon-40 in space dashing hopes that molecule may be marker of life**](#) [周一, 02 10月 23:28]

Observations made with the Atacama Large Millimeter/submillimeter Array (ALMA) and ESA's Rosetta mission, have revealed the presence of the organohalogen Freon-40 in gas around both an infant star and a comet. Organohalogens are formed by organic processes on Earth, but this is the first ever detection of them in interstellar space. This discovery suggests that organohalogens may not be as good markers of life as had been hoped, but that they may be significant components of the material from whi...

- [**Glowing news for organic materials**](#) [周一, 02 10月 23:28]

Researchers have developed the world's first glow-in-the-dark materials based on organic molecules. The materials eliminate the expensive metals and high-temperature processing needed by current inorganic glow-in-the-dark materials. In addition to reducing cost, organic materials are likely to enable improved flexibility, transparency, and bio-compatibility, opening the door for a variety of new applications.

- [**First look at electrons escaping atoms**](#) [周一, 02 10月 23:27]

Researchers have taken a first step toward controlling electrons' behavior inside matter -- and thus the first step down a long and complicated road that could eventually lead to the ability to create new states of matter at will.

- [**New 'building material' points toward quantum computers**](#) [周一, 02 10月 23:27]

It is possible to produce 'Majorana particles' in a new 'building material,' new research indicates. The study paves the road for new types of experiments -- and at the same time represents an important contribution to the construction of the information circuits of tomorrow.

- [**Superconductivity found in thin films of titanium oxide**](#) [周一, 02 10月 23:27]

Many of us are familiar with titanium dioxide, a whitener commonly used in sunscreens and paints such as the white lines seen on tennis courts. Less well known are other higher titanium oxides -- those with a higher number of titanium and oxygen atoms than TiO -- that are now the subject of intensifying research due to their potential use in next-generation electronic devices.

- [**International competition benchmarks metagenomics software**](#) [周一, 02 10月 23:23]

Communities of bacteria live everywhere: inside our bodies, on our bodies and all around us. The human gut alone contains hundreds of species of bacteria that help digest food and provide nutrients, but can also make us sick. Scientists use metagenomics -- the study of DNA from an environmental sample -- to study these bacterial communities.

- [**Tiny aquariums put nanoparticle self-assembly on display**](#) [周一, 02 10月 23:23]

Seeing is believing when it comes to nanoparticle self-assembly. A team of engineers is observing the interactions of colloidal gold nanoparticles inside tiny aquariumlike sample containers to gain more control over the self-assembly process of engineered materials.

• [**Tracking live brain activity with the new NeuBtracker open-source microscope**](#) [周一, 02 10月 22:52]

A team of scientists has successfully developed a new type of microscope. The so-called NeuBtracker is an open source microscope that allows to observe neuronal activities of zebrafish without altering their behavior. This is opening up completely new perspectives for science, because now it will be possible to track natural behavior while simultaneously imaging neuronal activity in the brain.

• [**Asphalt helps lithium batteries charge faster**](#) [周一, 02 10月 22:52]

A touch of asphalt may be the secret to high-capacity lithium batteries that charge up to 20 times faster than commercial lithium-ion batteries, according to scientists.

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [**Sunlight and 'right' microbes convert Arctic carbon into carbon dioxide**](#) [周四, 05 10月 04:38]

A new study outlines the mechanisms and points to the importance of both sunlight and the right microbial community as keys to converting permafrost carbon to CO₂.

- [**Climate change, population growth may lead to open ocean aquaculture**](#) [周四, 05 10月 04:37]

A new analysis suggests that open-ocean aquaculture for three species of finfish is a viable option for industry expansion under most climate change scenarios -- an option that may provide a new source of protein for the world's growing population.

- [**Are we at a tipping point with weed control?**](#) [周四, 05 10月 04:20]

Imagine walking the cereal aisle at your favorite grocery store. Are you reading labels? Scanning prices? Thinking about weeds? If you're like most American consumers, weeds probably aren't at the forefront of your mind when buying food. But if farmers could no longer control weeds with existing herbicides, Americans would take notice pretty quickly.

- [**New nanomaterial can extract hydrogen fuel from seawater**](#) [周四, 05 10月 04:20]

A new hybrid nanomaterial harvests solar energy and uses it to extract hydrogen from seawater, cheaply and efficiently. Future commercialization could mean a new source of environmentally friendly

fuel and less dependence on fossil fuels.

- [**Ancient humans left Africa to escape drying climate**](#) [周四, 05 10月 03:12]

Humans migrated out of Africa as the climate shifted from wet to dry about 60,000 years ago, according to new paleoclimate research. What the northeast Africa climate was like when people migrated from Africa into Eurasia between 70,000 and 55,000 years ago is still uncertain. The new research shows around 70,000 years ago, the Horn of Africa climate shifted from a wet phase called 'Green Sahara' to even drier than the region is now.

- [**Ornamented artifact may indicate long-distance exchange between Mesolithic communities**](#) [周四, 05 10月 02:26]

An ornamented bâton percé found in Central Poland may provide evidence of exchange between Mesolithic communities, according to a study.

- [**Light-activated nanoparticles can supercharge current antibiotics**](#) [周四, 05 10月 02:26]

Light-activated nanoparticles, also known as quantum dots, can provide a crucial boost in effectiveness for antibiotic treatments used to combat drug-resistant superbugs such as E. coli and Salmonella, new research shows.

- [**Meet Madagascar's oldest animal lineage, a whirligig beetle with 206-million-year-old origins**](#) [周四, 05 10月 02:01]

A new study suggests the Malagasy striped whirligig beetle *Heterogyrus milloti* boasts a genetic pedigree stretching back to the late Triassic period.

- [**Win-win for spotted owls and forest management**](#) [周四, 05 10月 02:01]

Remote sensing technology has detected what could be a win for both

spotted owls and forestry management, according to a study.

- [**A new way to produce clean hydrogen fuel from water using sunlight**](#) [周四, 05 10月 02:01]

Researchers combined graphitic carbon nitride and black phosphorous to make a new metal-free composite photocatalyst capable of producing hydrogen from water. The photocatalyst featured good photocatalytic production of hydrogen, even when powered by low-energy near infrared light.

- [**Accurately transcribing DNA overrides DNA repair, researchers find**](#) [周四, 05 10月 01:36]

Researchers found that in the model organism E. coli, the fidelity of transcribing DNA comes at the expense of DNA repair.

- [**Cell stress response sheds light on treating inflammation-related cancer, aging**](#) [周四, 05 10月 01:35]

Stress -- defined broadly -- can have a profoundly deleterious effect on the human body. Even individual cells have their own way of dealing with environmental strains such as ultraviolet radiation from the sun or germs. One response to stress -- called senescence -- can trigger cells to stop dividing in cases of cancer and aging. This may hold promise for treating inflammation-related disorders.

- [**In warmer climates, Greenlandic deltas have grown**](#) [周四, 05 10月 01:35]

Unlike most other deltas worldwide, Greenland's are growing -- a trend with major consequences for both fishing and tourism.

- [**A tubular structure to stop cell growth**](#) [周四, 05 10月 01:35]

TORC1 is an enzyme complex that controls the normal growth of our cells; but, when too active, it can promote diseases such as cancer. A new study describes how sugar regulates the activity of TORC1, through a surprising mechanism. In the absence of sugar, TORC1s assemble into a tubular structure, rendering them inactive and thus cell growth stops.

- [**Fish shrinking as ocean temperatures rise**](#) [周四, 05 10月

01:35]

One of the most economically important fish is shrinking in body weight, length and overall physical size as ocean temperatures rise, according to new research by LSU Boyd Professor R. Eugene Turner published today. The average body size of Menhaden -- a small, silver fish -- caught off the coasts from Maine to Texas -- has shrunk by about 15 percent over the past 65 years.

[**Bumblebees shed light on why some individuals are smarter than others**](#) [周四, 05 10月 01:28]

By examining the brains of bees trained to different tasks, the researchers found that the number of connections between nerve cells may hold the answer to questions about individual cognitive differences. Bees with a greater density of nerve connections (known as synaptic complexes) in a specific part of their brains had better memories and learned faster than bees with fewer connections in these areas.

[**In Iceland stream, possible glimpse of warming future**](#) [周四, 05 10月 01:26]

When a normally cold stream in Iceland was warmed, the make-up of life inside changed as larger organisms thrived while smaller ones struggled. The findings carry implications for life in a warming climate.

[**New fundamental insight into the battle against bacteria**](#) [周四, 05 10月 01:25]

The intestinal bacterium *E. coli* can adapt to changes in its surroundings. Scientists have discovered how the H-NS protein makes this possible. This new knowledge can be an important starting point in combating bacteria and diseases such as peritonitis.

[**The vitamin ergothioneine: an antioxidant for oxygen-free areas?**](#) [周四, 05 10月 00:05]

Chemists have been able to show for the first time that anaerobic bacteria can produce the vitamin ergothioneine in the absence of oxygen. This suggests that bacteria were forming this compound even before there was oxygen in the Earth's atmosphere. The vitamin's

function therefore remains a mystery, as it was previously ascribed a role in oxygen-dependent processes.

- [**Research rethinks the evolutionary importance of variability in a population**](#) [周四, 05 10月 00:05]

It's been long thought that variability within a population is key to population's growth and survival but new research questions that assumption. Researchers found that variability can actually lower population growth in single-cell organisms. This insight is important for characterizing the fitness of a population, which is useful, for instance, in understanding how bacteria respond to antibiotics.

- [**Antifungals and probiotics may play a key role in the development of treatment for Crohn's disease**](#) [周四, 05 10月 00:05]

Scientists have determined that fungus may play a key role in chronic intestinal inflammation disorders. They found that patients with Crohn's disease tend to have much higher levels of the fungus *Candida tropicalis* compared to their healthy family members. A new review looks at these findings and provides insights into potential new therapeutic approaches using antifungals and probiotics in the treatment of inflammatory bowel diseases (IBD) such as Crohn's disease (CD).

- [**Assessing regional earthquake risk and hazards in the age of exascale**](#) [周四, 05 10月 00:05]

Researchers are building the first-ever end-to-end simulation code to precisely capture the geology and physics of regional earthquakes, and how the shaking impacts buildings.

- [**Female fish like males who sing**](#) [周四, 05 10月 00:05]

Noisier seas seem to hamper fish reproduction. New research shows that noise pollution impedes reproduction in sand and common gobies, both of which are important food sources for juvenile cod.

- [**Flights worldwide face increased risk of severe turbulence due to climate change**](#) [周四, 05 10月 00:04]

Flights all around the world could be encountering lots more turbulence in the future, according to the first ever global projections of in-flight bumpiness.

• [**Albatross feces show diet of fishery discards**](#) [周四, 05 10月 00:04]

The first-ever analysis of fish DNA in albatross scat indicates a high level of interaction between seabirds and commercial fisheries. This non-invasive method could be used to assess whether fisheries are complying with discard policies. Extending the analysis to other marine predators could help monitor marine biodiversity and broader marine ecosystem changes.

• [**Hurricane exposes and washes away thousands of sea turtle nests**](#) [周四, 05 10月 00:04]

Marine biologists have released estimates of sea turtle nests lost to Hurricane Irma, finding that 56 percent of green turtle nests and 24 percent of loggerhead nests were lost within Archie Carr National Wildlife Refuge. Both are endangered species. The losses put a damper on what had been a record year for green turtle nesting.

• [**Rampant consumption of hippo teeth**](#) [周三, 04 10月 22:14]

Investigators have examined the case of hippo teeth and revealed discordance in trade volumes declared between importers and exporters -- a scenario that could threaten the survival of the species.

• [**Burmese python's hungry escapades may have consequences for human health**](#) [周三, 04 10月 22:12]

As the large, invasive Burmese python eats its way through south Florida's mammals, the mosquitoes in the area have fewer types of animals to bite. Now, more mosquitoes are drawing blood from a rat that carries a virus dangerous to humans.

• [**Toxic cocktail: Okinawan pit viper genome reveals evolution of snake venom**](#) [周三, 04 10月 21:49]

For the first time, researchers have sequenced a habu genome, that of the Taiwan habu, and compared it to that of its sister species.

- [**Soil amendments for healthier spinach: Combo of biosolids, zinc, limestone prevents toxic uptake**](#) [周三, 04 10月 21:30]

Soils keep plants healthy by providing plants with water, helpful minerals, and microbes, among other benefits. But what if the soil also contains toxic elements, such as cadmium? The solution goes back to the soil. Researchers are investigating which soil additives work best.

- [**Too little is known about wildfire smoke**](#) [周三, 04 10月 21:29]

How do fire-suppression chemicals and pesticides affect wildfire smoke and the health of those who breathe it? New research has discovered that this question cannot be answered based on current scientific evidence, say investigators.

- [**Excessive social interaction reduced collective response**](#) [周三, 04 10月 21:29]

Researchers have uncovered the detrimental effects of excessive interaction and network connections in a wide range of living and engineered systems.

- [**Nobel Prize in Chemistry 2017: Cryo-electron microscopy**](#) [周三, 04 10月 21:02]

The Nobel Prize in Chemistry 2017 goes to Jacques Dubochet, Joachim Frank, and Richard Henderson "for developing cryo-electron microscopy for the high-resolution structure determination of biomolecules in solution."

- [**Trophy hunting is unlikely to affect evolution**](#) [周三, 04 10月 20:49]

In recent years, there has been growing controversy surrounding the evolutionary effects of trophy hunting in big game animals worldwide.

- [**Black tea may help with weight loss, too**](#) [周三, 04 10月 20:49]

Black tea may promote weight loss and other health benefits by changing bacteria in the gut, research indicates for the first time.

- [**Pheasant roadkill peaks in autumn and late**](#)

[winter](#) [周三, 04 10月 08:29]

Chickens' motives for crossing the road are often questioned -- but pheasants should probably avoid it altogether, new research suggests.

• [Monitoring microbes to keep Marsonauts healthy](#) [周三, 04 10月 08:29]

To guarantee a safe environment for astronauts on long-duration space missions such as a journey to Mars, it is important to monitor how microorganisms such as bacteria adapt to the confined conditions onboard spacecraft, according to a study.

• [Got a picky eater? How 'nature and nurture' may be influencing eating behavior in young children](#) [周三, 04 10月 08:29]

Scientists have been working to define characteristics of picky eaters and to identify possible correlations of the behavior. In a new study, they wanted to see if chemosensory genes might have a possible relationship to picky eating behavior in young children. They found that certain genes related to taste perception may be behind some of these picky eating habits.

• [Ammonia emissions unlikely to be causing extreme China haze](#) [周三, 04 10月 08:29]

As China struggles to find ways to remedy the noxious haze that lingers over Beijing and other cities in the winter, researchers have cast serious doubt on one proposed cause: high levels of ammonia in the air.

• [Surrounded by potential: New science in converting biomass](#) [周三, 04 10月 08:29]

To take full advantage of biomass, lignin needs to be processed into usable components along with the plant cellulose. Currently, that process requires an acid plus high heat, or pyrolysis -- treating with high heat in the absence of oxygen. Besides being energy-consuming processing methods, the results are less than optimal. Scientists are now working to develop a method to deconstruct lignin in a way that is

economically feasible and into stable, readily useful components.

- [**Warming unlikely to have major impact on animal agriculture in Northeast**](#) [周三, 04 10月 08:29]

Climate change will not significantly impair animal agriculture in the Northeast region of the United States, according to a multidisciplinary team of researchers, who point out there are many variables in the future scenario they envision.

- [**Visualizing life in silico**](#) [周三, 04 10月 02:45]

Programming a molecular biology experiment can be similar to playing Sudoku; both are simple if you're working with only a few molecules or a small grid, but explode in complexity as they grow. Now, researchers have made it far easier for molecular biologists to make complex biological models.

- [**Gut bacteria metabolism may factor into hypertension**](#) [周三, 04 10月 02:45]

One in three American adults suffers from high blood pressure, or hypertension. The disease can be passed down in families, and certain lifestyle factors such as smoking, high-sodium diets, and stress can increase the risk. In recent years, scientists have discovered that certain gut bacteria may contribute to hypertension, as well.

- [**Designer biosensor can detect antibiotic production by microbes**](#) [周三, 04 10月 02:45]

Researchers from North Carolina State University have engineered designer biosensors that can detect antibiotic molecules of interest. The biosensors are a first step toward creating antibiotic-producing 'factories' within microbes such as E. coli.

- [**Microbial dispersal impacts animal guts**](#) [周三, 04 10月 01:10]

In a novel experiment, zebrafish with defective immune systems swam and dined with counterparts with normal immune systems. In short order, their gut microbiomes became similar. The experiment was designed to test, at a fundamental level, the impact of microbial dispersal among individuals with different microbiomes.

• [Livestock grazing harming giant panda habitat](#) [周三, 04 10月 00:54]

One third of the giant panda habitat in China's Wanglang National Nature Reserve has been degraded and lost to livestock grazing, a new study finds. Livestock numbers in the park have increased ninefold in the last 15 years.

• [Computational study sheds doubt on latest theory of birds' mysterious magnetic compass](#) [周三, 04 10月 00:54]

The European robin and other birds know where to migrate by sensing the direction of the Earth's magnetic field. Researchers have recently attributed this ability to a chemical reaction that takes place within the eye and whose success depends on the field direction. However, researchers now report that the current form of this 'radical-pair mechanism' is not sensitive enough to explain the disruption of the avian magnetic compass by certain radiofrequency magnetic fields.

• [Fecal transplant success for diabetes might depend on the recipient's gut microbes](#) [周三, 04 10月 00:54]

A small clinical trial in the Netherlands found that a fecal transplant from a lean donor can temporarily improve insulin resistance in obese men -- but only half of the recipients responded. Upon further investigation, the researchers discovered that they could predict the success of the treatment by analyzing each patient's fecal gut-bacterial makeup. This understanding could help shape the development of personalized fecal transplant for diabetes.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [**Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

- [**Parole violations, not new crimes, help drive prison's revolving door**](#) [周四, 05 10月 02:27]

Failing a drug test, associating with felons and other technical parole violations are among the key drivers of prison's 'revolving door,' according to new American research.

- [**Win-win for spotted owls and forest management**](#) [周四, 05 10月 02:01]

Remote sensing technology has detected what could be a win for both spotted owls and forestry management, according to a study.

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Unlike most other deltas worldwide, Greenland's are growing -- a trend with major consequences for both fishing and tourism.

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Researchers are building the first-ever end-to-end simulation code to precisely capture the geology and physics of regional earthquakes, and how the shaking impacts buildings.

• [**Albatross feces show diet of fishery discards**](#) [周四, 05 10月 00:04]

The first-ever analysis of fish DNA in albatross scat indicates a high level of interaction between seabirds and commercial fisheries. This non-invasive method could be used to assess whether fisheries are complying with discard policies. Extending the analysis to other marine predators could help monitor marine biodiversity and broader marine ecosystem changes.

• [**Safe motherhood campaign associated with more prenatal visits, birth planning, study finds**](#) [周四, 05 10月 00:04]

In Tanzania, pregnant women who were exposed to a national safe motherhood campaign designed to get them to visit health facilities for prenatal care and delivery were more likely to create birth plans and to attend more prenatal appointments.

• [**Rampant consumption of hippo teeth**](#) [周三, 04 10月 22:14]

Investigators have examined the case of hippo teeth and revealed discordance in trade volumes declared between importers and exporters -- a scenario that could threaten the survival of the species.

• [**Doing homework is associated with change in students' personality**](#) [周三, 04 10月 22:07]

Homework may have a positive influence on students' conscientiousness. Students who do more homework than their peers show positive changes in conscientiousness, according to new research. Thus, schools may be doing more than contributing to students' learning, but they may also be effecting changes of their students' personality.

• [**What is STEM education?**](#) [周三, 04 10月 21:51]

Everyone needs a good teacher -- including teachers. Two new studies show how digging deeper into what STEM education means and

strategically designing online classrooms can enhance teaching science, technology, engineering, and math.

- [**Too little is known about wildfire smoke**](#) [周三, 04 10月 21:29]

How do fire-suppression chemicals and pesticides affect wildfire smoke and the health of those who breathe it? New research has discovered that this question cannot be answered based on current scientific evidence, say investigators.

- [**Neighborhood affluence linked to positive birth outcomes**](#) [周三, 04 10月 02:48]

It's not uncommon for new parents to relocate in search of neighborhoods with better schools, safer streets and healthier, more kid-friendly activities. But a new study has found that living in such neighborhoods before a baby is born protects against the risks of poor birth outcomes.

- [**Women firefighters can improve safety, but department culture must change**](#) [周三, 04 10月 02:45]

A new study has discerned that gender may be a unique contributor to safety, but hypermasculine fire service culture creates barriers.

- [**Twitter a hotbed of anti-vaccine sentiment**](#) [周二, 03 10月 23:11]

Anti-vaccine sentiment is alive and growing on social media, with California, Connecticut, Massachusetts, New York and Pennsylvania showing the most negative tweets, according to a new 5-year study.

- [**Social action may give youth a career edge, education faculty research suggests**](#) [周二, 03 10月 23:11]

When disadvantaged youth engage in social activism, they tend to have high-status occupations in adulthood, according to researchers. The findings also suggest there's a place for more discussion of social issues in our educational systems.

- [**New method to quantify life cycle land use of natural gas**](#) [周二, 03 10月 23:10]

A case study of the Barnett Shale region in Texas, where hydraulic fracturing was first implemented, for the first time provides quantifiable information on the life cycle land use of generating electricity from natural gas based on physical measurements instead of using assumptions and averages that were previously used for evaluation.

- [**U.S. breast cancer death rates dropped 39 percent between 1989 and 2015**](#) [周二, 03 10月 23:10]

Breast cancer death rates dropped 39 percent between 1989 and 2015, averting 322,600 breast cancer deaths during those 26 years. Death rates in several states are now statistically equivalent, perhaps reflecting an elimination of disparities in those states.

- [**Incidence of measles in the United States**](#) [周二, 03 10月 23:10]

From 2001 to 2015, the overall annual incidence of measles in the United States remained extremely low (less than 1 case/million population) compared with incidence worldwide (40 cases/million population). Relative increases in measles rates were observed over the period, and the findings suggest that failure to vaccinate may be the main driver of measles transmission, according to a study.

- [**European sea bass show chronic impairment after exposure to crude oil**](#) [周二, 03 10月 21:46]

We may be underestimating the long-term impact of oil spills on fish, particularly their ability to tolerate low oxygen environments, according to research.

- [**New method could help disrupt opioid crisis**](#) [周二, 03 10月 21:40]

Researchers have zeroed in on a unique component of heroin that could help zero in on the locations of origin for individual batches.

- [**Program for parents improves ADHD behaviors in young children**](#) [周二, 03 10月 21:39]

Effective early intervention is crucial for young children with ADHD, due to the unfavorable short-term and long-term outcomes associated with the disorder.

• [**Cutting absenteeism in primary schools**](#) [周二, 03 10月 08:23]

A pilot program reduced absenteeism in elementary schools by an average of 10 percent, according to a new study.

• [**Breakthrough cancer treatment brings hope and challenges**](#) [周二, 03 10月 08:23]

The first gene therapy for cancer will transform approaches to cancer treatments, but it poses ethical challenges for policy-makers.

• [**New source of radioactivity from Fukushima disaster**](#) [周二, 03 10月 04:12]

Scientists have found a previously unsuspected place where radioactive material from the Fukushima Dai-ichi nuclear power plant disaster has accumulated -- in sands and brackish groundwater beneath beaches up to 60 miles away. The sands took up and retained radioactive cesium originating from the disaster in 2011 and have been slowly releasing it back to the ocean.

• [**Firearm-related injuries account for \\$2.8 billion on emergency room and inpatient charges each year**](#) [周二, 03 10月 04:12]

A new study of more than 704,000 people who arrived alive at a United States emergency room for treatment of a firearm-related injury between 2006 and 2014 finds decreasing incidence of such injury in some age groups, increasing trends in others, and affirmation of the persistently high cost of gunshot wounds in dollars and human suffering.

• [**Most Americans want the government to combat climate change, some willing to pay a high amount**](#) [周二, 03 10月 02:49]

Sixty-one percent of Americans think climate change is a problem that the government needs to address, including 43 percent of Republicans and 80 percent of Democrats, according to a new survey.

• [**Win-win strategies for climate and food security**](#)

[周一, 02 10月 20:48]

Efforts to reduce greenhouse gas emissions from the agriculture and forestry sectors could lead to increased food prices -- but new research identifies strategies that could help mitigate climate change while avoiding steep hikes in food prices.

- [**Adulteration of proprietary Chinese medicines and health products poses severe health risks**](#) [周一, 02月 20:48]

Traditional Chinese medicine is widely used as a form of complementary medicine all over the world for various indications and for improving general health. Various reports have documented the adulteration of pCMs and health products with undeclared agents, including prescription drugs, drug analogues, and banned drugs. Such adulteration can have serious and even fatal consequences.

- [**Who's judging you based on brand choices?**](#) [周六, 30月 03:22]

People with a flexible mindset do not tend to judge others based on the brands they use, while people with a fixed mindset use brands to judge another person's character, a new study shows.

- [**Physical abuse and punishment impact children's academic performance**](#) [周六, 30月 03:22]

Scientists have found that physical abuse was associated with decreases in children's cognitive performance, while non-abusive forms of physical punishment were independently associated with reduced school engagement and increased peer isolation.

- [**Compound from oilseeds may be high-value product**](#) [周六, 30月 01:35]

Extracting a substance called glucosinolate from camelina and carinata seeds may help bring these promising sources of biofuel one stop closer to reality.

- [**Video gamers have an advantage in learning**](#) [周六, 30月 00:51]

Neuropsychologists let video gamers compete against non-gamers in a learning competition. During the test, the video gamers performed significantly better and showed an increased brain activity in the brain

areas that are relevant for learning.

- [**Helium found in coal seams could aid safe shale gas extraction**](#) [周六, 30 9月 00:50]

Natural deposits of helium gas found in UK coal seams could help scientists monitor the secure recovery of coal or shale gas from underground sites, according to research.

- [**New technique could detect explosives, dangerous gases rapidly, remotely**](#) [周六, 30 9月 00:50]

A laser-based method that could be used to detect chemicals such as explosives and dangerous gases quickly and accurately has now been developed by researchers.

- [**Uncovering a winning basketball formula**](#) [周五, 29 9月 21:32]

Scientists have come up with a winning formula for basketball teams looking to take home Olympic gold.

- [**Sensible driving saves more gas than drivers think**](#) [周五, 29 9月 03:27]

A new study has quantified the impact speeding and slamming on the brakes has on fuel economy and consumption. Aggressive behavior behind the wheel can lower gas mileage in light-duty vehicles, which can equate to losing about \$0.25 to \$1 per gallon.

- [**Understanding connection between HIV transmission, racial/ethnic/geographical differences**](#) [周五, 29 9月 02:54]

The health effects of where people live, work, and interact are well documented, as are the value of neighborhood-level structural interventions designed to improve health. But place-based characteristics that contribute to disparities in HIV transmission and disease burden are poorly understood, possibly resulting in less-effective HIV risk reduction interventions and programming.

- [**Massive projected increase in use of**](#)

[antimicrobials in animals by 2030](#) [周五, 29 9月 02:21]

The amount of antimicrobials given to animals destined for human consumption is expected to rise by a staggering 52 percent and reach 200,000 tons by 2030 unless policies are implemented to limit their use, according to new research.

• [Why public appeals may fall flat with some would-be donors](#) [周五, 29 9月 02:21]

To give or not to give: sometimes the answer is in the question, researchers into human behavior and charitable giving have found. The study suggests that sometimes the 'ask' needs to suit the potential donors' sense of independence or interdependence.

• [Students know about learning strategies -- but don't use them](#) [周五, 29 9月 02:21]

Researchers find that university students have high levels of knowledge about self-regulated learning strategies, but many students don't use them. Specific training on how and when to use these techniques could help more students to maximize their academic potential.

• [Nearly one in six new HIV diagnoses in Europe are among people over 50](#) [周五, 29 9月 00:16]

A new study showed that while the rate of newly reported HIV cases in Europe remained steady in younger people between 2004 and 2015, it increased by 2 percent each year overall in older people. With around 30,000 newly diagnosed HIV infections reported each year over the last decade, the HIV epidemic remains a significant public health problem in the 31 countries of the European Union and European Economic Area.

• [Study provides first estimate of total US population with felony convictions](#) [周五, 29 9月 00:16]

New research on the growth in the scope and scale of felony convictions finds that, as of 2010, 3 percent of the total US population and 15 percent of the African-American male population have served time in prison. People with felony convictions more broadly account for 8

percent of the overall population and 33 percent of the African-American male population.

- [**In people with OCD, actions are at odds with beliefs**](#) [周五, 29 9月 00:16]

The repeated behaviors that characterize obsessive-compulsive disorder are a manifestation of an underlying brain dysfunction that is not yet well understood. Now, scientists report the use of a mathematical model that they say will help them get at the root of what causes OCD. They find that people with OCD develop an internal, accurate sense of how things work but do not use it to guide behavior.

- [**Don't rely on mixed messages to change health behaviors**](#) [周四, 28 9月 23:30]

Self-improvement messages to lose weight, quit smoking or eat more fruits and vegetables can fall on deaf ears if the intervention message is mixed, says new research.

- [**Abusive bosses experience short-lived benefits**](#) [周四, 28 9月 22:12]

Being a jerk to your employees may actually improve your well-being, but only for a short while, suggests new research on abusive bosses.

- [**Self-esteem in kids: Lavish praise is not the answer, warmth is**](#) [周四, 28 9月 20:51]

How do children construct views of themselves and their place in the world? Children's social relationships turn out to be critical. For example, children develop higher self-esteem when their parents treat them warmly. But they develop lower self-esteem when their parents lavish them with inflated praise.

- [**Achieving U.S. National HIV/AIDS Strategy targets would save lives, be cost effective**](#) [周四, 28 9月 20:47]

An analysis shows that achieving the treatment targets of the National HIV/AIDS Strategy by 2020 not only would prevent hundreds of thousands of new infections and deaths but also would demonstrate excellent value.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- [The super-Earth that came home for dinner](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire solar system to one side. It is a possible "Planet Nine" -- a world perhaps 10 times the mass of Earth and 20 times farther from the sun than Neptune.

- [Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

- [Female fish like males who sing](#) [周四, 05 10月 00:05]

Noisier seas seem to hamper fish reproduction. New research shows that noise pollution impedes reproduction in sand and common gobies, both of which are important food sources for juvenile cod.

- [Burmese python's hungry escapades may have consequences for human health](#) [周三, 04 10月 22:12]

As the large, invasive Burmese python eats its way through south Florida's mammals, the mosquitoes in the area have fewer types of animals to bite. Now, more mosquitoes are drawing blood from a rat that

carries a virus dangerous to humans.

- [**Prehistoric squid was last meal of newborn ichthyosaur 200 million years ago**](#) [周二, 03 10月 21:39]

Scientists have identified the smallest and youngest specimen of *Ichthyosaurus communis* on record and found an additional surprise preserved in its stomach.

- [**Ancient petrified salamander reveals its last meal**](#) [周二, 03 10月 21:39]

A new study on an exceptionally preserved salamander from the Eocene of France reveals that its soft organs are conserved under its skin and bones. Organs preserved in three dimensions include the lung, nerves, gut, and within it, the last meal of the animal, according to a new study.

- [**Monstrous crocodile fossil points to early rise of ancient reptiles**](#) [周二, 03 10月 08:22]

A newly identified prehistoric marine predator has shed light on the origins of the distant relatives of modern crocodiles.

- [**Immature flies in Central Park subsist on duck droppings**](#) [周二, 03 10月 04:12]

Introducing *Themira lohmanus*, a fly like no other, and the most recently discovered species in the popular Manhattan urban oasis of Central Park. The immature insects subsist on duck droppings.

- [**Meteorite tells us that Mars had a dense atmosphere 4 billion years ago**](#) [周一, 02 10月 23:42]

Exploration missions have suggested that Mars once had a warm climate, which sustained oceans on its surface. To keep Mars warm requires a dense atmosphere with a sufficient greenhouse effect, while the present-day Mars has a thin atmosphere whose surface pressure is only 0.006 bar, resulting in the cold climate it has today. It has been a big mystery as to when and how Mars lost its dense atmosphere.

- [**First look at electrons escaping atoms**](#) [周一, 02 10月 23:27]

Researchers have taken a first step toward controlling electrons' behavior inside matter -- and thus the first step down a long and complicated road that could eventually lead to the ability to create new states of matter at will.

- [**Asphalt helps lithium batteries charge faster**](#) [周一, 02 10月 22:52]

A touch of asphalt may be the secret to high-capacity lithium batteries that charge up to 20 times faster than commercial lithium-ion batteries, according to scientists.

- [**DNA: The next hot material in photonics?**](#) [周一, 02 10月 22:52]

Using DNA from salmon, researchers in South Korea hope to make better biomedical and other photonic devices based on organic thin films.

- [**Animals that play with objects learn how to use them as tools**](#) [周一, 02 10月 22:52]

New Caledonian crows and kea parrots can learn about the usefulness of objects by playing with them -- similar to human baby behavior.

- [**Electricity produced from tears**](#) [周一, 02 10月 22:51]

A team of scientists has discovered that applying pressure to a protein found in egg whites and tears can generate electricity. The researchers observed that crystals of lysozyme, a model protein that is abundant in egg whites of birds as well as in the tears, saliva and milk of mammals can generate electricity when pressed.

- [**Body energy as a power source**](#) [周一, 02 10月 20:56]

Smartphones, MP3 players, sports electronics devices such as pulse meters or trackers, medical equipment such as tonometers, pacemakers of the heart, or insulin pumps: An increasing number of electronic companions make daily life easier for us. But as useful these smart helpers may be: Their constant hunger for electricity is a problem. The solution: power supply by means of energy produced by body movements.

- [**A sea of spinning electrons**](#) [周一, 02 10月 20:48]

Picture two schools of fish swimming in clockwise and counterclockwise circles. It's enough to make your head spin, and now scientists have discovered the 'chiral spin mode' -- a sea of electrons spinning in opposing circles.

- ['Revolutionary' new gesture control tech turns any object into a TV remote](#) [周一, 02 10月 10:53]

Imagine changing the channel of your TV simply by moving your cup of tea, adjusting the volume on a music player by rolling a toy car, or rotating a spatula to pause a cookery video on your tablet. New gesture control technology that can turn everyday objects into remote controls could revolutionize how we interact with televisions, and other screens - ending frustrating searches for remotes that have slipped down the side of sofa cushions.

- [Small collisions make big impact on Mercury's thin atmosphere](#) [周五, 29 9月 23:29]

Mercury, our smallest planetary neighbor, has very little to call an atmosphere, but it does have a strange weather pattern: morning micro-meteor showers.

- [New clues from brain structures of mantis shrimp](#) [周五, 29 9月 21:33]

New research sheds new light on the evolution of some of the earliest brain structures, and stirs up new, intriguing questions about the origins of centers that support learning and memory.

- [Solving the mystery of Pluto's giant blades of ice](#) [周五, 29 9月 03:24]

NASA's New Horizons mission revolutionized our knowledge of Pluto when it flew past that distant world in July 2015. Among its many discoveries were images of strange formations resembling giant knife blades of ice, whose origin had remained a mystery. Now, scientists have turned up a fascinating explanation for this "bladed terrain": the structures are made almost entirely of methane ice, and likely formed as a specific kind of erosion wore away their surfaces.

• [**Farthest active inbound comet yet seen**](#) [周五, 29 9月 03:23]

NASA's Hubble Space Telescope has photographed the farthest active inbound comet ever seen, at a whopping distance of 1.5 billion miles from the Sun (beyond Saturn's orbit). Slightly warmed by the remote Sun, it has already begun to develop an 80,000-mile-wide fuzzy cloud of dust, called a coma, enveloping a tiny, solid nucleus of frozen gas and dust. These observations represent the earliest signs of activity ever seen from a comet entering the solar system's planetary zone for the first time.

• [**A fresh look at older data yields a surprise near the Martian equator**](#) [周五, 29 9月 03:22]

Scientists taking a new look at older data from NASA's longest-operating Mars orbiter have discovered evidence of significant hydration near the Martian equator -- a mysterious signature in a region of the Red Planet where planetary scientists figure ice shouldn't exist.

• [**Chimpanzees can learn how to use tools without observing others**](#) [周四, 28 9月 21:42]

New observations have led researchers to believe that chimpanzees can use tools spontaneously to solve a task, without needing to watch others first.

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ScienceDaily

周四, 12 10月 2017

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[周四, 12 10月 2017]

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- [**Rainstorm generator assesses watershed rainfall under climate change simulations**](#) [周四, 12 10月 01:58]

The Colorado River tumbles through varied landscapes, draining watersheds from seven western states. This 1,450-mile-long system is a critical water supply for agriculture, industry and municipalities from Denver to Tijuana.

- [**This is a test: Asteroid tracking network observes close approach**](#) [周四, 12 10月 01:55]

On Oct. 12 EDT (Oct. 11 PDT), a small asteroid designated 2012 TC4 will safely pass by Earth at a distance of approximately 26,000 miles (42,000 kilometers). This is a little over one tenth the distance to the Moon and just above the orbital altitude of communications satellites. This encounter with TC4 is being used by asteroid trackers around the world to test their ability to operate as a coordinated international asteroid warning network.

- [**Giant exoplanet hunters: Look for debris disks**](#) [周

四, 12 10月 01:52]
There's no map showing all the billions of exoplanets hiding in our galaxy -- they're so distant and faint compared to their stars, it's hard to find them. Now, astronomers hunting for new worlds have established a possible signpost for giant exoplanets.

- [**Injecting electrons jolts 2-D structure into new atomic pattern**](#) [周四, 12 10月 01:17]

The same electrostatic charge that can make hair stand on end and attach balloons to clothing could be an efficient way to drive atomically thin electronic memory devices of the future, according to a new study. Scientists have found a way to reversibly change the atomic structure of a 2-D material by injecting it with electrons. The process uses far less energy than current methods for changing the configuration of a material's structure.

- [**Ceramic pump moves molten metal at a record 1,400 degrees Celsius**](#) [周四, 12 10月 01:17]

A ceramic-based mechanical pump able to operate at record temperatures of more than 1,400 degrees Celsius (1,673 Kelvin) can transfer high temperature liquids such as molten tin, enabling a new generation of energy conversion and storage systems.

- [**New type of stem cell line produced offers expanded potential for research and treatments**](#) [周四, 12 10月 01:17]

Researchers have created expanded potential stem cells (EPSCs) in mice, for the first time, that have a greater potential for development than current stem cell lines. These stem cells have the features of the very first cells in the developing embryo, and can develop into any type of cell.

- [**Esophageal cancer 'cell of origin' identified**](#) [周四, 12 10月 01:17]

Researchers have identified cells in the upper digestive tract that can give rise to Barrett's esophagus, a precursor to esophageal cancer.

- [**Deciphering biological meaning from an atlas of gene expression across 42 tissue types**](#) [周四, 12 10月 01:17]

The human genome encodes instructions for which genes are expressed in what cell type, along with other molecules that control how much and when these genes are expressed. Variation in the regulation of gene expression gives rise to the diverse tissue types, with diverse functions,

in the human body. Finding new clues about the molecular origins of disease is the goal for a comprehensive atlas of variation in gene expression.

- [**Bycatch responsible for decline of endangered New Zealand sea lion**](#) [周四, 12 10月 01:17]

Getting caught in fishing nets is a major cause of death for the increasingly endangered New Zealand sea lion, according to new research.

- [**Serrated polyps plus conventional adenomas may mean higher risk for colorectal cancer**](#) [周四, 12 10月 01:16]

Examining more than 5,000 reports a research team finds that individuals with both conventional adenomas as well as a subset of lesions known as serrated polyps may be at higher risk for developing colorectal cancer or high-risk adenomas that can lead to colorectal cancer, than those who have serrated polyps or high-risk adenomas alone. Individuals with both serrated polyps and high-risk adenomas may therefore benefit from closer surveillance.

- [**Future smartwatches could sense hand movement using ultrasound imaging**](#) [周四, 12 10月 01:16]

New research has shown future wearable devices, such as smartwatches, could use ultrasound imaging to sense hand gestures.

- [**Gut fungi could play a role in obesity epidemic**](#) [周四, 12 10月 01:16]

A high-fat diet changes fungi in the gut and may play a role in the development of obesity, according to a new study. While gut microbes have previously been implicated in the development of obesity, this study shows that fungi may also play a role.

- [**Calcium lets T cells use sugar to multiply and fight infection**](#) [周四, 12 10月 01:16]

A calcium signal controls whether immune cells can use the nutrients needed to fuel their multiplication into a cellular army designed to fight invading viruses.

• [**Tracking the viral parasites of giant viruses over time**](#) [周四, 12 10月 00:39]

In freshwater lakes, microbes regulate the flow of carbon and determine if the bodies of water serve as carbon sinks or carbon sources. Viruses exist amidst all bacteria, usually in a 10-fold excess and include virophages which live in giant viruses and use their machinery to replicate and spread. Researchers have effectively doubled the number of known virophages.

• [**Storage is renewable energy's greatest challenge -- this low-cost sulfur battery may help**](#) [周四, 12 10月 00:38]

Motivated by the challenge to drastically reduce the cost of storing renewable energy on the grid while capturing more of it, a group of scientists has developed a battery powered by sulfur, air, water, and salt -- all readily available materials -- that is nearly 100 times less expensive to produce than batteries currently on the market and can store twice as much energy as a lead-acid battery. The inventors present their prototype in Joule.

• [**Beyond EPA's Clean Power decision: Climate action window could close as early as 2023**](#) [周四, 12 10月 00:38]

As the Trump administration repeals the US Clean Power Plan, a new study underscores the urgency of reducing greenhouse gas emissions -- from both environmental and economic perspectives.

• [**Where food is limited, guppy mothers gestate their young longer**](#) [周四, 12 10月 00:38]

When evolving in environments where a lack of predators makes food scarcity the main survival challenge, guppy mothers gestate their young longer so that they are born more ready to compete for their meals.

• [**New software speeds origami structure designs**](#) [周四, 12 10月 00:38]

Researchers have developed a new computer-aided approach that streamlines the design process for origami-based structures, making it easier for engineers and scientists to conceptualize new ideas graphically

while simultaneously generating the underlying mathematical data needed to build the structure in the real world.

- [**'Ridiculously healthy' elderly have the same gut microbiome as healthy 30 year-olds**](#) [周四, 12 10月 00:37]

In one of the largest microbiota studies conducted in humans, researchers have shown a potential link between healthy aging and a healthy gut.

- [**No dark side to using LED lights to supplement WiFi**](#) [周四, 12 10月 00:06]

Energy-saving Light Emitting Diodes (LEDs) could help meet demand for wireless communications without affecting the quality of light or environmental benefits they deliver, new research has shown.

- [**Will we be able to use zinc oxide nanoparticles as fertilizers?**](#) [周四, 12 10月 00:06]

Researchers from Universidad Politécnica de Madrid (UPM) and National Institute for Agricultural Research and Experimentation (INIA) have studied the effects of using zinc oxide nanoparticles on agriculture.

- [**New genetic clue to peanut allergy**](#) [周四, 12 10月 00:04]

Researchers have pinpointed a new gene associated with peanut allergy, offering further evidence that genes play a role in the development of food allergies and opening the door to future research, improved diagnostics and new treatment options.

- [**'Obscure' stalked filter feeder lived in Utah some 500 million years ago**](#) [周四, 12 10月 00:04]

The only fossilized specimen of a species previously unknown to science -- an 'obscure' stalked filter feeder -- has just been detailed for the first time.

- [**Study shows untapped creativity in workforce**](#) [周四, 12 10月 00:04]

With the U.S. economy less reliant on manufacturing, creativity and innovation are of increasing value. Arts graduates, and others who have

developed and honed their creative skills, can be critical assets.

• **[Our brain omits grammatical elements when it has limited resources](#)** [周四, 12 10月 00:03]

A study of the use of pronouns by French speakers with agrammatic aphasia shows that grammatical pronouns are significantly more impaired in speech than lexical ones. The findings support a new theory of grammar which suggests that grammatical elements contain secondary information that speakers with limited cognitive resources can omit from their speech and still make sense.

• **[New study examines full range of post-stroke visual impairments](#)** [周四, 12 10月 00:03]

Researchers have examined the visual impairment screening/referral forms from 915 post-stroke patients from 20 NHS hospital trusts. Overall 84% were visually symptomatic with visual field loss the most common complaint followed by blurred vision, reading difficulty, and diplopia.

• **[Kune Kune piglets possess social learning skills and have an astonishingly good memory](#)** [周四, 12 10月 00:03]

Pigs are socially competent and capable of learning. But the combination of these skills, learning by observing others, has been insufficiently studied so far. Exact copying and understanding of demonstrated actions -- highly developed learning abilities -- could not be proven. A new study with Kune Kune pigs, has now shown for the first time that pigs do learn from each other. The intelligent animals also possess remarkable long-term memory after internalizing a technique.

• **[Remote sensing for cosmic dust and other celestial bodies](#)** [周四, 12 10月 00:03]

Astronomers review the state-of-the-art in polarimetry studies of the small bodies in our solar system. Combined with different observational techniques, polarimetry may be used as a remote sensing technique to measure asteroids' size, to reveal the composition and size variation of dust in comets or of aerosols in planetary atmospheres, or even to detect

extra-terrestrial biomarkers.

- **[Brain chemical abnormalities in earliest stage of psychosis identified](#)** [周四, 12 10月 00:03]

A new study of young people experiencing a first episode of psychosis reports elevations in the brain chemicals glutamate and glycine.

- **[Experts express concerns over infant mental health assessment](#)** [周四, 12 10月 00:03]

Forty world experts on child development and mental health have released a joint statement calling for caution when applying an influential classification for assessing infant mental health and potential cases of abuse.

- **[Women seen as younger when eyes, lips and eyebrows stand out](#)** [周四, 12 10月 00:03]

Researchers in France and America find that aspects of facial contrast, a measure of how much facial features stand out in the face, decrease with age in women across a variety of ethnic groups. The researchers also find that observers perceive women with increased facial contrast as younger, regardless of the ethnic background of the women or the observers. This suggests that facial contrast is a cross-cultural cue to age perception.

- **[Climate change predicted to reduce size, stature of dominant Midwest plant, study finds](#)** [周四, 12 10月 00:03]

Researchers are involved in a study that found climate change may reduce the growth and stature of big bluestem -- a dominant prairie grass and a major forage grass for cattle.

- **[Key odorants in world's most expensive beef could help explain its allure](#)** [周四, 12 10月 00:03]

Renowned for its soft texture and characteristic flavor, Wagyu beef -- often referred to as Kobe beef in the US -- has become one of the world's most sought-after meats. Now scientists report that they have detected several key odorants that contribute to the delicacy's alluring

aroma.

- [**The making of medieval bling**](#) [周四, 12 10月 00:03]

Gold has long been valued for its luxurious glitter and hue, and threads of the gleaming metal have graced clothing and tapestries for centuries. Determining how artisans accomplished these adornments in the distant past can help scientists restore, preserve and date artifacts, but solutions to these puzzles have been elusive. Now scientists have revealed that medieval artisans used a gilding technology that has endured for centuries.

- [**Batteries of the future: Low-cost battery from waste graphite**](#) [周四, 12 10月 00:03]

Lithium ion batteries are flammable and the price of the raw material is rising. Are there alternatives? Yes: researchers have discovered promising approaches as to how we might produce batteries out waste graphite and scrap metal.

- [**Some plants grow bigger -- and 'meaner' -- when clipped, study finds**](#) [周四, 12 10月 00:03]

Some plants behave like the mythical monster Hydra: Cut off their heads and they grow back, bigger and better than before. A new study finds that these 'overcompensators,' as they are called, also augment their defensive chemistry -- think plant venom -- when they are clipped. The discovery could lead to the development of new methods for boosting plant growth while reducing the need for insecticides, the researchers said.

- [**Scientists discover one of the most luminous 'new stars' ever**](#) [周四, 12 10月 00:03]

Astronomers have discovered possibly the most luminous 'new star' ever -- a nova discovered in the direction of one of our closest neighboring galaxies: The Small Magellanic Cloud.

- [**Scientists eavesdrop on little-known beaked whales to learn how deeply they dive**](#) [周四, 12 10月 00:03]

Scientists have reported the first dive depths for Gervais' and True's beaked whales, two of the least known beaked whale species known as mesoplodonts. The study is also the first to use a towed linear hydrophone array to document dive depths for beaked whales, and researchers say it's a promising method to obtain dive depths for other beaked whale species.

- [**Major cities concentrate less scientific production**](#) [周四, 12 10月 00:00]

The world's major cities, such as New York, London, and Tokyo, are losing their dominant position in the production and circulation of scientific articles, according to a new study.

- [**Drivers are less cautious at railway crossings**](#) [周三, 11 10月 22:07]

Drivers aren't as cautious approaching a railway level crossing compared to a road intersection despite the greater risk of fatality if a collision occurs, a new study has found.

- [**Mimicking two natural energy processes with a single catalyst**](#) [周三, 11 10月 22:07]

Researchers take inspiration from natural chemical processes based on hydrogenase and photosystem II, to produce a single metal catalyst with both fuel cell and solar cell functionalities. The combination of these two processes into one system suggests great potential for biologically inspired energy generation technologies.

- [**Predatory bacteria: The quest for a new class of antibiotics**](#) [周三, 11 10月 22:07]

Researchers take one step forward toward understanding and genetically manipulating *B. bacteriovorus*, a type of bacteria with promising potential use as a living antibiotic.

- [**Resolving tension on the surface of polymer mixes**](#) [周三, 11 10月 22:07]

In a new paper, physicists study how mixing chemically identical chains into a melt produces unique effects on their surface due to how short and

long polymer chains interact with each other. The researchers found an elegant formula to calculate the surface tension of such melts, connected to the relative weight of the components of the mix.

- [**Quantum manipulation power for quantum information processing gets a boost**](#) [周三, 11 10月 22:07]

In a new study, researchers present methods for controlling the output power and efficiency of a quantum thermal engine based on a two-atom cavity, where the atoms interact with the light confined within the cavity. This could help improve quantum manipulation power for quantum information processing.

- [**The secret to improving liquid crystal's mechanical performance**](#) [周三, 11 10月 22:07]

Researchers have theoretically calculated the static and dynamical properties of the Cottrell clouds, which form around edge dislocations in liquid crystals of the smectic A variety. This work could help, for example, to improve the lubricating performance of such liquid crystals.

- [**World's 'better' countries have higher rates of cancer**](#) [周三, 11 10月 22:07]

The world's 'better' countries, with greater access to healthcare, experience much higher rates of cancer incidence than the world's 'worse off' countries, according to new research.

- [**What is a safe following distance?**](#) [周三, 11 10月 22:07]

Confusion over what is a 'safe following distance' has road safety researchers calling for a standardized definition to prevent tailgating.

- [**Hispanic children and exposure to adverse experiences**](#) [周三, 11 10月 21:18]

Although they experience more poverty, Hispanic children from immigrant families reported fewer exposures to such adverse childhood experiences (ACEs) as parental divorce and scenes of violence, a new American study of national survey information gathered on more than 12,000 people found.

- [**Hormone therapy may benefit migraine sufferers without increased risk of heart disease**](#)

[周三, 11 10月 21:18]

Migraine headaches are common among women, but due to various health risks can be challenging to treat in the elderly. While hormone therapy is effective in relieving many menopause symptoms, its safe use in women with migraines was unconfirmed. A new study demonstrates its safety for this population.

- [**Despite effectiveness women remain skeptical of hormones at menopause -- what's the problem?**](#)

[周三, 11 10月 21:18]

Women today have more options than ever before for treating their menopause symptoms, although hormone therapy still ranks as the most effective treatment for debilitating symptoms such as hot flashes. A new study demonstrates, however, that women remain skeptical regarding the safety of hormone therapy and prefer less proven options.

Rainstorm generator assesses watershed rainfall under climate change simulations -- ScienceDaily

The Colorado River tumbles through varied landscapes, draining watersheds from seven western states. This 1,450-mile-long system is a critical water supply for agriculture, industry and municipalities from Denver to Tijuana.

In the drylands of the Colorado's lower basin, formed by Nevada, Arizona and California, thunderstorms -- known in meteorological parlance as convective precipitation -- typically control runoff, stream flow, water supply and flood risk to human populations in addition to water availability to vegetation.

Convective precipitation, which can lead to huge floods and subsequent disasters, is generated by heat from the Earth's surface. Moisture quickly rises into the atmosphere and then condenses very rapidly to form sudden rainstorms that are poorly understood within global climate models and data sets.

Scientists use such information to explore how future climate change will impact rainfall, but to date they mostly have struck out when it comes to convective precipitation. Better understanding of this type of rainfall could help scientists improve statistical assessment and prediction of climate change through modeling.

To that end, hydrologists from UC Santa Barbara's Earth Research Institute have developed a simple rainstorm generator (STORM). Their model simulates watershed rainfall under various climate change scenarios that reflect differences in the degree of wetness or storminess. The team's findings, which appear in the journal *Environmental Research Letters*, provide insight into observed or projected regional hydrologic trends.

"We're tackling a general problem that has regional implications, particularly in water-scarce areas," said Michael Singer, also a lecturer at Cardiff University in Wales. "The general problem is, we know that climate change is occurring all over the globe, but what we don't know is how it will affect convective precipitation and associated runoff."

Singer and his co-author, Katerina Michaelides, addressed the problem by creating a model that enables researchers to investigate different types of climate change. They applied it to the area around the Walnut Gulch Experimental Watershed in Arizona, a place with excellent long-term historical rainfall data recorded on a per-minute basis.

"For a while, there's been this mystery of a declining runoff signal in the lower Colorado River basin, in particular in the San Pedro River downstream of Walnut Gulch, which is very important regionally within southeast Arizona," Singer explained. "In this part of the basin, people had long suspected that there was less runoff coming into these streams from ephemeral tributaries -- ephemeral meaning they're flowing sometimes but are dry most of the time."

Combining the STORM model with analysis of the rainfall data set allowed the investigators to gain insights into decadal trends in monsoonal rainfall intensity under climate change. They found that there has been an increase in rainfall but less water delivered in heavy storms. This goes against previous notions of how rainfall should respond to atmospheric warming. The researchers attributed the phenomenon to less

moisture being imported into the region from the Gulf of California or the Pacific Ocean during the monsoons.

"Even though it's raining more overall, each storm is less intense and drops less water," Singer said. "While the amount of rainfall is increasing through time and the smaller storms are dumping more rainfall overall, it comes in smaller and more frequent spurts. This lower-intensity rainfall implies less runoff over the surface, which means we should see a decline in runoff over a whole basin. And our model results agree well with runoff data: There has been a decline in runoff within this ephemeral stream."

Still, this change in ephemeral runoff was too small to affect downstream flow by itself. Singer suggested a regional decline in snowpacks and less groundwater recharge at the mountain fronts has negatively affected water resources.

"You could say that the whole Colorado River basin has been affected in many ways by climate change," explained Michaelides, also a senior lecturer at the University of Bristol in the United Kingdom. "Other research has shown declines in runoff for the upper

Colorado basin, so our results lend support for a broader regional decline in water resources, which is probably what we'll see in many places across the world."

Even though STORM was developed using data from a rain gauge network in a single dryland drainage basin, it is applicable anywhere. STORM enables scientists to examine, over multiple decades, the details of where rainfall occurs and how much fell on a per-minute basis. To date, Singer and Michaelides have used it to identify real climate change over a broad region, but they are in the process of coupling STORM to a runoff model to explore scenarios of climate change and how they might really affect the magnitude and the frequency of runoff.

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This is a test: Asteroid tracking network observes close approach -- ScienceDaily

On Oct. 12 EDT (Oct. 11 PDT), a small asteroid designated 2012 TC4 will safely pass by Earth at a distance of approximately 26,000 miles (42,000 kilometers). This is a little over one tenth the distance to the Moon and just above the orbital altitude of communications satellites. This encounter with TC4 is being used by asteroid trackers around the world to test their ability to operate as a coordinated international asteroid warning network.

2012 TC4 is estimated to be 50 to 100 feet (15 to 30 meters) in size. Orbit prediction experts say the asteroid poses no risk of impact with Earth. Nonetheless, its close approach to Earth is an opportunity to test the ability of a growing global observing network to communicate and coordinate its optical and radar observations in a real scenario.

This asteroid was discovered by the Panoramic Survey

Telescope and Rapid Response System (Pan-STARRS) in Hawaii in 2012. Pan-STARRS conducts a near-Earth object (NEO) survey funded by NASA's NEO Observations Program, a key element of NASA's Planetary Defense Coordination Office. However, 2012 TC4 traveled out of the range of asteroid-tracking telescopes shortly after it was discovered.

Based on the observations they were able to make in 2012, asteroid trackers predicted that it should come back into view in the fall of 2017. Observers with the European Space Agency and the European Southern Observatory were the first to recapture 2012 TC4, in late July 2017, using one of their large 8-meter aperture telescopes. Since then, observers around the world have been tracking the object as it approaches Earth and reporting their observations to the Minor Planet Center.

This "test" of what has become a global asteroid-impact early-warning system is a volunteer project, conceived and organized by NASA-funded asteroid observers and supported by the NASA Planetary Defense Coordination Office (PDCO).

As explained by Michael Kelley, program scientist and NASA PDCO lead for the TC4 observation campaign,

"Asteroid trackers are using this flyby to test the worldwide asteroid detection and tracking network, assessing our capability to work together in response to finding a potential real asteroid-impact threat."

No asteroid currently known is predicted to impact Earth for the next 100 years.

Asteroid TC4's closest approach to Earth will be over Antarctica at 1:42 AM EDT on Oct. 12 (10:42 p.m. PDT on Oct. 11). Tens of professionally run telescopes across the globe will be making ground-based observations in wavelengths from visible to near-infrared to radar. Amateur astronomers may contribute more observations, but the asteroid will be very difficult for backyard astronomers to see, as current estimates are that it will reach a visual magnitude of only about 17 at its brightest, and it will be moving very fast across the sky.

Many of the observers who are participating in this exercise are funded by NASA's NEO Observations Program, but observers supported by other countries' space agencies and space institutions around the world are now involved in the campaign.

Vishnu Reddy, an assistant professor at the University of Arizona's Lunar and Planetary Laboratory in Tucson, is leading the 2012 TC4 campaign. Reddy is principal investigator for a NASA-funded near-Earth asteroid characterization project. "This campaign is a team effort that involves more than a dozen observatories, universities and labs around the globe so we can collectively learn the strengths and limitations of our near-Earth object observation capabilities," he said. "This effort will exercise the entire system, to include the initial and follow-up observations, precise orbit determination, and international communications."

In September, asteroid observers were able to conduct a "pre-test" of coordinated tracking of the close approach of a much larger asteroid known as 3122 Florence. Florence, one of the largest known NEOs, at 2.8 miles (4.5 kilometers) in size, passed by Earth on Sept. 1 at 18 times the distance to the Moon. Coordinated observations of this asteroid revealed, among other things, that Florence has two moons.

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Giant exoplanet hunters: Look for debris disks -- ScienceDaily

There's no map showing all the billions of exoplanets hiding in our galaxy -- they're so distant and faint compared to their stars, it's hard to find them. Now, astronomers hunting for new worlds have established a possible signpost for giant exoplanets.

A new study finds that giant exoplanets that orbit far from their stars are more likely to be found around young stars that have a disk of dust and debris than those without disks. The study, published in *The Astronomical Journal*, focused on planets more than five times the mass of Jupiter. This study is the largest to date of stars with dusty debris disks, and has found the best evidence yet that giant planets are responsible for keeping that material in check.

"Our research is important for how future missions will plan which stars to observe," said Tiffany Meshkat, lead author and assistant research scientist at IPAC/Caltech in Pasadena, California. Meshkat worked on this study as a postdoctoral researcher at

NASA's Jet Propulsion Laboratory in Pasadena. "Many planets that have been found through direct imaging have been in systems that had debris disks, and now we know the dust could be indicators of undiscovered worlds."

Astronomers found the likelihood of finding long-period giant planets is nine times greater for stars with debris disks than stars without disks. Caltech graduate student Marta Bryan performed the statistical analysis that determined this result.

Researchers combined data from 130 single-star systems with debris disks detected by NASA's Spitzer Space Telescope, and compared them with 277 stars that do not appear to host disks. The two star groups were between a few million and 1 billion years old. Of the 130 stars, 100 were previously scanned for exoplanets. As part of this study, researchers followed up on the other 30 using the W. M. Keck Observatory in Hawaii and the European Southern Observatory's Very Large Telescope in Chile. They did not detect any new planets in those 30 systems, but the additional data helped characterize the abundance of planets in systems with disks.

The research does not directly resolve why the giant exoplanets would cause debris disks to form. Study authors suggest the massive gravity of giant planets causes small bodies called planetesimals to collide violently, rather than form proper planets, and remain in orbit as part of a disk.

"It's possible we don't find small planets in these systems because, early on, these massive bodies destroyed the building blocks of rocky planets, sending them smashing into each other at high speeds instead of gently combining," said co-author Dimitri Mawet, a Caltech associate professor of astronomy and a JPL senior research scientist.

On the other hand, giant exoplanets are easier to detect than rocky planets, and it is possible that there are some in these systems that have not yet been found.

Our own solar system is home to gas giants responsible for making "debris belts" -- the asteroid belt between Mars and Jupiter, shaped by Jupiter, and the Kuiper Belt, shaped by Neptune. Many of the systems Meshkat and Mawet studied also have two belts, but they are also much younger than ours -- up to 1 billion years old, compared to our system's present age of 4.5

billion years. The youth of these systems partly explains why they contain much more dust -- resulting from the collisions of small bodies -- than ours does.

One system discussed in the study is Beta Pictoris, which has been directly imaged from ground-based telescopes. This system has a debris disk, comets and one confirmed exoplanet. In fact, scientists predicted this planet's existence well before it was confirmed, based on the presence and structure of the prominent disk.

In a different scenario, the presence of two dust belts in a single debris disk suggests there are likely more planets in the system whose gravity maintains these belts, as is the case in the HR8799 system of four giant planets. The gravitational forces of giant planets nudge passing comets inward toward the star, which could mimic the period of our solar system's history about 4 billion years ago known as the Late Heavy Bombardment. Scientists think that during that period, the migration of Jupiter, Saturn, Uranus and Neptune deflected dust and small bodies into the Kuiper and asteroid belts we see today. When the Sun was young, there would have been a lot more dust in our solar system as well.

"By showing astronomers where future missions such as NASA's James Webb Space Telescope have their best chance to find giant exoplanets, this research paves the way to future discoveries," said Karl Stapelfeldt of JPL, chief scientist of NASA's Exoplanet Exploration Program Office and study co-author.

For more information about exoplanets, visit:

<https://exoplanets.nasa.gov>

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Injecting electrons jolts 2-D structure into new atomic pattern: Study is first to show potential of energy-efficient next-gen electronic memory -- ScienceDaily

The same electrostatic charge that can make hair stand on end and attach balloons to clothing could be an efficient way to drive atomically thin electronic memory devices of the future, according to a new study led by researchers at the Department of Energy's Lawrence Berkeley National Laboratory (Berkeley Lab).

In a study published today in the journal *Nature*, scientists have found a way to reversibly change the atomic structure of a 2-D material by injecting, or "doping," it with electrons. The process uses far less energy than current methods for changing the configuration of a material's structure.

"We show, for the first time, that it is possible to inject electrons to drive structural phase changes in

materials," said study principal investigator Xiang Zhang, senior faculty scientist at Berkeley Lab's Materials Sciences Division and a professor at UC Berkeley. "By adding electrons into a material, the overall energy goes up and will tip off the balance, resulting in the atomic structure re-arranging to a new pattern that is more stable. Such electron doping-driven structural phase transitions at the 2-D limit is not only important in fundamental physics; it also opens the door for new electronic memory and low-power switching in the next generation of ultra-thin devices."

Switching a material's structural configuration from one phase to another is the fundamental, binary characteristic that underlies today's digital circuitry. Electronic components capable of this phase transition have shrunk down to paper-thin sizes, but they are still considered to be bulk, 3-D layers by scientists. By comparison, 2-D monolayer materials are composed of a single layer of atoms or molecules whose thickness is 100,000 times as small as a human hair.

"The idea of electron doping to alter a material's atomic structure is unique to 2-D materials, which are much more electrically tunable compared with 3-D bulk materials," said study co-lead author Jun Xiao, a

graduate student in Zhang's lab.

The classic approach to driving the structural transition of materials involves heating to above 500 degrees Celsius. Such methods are energy-intensive and not feasible for practical applications. In addition, the excess heat can significantly reduce the life span of components in integrated circuits.

A number of research groups have also investigated the use of chemicals to alter the configuration of atoms in semiconductor materials, but that process is still difficult to control and has not been widely adopted by industry.

"Here we use electrostatic doping to control the atomic configuration of a two-dimensional material," said study co-lead author Ying Wang, another graduate student in Zhang's lab. "Compared to the use of chemicals, our method is reversible and free of impurities. It has greater potential for integration into the manufacturing of cell phones, computers and other electronic devices."

The researchers used molybdenum ditelluride (MoTe_2), a typical 2-D semiconductor, and coated it with an

ionic liquid (DEME-TFSI), which has an ultra-high capacitance, or ability to store electric charges. The layer of ionic liquid allowed the researchers to inject the semiconductor with electrons at a density of a hundred trillion to a quadrillion per square centimeter. It is an electron density that is one to two orders higher in magnitude than what could be achieved in 3-D bulk materials, the researchers said.

Through spectroscopic analysis, the researchers determined that the injection of electrons changed the atoms' arrangement of the molybdenum ditelluride from a hexagonal shape to one that is monoclinic, which has more of a slanted cuboid shape. Once the electrons were retracted, the crystal structure returned to its original hexagonal pattern, showing that the phase transition is reversible. Moreover, these two types of atom arrangements have very different symmetries, providing a large contrast for applications in optical components.

"Such an atomically thin device could have dual functions, serving simultaneously as optical or electrical transistors, and hence broaden the functionalities of the electronics used in our daily lives," said Wang.

This work was supported by DOE's Office of Science and by the National Science Foundation.

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Ceramic pump moves molten metal at a record 1,400 degrees Celsius: Device could store energy from renewables -- ScienceDaily

A ceramic-based mechanical pump able to operate at record temperatures of more than 1,400 degrees Celsius (1,673 Kelvin) can transfer high temperature liquids such as molten tin, enabling a new generation of energy conversion and storage systems.

The new pump could facilitate high efficiency, low-cost thermal storage, providing a new way to store renewable energy generated by wind and solar power, and facilitate an improved process for generating hydrogen directly from fuels such as methane -- without producing carbon dioxide. Use of ceramic components, normally considered too brittle for mechanical systems, was made possible by precision machining -- and seals made from another high-temperature material: graphite.

The research was supported by the Advanced Research

Projects Agency -- Energy (ARPA-E) and reported in the October 12 issue of the journal *Nature*. The pump was developed by researchers from the Georgia Institute of Technology with collaborators from Purdue University and Stanford University.

"Until now, we've had a ceiling for the highest temperatures at which we could move heat and store it, so this demonstration really enables energy advances, especially in renewables," said Asegun Henry, an assistant professor in Georgia Tech's Woodruff School of Mechanical Engineering. "The hotter we can operate, the more efficiently we can store and utilize thermal energy. This work will provide a step change in the infrastructure because now we can use some of the highest temperature materials to transfer heat. These materials are also the hardest materials on Earth."

Thermal energy, fundamental to power generation and many industrial processes, is most valuable at high temperatures because entropy -- which makes thermal energy unavailable for conversion -- declines at higher temperatures. Liquid metals such as molten tin and molten silicon could be useful in thermal storage and transfer, but until now, engineers didn't have pumps

and pipes that could withstand such extreme temperatures.

"The hotter you can operate, the more you can convert thermal energy to mechanical energy or electrical energy," Henry explained. "But when containment materials like metals get hot, they become soft and that limits the whole infrastructure."

Ceramic materials can withstand the heat, but they are brittle -- and many researchers felt they couldn't be used in mechanical applications like pumps. But Henry and graduate student Caleb Amy -- the paper's first author -- decided to challenge that assumption by trying to make a ceramic pump. "We weren't certain that it wouldn't work, and for the first four times, it didn't," Henry said.

The researchers used an external gear pump, which uses rotating gear teeth to suck in the liquid tin and push it out of an outlet. That technology differs from centrifugal and other pump technologies, but Henry chose it for its simplicity and ability to operate at relatively low speeds. The gears were custom-manufactured by a commercial supplier and modified in Henry's lab in the Carbon Neutral Energy Solutions

(CNES) building at Georgia Tech.

"What is new in the past few decades is our ability to fabricate different ceramic materials into large chunks of material that can be machined," Henry explained.

"The material is still brittle and you have to be careful with the engineering, but we've now shown that it can work."

Addressing another challenge, the researchers used another high-temperature material -- graphite -- to form the seals in the pump, piping and joints. Seals are normally made from flexible polymers, but they cannot withstand high temperatures. Henry and Amy used the special properties of graphite -- flexibility and strength -- to make the seals. The pump operates in a nitrogen environment to prevent oxidation at the extreme temperatures.

The pump operated for 72 hours continuously at a few hundred revolutions per minute at an average temperature of 1,473 Kelvin -- with brief operation up to 1,773 Kelvin in other experimental runs. Because the researchers used a relatively soft ceramic known as Shapal for ease of machining, the pump sustained wear. But Henry says other ceramics with greater

hardness will overcome that issue, and the team is already working on a new pump made with silicon carbide.

Among the most interesting applications for the high-temperature pump would be low-cost grid storage for surplus energy produced by renewables -- one of the greatest challenges to the penetration of renewables on the grid. Electricity produced by solar or wind sources could be used to heat molten silicon, creating thermal storage that could be used when needed to produce electricity.

"It appears likely that storing energy in the form of heat could be cheaper than any other form of energy storage that exists," Henry said. "This would allow us to create a new type of battery. You would put electricity in when you have an excess, and get electricity back out when you need it."

The Georgia Tech researchers are also looking at their molten metal pump as part of a system to produce hydrogen from methane without generating carbon dioxide. Because liquid tin doesn't react with hydrocarbons, bubbling methane into liquid tin would crack the molecule to produce hydrogen and solid

carbon -- without generating carbon dioxide, a greenhouse gas.

The pump could also be used to allow higher temperature operation in concentrated solar power applications, where molten salts are now used. The combination of liquid tin and ceramics would have an advantage in being able to operate at higher temperatures without corrosion, enabling higher efficiency and lower cost.

The ceramic pump uses gears just 36 millimeters in diameter, but Henry says scaling it up for industrial processing wouldn't require dramatically larger components. For example, by increasing the pump dimensions by only four or five times and operating the pump near its maximum rated speed, the total heat that could be transferred would increase by a factor of a thousand, from 10 kW to 100 MW, which would be consistent with utility-scale power plants.

For storage, molten silicon -- with still higher temperatures -- may be more useful because of its lower cost. The pump could operate at much higher temperatures than those demonstrated so far, even past 2,000 degrees Celsius, Henry said.

This research was supported by the Advanced Research Projects Agency -- Energy (ARPA-E) under award DE-AR0000339. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the funding agency.

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All Top News

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- [**Giant exoplanet hunters: Look for debris disks**](#) [周四, 12 10月 01:52]

There's no map showing all the billions of exoplanets hiding in our galaxy -- they're so distant and faint compared to their stars, it's hard to find them. Now, astronomers hunting for new worlds have established a possible signpost for giant exoplanets.

- [**New type of stem cell line produced offers expanded potential for research and treatments**](#) [周四, 12 10月 01:17]

Researchers have created expanded potential stem cells (EPSCs) in mice, for the first time, that have a greater potential for development than current stem cell lines. These stem cells have the features of the very first cells in the developing embryo, and can develop into any type of cell.

- [**Bycatch responsible for decline of endangered New Zealand sea lion**](#) [周四, 12 10月 01:17]

Getting caught in fishing nets is a major cause of death for the increasingly endangered New Zealand sea lion, according to new research.

- [**'Ridiculously healthy' elderly have the same gut microbiome as healthy 30 year-olds**](#) [周四, 12 10月 00:37]

In one of the largest microbiota studies conducted in humans, researchers have shown a potential link between healthy aging and a healthy gut.

- [**Kune Kune piglets possess social learning skills**](#)

[and have an astonishingly good memory](#) [周四, 12 10月 00:03]

Pigs are socially competent and capable of learning. But the combination of these skills, learning by observing others, has been insufficiently studied so far. Exact copying and understanding of demonstrated actions -- highly developed learning abilities -- could not be proven. A new study with Kune Kune pigs, has now shown for the first time that pigs do learn from each other. The intelligent animals also possess remarkable long-term memory after internalizing a technique.

• [Scientists discover one of the most luminous 'new stars' ever](#) [周四, 12 10月 00:03]

Astronomers have discovered possibly the most luminous 'new star' ever -- a nova discovered in the direction of one of our closest neighboring galaxies: The Small Magellanic Cloud.

• [One of planet's largest volcanic eruptions](#) [周三, 11 10月 21:11]

Researchers have determined that the Pacific Northwest was home to one of the Earth's largest known volcanic eruptions, a millennia-long spewing of sulfuric gas that blocked out the sun and cooled the planet. Only two other eruptions -- the basalt floods of the Siberian Traps and the Deccan Traps -- were larger, and they led to two of the Earth's great extinctions.

• [Anticipated social media buzz can drive tourism](#) [周三, 11 10月 10:45]

How much positive feedback travelers think they'll get on social media can predict whether they intend to visit a tourism destination, a new study has found.

• [World will have more obese children and adolescents than underweight by 2022](#) [周三, 11 10月 10:44]

The number of obese children and adolescents (aged 5 to 19 years) worldwide has risen tenfold in the past four decades, according to a new study. If current trends continue, more children and adolescents will be obese than moderately or severely underweight by 2022.

• [Better mini brains could help scientists identify](#)

[treatments for Zika-related brain damage](#) [周三, 11 10月 08:01]

Researchers have developed an improved technique for creating simplified human brain tissue from stem cells. Because these so-called 'mini brain organoids' mimic human brains in how they grow and develop, they're vital to studying complex neurological diseases.

• [How fever in early pregnancy causes heart, facial birth defects](#) [周三, 11 10月 02:44]

Researchers have known for decades that fevers in the first trimester of pregnancy increase risk for some heart defects and facial deformities such as cleft lip or palate. Exactly how this happens is unclear. Scientists have debated whether a virus or other infection source causes the defects, or if fever alone is the underlying problem.

• [Humpback whale blow microbiome described](#) [周三, 11 10月 01:39]

For the first time, scientists have identified an extensive conserved group of bacteria within healthy humpback whales' blow -- the moist breath that whales spray out of their blowholes when they exhale.

• [Breath instead of a blood test](#) [周三, 11 10月 00:41]

Blow into the tube, please. In the future, the procedure will not just be used by police checking for alcohol intoxication, but also for testing the condition of athletes and for people who want to lose that extra bit of weight. A new sensor makes it possible to measure when the body starts burning fat with a convenient breathalyser.

• [Mass extinctions led to low species diversity, dinosaur rule](#) [周三, 11 10月 00:40]

Two of Earth's five mass extinction events -- times when more than half of the world's species died -- resulted in the survival of a low number of so-called 'weedy' species that spread their sameness across the world as the Earth recovered from these dramatic upheavals. The findings could shed light on modern high extinction rates and how biological communities may change in the future.

• [Diversity of large animals plays an important](#)

[role in carbon cycle](#) [周二, 10 10月 22:56]

With abundant data on plants, large animals and their activity, and carbon soil levels in the Amazon, research suggests that large animal diversity influences carbon stocks and contributes to climate change mitigation.

• [Size doesn't matter, at least for hammerheads and swimming performance](#) [周二, 10 10月 22:56]

Different head shapes and different body sizes of hammerhead sharks should result in differences in their swimming performance right? Researchers have conducted the first study to examine the whole body shape and swimming kinematics of two closely related yet very different hammerhead sharks, with some unexpected results.

• [Best way to recognize emotions in others: Listen](#) [周二, 10 10月 22:56]

If you want to know how someone is feeling, it might be better to close your eyes and use your ears: People tend to read others' emotions more accurately when they listen and don't look, according to research.

• ['Fake fin' discovery reveals new ichthyosaur species](#) [周二, 10 10月 22:56]

An ichthyosaur first discovered in the 1970s but then dismissed and consigned to museum storerooms across the country has been re-examined and found to be a new species.

• [Genetically boosting the nutritional value of corn could benefit millions](#) [周二, 10 10月 03:49]

Scientists have found an efficient way to enhance the nutritional value of corn -- the world's largest commodity crop -- by inserting a bacterial gene that causes it to produce a key nutrient called methionine, according to a new study.

• [Huge energy potential in open ocean wind farms in the North Atlantic](#) [周二, 10 10月 03:49]

Because wind speeds are higher on average over ocean than over land, wind turbines in the open ocean could in theory intercept more than five

times as much energy as wind turbines over land. This presents an enticing opportunity for generating renewable energy through wind turbines. But it was unknown whether the faster ocean winds could actually be converted to increased amounts of electricity.

- [**Human brain recalls visual features in reverse order than it detects them**](#) [周二, 10 10月 03:49]

New research has contributed to solving a paradox of perception, literally upending models of how the brain constructs interpretations of the outside world. When observing a scene, the brain first processes details -- spots, lines and simple shapes -- and uses that information to build internal representations of more complex objects, like cars and people. But during recall, the brain remembers those larger concepts first. This could shed light on concepts such as eyewitness testimony to autism.

- [**'Turbo charge' for your brain?**](#) [周二, 10 10月 03:49]

Two brain regions -- the medial frontal and lateral prefrontal cortices -- control most executive function. Researchers used high-definition transcranial alternating current stimulation (HD-tACS) to synchronize oscillations between them, improving brain processing. De-synchronizing did the opposite.

- [**Amazon farmers discovered the secret of domesticating wild rice 4,000 years ago**](#) [周二, 10 10月 03:47]

Amazonian farmers discovered how to manipulate wild rice so the plants could provide more food 4,000 years ago, long before Europeans colonized America, archaeologists have discovered.

- [**Farsighted children struggle with attention, study finds**](#) [周二, 10 10月 00:40]

Farsighted preschoolers and kindergartners have a harder time paying attention and that could put them at risk of slipping behind in school, a new study suggests.

- [**The female brain reacts more strongly to**](#)

[prosocial behavior than the male brain, study finds](#) [周二, 10 10月 00:32]

Women are more generous than men, behavioral experiments show. Now, researchers have been able to demonstrate that female and male brains process prosocial and selfish behavior differently. For women, prosocial behavior triggers a stronger reward signal, while male reward systems respond more strongly to selfish behavior.

[Bacteria self-organize to build working sensors](#) [周二, 10 10月 00:32]

By programming bacteria with a synthetic gene circuit that can recruit gold nanoparticles to the surface of their colony, researchers can build functional devices. A proof-of-concept study uses this technique to build dome-shaped pressure sensors with the help of living bacteria.

[Solar energy: Prototype shows how tiny photodetectors can double their efficiency](#) [周二, 10 10月 00:32]

Physicists have developed a photodetector -- a device that converts light into electrons -- by combining two distinct inorganic materials and producing quantum mechanical processes that could revolutionize the way solar energy is collected. The researchers stacked two atomic layers of tungsten diselenide on a single atomic layer of molybdenum diselenide. Such stacking results in properties vastly different from those of the parent layers, allowing for customized electronic engineering at the tini...

[Droughts and wildfires: How global warming is drying up the North American monsoon](#) [周二, 10 10月 00:31]

Previous researchers had concluded that global warming was simply delaying the North American monsoon, which brings summer rains to the southwestern US and northwestern Mexico. But a new, high-resolution climate model that corrects for persistent sea surface temperature (SST) biases now accurately reflects current rainfall conditions and demonstrates that the monsoon is not simply delayed, but that the region's total rainfall is facing a dramatic reduction.

- [**Novel circuit design boosts wearable thermoelectric generators**](#) [周一, 09 10月 21:33]

Using flexible conducting polymers and novel circuitry patterns printed on paper, researchers have demonstrated proof-of-concept wearable thermoelectric generators that can harvest energy from body heat to power simple biosensors for measuring heart rate, respiration or other factors.

- [**Official fish trade 'hugely underestimates' global catches**](#) [周一, 09 10月 21:29]

Conservation of dwindling fish stocks is being severely hampered by poor controls on global trade, according to new research.

- [**Mars study yields clues to possible cradle of life**](#) [周六, 07 10月 03:49]

The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth. The research offers evidence that these deposits were formed by heated water from a volcanically active part of the planet's crust entering the bottom of a large sea long ago.

- [**New telescope attachment allows ground-based observations of new worlds**](#) [周六, 07 10月 02:22]

A new, low-cost attachment to telescopes allows previously unachievable precision in ground-based observations of planets beyond our solar system. With it, ground-based telescopes can produce measurements of light intensity that rival the highest quality photometric observations from space.

- [**Breast cancer linked to bacterial imbalances**](#) [周六, 07 10月 00:40]

Researchers have uncovered differences in the bacterial composition of breast tissue of healthy women vs. women with breast cancer. The research team has discovered for the first time that healthy breast tissue contains more of the bacterial species *Methylobacterium*, a finding which could offer a new perspective in the battle against breast cancer.

- [**Exotic quantum particle observed in bilayer**](#)

[**graphene**](#) [周五, 06 10月 21:22]

Physicists have definitively observed an intensely studied anomaly in condensed matter physics -- the even-denominator fractional quantum Hall state -- via transport measurement in bilayer graphene.

. [**Old Faithful's geological heart revealed**](#) [周五, 06 10月 07:02]

Scientists have mapped the near-surface geology around Old Faithful, revealing the reservoir of heated water that feeds the geyser's surface vent and how the ground shaking behaves in between eruptions.

. [**3-D quantum gas atomic clock offers new dimensions in measurement**](#) [周五, 06 10月 02:18]

Physicists have created an entirely new design for an atomic clock, in which strontium atoms are packed into a tiny three-dimensional cube at 1,000 times the density of previous one-dimensional clocks. In doing so, they are the first to harness the ultra-controlled behavior of a so-called 'quantum gas' to make a practical measurement device.

. [**Carbon feedback from forest soils to accelerate global warming**](#) [周五, 06 10月 02:18]

After 26 years, the world's longest-running experiment to discover how warming temperatures affect forest soils has revealed a surprising, cyclical response: Soil warming stimulates periods of abundant carbon release from the soil to the atmosphere alternating with periods of no detectable loss in soil carbon stores. The study indicates that in a warming world, a self-reinforcing and perhaps uncontrollable carbon feedback will occur between forest soils and the climate system, accelerating global...

. [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

. [**Prehistoric humans are likely to have formed**](#)

[**mating networks to avoid inbreeding**](#) [周五, 06 10月 02:17]

Early humans seem to have recognized the dangers of inbreeding at least 34,000 years ago, and developed surprisingly sophisticated social and mating networks to avoid it, new research has found.

• [**12,000 years ago, Florida hurricanes heated up despite chilly seas**](#) [周五, 06 10月 00:50]

Category 5 hurricanes may have slammed Florida repeatedly during the chilly Younger Dryas, 12,000 years ago. The cause? Hurricane-suppressing effects of cooler sea surface were out-weighed by side effects of slowed ocean circulation.

• [**Brain study reveals how insects make beeline for home**](#) [周五, 06 10月 00:50]

Scientists have discovered how the wiring of bees' brains helps them plot the most direct route back to their hive.

• [**Once declared extinct, Lord Howe Island stick insects really do live**](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead Lord Howe Island stick insects have some good news: those rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

• [**More traits associated with your Neanderthal DNA**](#) [周五, 06 10月 00:11]

After humans and Neanderthals met many thousands of years ago, the two species began interbreeding. Recent studies have shown that some of those Neanderthal genes have contributed to human immunity and modern diseases. Now researchers have found that our Neanderthal inheritance has contributed to other characteristics, too, including skin tone, hair color, sleep patterns, mood, and even a person's smoking

status.

- [**Violent helium reaction on white dwarf surface triggers supernova explosion**](#) [周四, 05 10月 23:11]

Astronomers have found solid evidence about what triggered a star to explode, which will contribute to a further understanding of supernova history and behavior.

- [**'Squirtable' elastic surgical glue seals wounds in 60 seconds**](#) [周四, 05 10月 22:27]

A highly elastic and adhesive surgical glue that quickly seals wounds without the need for common staples or sutures could transform how surgeries are performed.

- [**Mars' moon Phobos examined in a different light**](#) [周四, 05 10月 22:27]

NASA's longest-lived mission to Mars has gained its first look at the Martian moon Phobos, pursuing a deeper understanding by examining it in infrared wavelengths.

- [**Who fatally undermined Scott's Antarctic expedition?**](#) [周四, 05 10月 22:26]

What doomed Captain Robert Falcon Scott's British Antarctic Expedition in 1912? Scientists have uncovered documents and diary entries that suggest a team member stole food Scott needed, failed to pass on orders that would have sent out a dog team to meet the men and then changed his story over time to cover up his role in their deaths.

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Health News

Top stories featured on ScienceDaily's Health & Medicine, Mind & Brain, and Living Well sections.

- [**New type of stem cell line produced offers expanded potential for research and treatments**](#)

[周四, 12 10月 01:17]

Researchers have created expanded potential stem cells (EPSCs) in mice, for the first time, that have a greater potential for development than current stem cell lines. These stem cells have the features of the very first cells in the developing embryo, and can develop into any type of cell.

- [**Esophageal cancer 'cell of origin' identified**](#) [周四, 12 10月 01:17]

Researchers have identified cells in the upper digestive tract that can give rise to Barrett's esophagus, a precursor to esophageal cancer.

- [**Deciphering biological meaning from an atlas of gene expression across 42 tissue types**](#) [周四, 12 10月 01:17]

The human genome encodes instructions for which genes are expressed in what cell type, along with other molecules that control how much and when these genes are expressed. Variation in the regulation of gene expression gives rise to the diverse tissue types, with diverse functions, in the human body. Finding new clues about the molecular origins of disease is the goal for a comprehensive atlas of variation in gene expression.

- [**Serrated polyps plus conventional adenomas may mean higher risk for colorectal cancer**](#) [周四, 12 10月 01:16]

Examining more than 5,000 reports a research team finds that individuals with both conventional adenomas as well as a subset of

lesions known as serrated polyps may be at higher risk for developing colorectal cancer or high-risk adenomas that can lead to colorectal cancer, than those who have serrated polyps or high-risk adenomas alone. Individuals with both serrated polyps and high-risk adenomas may therefore benefit from closer surveillance.

- [**Future smartwatches could sense hand movement using ultrasound imaging**](#) [周四, 12 10月 01:16]

New research has shown future wearable devices, such as smartwatches, could use ultrasound imaging to sense hand gestures.

- [**Gut fungi could play a role in obesity epidemic**](#) [周四, 12 10月 01:16]

A high-fat diet changes fungi in the gut and may play a role in the development of obesity, according to a new study. While gut microbes have previously been implicated in the development of obesity, this study shows that fungi may also play a role.

- [**Calcium lets T cells use sugar to multiply and fight infection**](#) [周四, 12 10月 01:16]

A calcium signal controls whether immune cells can use the nutrients needed to fuel their multiplication into a cellular army designed to fight invading viruses.

- [**'Ridiculously healthy' elderly have the same gut microbiome as healthy 30 year-olds**](#) [周四, 12 10月 00:37]

In one of the largest microbiota studies conducted in humans, researchers have shown a potential link between healthy aging and a healthy gut.

- [**Will we be able to use zinc oxide nanoparticles as fertilizers?**](#) [周四, 12 10月 00:06]

Researchers from Universidad Politécnica de Madrid (UPM) and National Institute for Agricultural Research and Experimentation (INIA) have studied the effects of using zinc oxide nanoparticles on agriculture.

- [**New genetic clue to peanut allergy**](#) [周四, 12 10月 00:04]

Researchers have pinpointed a new gene associated with peanut allergy, offering further evidence that genes play a role in the development of food allergies and opening the door to future research, improved diagnostics and new treatment options.

• [**Study shows untapped creativity in workforce**](#) [周四, 12 10月 00:04]

With the U.S. economy less reliant on manufacturing, creativity and innovation are of increasing value. Arts graduates, and others who have developed and honed their creative skills, can be critical assets.

• [**Our brain omits grammatical elements when it has limited resources**](#) [周四, 12 10月 00:03]

A study of the use of pronouns by French speakers with agrammatic aphasia shows that grammatical pronouns are significantly more impaired in speech than lexical ones. The findings support a new theory of grammar which suggests that grammatical elements contain secondary information that speakers with limited cognitive resources can omit from their speech and still make sense.

• [**New study examines full range of post-stroke visual impairments**](#) [周四, 12 10月 00:03]

Researchers have examined the visual impairment screening/referral forms from 915 post-stroke patients from 20 NHS hospital trusts. Overall 84% were visually symptomatic with visual field loss the most common complaint followed by blurred vision, reading difficulty, and diplopia.

• [**Brain chemical abnormalities in earliest stage of psychosis identified**](#) [周四, 12 10月 00:03]

A new study of young people experiencing a first episode of psychosis reports elevations in the brain chemicals glutamate and glycine.

• [**Experts express concerns over infant mental health assessment**](#) [周四, 12 10月 00:03]

Forty world experts on child development and mental health have released a joint statement calling for caution when applying an

influential classification for assessing infant mental health and potential cases of abuse.

- [**Women seen as younger when eyes, lips and eyebrows stand out**](#) [周四, 12 10月 00:03]

Researchers in France and America find that aspects of facial contrast, a measure of how much facial features stand out in the face, decrease with age in women across a variety of ethnic groups. The researchers also find that observers perceive women with increased facial contrast as younger, regardless of the ethnic background of the women or the observers. This suggests that facial contrast is a cross-cultural cue to age perception.

- [**Drivers are less cautious at railway crossings**](#) [周三, 11 10月 22:07]

Drivers aren't as cautious approaching a railway level crossing compared to a road intersection despite the greater risk of fatality if a collision occurs, a new study has found.

- [**Predatory bacteria: The quest for a new class of antibiotics**](#) [周三, 11 10月 22:07]

Researchers take one step forward toward understanding and genetically manipulating *B. bacteriovorus*, a type of bacteria with promising potential use as a living antibiotic.

- [**World's 'better' countries have higher rates of cancer**](#) [周三, 11 10月 22:07]

The world's 'better' countries, with greater access to healthcare, experience much higher rates of cancer incidence than the world's 'worse off' countries, according to new research.

- [**Hispanic children and exposure to adverse experiences**](#) [周三, 11 10月 21:18]

Although they experience more poverty, Hispanic children from immigrant families reported fewer exposures to such adverse childhood experiences (ACEs) as parental divorce and scenes of violence, a new American study of national survey information gathered on more than

12,000 people found.

- [**Hormone therapy may benefit migraine sufferers without increased risk of heart disease**](#)

[周三, 11 10月 21:18]

Migraine headaches are common among women, but due to various health risks can be challenging to treat in the elderly. While hormone therapy is effective in relieving many menopause symptoms, its safe use in women with migraines was unconfirmed. A new study demonstrates its safety for this population.

- [**Despite effectiveness women remain skeptical of hormones at menopause -- what's the problem?**](#) [周

三, 11 10月 21:18]

Women today have more options than ever before for treating their menopause symptoms, although hormone therapy still ranks as the most effective treatment for debilitating symptoms such as hot flashes. A new study demonstrates, however, that women remain skeptical regarding the safety of hormone therapy and prefer less proven options.

- [**Confusion about long-term treatment of osteoporosis clarified**](#) [周三, 11 10月 21:18]

Osteoporosis is a common disorder among postmenopausal women which results in an increased risk of fractures. While several therapies improve bone strength and reduce the risk of spine and hip fracture, there is no cure for osteoporosis, and long-term treatment is needed.

- [**How serious is postmenopausal bleeding?**](#) [周三, 11 10月

21:17]

If you're postmenopausal, you shouldn't be bleeding. The very definition of menopause is having gone more than 12 months without a period. So if you're still bleeding, something is wrong. Determining the seriousness of the problem and treating it, is not always evident.

- [**Once a lesbian always a lesbian, right? Or not?**](#) [周

三, 11 10月 21:17]

Are people's sexual attractions likely to change as they age? That's the question at the core of an ongoing debate as to whether or not sexuality remains stable throughout a person's life. An upcoming presentation will

review the latest research on the prevalence of same-sex sexuality and sexual fluidity and their implications for healthcare providers.

- **[Traumatic events take toll on the heart](#)** [周三, 11 10月 21:17]

Today it seems about everything has been shown to lead to heart disease. Of course smoking is bad for you, as is high blood pressure. There's even mounting evidence that psychosocial factors can cause heart problems. A new study demonstrates how traumatic experiences can affect vascular health and, ultimately, heart disease.

- **[A specific protein regulates the burning of body fat to generate heat](#)** [周三, 11 10月 21:17]

Scientists have identified a protein that holds promise as a target for therapies to reduce obesity. They have demonstrated that MKK6 controls the conversion of fat stores, known as white fat, into brown fat, in which lipids are burned to maintain body temperature and reduce obesity.

- **[Gel to fight rheumatoid arthritis](#)** [周三, 11 10月 21:17]

A new potentially therapeutic gel has been developed, which detects nitric oxide, absorbs excess fluids and delivers drugs.

- **[Cities taking narrow approach to start adapting to climate change see benefits](#)** [周三, 11 10月 21:17]

A new study led by a University of Kansas urban planning researcher sheds light on tradeoffs between taking a narrow approach focused on connections between climate change adaptation and reducing risks from hazards like Hurricanes Harvey, Irma and Maria, and taking a broader approach connecting adaptation to a wide array of city functions.

- **[Aging slows perception of falls](#)** [周三, 11 10月 21:17]

Seniors need twice as long as young adults to realize they are falling, a delay that puts them at increased risk for serious injury, according to a new study. The findings will help shape the development of wearable fall prevention technology and allow clinicians to more accurately identify at-risk individuals.

- **[Average wages for all workers, men and women,](#)**

have increased as a result of women joining the workforce [周三, 11 10月 21:17]

Economists are continually examining the effect of the economy on women, but this male-dominated field seems to be failing to ask what impact women in turn have on the economy? Researchers have examined how women's participation in the workforce has affected economic growth and productivity in cities across the US. They estimate that every 10% increase in female labor force participation rates increases average real wage growth in cities by approximately 5%.

Anticipated social media buzz can drive tourism [周三, 11 10月 10:45]

How much positive feedback travelers think they'll get on social media can predict whether they intend to visit a tourism destination, a new study has found.

Epidurals don't slow labor, study shows [周三, 11 10月 10:45]

Research has demonstrated that epidural medication had no effect on the duration of the second stage of labor, normal vaginal delivery rate, incidence of episiotomy, the position of the fetus at birth or any other measure of fetal well-being the researchers investigated. The study compared the effects of catheter-infused, low-concentration epidural anesthetic to a catheter-infused saline placebo in this double-blinded, randomized trial of 400 women.

World will have more obese children and adolescents than underweight by 2022 [周三, 11 10月 10:44]

The number of obese children and adolescents (aged 5 to 19 years) worldwide has risen tenfold in the past four decades, according to a new study. If current trends continue, more children and adolescents will be obese than moderately or severely underweight by 2022.

Better mini brains could help scientists identify treatments for Zika-related brain damage [周三, 11 10月 08:01]

Researchers have developed an improved technique for creating simplified human brain tissue from stem cells. Because these so-called

'mini brain organoids' mimic human brains in how they grow and develop, they're vital to studying complex neurological diseases.

- [**Scientists reveal how inflammation affects the life of brain cells**](#) [周三, 11 10月 08:01]

New research reveals how blood inflammation affects the birth and death of brain cells, which could offer new treatment targets for antidepressants.

- [**New Zika serotypes may emerge, researcher warns**](#) [周三, 11 10月 08:01]

The virus is mutating very fast in Brazilian patients. Appearance of new serotypes could hinder development of vaccines and efficacy of diagnostic tests, according to a member of one of the leading group of scientists on Zika-related investigations.

- [**Gold 'nanoprobes' used to track blood flow in tiny vessels**](#) [周三, 11 10月 08:01]

Scientists have designed gold nanoparticles, no bigger than 100 nanometers, which can be coated and used to track blood flow in the smallest blood vessels in the body.

- [**Menopause triggers metabolic changes in brain that may promote Alzheimer's**](#) [周三, 11 10月 08:01]

Menopause causes metabolic changes in the brain that may increase the risk of Alzheimer's disease, a team of scientists has shown in new research.

- [**Homicide is the largest contributor to years of lost life among black Americans**](#) [周三, 11 10月 08:01]

Homicide is the largest contributor to potential years of life lost among black Americans, according to a new study published in PLOS ONE and conducted by researchers at the Indiana University School of Public Health-Bloomington.

- [**New smell test could aid early detection of**](#)

[Alzheimer's and Parkinson's](#) [周三, 11 10月 08:01]

Problems with olfaction have been linked to a variety of health conditions. Scientists have developed new tests to detect smell loss more reliably.

• [Doctors need a nudge to reduce antibiotic prescriptions, study finds](#) [周三, 11 10月 03:29]

An update to a behavioral economics study on clinicians' prescriptions of antibiotics showed that the clinicians may, without long-term interventions, return to bad prescription habits.

• [How the cone snail's deadly venom can help us build better medicines](#) [周三, 11 10月 03:29]

By researching deadly cone snail venom, researchers hope to find solutions to tough medical problems and diseases.

• [New breast cancer drug defeats the Ras genes notorious for causing many types of cancer](#) [周三, 11 10月 03:28]

A new study has shown the recently approved breast cancer drug neratinib can block the function of Ras as well as several other oncogenes through an unexpected process.

• [Raging Bull: First study to find link between testosterone and stock market instability](#) [周三, 11 10月 03:27]

In the U.S. today, the majority of professional stock market traders are young males and new evidence suggests biology strongly influences their trading behavior. According to a new study this could be a significant contributor to fluctuations in the market, as high testosterone levels can cause these traders to overestimate future stock values and change their trading behavior, leading to dangerous price bubbles and subsequent crashes.

• [Concussion: How the NFL came to shape the issue that plagued it](#) [周三, 11 10月 03:27]

Players kneeling during the national anthem is the most recent NFL

controversy, but certainly not the first nor the biggest. Concussion has dogged the NFL since the 1990s, and its initial response -- avoidance and superficial gestures to mollify critics -- damaged its public image. However, in recent years, the league has repositioned itself as a leader in concussion prevention and research, a new study shows.

- [**How fever in early pregnancy causes heart, facial birth defects**](#) [周三, 11 10月 02:44]

Researchers have known for decades that fevers in the first trimester of pregnancy increase risk for some heart defects and facial deformities such as cleft lip or palate. Exactly how this happens is unclear. Scientists have debated whether a virus or other infection source causes the defects, or if fever alone is the underlying problem.

- [**When the brain's wiring breaks**](#) [周三, 11 10月 02:32]

Among all the bad things that can happen to the brain when it is severely jolted - in a car accident, for example - one of the most common and worrisome is axon damage. Axons are the long stalks that grow out of the bodies of neurons. When the brain receives a strong blow, axons can break or swiftly degenerate. Researchers have revealed new molecular details of this and a path toward repair.

- [**Bright light therapy at midday helped patients with bipolar depression**](#) [周三, 11 10月 02:32]

Daily exposure to bright white light at midday significantly decreased symptoms of depression and increased functioning in people with bipolar disorder, a recent study found. More than 68 percent of patients who received midday bright light achieved a normal level of mood, compared to 22.2 percent of patients who received a dim placebo light.

- [**Unexpected regulation of transcription factors critical to development**](#) [周三, 11 10月 02:32]

Developmental biologists have for the first time described how two transcription factors that are 'absolutely essential for human development' are regulated by a cell surface metalloprotease known as ADAM13. The discovery adds to knowledge of how cells migrate in

vertebrate embryos, how stem cells differentiate and how cancer cells metastasize.

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [**Rainstorm generator assesses watershed rainfall under climate change simulations**](#) [周四, 12 10月 01:58]

The Colorado River tumbles through varied landscapes, draining watersheds from seven western states. This 1,450-mile-long system is a critical water supply for agriculture, industry and municipalities from Denver to Tijuana.

- [**This is a test: Asteroid tracking network observes close approach**](#) [周四, 12 10月 01:55]

On Oct. 12 EDT (Oct. 11 PDT), a small asteroid designated 2012 TC4 will safely pass by Earth at a distance of approximately 26,000 miles (42,000 kilometers). This is a little over one tenth the distance to the Moon and just above the orbital altitude of communications satellites. This encounter with TC4 is being used by asteroid trackers around the world to test their ability to operate as a coordinated international asteroid warning network.

- [**Giant exoplanet hunters: Look for debris disks**](#) [周四, 12 10月 01:52]

There's no map showing all the billions of exoplanets hiding in our galaxy -- they're so distant and faint compared to their stars, it's hard to find them. Now, astronomers hunting for new worlds have established a possible signpost for giant exoplanets.

- [**Injecting electrons jolts 2-D structure into new atomic pattern**](#) [周四, 12 10月 01:17]

The same electrostatic charge that can make hair stand on end and attach

balloons to clothing could be an efficient way to drive atomically thin electronic memory devices of the future, according to a new study. Scientists have found a way to reversibly change the atomic structure of a 2-D material by injecting it with electrons. The process uses far less energy than current methods for changing the configuration of a material's structure.

- [**Ceramic pump moves molten metal at a record 1,400 degrees Celsius**](#) [周四, 12 10月 01:17]

A ceramic-based mechanical pump able to operate at record temperatures of more than 1,400 degrees Celsius (1,673 Kelvin) can transfer high temperature liquids such as molten tin, enabling a new generation of energy conversion and storage systems.

- [**Future smartwatches could sense hand movement using ultrasound imaging**](#) [周四, 12 10月 01:16]

New research has shown future wearable devices, such as smartwatches, could use ultrasound imaging to sense hand gestures.

- [**Storage is renewable energy's greatest challenge -- this low-cost sulfur battery may help**](#) [周四, 12 10月 00:38]

Motivated by the challenge to drastically reduce the cost of storing renewable energy on the grid while capturing more of it, a group of scientists has developed a battery powered by sulfur, air, water, and salt -- all readily available materials -- that is nearly 100 times less expensive to produce than batteries currently on the market and can store twice as much energy as a lead-acid battery. The inventors present their prototype in Joule.

- [**New software speeds origami structure designs**](#) [周四, 12 10月 00:38]

Researchers have developed a new computer-aided approach that streamlines the design process for origami-based structures, making it easier for engineers and scientists to conceptualize new ideas graphically while simultaneously generating the underlying mathematical data needed to build the structure in the real world.

- [**No dark side to using LED lights to supplement WiFi**](#) [周四, 12 10月 00:06]

Energy-saving Light Emitting Diodes (LEDs) could help meet demand for wireless communications without affecting the quality of light or environmental benefits they deliver, new research has shown.

- [**Study shows untapped creativity in workforce**](#) [周四, 12 10月 00:04]

With the U.S. economy less reliant on manufacturing, creativity and innovation are of increasing value. Arts graduates, and others who have developed and honed their creative skills, can be critical assets.

- [**Remote sensing for cosmic dust and other celestial bodies**](#) [周四, 12 10月 00:03]

Astronomers review the state-of-the-art in polarimetry studies of the small bodies in our solar system. Combined with different observational techniques, polarimetry may be used as a remote sensing technique to measure asteroids' size, to reveal the composition and size variation of dust in comets or of aerosols in planetary atmospheres, or even to detect extra-terrestrial biomarkers.

- [**Key odorants in world's most expensive beef could help explain its allure**](#) [周四, 12 10月 00:03]

Renowned for its soft texture and characteristic flavor, Wagyu beef -- often referred to as Kobe beef in the US -- has become one of the world's most sought-after meats. Now scientists report that they have detected several key odorants that contribute to the delicacy's alluring aroma.

- [**The making of medieval bling**](#) [周四, 12 10月 00:03]

Gold has long been valued for its luxurious glitter and hue, and threads of the gleaming metal have graced clothing and tapestries for centuries. Determining how artisans accomplished these adornments in the distant past can help scientists restore, preserve and date artifacts, but solutions to these puzzles have been elusive. Now scientists have revealed that medieval artisans used a gilding technology that has endured for

centuries.

- [**Batteries of the future: Low-cost battery from waste graphite**](#) [周四, 12 10月 00:03]

Lithium ion batteries are flammable and the price of the raw material is rising. Are there alternatives? Yes: researchers have discovered promising approaches as to how we might produce batteries out waste graphite and scrap metal.

- [**Scientists discover one of the most luminous 'new stars' ever**](#) [周四, 12 10月 00:03]

Astronomers have discovered possibly the most luminous 'new star' ever -- a nova discovered in the direction of one of our closest neighboring galaxies: The Small Magellanic Cloud.

- [**Mimicking two natural energy processes with a single catalyst**](#) [周三, 11 10月 22:07]

Researchers take inspiration from natural chemical processes based on hydrogenase and photosystem II, to produce a single metal catalyst with both fuel cell and solar cell functionalities. The combination of these two processes into one system suggests great potential for biologically inspired energy generation technologies.

- [**Resolving tension on the surface of polymer mixes**](#) [周三, 11 10月 22:07]

In a new paper, physicists study how mixing chemically identical chains into a melt produces unique effects on their surface due to how short and long polymer chains interact with each other. The researchers found an elegant formula to calculate the surface tension of such melts, connected to the relative weight of the components of the mix.

- [**Quantum manipulation power for quantum information processing gets a boost**](#) [周三, 11 10月 22:07]

In a new study, researchers present methods for controlling the output power and efficiency of a quantum thermal engine based on a two-atom cavity, where the atoms interact with the light confined within the

cavity. This could help improve quantum manipulation power for quantum information processing.

- [**The secret to improving liquid crystal's mechanical performance**](#) [周三, 11 10月 22:07]

Researchers have theoretically calculated the static and dynamical properties of the Cottrell clouds, which form around edge dislocations in liquid crystals of the smectic A variety. This work could help, for example, to improve the lubricating performance of such liquid crystals.

- [**What is a safe following distance?**](#) [周三, 11 10月 22:07]

Confusion over what is a 'safe following distance' has road safety researchers calling for a standardized definition to prevent tailgating.

- [**Better managing plastic waste in a handful of rivers could stem plastics in the ocean**](#) [周三, 11 10月 21:17]

Massive amounts of plastic bits that are dangerous to aquatic life are washing into the oceans and into even the most pristine waters. But how it all gets there from inland cities has not been fully understood. Now scientists have found that 10 rivers around the world where plastic waste is mismanaged contribute to most of the oceans' total loads that come from rivers.

- [**A fashionable chemical and biological threat detector-on-a-ring**](#) [周三, 11 10月 21:17]

Wearable sensors are revolutionizing the tech-world, capable of tracking processes in the body, such as heart rates. They're even becoming fashionable, with many of them sporting sleek, stylish designs. But wearable sensors also can have applications in detecting threats that are external to the body. Researchers now report a first-of-its kind device that can do just that. And to stay fashionable, they've designed it as a ring.

- [**Scientists develop machine-learning method to predict the behavior of molecules**](#) [周三, 11 10月 21:17]

A team of scientists has come up with a machine-learning method that

predicts molecular behavior, a breakthrough that can aid in the development of pharmaceuticals and the design of new molecules that can be used to enhance the performance of emerging battery technologies, solar cells, and digital displays.

- [**Scientists develop tool which can predict coastal erosion and recovery in extreme storms**](#) [周三, 11 10月 21:17]

Coastal scientists have developed a computerized model which goes some way to answering their subject's 'holy grail' -- how to use existing data to confidently forecast annual coastal erosion and accretion.

- [**Average wages for all workers, men and women, have increased as a result of women joining the workforce**](#) [周三, 11 10月 21:17]

Economists are continually examining the effect of the economy on women, but this male-dominated field seems to be failing to ask what impact women in turn have on the economy? Researchers have examined how women's participation in the workforce has affected economic growth and productivity in cities across the US. They estimate that every 10% increase in female labor force participation rates increases average real wage growth in cities by approximately 5%.

- [**Solar-powered devices made of wood could help mitigate water scarcity crisis**](#) [周三, 11 10月 10:45]

Energy from the sun and a block of wood smaller than an adult's hand are the only components needed to heat water to its steaming point in these purifying devices.

- [**Better mini brains could help scientists identify treatments for Zika-related brain damage**](#) [周三, 11 10月 08:01]

Researchers have developed an improved technique for creating simplified human brain tissue from stem cells. Because these so-called 'mini brain organoids' mimic human brains in how they grow and develop, they're vital to studying complex neurological diseases.

- [**Gold 'nanoprobes' used to track blood flow in**](#)

[tiny vessels](#) [周三, 11 10月 08:01]

Scientists have designed gold nanoparticles, no bigger than 100 nanometers, which can be coated and used to track blood flow in the smallest blood vessels in the body.

• [The costs of transporting petroleum products by pipelines and rail](#) [周三, 11 10月 03:29]

While the policy debate surrounding crude oil transportation costs has emphasized accidents and spills, a new study indicates the debate is overlooking a far more serious external cost -- air pollution and greenhouse gas emissions.

• [Step toward creating planes that travel at hypersonic speed](#) [周三, 11 10月 03:29]

A recent study could lead to a drastic decrease in flight times. The study is one of the first steps toward the creation of planes able to move at hypersonic speeds, five to 10 times the speed of sound.

• [Raging Bull: First study to find link between testosterone and stock market instability](#) [周三, 11 10月 03:27]

In the U.S. today, the majority of professional stock market traders are young males and new evidence suggests biology strongly influences their trading behavior. According to a new study this could be a significant contributor to fluctuations in the market, as high testosterone levels can cause these traders to overestimate future stock values and change their trading behavior, leading to dangerous price bubbles and subsequent crashes.

• [Changes in perspective may affect how useful drones really are](#) [周三, 11 10月 01:39]

Users have trouble utilizing images from unmanned aerial systems (UASs), or drones, to find the position of objects on the ground, research shows. This finding highlights challenges facing the use of UAS technology for emergency operations and other applications, while offering guidance for future technology and training development.

- [**Tough humanmade rubbers for future Soldier protection systems**](#) [周三, 11 10月 01:39]

Researchers advanced a unique experimental device to better test the durability of high performance and robust polymeric materials that appear to strengthen themselves under attack by rapid impact.

- [**Flexible sensors can detect movement in GI tract**](#) [周三, 11 10月 01:39]

A flexible ingestible sensor has been devised that could help doctors to diagnose problems caused by a slowdown of food flowing through the digestive tract. The sensors could also be used to detect food pressing on the stomach, helping doctors to monitor food intake by patients being treated for obesity.

- [**Army researchers point to early warning signs in military vehicle structural 'wellness'**](#) [周三, 11 10月 01:39]

Researchers have shown that early fatigue damage behavior in structures may be predicted through the study of the microscale mechanical behavior of the material. The findings are an important result for the structural health monitoring (SHM) community and may lead to new sensing techniques for predicting the service life of critical components.

- [**Breath instead of a blood test**](#) [周三, 11 10月 00:41]

Blow into the tube, please. In the future, the procedure will not just be used by police checking for alcohol intoxication, but also for testing the condition of athletes and for people who want to lose that extra bit of weight. A new sensor makes it possible to measure when the body starts burning fat with a convenient breathalyser.

- [**Machine learning translates 'hidden' information to reveal chemistry in action**](#) [周三, 11 10月 00:41]

Scientists have developed a new way to capture the details of chemistry choreography as it happens. The method -- which relies on computers that have learned to recognize hidden signs of the steps -- should help them improve the performance of catalysts to drive reactions toward desired products faster.

- [**Ancient asteroid impact exposes the moon's interior**](#) [周三, 11 10月 00:41]

A large basin on the moon has revealed that its interior is made of a different mineral than Earth's interior, contradicting the theory that the interior of the planets look mostly the same.

- [**Forget about it: A material that mimics the brain**](#) [周三, 11 10月 00:40]

Inspired by human forgetfulness -- how our brains discard unnecessary data to make room for new information -- scientists conducted a recent study that combined supercomputer simulation and X-ray characterization of a material that gradually 'forgets.' This could one day be used for advanced bio-inspired computing.

- [**A self-propelled catheter with earthworm-like peristaltic motion**](#) [周二, 10 10月 23:46]

A research team has developed a mechanism of a self-propelled catheter capable of generating peristaltic motion just like an earthworm by applying pneumatic pressure inside only one tube. The goal is to develop an AutoGuide robot that propels itself inside bronchi, automatically reaching the target lesion within the lungs, and can take a lesion sample and provide treatment.

- [**Electrons surfing on a laser beam**](#) [周二, 10 10月 23:46]

The largest particle accelerator in the world - the Large Hadron Collider at CERN in Switzerland -- has a circumference of around 26 kilometers. Researchers are now attempting to go to the other extreme by building the world's smallest machine of this kind -- a particle accelerator that fits on a microchip.

- [**This soft robotic gripper can screw in your light bulbs for you**](#) [周二, 10 10月 23:46]

How many robots does it take to screw in a light bulb? The answer: just one, assuming you're talking about a newly created robotic gripper. The engineering team has designed and built a gripper that can pick up and

manipulate objects without needing to see them and needing to be trained.

• [Seeing the next dimension of computer chips](#) [周二, 10月 23:46]

Researchers used a scanning tunneling microscope to image the side-surfaces of 3-D silicon crystals for the first time. The pictures, captured with atomic-level of resolution, can help semiconductor manufacturers build the next generation of computer chips with three-dimensional features.

• [Scientists discover more about the ingredients for star formation](#) [周二, 10月 22:58]

In the local universe close to us, about 70 percent of the hydrogen gas is found in individual atoms, while the rest is in molecules. Astronomers had expected that as they looked back in time, younger galaxies would contain more and more molecular hydrogen until it dominated the gas in the galaxy. Instead, they found that atomic hydrogen makes up the majority of gas in younger galaxies too.

• [Computer program detects differences between human cells](#) [周二, 10月 22:57]

'How many different cell types are there in a human body? And how do these differences develop? Nobody really knows.' But thanks to a new method, that may be about to change.

• [When a porous solid retains its properties in liquid form](#) [周二, 10月 22:57]

Known for their exceptional porosity that enables the trapping or transport of molecules, metal-organic frameworks (MOFs) take the form of a powder, which makes them difficult to format. For the first time, scientists have evidenced the surprising ability of a type of MOF to retain its porous properties in the liquid and then glass state. These findings open the way towards new industrial applications.

• [Three million francs' worth of gold and silver going to waste](#) [周二, 10月 21:13]

Trace elements are increasingly widely used in the high-tech and medical sectors – for example, the transition metal tantalum and the semimetal germanium in electronic components, niobium and titanium in alloys and coatings, or gadolinium as a contrast medium and in luminous paints. While the ultimate fate of the various elements has been little studied to date, a large proportion is known to enter wastewater.

- [**Illegal use of natural resources in the protected Brazilian Amazon mapped**](#) [周二, 10 10月 20:55]

New research uses law enforcement data collected from 2010 to 2015 to understand the geographical distribution of the illegal use of natural resources across the region's protected area network. In the study, a total of 4,243 reports of illegal use of natural resources were evaluated and mapped. These reports generated US \$224.6 million in fines.

- [**Invisibility is within sight**](#) [周二, 10 10月 04:11]

The theoretical discovery of transparent particles that break the previously accepted limit of visibility opens a new door in the search for perfect transparency, report scientists.

- [**Building a barrier against oxidation**](#) [周二, 10 10月 04:11]

Chemically stabilizing atomically flat materials improves their potential for commercial application, report scientists.

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [**Rainstorm generator assesses watershed rainfall under climate change simulations**](#) [周四, 12 10月 01:58]

The Colorado River tumbles through varied landscapes, draining watersheds from seven western states. This 1,450-mile-long system is a critical water supply for agriculture, industry and municipalities from Denver to Tijuana.

- [**Deciphering biological meaning from an atlas of gene expression across 42 tissue types**](#) [周四, 12 10月 01:17]

The human genome encodes instructions for which genes are expressed in what cell type, along with other molecules that control how much and when these genes are expressed. Variation in the regulation of gene expression gives rise to the diverse tissue types, with diverse functions, in the human body. Finding new clues about the molecular origins of disease is the goal for a comprehensive atlas of variation in gene expression.

- [**Bycatch responsible for decline of endangered New Zealand sea lion**](#) [周四, 12 10月 01:17]

Getting caught in fishing nets is a major cause of death for the increasingly endangered New Zealand sea lion, according to new research.

- [**Gut fungi could play a role in obesity epidemic**](#) [周四, 12 10月 01:16]

A high-fat diet changes fungi in the gut and may play a role in the development of obesity, according to a new study. While gut microbes

have previously been implicated in the development of obesity, this study shows that fungi may also play a role.

- [**Tracking the viral parasites of giant viruses over time**](#) [周四, 12 10月 00:39]

In freshwater lakes, microbes regulate the flow of carbon and determine if the bodies of water serve as carbon sinks or carbon sources. Viruses exist amidst all bacteria, usually in a 10-fold excess and include virophages which live in giant viruses and use their machinery to replicate and spread. Researchers have effectively doubled the number of known virophages.

- [**Storage is renewable energy's greatest challenge -- this low-cost sulfur battery may help**](#) [周四, 12 10月 00:38]

Motivated by the challenge to drastically reduce the cost of storing renewable energy on the grid while capturing more of it, a group of scientists has developed a battery powered by sulfur, air, water, and salt -- all readily available materials -- that is nearly 100 times less expensive to produce than batteries currently on the market and can store twice as much energy as a lead-acid battery. The inventors present their prototype in Joule.

- [**Beyond EPA's Clean Power decision: Climate action window could close as early as 2023**](#) [周四, 12 10月 00:38]

As the Trump administration repeals the US Clean Power Plan, a new study underscores the urgency of reducing greenhouse gas emissions -- from both environmental and economic perspectives.

- [**Where food is limited, guppy mothers gestate their young longer**](#) [周四, 12 10月 00:38]

When evolving in environments where a lack of predators makes food scarcity the main survival challenge, guppy mothers gestate their young longer so that they are born more ready to compete for their meals.

- [**'Ridiculously healthy' elderly have the same gut microbiome as healthy 30 year-olds**](#) [周四, 12 10月 00:37]

In one of the largest microbiota studies conducted in humans, researchers have shown a potential link between healthy aging and a healthy gut.

- [**New genetic clue to peanut allergy**](#) [周四, 12 10月 00:04]

Researchers have pinpointed a new gene associated with peanut allergy, offering further evidence that genes play a role in the development of food allergies and opening the door to future research, improved diagnostics and new treatment options.

- [**'Obscure' stalked filter feeder lived in Utah some 500 million years ago**](#) [周四, 12 10月 00:04]

The only fossilized specimen of a species previously unknown to science -- an 'obscure' stalked filter feeder -- has just been detailed for the first time.

- [**Kune Kune piglets possess social learning skills and have an astonishingly good memory**](#) [周四, 12 10月 00:03]

Pigs are socially competent and capable of learning. But the combination of these skills, learning by observing others, has been insufficiently studied so far. Exact copying and understanding of demonstrated actions -- highly developed learning abilities -- could not be proven. A new study with Kune Kune pigs, has now shown for the first time that pigs do learn from each other. The intelligent animals also possess remarkable long-term memory after internalizing a technique.

- [**Climate change predicted to reduce size, stature of dominant Midwest plant, study finds**](#) [周四, 12 10月 00:03]

Researchers are involved in a study that found climate change may reduce the growth and stature of big bluestem -- a dominant prairie grass and a major forage grass for cattle.

- [**Key odorants in world's most expensive beef could help explain its allure**](#) [周四, 12 10月 00:03]

Renowned for its soft texture and characteristic flavor, Wagyu beef -- often referred to as Kobe beef in the US -- has become one of the

world's most sought-after meats. Now scientists report that they have detected several key odorants that contribute to the delicacy's alluring aroma.

• [**The making of medieval bling**](#) [周四, 12 10月 00:03]

Gold has long been valued for its luxurious glitter and hue, and threads of the gleaming metal have graced clothing and tapestries for centuries. Determining how artisans accomplished these adornments in the distant past can help scientists restore, preserve and date artifacts, but solutions to these puzzles have been elusive. Now scientists have revealed that medieval artisans used a gilding technology that has endured for centuries.

• [**Some plants grow bigger -- and 'meaner' -- when clipped, study finds**](#) [周四, 12 10月 00:03]

Some plants behave like the mythical monster Hydra: Cut off their heads and they grow back, bigger and better than before. A new study finds that these 'overcompensators,' as they are called, also augment their defensive chemistry -- think plant venom -- when they are clipped. The discovery could lead to the development of new methods for boosting plant growth while reducing the need for insecticides, the researchers said.

• [**Scientists eavesdrop on little-known beaked whales to learn how deeply they dive**](#) [周四, 12 10月 00:03]

Scientists have reported the first dive depths for Gervais' and True's beaked whales, two of the least known beaked whale species known as mesoplodonts. The study is also the first to use a towed linear hydrophone array to document dive depths for beaked whales, and researchers say it's a promising method to obtain dive depths for other beaked whale species.

• [**Mimicking two natural energy processes with a single catalyst**](#) [周三, 11 10月 22:07]

Researchers take inspiration from natural chemical processes based on hydrogenase and photosystem II, to produce a single metal catalyst with

both fuel cell and solar cell functionalities. The combination of these two processes into one system suggests great potential for biologically inspired energy generation technologies.

- [**Predatory bacteria: The quest for a new class of antibiotics**](#) [周三, 11 10月 22:07]

Researchers take one step forward toward understanding and genetically manipulating *B. bacteriovorus*, a type of bacteria with promising potential use as a living antibiotic.

- [**Better managing plastic waste in a handful of rivers could stem plastics in the ocean**](#) [周三, 11 10月 21:17]

Massive amounts of plastic bits that are dangerous to aquatic life are washing into the oceans and into even the most pristine waters. But how it all gets there from inland cities has not been fully understood. Now scientists have found that 10 rivers around the world where plastic waste is mismanaged contribute to most of the oceans' total loads that come from rivers.

- [**A fashionable chemical and biological threat detector-on-a-ring**](#) [周三, 11 10月 21:17]

Wearable sensors are revolutionizing the tech-world, capable of tracking processes in the body, such as heart rates. They're even becoming fashionable, with many of them sporting sleek, stylish designs. But wearable sensors also can have applications in detecting threats that are external to the body. Researchers now report a first-of-its kind device that can do just that. And to stay fashionable, they've designed it as a ring.

- [**Gene to help hybrid wheat breeding identified**](#) [周三, 11 10月 21:17]

Researchers have identified a naturally occurring wheat gene that, when turned off, eliminates self-pollination but still allows cross-pollination -- opening the way for breeding high-yielding hybrid wheats.

- [**Grazing horses on better pastures**](#) [周三, 11 10月 21:17]

Horses in less temperate zones may get some extra grazing. A new study

shows warm-season annual grasses have good potential for use in horse pastures.

- [**Removing invasive plants can increase biodiversity in stream waters**](#) [周三, 11 10月 21:17]

Restoration projects to remove invasive plants can make a positive impact on native plant species. But a new study shows restoration has an additional benefit. Removal of invasive species growing alongside a stream or river can also improve the biodiversity of aquatic organisms.

- [**Scientists develop tool which can predict coastal erosion and recovery in extreme storms**](#) [周三, 11 10月 21:17]

Coastal scientists have developed a computerized model which goes some way to answering their subject's 'holy grail' -- how to use existing data to confidently forecast annual coastal erosion and accretion.

- [**One of planet's largest volcanic eruptions**](#) [周三, 11 10月 21:11]

Researchers have determined that the Pacific Northwest was home to one of the Earth's largest known volcanic eruptions, a millennia-long spewing of sulfuric gas that blocked out the sun and cooled the planet. Only two other eruptions -- the basalt floods of the Siberian Traps and the Deccan Traps -- were larger, and they led to two of the Earth's great extinctions.

- [**Solar-powered devices made of wood could help mitigate water scarcity crisis**](#) [周三, 11 10月 10:45]

Energy from the sun and a block of wood smaller than an adult's hand are the only components needed to heat water to its steaming point in these purifying devices.

- [**Anticipated social media buzz can drive tourism**](#) [周三, 11 10月 10:45]

How much positive feedback travelers think they'll get on social media can predict whether they intend to visit a tourism destination, a new study has found.

- [**Citrus fruit peel: Potential alternative to**](#)

[mosquito control discovered](#) [周三, 11 10月 08:01]

Natural essential oils extracted from the peel of a citrus fruit could be an effective new eco-friendly alternative in mosquitoes control programs, reports a new study.

• [New Zika serotypes may emerge, researcher warns](#) [周三, 11 10月 08:01]

The virus is mutating very fast in Brazilian patients. Appearance of new serotypes could hinder development of vaccines and efficacy of diagnostic tests, according to a member of one of the leading group of scientists on Zika-related investigations.

• [Hibernating ribosomes help bacteria survive](#) [周三, 11 10月 08:01]

Scientists are uncovering the secrets of how ribosomes hibernate under stressful conditions.

• [The costs of transporting petroleum products by pipelines and rail](#) [周三, 11 10月 03:29]

While the policy debate surrounding crude oil transportation costs has emphasized accidents and spills, a new study indicates the debate is overlooking a far more serious external cost -- air pollution and greenhouse gas emissions.

• [How the cone snail's deadly venom can help us build better medicines](#) [周三, 11 10月 03:29]

By researching deadly cone snail venom, researchers hope to find solutions to tough medical problems and diseases.

• [Improving Lake Erie's water quality](#) [周三, 11 10月 03:28]

The conditions in Lake Erie continue to pose several health risks to Ohioans in coastal communities, making it difficult to maintain good water quality for citizens, state and local policymakers. Researchers in the Great Lakes region are now working toward innovative solutions.

• [Unexpected regulation of transcription factors critical to development](#) [周三, 11 10月 02:32]

Developmental biologists have for the first time described how two transcription factors that are 'absolutely essential for human development' are regulated by a cell surface metalloprotease known as ADAM13. The discovery adds to knowledge of how cells migrate in vertebrate embryos, how stem cells differentiate and how cancer cells metastasize.

• [**A molecular garbage disposal complex has a role in packing the genome**](#) [周三, 11 10月 02:03]

New research has found that the proteasome, an essential protein complex that breaks down proteins in cells, has another unexpected function: directly regulating the packing of DNA in the nucleus.

• [**Humpback whale blow microbiome described**](#) [周三, 11 10月 01:39]

For the first time, scientists have identified an extensive conserved group of bacteria within healthy humpback whales' blow -- the moist breath that whales spray out of their blowholes when they exhale.

• [**Protein restricts sap uptake by aphids**](#) [周三, 11 10月 01:02]

Researchers have discovered how plants can defend themselves against aphids. They recorded aphid behavior on video, and identified a plant protein that keeps aphids from feeding.

• [**Do male fish prefer them big and colorful?**](#) [周三, 11 10月 00:41]

Male black-finned goodeid or mexcalpique fish know what they want when they pick a female to mate with; they prefer them big-bellied and as orange as possible. Interestingly, females displaying these traits are the ones most able to produce more offspring that survive, two researchers from the National Autonomous University of Mexico have found.

• [**Mass extinctions led to low species diversity, dinosaur rule**](#) [周三, 11 10月 00:40]

Two of Earth's five mass extinction events -- times when more than half of the world's species died -- resulted in the survival of a low number of so-called 'weedy' species that spread their sameness across the world as

the Earth recovered from these dramatic upheavals. The findings could shed light on modern high extinction rates and how biological communities may change in the future.

- [**Breeding salt-tolerant plants**](#) [周三, 11 10月 00:40]

The quinoa plant might serve as a model for making other crops salt-tolerant. It grows well on saline soils because the excess salt is simply dumped into special bladders on its leaves.

- [**Stepped care beneficial after hurricanes**](#) [周三, 11 10月 00:38]

Stepped care is more effective than usual care in reducing the prevalence of posttraumatic stress disorder in the aftermath of hurricanes, according to a new study.

- [**Parasite study paves way for therapies to tackle deadly infections**](#) [周二, 10 10月 23:46]

New understanding of a parasite that causes a million cases of disease each year could point towards effective drug treatments.

- [**Forest grazing counteracts the effectiveness of trees to reduce flood risk**](#) [周二, 10 10月 23:46]

Planting trees can reduce flood risk, but a high intensity forest land use, such as grazing, can counteract the positive effect of the trees, a recently published study suggests. The study investigated the rate that water infiltrated the soil under trees at an experimental agroforestry site in Scotland.

- [**Conservationists' eco-footprints suggest education alone won't change behavior**](#) [周二, 10 10月 23:46]

A new study shows that even those presumably best informed on the environment find it hard to consistently 'walk the walk,' prompting scientists to question whether relying solely on information campaigns will ever be enough.

- [**A step towards a new drug to treat fungal infections that kill 1.6 million people annually**](#) [周二, 10 10月 23:46]

10 10月 23:46]

Scientists are a step closer to developing a drug to treat life-threatening fungal infections that cause more than 1.6 million deaths annually.

• [**Green gentrification can limit the favorable effects of green areas on health**](#) [周二, 10 10月 22:58]

A new study suggests that more socially disadvantaged neighbors do not benefit equally from the effects newly created green areas have on health. Scientists consider that greener cities are not healthier and more equal for everyone.

• [**Salt marsh research warns of pumpkin-colored 'zombies'**](#) [周二, 10 10月 22:57]

Salt marsh research shows that growing abundance of tiny shrimp infected by a microscopic parasite may portend future threats to humankind through disease.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [**Beyond EPA's Clean Power decision: Climate action window could close as early as 2023**](#) [周四, 12 10月 00:38]

As the Trump administration repeals the US Clean Power Plan, a new study underscores the urgency of reducing greenhouse gas emissions -- from both environmental and economic perspectives.

- [**Study shows untapped creativity in workforce**](#) [周四, 12 10月 00:04]

With the U.S. economy less reliant on manufacturing, creativity and innovation are of increasing value. Arts graduates, and others who have developed and honed their creative skills, can be critical assets.

- [**Experts express concerns over infant mental health assessment**](#) [周四, 12 10月 00:03]

Forty world experts on child development and mental health have released a joint statement calling for caution when applying an influential classification for assessing infant mental health and potential cases of abuse.

- [**Major cities concentrate less scientific production**](#) [周四, 12 10月 00:00]

The world's major cities, such as New York, London, and Tokyo, are losing their dominant position in the production and circulation of scientific articles, according to a new study.

- [**Drivers are less cautious at railway crossings**](#) [周三, 11 10月 22:07]

Drivers aren't as cautious approaching a railway level crossing compared

to a road intersection despite the greater risk of fatality if a collision occurs, a new study has found.

- [**World's 'better' countries have higher rates of cancer**](#) [周三, 11 10月 22:07]

The world's 'better' countries, with greater access to healthcare, experience much higher rates of cancer incidence than the world's 'worse off' countries, according to new research.

- [**What is a safe following distance?**](#) [周三, 11 10月 22:07]

Confusion over what is a 'safe following distance' has road safety researchers calling for a standardized definition to prevent tailgating.

- [**Average wages for all workers, men and women, have increased as a result of women joining the workforce**](#) [周三, 11 10月 21:17]

Economists are continually examining the effect of the economy on women, but this male-dominated field seems to be failing to ask what impact women in turn have on the economy? Researchers have examined how women's participation in the workforce has affected economic growth and productivity in cities across the US. They estimate that every 10% increase in female labor force participation rates increases average real wage growth in cities by approximately 5%.

- [**Homicide is the largest contributor to years of lost life among black Americans**](#) [周三, 11 10月 08:01]

Homicide is the largest contributor to potential years of life lost among black Americans, according to a new study published in PLOS ONE and conducted by researchers at the Indiana University School of Public Health-Bloomington.

- [**Doctors need a nudge to reduce antibiotic prescriptions, study finds**](#) [周三, 11 10月 03:29]

An update to a behavioral economics study on clinicians' prescriptions of antibiotics showed that the clinicians may, without long-term interventions, return to bad prescription habits.

- [**The costs of transporting petroleum products by pipelines and rail**](#) [周三, 11 10月 03:29]

While the policy debate surrounding crude oil transportation costs has emphasized accidents and spills, a new study indicates the debate is overlooking a far more serious external cost -- air pollution and greenhouse gas emissions.

- [**Raging Bull: First study to find link between testosterone and stock market instability**](#) [周三, 11 10月 03:27]

In the U.S. today, the majority of professional stock market traders are young males and new evidence suggests biology strongly influences their trading behavior. According to a new study this could be a significant contributor to fluctuations in the market, as high testosterone levels can cause these traders to overestimate future stock values and change their trading behavior, leading to dangerous price bubbles and subsequent crashes.

- [**More than half of police killings not officially documented on US death certificates, study finds**](#) [周三, 11 10月 02:14]

Official death certificates in the US failed to count more than half of the people killed by police in 2015 -- and the problem of undercounting is especially pronounced in lower-income counties and for deaths that are due to Tasers, according to a new study.

- [**Indian government needs to do more to tackle rising sale of unapproved antibiotics, experts say**](#) [周三, 11 10月 00:41]

In India, the sale of antibiotics requiring the tightest control and regulation is rising the fastest, according to a new analysis. The correspondence highlights serious hurdles for controlling antimicrobial resistance in the country.

- [**Stepped care beneficial after hurricanes**](#) [周三, 11 10月 00:38]

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- [**Green gentrification can limit the favorable effects of green areas on health**](#) [周二, 10 10月 22:58]

A new study suggests that more socially disadvantaged neighbors do not benefit equally from the effects newly created green areas have on health. Scientists consider that greener cities are not healthier and more equal for everyone.

- [**No 'narcissism epidemic' among college students, study finds**](#) [周二, 10 10月 22:57]

Today's college students are slightly less narcissistic than their counterparts were in the 1990s, researchers report in a new study - not significantly more, as some have proposed. The study analyzed data from 1,166 students at the University of California, Berkeley in the 1990s, and from tens of thousands of students at the University of Illinois at Urbana-Champaign and the University of California, Davis in the 2000s and 2010s.

- [**A lesson for Canada: Quebec pharmacare system creates winners and losers**](#) [周二, 10 10月 22:56]

Quebec spends \$200 more per person than the rest of Canada to provide prescription drug coverage to everyone in the province, finds new research that could inform plans for a nationwide universal drug plan.

- [**Illegal use of natural resources in the protected Brazilian Amazon mapped**](#) [周二, 10 10月 20:55]

New research uses law enforcement data collected from 2010 to 2015 to understand the geographical distribution of the illegal use of natural

resources across the region's protected area network. In the study, a total of 4,243 reports of illegal use of natural resources were evaluated and mapped. These reports generated US \$224.6 million in fines.

- [**Heads-up, ceos: Corporate social responsibility may get you fired, study finds**](#) [周二, 10 10月 07:20]

Investing in product safety, employee diversity and carbon footprint reduction are all examples of corporate social responsibility (CSR) that can result in high praise for a chief executive — or get them fired — according to new research.

- [**School year 'relative age' causing bias in ADHD diagnosis, says research**](#) [周二, 10 10月 07:15]

Younger primary school children are more likely to be diagnosed with attention deficit hyperactivity disorder (ADHD) than their older peers within the same school year, new research has shown.

- [**Huge energy potential in open ocean wind farms in the North Atlantic**](#) [周二, 10 10月 03:49]

Because wind speeds are higher on average over ocean than over land, wind turbines in the open ocean could in theory intercept more than five times as much energy as wind turbines over land. This presents an enticing opportunity for generating renewable energy through wind turbines. But it was unknown whether the faster ocean winds could actually be converted to increased amounts of electricity.

- [**'Turbo charge' for your brain?**](#) [周二, 10 10月 03:49]

Two brain regions -- the medial frontal and lateral prefrontal cortices -- control most executive function. Researchers used high-definition transcranial alternating current stimulation (HD-tACS) to synchronize oscillations between them, improving brain processing. De-synchronizing did the opposite.

- [**The female brain reacts more strongly to prosocial behavior than the male brain, study finds**](#) [周二, 10 10月 00:32]

Women are more generous than men, behavioral experiments show. Now, researchers have been able to demonstrate that female and male brains process prosocial and selfish behavior differently. For women, prosocial behavior triggers a stronger reward signal, while male reward systems respond more strongly to selfish behavior.

- [**Scientists complete conservation puzzle, shaping understanding of life on Earth**](#) [周二, 10 10月 00:31]

An international team of scientists has completed the 'atlas of life' -- the first global review and map of every vertebrate on Earth. The 39 scientists have produced a catalogue and atlas of the world's reptiles. By linking this atlas with existing maps for birds, mammals and amphibians, the team have found many new areas where conservation action is vital.

- [**A new kind of influenza vaccine: One shot might do the trick**](#) [周一, 09 10月 21:33]

Certain proteins in the influenza virus remain constant year after year. Researchers are taking one of those conserved proteins, Matrix-2 (M2), and packaging it in a nanoscale, controlled-release "capsule" in an attempt to create a quick-acting, long-lasting, multi-strain vaccine against pandemic influenza A.

- [**Official fish trade 'hugely underestimates' global catches**](#) [周一, 09 10月 21:29]

Conservation of dwindling fish stocks is being severely hampered by poor controls on global trade, according to new research.

- [**Sustainable irrigation may harm other development goals**](#) [周一, 09 10月 20:43]

Pursuing sustainable irrigation without significant irrigation efficiency gains could negatively impact environmental and development goals in many areas of the world, a new study has found.

- [**New study analyzes volcanic fatalities in more detail than ever before**](#) [周五, 06 10月 22:18]

Building on existing information and databases relating to volcanic fatalities, scientists have, for the first time, been able to classify victims by activity or occupation and look at the distance of their death from the volcano.

- [**Social acceptance more important than economic factors in fertility treatment availability**](#) [周五, 06 10月 20:59]

A new British study has shed light on some of the reasons why Assisted Reproductive Technologies (ART) usage varies across Europe -- pinpointing moral and social acceptance of the treatment and religion as key. Scientists have, for the first time, assessed the relative importance of the role that economic, demographic and cultural normative factors play in the process.

- [**Pushy or laid back? Economic factors influence parenting style**](#) [周五, 06 10月 07:03]

A new study argues that parenting styles are shaped by economic factors that incentivize one strategy over others.

- [**'Transformative' research unrealistic to predict, scientists tell granting agencies**](#) [周五, 06 10月 07:03]

Research-funding agencies that require scientists to declare at the proposal stage how their projects will be 'transformative' may actually be hindering discovery.

- [**Screen children with reading difficulties for hearing problems**](#) [周五, 06 10月 07:02]

A new study found 25 percent of its young participants who had reading difficulties showed mild or moderate hearing impairment, of which their parents and teachers were unaware.

- [**Multiple research approaches are key to pandemic preparedness**](#) [周五, 06 10月 03:11]

Preparedness in the face of major disease outbreaks can save thousands of lives. A new article examines the multifaceted nature of effective

preparedness and the role that biomedical research plays. Specifically, the article examines three approaches to pandemic preparedness: pathogen-specific work, platform-based technologies, and prototype-pathogen efforts.

- [**Interpreting hurricane forecast displays can be difficult for general public**](#) [周五, 06 10月 03:11]

The 2017 hurricane season has highlighted the critical need to communicate a storm's impact path and intensity accurately, but new research shows significant misunderstandings of the two most commonly used storm forecast visualization methods.

- [**Do earthquakes have a 'tell'?**](#) [周五, 06 10月 03:11]

Data scientists and seismologists could potentially forecast strong earthquakes through algorithms designed to detect and monitor 'deep tremor.'

- [**Decision to rescind Waters of the United States rule \(WOTUS\) based on flawed analysis**](#) [周五, 06 10月 02:18]

New evidence suggests that the Trump Administration's proposal to rescind the 2015 Waters of the United States (WOTUS) rule that would limit the scope of the Clean Water Act inappropriately overlooks wetlands-related values.

- [**Middle managers may turn to unethical behavior to face unrealistic expectations**](#) [周五, 06 10月 02:17]

While unethical behavior in organizations is often portrayed as flowing down from top management, or creeping up from low-level positions, a team of researchers suggest that middle management also can play a key role in promoting wide-spread unethical behavior among their subordinates.

- [**Why lab researchers should talk with industry counterparts**](#) [周五, 06 10月 02:17]

A research team has found both obstacles and lessons from the process of getting a novel membrane for chemical processing out of the lab into

the commercial world.

- **[Delivering bad news? Don't beat around the bush](#)** [周五, 06 10月 02:17]

New research shows that when it comes to receiving bad news, most people prefer directness, candor and very little -- if any -- buffer.

- **[Road pricing most effective in reducing vehicle emissions](#)** [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

- **[Identifying ways to minimize the harm of energy drinks](#)** [周五, 06 10月 02:17]

Because many countries allow the sale of energy drinks to young people, identifying ways to minimize potential harm from energy drinks is critical. A new study provided unique insights into intervention strategies suggested by young people themselves to reduce consumption. In addition to more research and education, these strategies included policy changes targeting energy drink sales, packaging, price, and visibility.

- **[Planning for the future](#)** [周五, 06 10月 02:17]

Over the past decade, increasing temperatures across much of Africa and decreasing rainfall across East Africa have come to represent an alarming climate trend. Chief among concerns is the impact such conditions have on human health.

- **[Something universal occurs in the brain when it processes stories, regardless of language](#)** [周五, 06 10月 02:17]

New brain research shows that reading stories generates activity in the

same regions of the brain for speakers of three different languages.

- [**Air pollution exposure on home-to-school routes reduces the growth of working memory**](#) [周五, 06 10月 00:50]

A new study has demonstrated that exposure to air pollution on the way to school can have damaging effects on children's cognitive development. The study found an association between a reduction in working memory and exposure to fine particulate matter (PM2.5) and black carbon during the walking commute to and from school.

- [**Fingerprints lack scientific basis for legal certainty**](#) [周四, 05 10月 23:11]

A new report on the quality of latent fingerprint analysis says that courtroom testimony and reports stating or even implying that fingerprints collected from a crime scene belong to a single person are indefensible and lack scientific foundation.

- [**Perpetrators of genocide say they're 'good people'**](#) [周四, 05 10月 22:33]

The men who were tried for their role in the 1994 Rwandan genocide that killed up to 1 million people want you to know that they're actually very good people. That's the most common way accused men try to account for their actions in testimony before the International Criminal Tribunal for Rwanda, a new study has found.

- [**Beer brands popular among youth violate code with youth-appealing ads**](#) [周四, 05 10月 22:27]

Alcohol brands popular among underage drinkers are more likely to air television advertisements that violate the industry's voluntary code by including youth-appealing content, according to a new study.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- ['Obscure' stalked filter feeder lived in Utah some 500 million years ago](#) [周四, 12 10月 00:04]

The only fossilized specimen of a species previously unknown to science -- an 'obscure' stalked filter feeder -- has just been detailed for the first time.

- [Our brain omits grammatical elements when it has limited resources](#) [周四, 12 10月 00:03]

A study of the use of pronouns by French speakers with agrammatic aphasia shows that grammatical pronouns are significantly more impaired in speech than lexical ones. The findings support a new theory of grammar which suggests that grammatical elements contain secondary information that speakers with limited cognitive resources can omit from their speech and still make sense.

- [Kune Kune piglets possess social learning skills and have an astonishingly good memory](#) [周四, 12 10月 00:03]

Pigs are socially competent and capable of learning. But the combination of these skills, learning by observing others, has been insufficiently studied so far. Exact copying and understanding of demonstrated actions -- highly developed learning abilities -- could not be proven. A new study with Kune Kune pigs, has now shown for the first time that pigs do learn from each other. The intelligent animals also possess remarkable long-term memory after internalizing a technique.

- [The making of medieval bling](#) [周四, 12 10月 00:03]

Gold has long been valued for its luxurious glitter and hue, and threads

of the gleaming metal have graced clothing and tapestries for centuries. Determining how artisans accomplished these adornments in the distant past can help scientists restore, preserve and date artifacts, but solutions to these puzzles have been elusive. Now scientists have revealed that medieval artisans used a gilding technology that has endured for centuries.

• [**Some plants grow bigger -- and 'meaner' -- when clipped, study finds**](#) [周四, 12 10月 00:03]

Some plants behave like the mythical monster Hydra: Cut off their heads and they grow back, bigger and better than before. A new study finds that these 'overcompensators,' as they are called, also augment their defensive chemistry -- think plant venom -- when they are clipped. The discovery could lead to the development of new methods for boosting plant growth while reducing the need for insecticides, the researchers said.

• [**Step toward creating planes that travel at hypersonic speed**](#) [周三, 11 10月 03:29]

A recent study could lead to a drastic decrease in flight times. The study is one of the first steps toward the creation of planes able to move at hypersonic speeds, five to 10 times the speed of sound.

• [**Do male fish prefer them big and colorful?**](#) [周三, 11 10月 00:41]

Male black-finned goodeid or mexcalpique fish know what they want when they pick a female to mate with; they prefer them big-bellied and as orange as possible. Interestingly, females displaying these traits are the ones most able to produce more offspring that survive, two researchers from the National Autonomous University of Mexico have found.

• [**A self-propelled catheter with earthworm-like peristaltic motion**](#) [周二, 10 10月 23:46]

A research team has developed a mechanism of a self-propelled catheter capable of generating peristaltic motion just like an earthworm by applying pneumatic pressure inside only one tube. The goal is to

develop an AutoGuide robot that propels itself inside bronchi, automatically reaching the target lesion within the lungs, and can take a lesion sample and provide treatment.

- [**This soft robotic gripper can screw in your light bulbs for you**](#) [周二, 10 10月 23:46]

How many robots does it take to screw in a light bulb? The answer: just one, assuming you're talking about a newly created robotic gripper. The engineering team has designed and built a gripper that can pick up and manipulate objects without needing to see them and needing to be trained.

- [**Salt marsh research warns of pumpkin-colored 'zombies'**](#) [周二, 10 10月 22:57]

Salt marsh research shows that growing abundance of tiny shrimp infected by a microscopic parasite may portend future threats to humankind through disease.

- [**'Fake fin' discovery reveals new ichthyosaur species**](#) [周二, 10 10月 22:56]

An ichthyosaur first discovered in the 1970s but then dismissed and consigned to museum storerooms across the country has been re-examined and found to be a new species.

- [**Invisibility is within sight**](#) [周二, 10 10月 04:11]

The theoretical discovery of transparent particles that break the previously accepted limit of visibility opens a new door in the search for perfect transparency, report scientists.

- [**What soot-covered, hundred-year-old birds can tell us about saving the environment**](#) [周二, 10 10月 03:50]

Birds in museum collections from Rust Belt cities around the turn of the century are covered with black soot from air pollution at the time. Scientists have compared the amount of soot on birds through the years to track environmental pollution over the last 135 years.

- [**'Turbo charge' for your brain?**](#) [周二, 10 10月 03:49]

Two brain regions -- the medial frontal and lateral prefrontal cortices -- control most executive function. Researchers used high-definition transcranial alternating current stimulation (HD-tACS) to synchronize oscillations between them, improving brain processing. De-synchronizing did the opposite.

- [**Human minibrains reveal effects of psychedelic substance**](#) [周一, 09 10月 20:44]

Scientists have identified changes in signaling pathways associated with neural plasticity, inflammation and neurodegeneration triggered by a compound from the family of dimethyltryptamine known as 5-MeO-DMT.

- [**Smartphone-controlled smart bandage for better, faster healing**](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [**New technology uses mouth gestures to interact in virtual reality**](#) [周五, 06 10月 02:42]

Researchers have developed a new technology that allows users to interact in a virtual reality environment using only mouth gestures.

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [**How yellow and blue make green in parrots**](#) [周五, 06 10月 00:11]

Many brightly colored birds get their pigments from the foods that they eat, but that's not true of parrots. Now, researchers reporting a study of familiar pet store parakeets -- also known as budgies -- have new evidence to explain how the birds produce their characteristic yellow,

blue, and green feathers.

• [Once declared extinct, Lord Howe Island stick insects really do live](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead Lord Howe Island stick insects have some good news: those rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

• [More traits associated with your Neanderthal DNA](#) [周五, 06 10月 00:11]

After humans and Neanderthals met many thousands of years ago, the two species began interbreeding. Recent studies have shown that some of those Neanderthal genes have contributed to human immunity and modern diseases. Now researchers have found that our Neanderthal inheritance has contributed to other characteristics, too, including skin tone, hair color, sleep patterns, mood, and even a person's smoking status.

• [How much can watching hockey stress your heart?](#) [周四, 05 10月 22:27]

A new study suggests that both the thrill of victory and the agony of defeat can have a substantial effect on the cardiovascular system. Investigators took the pulse of fans during a hockey game and found that on average, their heart rate increased by 75 percent when watching on TV, and by a whopping 110 percent (more than doubled, equivalent to the cardiac stress with vigorous exercise) when watching in person.

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- [**Scientists dig into the origin of organics on dwarf planet Ceres**](#) [周四, 19 10月 03:18]

Since NASA's Dawn spacecraft detected localized organic-rich material on Ceres, scientists have been digging into the data to explore different scenarios for its origin. After considering the viability of comet or asteroid delivery, the preponderance of evidence suggests the organics are most likely native to Ceres.

- [**Obesity: Engineered proteins lower body weight in mice, rats and primates**](#) [周四, 19 10月 03:18]

Researchers have created engineered proteins that lowered body weight, bloodstream insulin, and cholesterol levels in obese mice, rats, and primates.

- [**Duplications of noncoding DNA may have affected evolution of human-specific traits**](#) [周四, 19 10月 01:32]

Duplications of large segments of noncoding DNA in the human genome may have contributed to the emergence of differences between humans and nonhuman primates, according to new results. Identifying these duplications, which include regulatory sequences, and their effect on traits and behavior may help scientists explain genetic contributions to human disease.

- [**Online resource enables open data sharing for rare Mendelian diseases**](#) [周四, 19 10月 01:32]

MyGene2, a new open data resource, helps patients with rare genetic conditions, clinicians, and researchers share information, connect with one another, and enable faster gene discovery.

- [**Understanding the coevolving web of life as a network**](#) [周四, 19 10月 01:32]

Coevolution, which occurs when species interact and adapt to each other, is often studied in the context of pair-wise interactions between mutually beneficial symbiotic partners. But many species have mutualistic interactions with multiple partners, leading to complex networks of interacting species.

- [**New material for digital memories of the future**](#) [周四, 19 10月 01:32]

Scientists have developed the first material with conductivity properties that can be switched on and off using ferroelectric polarization.

- [**At tremendous precision, the proton and antiproton still seem identical**](#) [周四, 19 10月 01:29]

Using a novel two-particle measurement method, a group of researchers measured the magnetic moment of the antiproton at a precision 350 times higher than any previous measurement. The result shows that the magnetic moments of the proton and antiproton are tremendously close, meaning that so-called CPT asymmetry -- a key factor in the lack of antimatter -- must be very small if it exists at all.

- [**Nature or nurture? Innate social behaviors in the mouse brain**](#) [周四, 19 10月 01:29]

The brain circuitry that controls innate, or instinctive, behaviors such as mating and fighting was thought to be genetically hardwired. Not so, neuroscientists now say.

- [**Riddle of matter remains unsolved: Proton and antiproton share fundamental properties**](#) [周四, 19 10月 01:28]

Physicists have been able to measure the magnetic force of antiprotons with almost unbelievable precision.

• [**Inflammation trains the skin to heal faster**](#) [周四, 19 10月 01:28]

Stem cells in the skin remember an injury, helping them close recurring wounds faster, researchers have found. The discovery could advance research and treatment of psoriasis and other inflammatory diseases.

• [**Petals produce a 'blue halo' that helps bees find flowers**](#) [周四, 19 10月 01:28]

Latest research has found that several common flower species have nanoscale ridges on the surface of their petals that meddle with light when viewed from certain angles.

• [**Solar eruptions could electrify Martian moons**](#) [周四, 19 10月 00:41]

Powerful solar eruptions could electrically charge areas of the Martian moon Phobos to hundreds of volts, presenting a complex electrical environment that could possibly affect sensitive electronics carried by future robotic explorers, according to a new NASA study. The study also considered electrical charges that could develop as astronauts transit the surface on potential human missions to Phobos.

• [**For \\$1000, anyone can purchase online ads to track your location and app use**](#) [周四, 19 10月 00:41]

New research finds that for a budget of roughly \$1000, it is possible for someone to track your location and app use by purchasing and targeting mobile ads. The team hopes to raise industry awareness about the potential privacy threat.

• [**Illinois sportfish recovery a result of 1972 Clean Water Act, scientists report**](#) [周四, 19 10月 00:17]

Populations of largemouth bass, bluegill, catfish and other sportfish are at the highest levels recorded in more than a century in the Illinois River, according to a new report. Their dramatic recovery, from populations close to zero near Chicago throughout much of the 20th century, began just after implementation of the Clean Water Act, the

researchers say.

- [**New findings explain how UV rays trigger skin cancer**](#) [周四, 19 10月 00:16]

Melanoma, a cancer of skin pigment cells called melanocytes, will strike an estimated 87,110 people in the US in 2017, according to the Centers for Disease Control and Prevention. A fraction of those melanomas come from pre-existing moles, but the majority of them come from sources unknown -- until now.

- [**DNA tests on albatross excrement reveal secret diet of top predator**](#) [周三, 18 10月 23:35]

A study that used DNA tests to analyse the scats of one of the world's most numerous albatrosses has revealed surprising results about the top predator's diet. DNA analysis of 1460 scats from breeding sites around the Southern Ocean has shown that the diet of black-browed albatrosses contains a much higher proportion of jellyfish than previously thought.

- [**Competing forces: How molecules maintain their structure**](#) [周三, 18 10月 23:35]

A double helix twisted around itself: this is the distinctive structure of DNA, which is made up of large molecules. Using synthetically produced molecules, chemists and physicists have investigated the forces which are at work inside the molecule to give it its three-dimensional structure.

- [**Ancient, lost, mountains in the Karoo reveals the secrets of massive extinction event**](#) [周三, 18 10月 23:35]

A researcher studied the fossil-rich sediments present in the Karoo, deposited during the tectonic events that created the Gondwanides, and found that the vertebrate animals in the area started to either go extinct or become less common much earlier than what was previously thought.

- [**Hardy corals make their moves to build new reefs from scratch**](#) [周三, 18 10月 23:35]

Resilient species of coral can move to inhospitable areas and lay the

foundations for new reefs, a study shows.

- [**Dutch courage: Alcohol improves foreign language skills**](#) [周三, 18 10月 23:35]

A new study shows that bilingual speakers' ability to speak a second language is improved after they have consumed a low dose of alcohol.

- [**Death by a thousand cuts? Not for small populations**](#) [周三, 18 10月 23:35]

New research provides a look at how certain species survive by evolving a greater ability to weed out harmful mutations -- a new concept called 'drift robustness'.

- [**One step closer toward a treatment for Alzheimer's disease?**](#) [周三, 18 10月 23:35]

Scientists have characterized a new class of drugs as potential therapeutics for Alzheimer's disease and discovered a piece in the puzzle of how they would work.

- [**New clues to treat Alagille Syndrome from zebrafish**](#) [周三, 18 10月 23:35]

A new study identifies potential new therapeutic avenues for patients with Alagille syndrome, a rare genetic disorder caused by mutations primarily in the JAGGED1 gene.

- [**Stiff fibers spun from slime**](#) [周三, 18 10月 23:35]

Nanoparticles from the secretion of velvet worms form recyclable polymer fibers.

- [**Turning brain cells into skin cells**](#) [周三, 18 10月 23:35]

A new study reveals that it is possible to repurpose the function of different mature cells across the body and harvest new tissue and organs from these cells.

- [**Nanoelectronics breakthrough could lead to more efficient quantum devices**](#) [周三, 18 10月 23:35]

Researchers have made a breakthrough that could help your electronic

devices get even smarter. Their findings examine electron behavior within nanoelectronics, as outlined in a new article.

- [**Mass killings happen randomly, yet rate has remained steady, study finds**](#) [周三, 18 10月 23:35]

Mass killings may have increasing news coverage, but the events themselves have happened at a steady rate for more than a decade, according to a new study. Furthermore, some types of mass-killing events seem to occur randomly over time, making prediction difficult and response crucial.

- [**Life in the city: Living near a forest keeps your amygdala healthier**](#) [周三, 18 10月 23:35]

A new study examined the relationship between the availability of nature near city dwellers' homes and their brain health. Its findings are relevant for urban planners among others.

- [**Cocaine use during adolescence is even more harmful than during adulthood**](#) [周三, 18 10月 23:35]

Scientists found that addicts who began using cocaine before and after the age of 18 showed differences in sustained attention and working memory, among other brain functions. The research, made under controlled drug abstinence condition, measured cocaine's impact on more than a hundred drug users' cognition, and recommended multidisciplinary treatment for patients with an accentuated cognitive deficit.

- [**Customizing catalysts to boost product yields, decrease separation costs**](#) [周三, 18 10月 23:35]

For some crystalline catalysts, what you see on the surface is not always what you get in the bulk. Investigators discovered that treating a complex oxide crystal with either heat or chemicals caused different atoms to segregate on the surface, i.e., surface reconstruction. Those differences created catalysts with dissimilar behaviors, which encouraged different reaction pathways and ultimately yielded distinct products.

- [**Reducing power plants' freshwater consumption with new silica filter**](#) [周三, 18 10月 23:35]

Power plants draw more freshwater than any other consumer in the United States, accounting for more than 50 percent of the nation's freshwater use at about 500 billion gallons daily. To help save this water, researchers have developed a new silica filter for power plant cooling waters that decreases the amount of freshwater power plants consume by increasing the number of times cooling tower water can be reused and recycled.

- [**A mission to Mars could make its own oxygen thanks to plasma technology**](#) [周三, 18 10月 23:33]

Plasma technology could hold the key to creating a sustainable oxygen supply on Mars, a new study has found. It suggests that Mars, with its 96 per cent carbon dioxide atmosphere, has nearly ideal conditions for creating oxygen from CO₂ through a process known as decomposition.

- [**Global calcium consumption appears low, especially in Asia**](#) [周三, 18 10月 23:31]

A new systematic review of global daily calcium consumption suggests substantial regional differences -- it's lowest in East Asia and highest in Northern Europe.

- [**Electrode materials from the microwave oven**](#) [周三, 18 10月 23:31]

Power on the go is in demand: The higher the battery capacity, the larger the range of electric cars and the longer the operating time of cell phones and laptops. Researchers have now developed a process that allows a fast, simple, and cost-effective production of the promising cathode material lithium cobalt phosphate in high quality.

- [**Potential human habitat located on the moon**](#) [周三, 18 10月 22:43]

A new study confirms the existence of a large open lava tube in the Marius Hills region of the moon, which could be used to protect astronauts from hazardous conditions on the surface.

- [**Force field analysis provides clues to protein-ion**](#)

[interaction](#) [周三, 18 10月 21:22]

The importance of proteins and metal ion interactions is well understood, but the mechanistic interactions between the two are still far from a complete picture. Researchers are working to quantitatively describe protein-ion interactions using what is called an atomic multipole optimized energetics for biomolecular applications force field.

[Water droplet physics: The drop that's good to the very end](#) [周三, 18 10月 21:22]

Two researchers, using laser-flash photography of microscopic droplet-particle collisions, have discovered that water droplets still have liquid tricks to reveal. Previous research has primarily examined droplet collisions with flat surfaces, such as a wall, but this research team examined the less studied case of a droplet having a head-on collision with a solid, spherical particle.

[Active sieving could improve dialysis and water purification filters](#) [周三, 18 10月 21:22]

Physicists have proven theoretically that active sieving, as opposed to its passive counterpart, can improve the separation abilities of filtration systems. Active sieving also has the potential to filter molecules based on movement dynamics, opening up a whole new avenue in the field of membrane science based on the ability to tune osmotic pressure.

[Origami lattice paves the way for new noise-dampening barriers on the road](#) [周三, 18 10月 21:22]

Researchers have brought a new method into the sound-dampening fold, demonstrating an origami lattice prototype that can potentially reduce acoustic noise on roadways. The technique allows researchers to selectively dampen noise at various frequencies by adjusting the distance between noise-diffusing elements.

[The puzzle to plugging the worst natural gas release in history](#) [周三, 18 10月 21:16]

By the time scientists visited the Aliso Canyon natural gas storage

facility in December 2015, the SS-25 well blowout had been leaking natural gas into the air for more than six weeks. The notoriously strong winds at Aliso Canyon carried the natural gas and its added odorant to the nearby Porter Ranch neighborhood, leading to thousands of families evacuating their homes.

• **[Workers may 'choke' under pressure of non-monetary incentives](#)** [周三, 18 10月 21:16]

Competition for non-monetary awards can have adverse effects on performance and may cause employees to “choke” under pressure, according to a new study.

• **[Researchers release the brakes on the immune system](#)** [周三, 18 10月 21:13]

Many tumors possess mechanisms to avoid destruction by the immune system. For instance, they misuse the natural “brakes” in the immune defense mechanism, which normally prevent an excessive immune response. Researchers have now been able to take off one of these brakes. The study could pave the way for more effective cancer therapies, they say.

• **[Ancient preen oil: Researchers discover 48-million-year-old lipids in a fossil bird](#)** [周三, 18 10月 21:12]

As a rule, soft parts do not withstand the ravages of time; hence, the majority of vertebrate fossils consist only of bones. Under these circumstances, a new discovery from the UNESCO World Heritage Site “Messel Pit” near Darmstadt in Germany comes as an even bigger surprise: a 48-million-year old skin gland from a bird, containing lipids of the same age. The oldest lipids ever recorded in a fossil vertebrate were used by the bird to preen its plumage.

• **[Gene therapy can cure lameness in horses, research finds](#)** [周三, 18 10月 21:11]

Injecting DNA into injured horse tendons and ligaments can cure lameness, new research has found.

- [**Space greens beat the blues**](#) [周三, 18 10月 21:11]

Where people will go in the cosmos, plants will go, say researchers in a new report. Plants may also play a key role in maintaining the psychological well-being of space crews. The next frontier of space plant experimentation is to examine the psychological impact of plant life on astronauts.

- [**High risk of injury in young elite athletes**](#) [周三, 18 10月 21:09]

Every week, an average of three in every ten adolescent elite athletes suffer an injury. Worst affected are young women, and the risk of injury increases with low self-esteem, especially in combination with less sleep and higher training volume and intensity, research from in Sweden shows.

- [**Mouse studies shed light on how protein controls heart failure**](#) [周三, 18 10月 21:02]

A new study on two specially bred strains of mice has illuminated how abnormal addition of the chemical phosphate to a specific heart muscle protein may sabotage the way the protein behaves in a cell, and may damage the way the heart pumps blood around the body.

- [**Yeast spotlights genetic variation's link to drug resistance**](#) [周三, 18 10月 21:02]

Researchers have shown that genetic diversity plays a key role in enabling drug resistance to evolve. Scientists show that high genetic diversity can prime new mutations that cause drug resistance. The study has implications for our understanding of the evolution of resistance to antimicrobial and anticancer drugs.

- [**Bridging the terahertz gap**](#) [周三, 18 10月 21:02]

Researchers are exploring the possibility of using an infrared frequency comb to generate elusive terahertz frequencies. These frequencies -- which lie in the electromagnetic spectrum between radio waves and infrared light -- have long promised to transform communications and sensing but are very challenging to source. By harnessing a recently discovered laser state, researchers have discovered an infrared frequency

comb in a quantum cascade laser that offers a new way to generate terahertz frequ...

• **[Art advancing science at the nanoscale](#)** [周三, 18 10月 21:02]

Could studying molecular biology ever be as fun as watching a Star Wars movie? Two scientists decided to create their own science film to entertain viewers, and ended up making new scientific discoveries in the process. The researchers-turned-filmmakers used a novel combination of computer animation and simulation softwares to create a scientific model that is accurate down to the atomic scale, and hope that their success inspires more scientists to approach their work like artists.

Scientists dig into the origin of organics on dwarf planet Ceres: Organic materials are probably native to the planet -- ScienceDaily

Since NASA's Dawn spacecraft detected localized organic-rich material on Ceres, Southwest Research Institute (SwRI) has been digging into the data to explore different scenarios for its origin. After considering the viability of comet or asteroid delivery, the preponderance of evidence suggests the organics are most likely native to Ceres.

"The discovery of a locally high concentration of organics close to the Ernutet crater poses an interesting conundrum," said Dr. Simone Marchi, a principal scientist at SwRI. He is discussing his team findings today at a press conference at the American Astronomical Society's 49th Division for Planetary Sciences Meeting in Provo. "Was the organic material delivered to Ceres after its formation? Or was it synthesized and/or concentrated in a specific location on Ceres via internal processes? Both scenarios have

shortfalls, so we may be missing a critical piece of the puzzle."

Ceres is believed to have originated about 4.5 billion years ago at the dawn of our solar system. Studying its organics can help explain the origin, evolution, and distribution of organic species across the solar system. The very location of Ceres at the boundary between the inner and outer solar system and its intriguing composition characterized by clays, sodium- and ammonium-carbonates, suggest a very complex chemical evolution. The role of organics in this evolution is not fully understood, but has important astrobiological implications.

"Earlier research that focused on the geology of the organic-rich region on Ceres were inconclusive about their origin," Marchi said. "Recently, we more fully investigated the viability of organics arriving via an asteroid or comet impact."

Scientists explored a range of impact parameters, such as impactor sizes and velocities, using iSALE shock physics code simulations. These models indicated that comet-like projectiles with relatively high impact velocities would lose almost all of their organics due to

shock compression. Impacting asteroids, with lower incident velocities, can retain between 20 and 30 percent of their pre-impact organic material during delivery, especially for small impactors at oblique impact angles. However, the localized spatial distribution of organics on Ceres seems difficult to reconcile with delivery from small main belt asteroids.

"These findings indicate that the organics are likely to be native to Ceres," Marchi said.

Story Source:

[Materials](#) provided by [Southwest Research Institute](#).

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Obesity: Engineered proteins lower body weight in mice, rats and primates -- ScienceDaily

Researchers have created engineered proteins that lowered body weight, bloodstream insulin, and cholesterol levels in obese mice, rats, and primates. Their results could pave the way for urgently needed alternatives to bariatric surgery for treating obesity in humans -- the rates of which have nearly tripled worldwide since 1975.

Based on the observation that obese mice, rats, and humans all had elevated serum concentrations of a protein called GDF15 compared to lean controls, Yumei Xiong and colleagues set out to develop therapies derived from the molecule. In multiple mouse models of diet-induced and genetic obesity, delivery of the GDF15 gene reduced body weights, food intake, and serum insulin levels in the animals.

Because GDF15 has a short plasma half-life and is difficult to produce in substantial quantities, the

scientists generated two different fusion proteins that were more stable in the circulation and led to higher yields. Both fusion proteins effectively decreased body weights for obese mice and cynomolgus monkeys.

Interestingly, Xiong et al. further showed that the GDF15 regimen altered food preferences in mice -- leading the animals to opt for lower calorie chow when offered a choice between standard food and an extra-rich condensed-milk diet (untreated mice gorged themselves on the high-calorie eats).

The authors determined that GDF15 activated a population of nerve cells called AP neurons that make up a portion of the gut-brain axis, yet note that further studies to identify the protein's cellular receptor are needed as potential therapeutics make their way to the clinic.

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Duplications of noncoding DNA may have affected evolution of human-specific traits -- ScienceDaily

Duplications of large segments of noncoding DNA in the human genome may have contributed to the emergence of differences between humans and nonhuman primates, according to results presented at the American Society of Human Genetics (ASHG) 2017 Annual Meeting in Orlando, Fla. Identifying these duplications, which include regulatory sequences, and their effect on traits and behavior may help scientists explain genetic contributions to human disease.

Paulina Carmona-Mora, PhD, who presented the work; Megan Dennis, PhD; and their colleagues at the University of California, Davis, study the history of human-specific duplications (HSDs), segments of DNA longer than 1,000 base pairs that are repeated in humans but not in primates or other animals. In this study, they focused on HSD regions that do not code for genes, but instead regulate the expression of other

genes.

"What's special about these regulatory elements is that they have the propensity to impact the expression of genes nearby on the same chromosome, as well as elsewhere in the genome," said Dr. Dennis. "This means that one duplication could affect many genes, amplifying its impact."

Since duplicated segments are more than 98% identical, it is difficult to distinguish between them, Dr. Dennis explained. As a result, they were discarded in many past genomic analyses. For this reason, the researchers began by creating a new human reference genome that included the duplicated segments. This allowed them to identify areas likely to contain enhancers, which are regulatory elements that increase expression of other genes, and assess their effect on gene expression across organs and tissue types.

For example, duplication of the SRGAP2 segment, which took place about three million years ago, may be associated with several neurological traits specific to humans, such as a larger prefrontal cortex in the brain and more efficient synapses, or connections between brain cells. Strikingly, when human-specific

SRGAP2C was expressed in laboratory mouse embryos, the mice had similar outcomes. Beyond SRGAP2, many of the genes contained in HSDs examined were associated with neurological development, and some may also have implications for immune response.

"Our results point to differences between humans and primates, and hint at what makes us unique as humans," said Dr. Dennis. Additionally, since many of the genomic regions prone to duplication were related to neurological traits, this work may suggest future avenues for scientists seeking to explain the genetic mechanisms behind neurological diseases such as autism, epilepsy, and schizophrenia.

The researchers are currently validating the candidate enhancer regions they found by comparing gene expression levels across tissue types. They are also assessing the effects of a duplication's introduction on the structure and function of nearby segments. Finally, they are measuring differences between original (ancestral) segments and the duplicated versions appearing in later generations, such as sequence changes since the duplication and potential effects on function.

"We tend to think of DNA as a linear sequence, but these results remind us how dynamic it is," said Dr. Carmona-Mora. "It's exciting to see that not only does duplication of genes play a role in human evolution, but perhaps duplication of regulatory elements does, too -- even those outside the expected regions."

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Online resource enables open data sharing for rare Mendelian diseases -- ScienceDaily

MyGene2, a new open data resource, helps patients with rare genetic conditions, clinicians, and researchers share information, connect with one another, and enable faster gene discovery, according to results presented at the American Society of Human Genetics (ASHG) 2017 Annual Meeting in Orlando, Fla.

"With MyGene2, we hope to help patients and their families engage with researchers and clinicians and vice versa, as well as speed up awareness of genes associated with rare Mendelian diseases," said Jessica Chong, PhD, Analysis Group Lead at the federally-funded University of Washington Center for Mendelian Genomics (UW-CMG), who presented the work.

Dr. Chong and Michael Bamshad, MD, Chief of the UW Division of Genetic Medicine, were working in rare disease gene discovery when they observed that a lack of open data sharing was slowing down scientific

progress. "We found that good research findings were just not getting out there," she said. "Researchers may know of a gene's discovery years before it gets published, during which time patients and their families are undiagnosed and unaware."

At the same time, they noted that rare disease patients and families who were using existing social networks to make connections were running up against the limitations of those platforms, such as balancing worldwide reach with patient privacy and achieving consistency in terminology.

"We created MyGene2 to address these limitations, as a single place for patients and families to look for and share information rather than a hodgepodge of search terms and platforms," said Dr. Bamshad. The website helps patients enter their genetic data so it is searchable and useful to researchers and clinicians, along with detailed information about their phenotypes and experiences to help define symptoms and describe the course of disease. "This data can be de-identified to protect patient privacy, but remains complete and accessible, while allowing contact between families, researchers, and clinicians," Dr. Bamshad added.

In the year since the site was launched, more than 1,000 profiles have been created. The researchers are starting to see matches among patients with the same rare disease, and between patients and scientists studying their disease. In addition, they have been able to offer low-cost exome sequencing to patients whose insurance does not cover it, as well as comprehensive reporting of results and tools to identify secondary results.

Dr. Bamshad stresses the important role of patients and families in moving rare disease genetics forward. "Families need to be their own biggest advocates, and one way to do that is by sharing their data," he said.

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Understanding the coevolving web of life as a network: New study exploring how mutualistic species coevolve suggests rapid environmental change can destabilize networks of interacting species -- ScienceDaily

Coevolution, which occurs when species interact and adapt to each other, is often studied in the context of pair-wise interactions between mutually beneficial symbiotic partners. But many species have mutualistic interactions with multiple partners, leading to complex networks of interacting species.

In a paper published October 18 in the journal *Nature*, a group of ecologists and evolutionary biologists from five universities has attempted to understand how species coevolve within large webs of mutualistic species. The study yielded surprising findings about the relative importance of direct and indirect effects within such networks.

"When pair-wise interactions are embedded within a larger web of interactions, what happens as the effects diffuse through the network? It's a really difficult problem to solve, and not just in biology," said coauthor John Thompson, distinguished professor of ecology and evolutionary biology at UC Santa Cruz.

The power of webs and networks is familiar in this internet age. The internet and its users form webs, as do roads and cars, businesses and cities, and the neurons within our bodies. Earth's millions of species also form webs as species prey on each other, parasitize each other, compete for food, and form mutually beneficial associations.

Natural selection favors predators that are better at capturing prey, prey that have better defenses, and individuals that compete better against other species. Among mutualistic species, natural selection favors, for example, plants that are better at attracting pollinating insects and flower-visiting insects that are better at extracting pollen and nectar from flowers.

Just describing the full pattern of connections within these webs is a daunting task. In the new study, the authors began with a set of 75 webs of interacting

species that other researchers had previously described from a wide range of terrestrial and marine environments. These webs included, for example, plants and pollinators, plants and fruit-eating birds and mammals, and anemones and anemone fish.

Each web had, at one extreme, species that interact with only one other species and, at the other extreme, species that interact with many other species. When drawn as a network, each species is a node and each interaction between species is a line between two nodes. Each line is therefore a direct interaction between two species.

Using these webs as a starting point, the authors developed a mathematical model that allowed them to explore for the first time how coevolution might shape the traits of species throughout complex webs of many interacting species. They wanted to understand how coevolution shapes species that interact both directly and indirectly. If two species interact and coevolve with each other, then their coevolution, in turn, could indirectly affect the future evolution of other species within the web. The authors studied the relative effects of direct and indirect coevolution on the evolution of traits within webs of different shapes.

Their analyses suggested two counterintuitive results. First, the stronger the importance of coevolutionary selection between partners, the greater the importance of indirect effects on overall evolution throughout the network. Second, in mutualisms involving multiple partners, the most specialized species -- those species with the fewest direct partners -- are more influenced by indirect effects than by their direct partners.

These two results, together with other results reported in the paper, have many implications for the understanding of evolution and coevolution within webs of interacting species. Among the most important are two conclusions that link evolution, coevolution, and the rate of environmental change.

With slow environmental change, the indirect effects of species on the evolution of other species may help mutualistic interactions persist over long periods of time. In contrast, rapid environmental change may slow the overall rate of evolution driven by direct interactions within large networks, making each species more vulnerable to extinction. With rapid environmental change, then, environments may change faster than species can adapt within large mutualistic networks.

"The indirect effects serve to buffer the system under slow environmental change, keeping it stable. With the kinds of rapid environmental changes we're seeing now, however, this buffering effect can actually prevent species from adapting fast enough," Thompson said.

The problem of direct and indirect effects within networks is not unique to biology. How to study indirect effects within webs has troubled scientists in physics, engineering, computer science, and other disciplines. The modeling framework developed by the authors is applicable to many types of networks.

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All Top News

Top science stories featured on ScienceDaily's home page.

- [**Scientists dig into the origin of organics on dwarf planet Ceres**](#) [周四, 19 10月 03:18]

Since NASA's Dawn spacecraft detected localized organic-rich material on Ceres, scientists have been digging into the data to explore different scenarios for its origin. After considering the viability of comet or asteroid delivery, the preponderance of evidence suggests the organics are most likely native to Ceres.

- [**Understanding the coevolving web of life as a network**](#) [周四, 19 10月 01:32]

Coevolution, which occurs when species interact and adapt to each other, is often studied in the context of pair-wise interactions between mutually beneficial symbiotic partners. But many species have mutualistic interactions with multiple partners, leading to complex networks of interacting species.

- [**Nature or nurture? Innate social behaviors in the mouse brain**](#) [周四, 19 10月 01:29]

The brain circuitry that controls innate, or instinctive, behaviors such as mating and fighting was thought to be genetically hardwired. Not so, neuroscientists now say.

- [**Inflammation trains the skin to heal faster**](#) [周四, 19 10月 01:28]

Stem cells in the skin remember an injury, helping them close recurring wounds faster, researchers have found. The discovery could advance research and treatment of psoriasis and other inflammatory diseases.

- [**Petals produce a 'blue halo' that helps bees find**](#)

[**flowers**](#) [周四, 19 10月 01:28]

Latest research has found that several common flower species have nanoscale ridges on the surface of their petals that meddle with light when viewed from certain angles.

• [**Solar eruptions could electrify Martian moons**](#) [周四, 19 10月 00:41]

Powerful solar eruptions could electrically charge areas of the Martian moon Phobos to hundreds of volts, presenting a complex electrical environment that could possibly affect sensitive electronics carried by future robotic explorers, according to a new NASA study. The study also considered electrical charges that could develop as astronauts transit the surface on potential human missions to Phobos.

• [**Stiff fibers spun from slime**](#) [周三, 18 10月 23:35]

Nanoparticles from the secretion of velvet worms form recyclable polymer fibers.

• [**Potential human habitat located on the moon**](#) [周三, 18 10月 22:43]

A new study confirms the existence of a large open lava tube in the Marius Hills region of the moon, which could be used to protect astronauts from hazardous conditions on the surface.

• [**Ancient preen oil: Researchers discover 48-million-year-old lipids in a fossil bird**](#) [周三, 18 10月 21:12]

As a rule, soft parts do not withstand the ravages of time; hence, the majority of vertebrate fossils consist only of bones. Under these circumstances, a new discovery from the UNESCO World Heritage Site “Messel Pit” near Darmstadt in Germany comes as an even bigger surprise: a 48-million-year old skin gland from a bird, containing lipids of the same age. The oldest lipids ever recorded in a fossil vertebrate were used by the bird to preen its plumage.

• [**Battling flames increases firefighters' exposure to carcinogens**](#) [周三, 18 10月 21:02]

The threat of getting burned by roaring flames is an obvious danger of firefighting, but other health risks are more subtle. For example,

firefighters have been found to develop cancer at higher rates than the general population. Now researchers have measured how much firefighters' exposure to carcinogens and other harmful compounds increases when fighting fires. Their study also points to one possible way to reduce that exposure.

• [**New research opens the door to 'functional cure' for HIV**](#) [周三, 18 10月 03:30]

Scientists have for the first time shown that a novel compound effectively suppresses production of the virus in chronically infected cells.

• [**How we determine who's to blame**](#) [周三, 18 10月 00:44]

Using eye-tracking technology, cognitive scientists have obtained the first direct evidence that people use a process called counterfactual simulation to imagine how a situation could have played out differently to assign responsibility for an outcome.

• [**Flexible 'skin' can help robots, prosthetics perform everyday tasks by sensing shear force**](#) [周三, 18 10月 00:43]

Engineers have developed a flexible sensor 'skin' that can be stretched over any part of a robot's body or prosthetic to accurately convey information about shear forces and vibration, which are critical to tasks ranging from cooking an egg to dismantling a bomb.

• [**Study reshapes understanding of climate change's impact on early societies**](#) [周三, 18 10月 00:43]

A new study linking paleoclimatology -- the reconstruction of past global climates -- with historical analysis shows a link between environmental stress and its impact on the economy, political stability, and war-fighting capacity of ancient Egypt.

• [**Scientists determine source of world's largest mud eruption**](#) [周二, 17 10月 23:43]

More than 11 years after the Lusi mud volcano first erupted on the Indonesian island of Java, researchers may have figured out why the

mudflows haven't stopped: deep underground, Lusi is connected to a nearby volcanic system.

- [**Study shows how water could have flowed on 'cold and icy' ancient Mars**](#) [周二, 17 10月 23:43]

Research by planetary scientists finds that periodic melting of ice sheets on a cold early Mars would have created enough water to carve the ancient valleys and lakebeds seen on the planet today.

- [**What training exercise boosts brain power best? New research finds out**](#) [周二, 17 10月 23:43]

One of the two brain-training methods most scientists use in research is significantly better in improving memory and attention. It also results in more significant changes in brain activity.

- [**Domestication has not made dogs cooperate more with each other compared to wolves**](#) [周二, 17 10月 23:01]

Following domestication, dogs should be more tolerant and cooperative with conspecifics and humans compared to wolves. But looking at both in more naturalistic living conditions, however, speaks for more cooperative behavior of wolves. Researchers now show that the wild ancestors are excelling their domesticated relatives in teamwork. In an experimental approach dogs but not wolves failed to cooperatively pull the two ends of a rope to obtain a piece of food.

- [**Keratin, proteins from 54-million-year-old sea turtle show survival trait evolution**](#) [周二, 17 10月 21:18]

Researchers have retrieved original pigment, beta-keratin and muscle proteins from a 54-million-year-old sea turtle hatchling. The work adds to the growing body of evidence supporting persistence of original molecules over millions of years and also provides direct evidence that a pigment-based survival trait common to modern sea turtles evolved at least 54 million years ago.

- [**Filling the early universe with knots can explain why the world is three-dimensional**](#) [周二, 17 10月 07:03]

Filling the universe with knots shortly after it popped into existence 13.8 billion years ago provides a neat explanation for why we inhabit a three-dimensional world. That is the basic idea advanced by an out-of-the-box theory developed by an international team of physicists.

- [**Whales and dolphins have rich 'human-like' cultures and societies**](#) [周二, 17 10月 00:22]

Whales and dolphins (cetaceans) live in tightly-knit social groups, have complex relationships, talk to each other and even have regional dialects -- much like human societies. A major new study has linked the complexity of Cetacean culture and behavior to the size of their brains.

- [**Bite on this: Alligators caught eating sharks**](#) [周二, 17 10月 00:21]

Jaws, beware! Alligators may be coming for you. A new study documents American alligators on the Atlantic and Gulf coasts are eating small sharks and stingrays. This is the first scientific documentation of a widespread interaction between the two predators.

- [**Hubble observes source of gravitational waves for the first time**](#) [周二, 17 10月 00:21]

The NASA/ESA Hubble Space Telescope has observed for the first time the source of a gravitational wave, created by the merger of two neutron stars. This merger created a kilonova -- an object predicted by theory decades ago -- that ejects heavy elements such as gold and platinum into space. This event also provides the strongest evidence yet that short duration gamma-ray bursts are caused by mergers of neutron stars.

- [**Radio 'eyes' unlocking secrets of neutron-star collision**](#) [周一, 16 10月 22:28]

When a pair of superdense neutron stars collided and potentially formed a black hole in a galaxy 130 million light-years from Earth, they unleashed not only a train of gravitational waves but also an ongoing torrent of radio waves that are answering some of the biggest questions about the nature of such a cataclysmic event.

- [**Astronomers strike cosmic gold, confirm origin**](#)

[of precious metals in neutron star mergers](#) [周一, 16 10月 22:28]

What many thought would be a long way off, the detection of gravitational waves from the merger of binary neutron stars, actually happened on Aug. 17. The observation of a blue and then red glow from the radioactive debris cloud left behind matched simulations of what the merger should look like, proving that such mergers are the source of most of the very heavy elements in the universe, including gold.

• [Harvey runoff menaces Texas' coral reefs](#) [周一, 16 10月 22:28]

The more than 13 trillion gallons of floodwater from Hurricane Harvey have created a massive plume of freshwater in the Gulf of Mexico that is threatening the coral reefs of the Flower Garden Banks National Marine Sanctuary about 100 miles offshore of Galveston.

• [First observations of merging neutron stars mark a new era in astronomy](#) [周一, 16 10月 22:28]

After LIGO detected gravitational waves from the merger of two neutron stars, the race was on to detect a visible counterpart, because unlike the colliding black holes responsible for LIGO's four previous detections, this event was expected to produce an explosion of visible light. Researchers have now found the source of the gravitational waves, capturing the first images of the event with the Swope Telescope in Chile.

• [Fanged kangaroo research could shed light on extinction](#) [周一, 16 10月 21:27]

Fanged kangaroos -- an extinct family of small fanged Australian kangaroos -- might have survived at least five million years longer than previously thought. A new study has found the species might have competed for resources with ancestors of modern kangaroos.

• [Melting ice makes the sea around Greenland less saline](#) [周五, 13 10月 23:30]

For the first time, ocean data from Northeast Greenland reveals the long-term impact of the melting of the Greenland ice sheet. The observed

increase in freshwater content will affect the conditions in all Greenland fjords and may ultimately affect the global ocean currents that keep Europe warm.

- [**Star Dust Helps Explain Mysterious Dimming Star**](#) [周五, 13 10月 21:19]

Astronomers are working to understand the mysterious dimming of Tabby's Star. The astronomers report that space dust orbiting the star -- not alien megastructures -- is the likely cause of the star's long-term dimming.

- [**New insight into the limits of possible life on Mars**](#) [周五, 13 10月 21:10]

Researchers investigating whether liquid water could exist on Mars have provided new insight into the limits of life on the red planet.

- [**Learning and staying in shape key to longer lifespan, study finds**](#) [周五, 13 10月 21:10]

People who are overweight cut their life expectancy by two months for every extra kilogram of weight they carry, research suggests. A major study has also found that education leads to a longer life, with almost a year added for each year spent studying beyond school.

- [**Is it gonna blow? Measuring volcanic emissions from space**](#) [周五, 13 10月 08:02]

Carbon dioxide measured by a NASA satellite pinpoints sources of the gas from human and volcanic activities, which may help monitor greenhouse gases responsible for climate change.

- [**Intense storms batter Saturn's largest moon, scientists report**](#) [周五, 13 10月 05:25]

Titan, the largest of Saturn's more than 60 moons, has surprisingly intense rainstorms, according to research by a team of UCLA planetary scientists and geologists. Although the storms are relatively rare -- they occur less than once per Titan year, which is 29 and a half Earth years -- they occur much more frequently than the scientists expected.

- [**Spotting the spin of the Majorana fermion under the microscope**](#) [周五, 13 10月 02:33]

Using a new twist on a technique for imaging atomic structures, researchers have detected a unique quantum property of the Majorana fermion, an elusive particle with the potential for use in quantum information systems.

- [**Newfoundland populated multiple times by distinct groups, DNA evidence shows**](#) [周五, 13 10月 02:33]

Researchers who've examined genetic evidence from mitochondrial DNA provide evidence that two groups of indigenous people in Canada, known as the Maritime Archaic and Beothuk, brought different matrilineal lineages to the island, adding further support to the notion that those groups had distinct population histories.

- [**Baby talk in any language: Shifting the timbre of our voices**](#) [周五, 13 10月 02:33]

When talking with their young infants, parents instinctively use 'baby talk,' a unique form of speech including exaggerated pitch contours and short, repetitive phrases. Now, researchers have found another unique feature of the way mothers talk to their babies: they shift the timbre of their voice in a rather specific way. The findings hold true regardless of a mother's native language.

- [**Genes responsible for diversity of human skin colors identified**](#) [周五, 13 10月 02:33]

A study of diverse African groups by geneticists has identified new genetic variants associated with skin pigmentation. The findings help explain the vast range of skin color on the African continent, shed light on human evolution and inform an understanding of the genetic risk factors for conditions such as skin cancer.

- [**Engineers develop a programmable 'camouflaging' material inspired by octopus skin**](#) [周五, 13 10月 02:33]

Engineers have invented stretchable surfaces with programmable 3-D

texture morphing, a synthetic 'camouflaging skin' inspired by studying and modeling the real thing in octopus and cuttlefish.

- [**Paleogenomic analysis sheds light on Easter Island mysteries**](#) [周五, 13 10月 00:30]

New paleogenomic research appears to rule out the likelihood that inhabitants of Easter Island intermixed with South Americans prior to the arrival of Europeans on the island in 1722.

- [**Devourer of planets? Astronomers dub star 'Kronos'**](#) [周五, 13 10月 00:28]

'Kronos' is enhanced in metals and other rock-forming elements but not in volatiles, prompting a team of researchers to conclude that it absorbed as much as 15 Earth masses worth of rocky planets. Its twin, 'Krios,' does not show this unusual pattern of enhancement.

- [**Brain waves reflect different types of learning**](#) [周五, 13 10月 00:28]

Researchers have, for the first time, identified neural signatures of explicit and implicit learning.

- [**Geologic evidence is the forerunner of ominous prospects for a warming Earth**](#) [周四, 12 10月 23:48]

While strong seasonal hurricanes have devastated many of the Caribbean and Bahamian islands this year, geologic studies on several of these islands illustrate that more extreme conditions existed in the past. A new analysis shows that the limestone islands of the Bahamas and Bermuda experienced climate changes that were even more extreme than historical events.

- [**Scientists begin bold conservation effort to save the vaquita porpoise from extinction**](#) [周四, 12 10月 22:37]

An international team of experts has gathered in San Felipe, Mexico at the request of the Mexican government (SEMARNAT) and has begun a bold, compassionate plan known as VaquitaCPR to save the endangered vaquita porpoise from extinction.

[**Pumas found to exhibit behaviors like social animals**](#) [周四, 12 10月 22:36]

Pumas, long known as solitary carnivores, are more social than previously thought, according to a new study. The findings provide the first evidence of complex social strategies in any solitary carnivore -- and may have implications for multiple species, including other wild cats around the world.

[**Haumea, the most peculiar of Pluto companions, has a ring around it**](#) [周四, 12 10月 21:33]

The trans-neptunian belt contains four dwarf planets, among which Haumea stands out for its extremely elongated shape and rapid rotation. A stellar occultation makes it possible to establish the main physical characteristics of this previously little known body -- among which most surprising was the presence of a ring.

[**New threat to the ozone layer**](#) [周四, 12 10月 21:10]

'Ozone depletion is a well-known phenomenon and, thanks to the success of the Montreal Protocol, is widely perceived as a problem solved,' say some. But an international team of researchers, has now found an unexpected, growing danger to the ozone layer from substances not regulated by the treaty.

[**Last common ancestor of humans and apes weighed about five kilograms**](#) [周四, 12 10月 21:09]

New research suggests that the last common ancestor of apes -- including great apes and humans -- was much smaller than previously thought, about the size of a gibbon. The findings, published today in the journal Nature Communications, are fundamental to understanding the evolution of the human family tree.

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Health News

Top stories featured on ScienceDaily's Health & Medicine, Mind & Brain, and Living Well sections.

- [**Obesity: Engineered proteins lower body weight in mice, rats and primates**](#) [周四, 19 10月 03:18]

Researchers have created engineered proteins that lowered body weight, bloodstream insulin, and cholesterol levels in obese mice, rats, and primates.

- [**Duplications of noncoding DNA may have affected evolution of human-specific traits**](#) [周四, 19 10月 01:32]

Duplications of large segments of noncoding DNA in the human genome may have contributed to the emergence of differences between humans and nonhuman primates, according to new results. Identifying these duplications, which include regulatory sequences, and their effect on traits and behavior may help scientists explain genetic contributions to human disease.

- [**Online resource enables open data sharing for rare Mendelian diseases**](#) [周四, 19 10月 01:32]

MyGene2, a new open data resource, helps patients with rare genetic conditions, clinicians, and researchers share information, connect with one another, and enable faster gene discovery.

- [**Nature or nurture? Innate social behaviors in the mouse brain**](#) [周四, 19 10月 01:29]

The brain circuitry that controls innate, or instinctive, behaviors such as mating and fighting was thought to be genetically hardwired. Not so, neuroscientists now say.

- [**Inflammation trains the skin to heal faster**](#) [周四, 19 10月 01:28]

Stem cells in the skin remember an injury, helping them close recurring wounds faster, researchers have found. The discovery could advance research and treatment of psoriasis and other inflammatory diseases.

- [**New findings explain how UV rays trigger skin cancer**](#) [周四, 19 10月 00:16]

Melanoma, a cancer of skin pigment cells called melanocytes, will strike an estimated 87,110 people in the US in 2017, according to the Centers for Disease Control and Prevention. A fraction of those melanomas come from pre-existing moles, but the majority of them come from sources unknown -- until now.

- [**Dutch courage: Alcohol improves foreign language skills**](#) [周三, 18 10月 23:35]

A new study shows that bilingual speakers' ability to speak a second language is improved after they have consumed a low dose of alcohol.

- [**One step closer toward a treatment for Alzheimer's disease?**](#) [周三, 18 10月 23:35]

Scientists have characterized a new class of drugs as potential therapeutics for Alzheimer's disease and discovered a piece in the puzzle of how they would work.

- [**New clues to treat Alagille Syndrome from zebrafish**](#) [周三, 18 10月 23:35]

A new study identifies potential new therapeutic avenues for patients with Alagille syndrome, a rare genetic disorder caused by mutations primarily in the JAGGED1 gene.

- [**Turning brain cells into skin cells**](#) [周三, 18 10月 23:35]

A new study reveals that it is possible to repurpose the function of different mature cells across the body and harvest new tissue and organs from these cells.

- [**Life in the city: Living near a forest keeps your**](#)

[amygdala healthier](#) [周三, 18 10月 23:35]

A new study examined the relationship between the availability of nature near city dwellers' homes and their brain health. Its findings are relevant for urban planners among others.

[Cocaine use during adolescence is even more harmful than during adulthood](#) [周三, 18 10月 23:35]

Scientists found that addicts who began using cocaine before and after the age of 18 showed differences in sustained attention and working memory, among other brain functions. The research, made under controlled drug abstinence condition, measured cocaine's impact on more than a hundred drug users' cognition, and recommended multidisciplinary treatment for patients with an accentuated cognitive deficit.

[Global calcium consumption appears low, especially in Asia](#) [周三, 18 10月 23:31]

A new systematic review of global daily calcium consumption suggests substantial regional differences -- it's lowest in East Asia and highest in Northern Europe.

[Active sieving could improve dialysis and water purification filters](#) [周三, 18 10月 21:22]

Physicists have proven theoretically that active sieving, as opposed to its passive counterpart, can improve the separation abilities of filtration systems. Active sieving also has the potential to filter molecules based on movement dynamics, opening up a whole new avenue in the field of membrane science based on the ability to tune osmotic pressure.

[Workers may 'choke' under pressure of non-monetary incentives](#) [周三, 18 10月 21:16]

Competition for non-monetary awards can have adverse effects on performance and may cause employees to “choke” under pressure, according to a new study.

[Researchers release the brakes on the immune](#)

[system](#) [周三, 18 10月 21:13]

Many tumors possess mechanisms to avoid destruction by the immune system. For instance, they misuse the natural “brakes” in the immune defense mechanism, which normally prevent an excessive immune response. Researchers have now been able to take off one of these brakes. The study could pave the way for more effective cancer therapies, they say.

• [High risk of injury in young elite athletes](#) [周三, 18 10月 21:09]

Every week, an average of three in every ten adolescent elite athletes suffer an injury. Worst affected are young women, and the risk of injury increases with low self-esteem, especially in combination with less sleep and higher training volume and intensity, research from in Sweden shows.

• [Mouse studies shed light on how protein controls heart failure](#) [周三, 18 10月 21:02]

A new study on two specially bred strains of mice has illuminated how abnormal addition of the chemical phosphate to a specific heart muscle protein may sabotage the way the protein behaves in a cell, and may damage the way the heart pumps blood around the body.

• [Yeast spotlights genetic variation's link to drug resistance](#) [周三, 18 10月 21:02]

Researchers have shown that genetic diversity plays a key role in enabling drug resistance to evolve. Scientists show that high genetic diversity can prime new mutations that cause drug resistance. The study has implications for our understanding of the evolution of resistance to antimicrobial and anticancer drugs.

• [MRI may predict neurological outcomes for cardiac arrest survivors](#) [周三, 18 10月 21:02]

MRI-based measurements of the functional connections in the brain can help predict long-term recovery in patients who suffer neurological disability after cardiac arrest, according to new research.

- [**Newborns with trisomy 13 or 18 benefit from heart surgery, study finds**](#) [周三, 18 10月 21:02]

Heart surgery significantly decreases in-hospital mortality among infants with either of two genetic disorders that cause severe physical and intellectual disabilities, according to a new study.

- [**Battling flames increases firefighters' exposure to carcinogens**](#) [周三, 18 10月 21:02]

The threat of getting burned by roaring flames is an obvious danger of firefighting, but other health risks are more subtle. For example, firefighters have been found to develop cancer at higher rates than the general population. Now researchers have measured how much firefighters' exposure to carcinogens and other harmful compounds increases when fighting fires. Their study also points to one possible way to reduce that exposure.

- [**Arsenic in domestic well water could affect 2 million people in the US**](#) [周三, 18 10月 21:02]

Clean drinking water can be easy to take for granted if your home taps into treated water sources. But more than 44 million people in the U.S. get their water from private domestic wells, which are largely unregulated. Of those, a new report estimates that about 2 million people could be exposed to high levels of naturally occurring arsenic in their water.

- [**Anxiety and depression linked to migraines**](#) [周三, 18 10月 21:02]

In a study of 588 patients who attended an outpatient headache clinic, more frequent migraines were experienced by participants with symptoms of anxiety and depression.

- [**Gentle touch soothes the pain of social rejection**](#) [周三, 18 10月 21:02]

The gentle touch of another individual soothes the effects of social exclusion, one of the most emotionally painful human experiences, according to new research.

- [**New simple method determines rate at which we**](#)

[burn calories walking up, down, flat](#) [周三, 18 10月 21:01]

A new way to predict the energy a person expends walking will help predict and monitor the physiological status of walkers, including foot soldiers. Researchers have developed the Army-funded method, which significantly improves on two existing standards, and relies on three readily available variables. Accurate prediction is important because the rate at which people burn calories walking can vary tenfold depending on speed, carried load and whether uphill, at-grade or downhill.

• [Machine learning identifies breast lesions likely to become cancer](#) [周三, 18 10月 21:01]

A machine learning tool can help identify which high-risk breast lesions are likely to become cancerous, according to a new study. Researchers said the technology has the potential to reduce unnecessary surgeries.

• [Navigational view of the brain thanks to powerful X-rays](#) [周三, 18 10月 04:37]

Imagine Google Earth with only the street view and a far-away satellite view but not much of a map view. Brain imaging, for the most part, has been missing just that, and a lot of research on how the brain computes happens on that map-like level. New imaging tackles this special view of the brain with the highest-energy X-rays in the country that illuminate thick sections of a mouse brain.

• ['Wasabi receptor' for pain discovered in flatworms](#) [周三, 18 10月 04:37]

A research team has discovered how scalding heat and tissue injury activate an ancient 'pain' receptor in simple animals. The findings, from a study of flatworms, could lead to new strategies for analgesic drug design for the treatment of humans. That planarian flatworms use the same molecular receptor as flies, mice and humans to detect potentially damaging or noxious stimuli from the environment shows a remarkable level of evolutionary conservation, the researchers say.

• [High blood pressure linked to common heart](#)

[valve disorder](#) [周三, 18 10月 03:31]

For the first time, a strong link has been established between high blood pressure and the most common heart valve disorder in high-income countries.

• [New research opens the door to 'functional cure' for HIV](#) [周三, 18 10月 03:30]

Scientists have for the first time shown that a novel compound effectively suppresses production of the virus in chronically infected cells.

• [New examination of occupational licensing contradicts decades of research](#) [周三, 18 10月 03:30]

From doctors to engineers to carpet layers to massage therapists, more than one in three Americans is required to hold a license to work in their occupation. Broad consensus among researchers holds that licensure creates wage premiums by establishing economic monopolies, but according to research, licensure does not limit competition nor does it increase wages.

• [Therapeutic form of arsenic is a potential treatment for deadly type of brain cancer](#) [周三, 18 10月 03:29]

From Sherlock Holmes to Agatha Christie, arsenic is often the poison of choice in popular whodunits. But in ultra-low dosage, and in the right form, this naturally occurring chemical element may be a potent force against cancer.

• [How we determine who's to blame](#) [周三, 18 10月 00:44]

Using eye-tracking technology, cognitive scientists have obtained the first direct evidence that people use a process called counterfactual simulation to imagine how a situation could have played out differently to assign responsibility for an outcome.

• ['Busybody' protein may get on your nerves, but that's a good thing](#) [周三, 18 10月 00:43]

The p75 protein is vital for signaling pain in nervous system, researchers

have discovered.

- [**You would not ask a firefighter to perform open-heart surgery: Understanding 'collective intelligence'**](#) [周三, 18 10月 00:43]

The concept of 'collective intelligence' is simple -- it asserts that if a team performs well on one task, it will repeat that success on other projects, regardless of the scope or focus of the work. While it sounds good in theory, it doesn't work that way in reality, according to a researcher.

- [**Flexible 'skin' can help robots, prosthetics perform everyday tasks by sensing shear force**](#) [周三, 18 10月 00:43]

Engineers have developed a flexible sensor 'skin' that can be stretched over any part of a robot's body or prosthetic to accurately convey information about shear forces and vibration, which are critical to tasks ranging from cooking an egg to dismantling a bomb.

- [**Cancer: New compound targets energy generation, thereby killing metastatic cells**](#) [周三, 18 10月 00:43]

Researchers have identified an enzyme that supports the survival and dissemination of metastatic cells, and developed a synthetic compound that targets the enzyme and kills the metastatic cells in mice with cancer.

- [**Assessment shows metagenomics software has much room for improvement**](#) [周三, 18 10月 00:42]

A recent critical assessment of software tools represents a key step toward taming the 'Wild West' nature of the burgeoning field of metagenomics.

- [**What training exercise boosts brain power best? New research finds out**](#) [周二, 17 10月 23:43]

One of the two brain-training methods most scientists use in research is significantly better in improving memory and attention. It also results in more significant changes in brain activity.

[Single cell level sorting technology uses sound waves](#) [周二, 17 10月 23:01]

Researchers have developed a highly accurate single cell sorting technology using focused sound waves. This new technology enables rapid and accurate isolation of single cells from complex biological samples, which will facilitate the broad application of single cell analysis toward precision medicine.

[HIV infection, even with antiretroviral therapy, appears to damage a growing child's brain](#) [周二, 17 10月 23:01]

One of the largest and best-documented trials of children receiving early antiretroviral therapy -- the CHER clinical trial in South Africa -- finds ongoing white matter damage in HIV-positive children at the age of 7 years. The study aims to contribute to a better understanding of brain development in HIV-infected and exposed children, as well as the impact of long-term antiretroviral treatment.

[Corticosteroids aid healing -- if the timing is right](#) [周二, 17 10月 23:01]

A corticosteroid can improve the healing of damaged tendons, but it must be given at the right time, according to a new study from Sweden. In rats, the tendon became twice as strong.

[Matchmaking with consequences: When cells become cancerous](#) [周二, 17 10月 23:01]

Myc proteins play an important role when cells become cancerous. Researchers have studied just how they do this. They might thus open up ways to develop new therapies.

[Resolving traffic jams in human ALS motor neurons](#) [周二, 17 10月 23:00]

A team of researchers used stem cell technology to generate motor neurons from ALS patients carrying mutations in FUS. They found disturbed axonal transport in these motor neurons, but also identified genetic and pharmacological strategies that mitigate this defect.

- [**On-and-off fasting helps fight obesity, study finds**](#) [周二, 17 10月 23:00]

Up to sixteen weeks of intermittent fasting without otherwise having to count calories helps fight obesity and other metabolic disorders. Such fasting already shows benefits after only six weeks, according to a new study.

- [**Need for speed makes genome editing efficient, if not better**](#) [周二, 17 10月 23:00]

Researchers have developed a computational model to quantify the mechanism by which CRISPR-Cas9 proteins find their genome-editing targets.

- [**New imaging approach maps whole-brain changes from Alzheimer's disease in mice**](#) [周二, 17 10月 23:00]

A new imaging system that offers a better way to monitor the brain changes indicative of Alzheimer's in mouse models of the disease could help speed new drug development.

- [**Zinc-binding is vital for regulating pH levels in the brain**](#) [周二, 17 10月 21:22]

Researchers in Oslo, Norway, have discovered that Zinc-binding plays an important role in the sensing and regulation of pH in the human brain. The findings come as one of the first studies that directly link Zinc-binding with bicarbonate transporters.

- [**Possible approach discovered for treating Multiple Sclerosis**](#) [周二, 17 10月 21:21]

Around 2.5 million people are affected by the autoimmune disease Multiple Sclerosis (MS), the most common central nervous system disease among young adults. There are around 12,500 MS sufferers in Austria and 400 new cases every year. There is currently no cure for MS but, with appropriate treatment, it is possible to delay the typical progression of the disease.

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [**Scientists dig into the origin of organics on dwarf planet Ceres**](#) [周四, 19 10月 03:18]

Since NASA's Dawn spacecraft detected localized organic-rich material on Ceres, scientists have been digging into the data to explore different scenarios for its origin. After considering the viability of comet or asteroid delivery, the preponderance of evidence suggests the organics are most likely native to Ceres.

- [**New material for digital memories of the future**](#) [周四, 19 10月 01:32]

Scientists have developed the first material with conductivity properties that can be switched on and off using ferroelectric polarization.

- [**At tremendous precision, the proton and antiproton still seem identical**](#) [周四, 19 10月 01:29]

Using a novel two-particle measurement method, a group of researchers measured the magnetic moment of the antiproton at a precision 350 times higher than any previous measurement. The result shows that the magnetic moments of the proton and antiproton are tremendously close, meaning that so-called CPT asymmetry -- a key factor in the lack of antimatter -- must be very small if it exists at all.

- [**Riddle of matter remains unsolved: Proton and antiproton share fundamental properties**](#) [周四, 19 10月 01:28]

Physicists have been able to measure the magnetic force of antiprotons with almost unbelievable precision.

- [**Solar eruptions could electrify Martian moons**](#) [周四, 19 10月 00:41]

Powerful solar eruptions could electrically charge areas of the Martian moon Phobos to hundreds of volts, presenting a complex electrical environment that could possibly affect sensitive electronics carried by future robotic explorers, according to a new NASA study. The study also considered electrical charges that could develop as astronauts transit the surface on potential human missions to Phobos.

- [**For \\$1000, anyone can purchase online ads to track your location and app use**](#) [周四, 19 10月 00:41]

New research finds that for a budget of roughly \$1000, it is possible for someone to track your location and app use by purchasing and targeting mobile ads. The team hopes to raise industry awareness about the potential privacy threat.

- [**Competing forces: How molecules maintain their structure**](#) [周三, 18 10月 23:35]

A double helix twisted around itself: this is the distinctive structure of DNA, which is made up of large molecules. Using synthetically produced molecules, chemists and physicists have investigated the forces which are at work inside the molecule to give it its three-dimensional structure.

- [**Stiff fibers spun from slime**](#) [周三, 18 10月 23:35]

Nanoparticles from the secretion of velvet worms form recyclable polymer fibers.

- [**Nanoelectronics breakthrough could lead to more efficient quantum devices**](#) [周三, 18 10月 23:35]

Researchers have made a breakthrough that could help your electronic devices get even smarter. Their findings examine electron behavior within nanoelectronics, as outlined in a new article.

- [**Customizing catalysts to boost product yields, decrease separation costs**](#) [周三, 18 10月 23:35]

For some crystalline catalysts, what you see on the surface is not always

what you get in the bulk. Investigators discovered that treating a complex oxide crystal with either heat or chemicals caused different atoms to segregate on the surface, i.e., surface reconstruction. Those differences created catalysts with dissimilar behaviors, which encouraged different reaction pathways and ultimately yielded distinct products.

- [**Reducing power plants' freshwater consumption with new silica filter**](#) [周三, 18 10月 23:35]

Power plants draw more freshwater than any other consumer in the United States, accounting for more than 50 percent of the nation's freshwater use at about 500 billion gallons daily. To help save this water, researchers have developed a new silica filter for power plant cooling waters that decreases the amount of freshwater power plants consume by increasing the number of times cooling tower water can be reused and recycled.

- [**A mission to Mars could make its own oxygen thanks to plasma technology**](#) [周三, 18 10月 23:33]

Plasma technology could hold the key to creating a sustainable oxygen supply on Mars, a new study has found. It suggests that Mars, with its 96 per cent carbon dioxide atmosphere, has nearly ideal conditions for creating oxygen from CO₂ through a process known as decomposition.

- [**Electrode materials from the microwave oven**](#) [周三, 18 10月 23:31]

Power on the go is in demand: The higher the battery capacity, the larger the range of electric cars and the longer the operating time of cell phones and laptops. Researchers have now developed a process that allows a fast, simple, and cost-effective production of the promising cathode material lithium cobalt phosphate in high quality.

- [**Potential human habitat located on the moon**](#) [周三, 18 10月 22:43]

A new study confirms the existence of a large open lava tube in the Marius Hills region of the moon, which could be used to protect astronauts from hazardous conditions on the surface.

- **[Force field analysis provides clues to protein-ion interaction](#)** [周三, 18 10月 21:22]

The importance of proteins and metal ion interactions is well understood, but the mechanistic interactions between the two are still far from a complete picture. Researchers are working to quantitatively describe protein-ion interactions using what is called an atomic multipole optimized energetics for biomolecular applications force field.

- **[Water droplet physics: The drop that's good to the very end](#)** [周三, 18 10月 21:22]

Two researchers, using laser-flash photography of microscopic droplet-particle collisions, have discovered that water droplets still have liquid tricks to reveal. Previous research has primarily examined droplet collisions with flat surfaces, such as a wall, but this research team examined the less studied case of a droplet having a head-on collision with a solid, spherical particle.

- **[Active sieving could improve dialysis and water purification filters](#)** [周三, 18 10月 21:22]

Physicists have proven theoretically that active sieving, as opposed to its passive counterpart, can improve the separation abilities of filtration systems. Active sieving also has the potential to filter molecules based on movement dynamics, opening up a whole new avenue in the field of membrane science based on the ability to tune osmotic pressure.

- **[Origami lattice paves the way for new noise-dampening barriers on the road](#)** [周三, 18 10月 21:22]

Researchers have brought a new method into the sound-dampening fold, demonstrating an origami lattice prototype that can potentially reduce acoustic noise on roadways. The technique allows researchers to selectively dampen noise at various frequencies by adjusting the distance between noise-diffusing elements.

- **[The puzzle to plugging the worst natural gas release in history](#)** [周三, 18 10月 21:16]

By the time scientists visited the Aliso Canyon natural gas storage facility in December 2015, the SS-25 well blowout had been leaking natural gas into the air for more than six weeks. The notoriously strong winds at Aliso Canyon carried the natural gas and its added odorant to the nearby Porter Ranch neighborhood, leading to thousands of families evacuating their homes.

- [**Space greens beat the blues**](#) [周三, 18 10月 21:11]

Where people will go in the cosmos, plants will go, say researchers in a new report. Plants may also play a key role in maintaining the psychological well-being of space crews. The next frontier of space plant experimentation is to examine the psychological impact of plant life on astronauts.

- [**Bridging the terahertz gap**](#) [周三, 18 10月 21:02]

Researchers are exploring the possibility of using an infrared frequency comb to generate elusive terahertz frequencies. These frequencies -- which lie in the electromagnetic spectrum between radio waves and infrared light -- have long promised to transform communications and sensing but are very challenging to source. By harnessing a recently discovered laser state, researchers have discovered an infrared frequency comb in a quantum cascade laser that offers a new way to generate terahertz frequ...

- [**Art advancing science at the nanoscale**](#) [周三, 18 10月 21:02]

Could studying molecular biology ever be as fun as watching a Star Wars movie? Two scientists decided to create their own science film to entertain viewers, and ended up making new scientific discoveries in the process. The researchers-turned-filmmakers used a novel combination of computer animation and simulation softwares to create a scientific model that is accurate down to the atomic scale, and hope that their success inspires more scientists to approach their work like artists.

- [**New membrane makes separating methane and carbon dioxide more efficient**](#) [周三, 18 10月 21:01]

To make natural gas and biogas suitable for use, the methane has to be separated from the carbon dioxide. This involves the use of membranes:

filters that stop the methane and let the CO2 pass through. Researchers in Belgium have developed a new membrane that makes the separation process much more effective.

- [**Machine learning identifies breast lesions likely to become cancer**](#) [周三, 18 10月 21:01]

A machine learning tool can help identify which high-risk breast lesions are likely to become cancerous, according to a new study. Researchers said the technology has the potential to reduce unnecessary surgeries.

- [**Nice ice, maybe: Study finds water-repelling surfaces ease ice removal**](#) [周三, 18 10月 20:56]

A new study has discovered that ice grows differently on water-absorbent vs. water-repellent surfaces. The research suggests that applying water-repellent coatings to windshields before winter storms -- or engineering surfaces that inherently repel water -- could enable a strong breeze to handle the burden of ice removal.

- [**Navigational view of the brain thanks to powerful X-rays**](#) [周三, 18 10月 04:37]

Imagine Google Earth with only the street view and a far-away satellite view but not much of a map view. Brain imaging, for the most part, has been missing just that, and a lot of research on how the brain computes happens on that map-like level. New imaging tackles this special view of the brain with the highest-energy X-rays in the country that illuminate thick sections of a mouse brain.

- [**How bright is the moon, really?**](#) [周三, 18 10月 04:37]

The National Institute of Standards and Technology (NIST) is planning to take new measurements of the Moon's brightness, a highly useful property that satellites rely upon every day.

- [**Wearables to boost security of voice-based log-in**](#) [周三, 18 10月 00:44]

A security-token necklace, ear buds or eyeglasses developed by researchers could eliminate vulnerabilities in voice authentication -- the practice of logging in to a device or service with your voice alone.

- [**To keep Saturn's A ring contained, its moons stand united**](#) [周三, 18 10月 00:43]

For three decades, astronomers thought that only Saturn's moon Janus confined the planet's A ring -- the largest and farthest of the visible rings. But after poring over NASA's Cassini mission data, astronomers now conclude that the teamwork of seven moons keeps this ring corralled.

- [**Flexible 'skin' can help robots, prosthetics perform everyday tasks by sensing shear force**](#) [周三, 18 10月 00:43]

Engineers have developed a flexible sensor 'skin' that can be stretched over any part of a robot's body or prosthetic to accurately convey information about shear forces and vibration, which are critical to tasks ranging from cooking an egg to dismantling a bomb.

- [**Assessment shows metagenomics software has much room for improvement**](#) [周三, 18 10月 00:42]

A recent critical assessment of software tools represents a key step toward taming the 'Wild West' nature of the burgeoning field of metagenomics.

- [**Study shows how water could have flowed on 'cold and icy' ancient Mars**](#) [周二, 17 10月 23:43]

Research by planetary scientists finds that periodic melting of ice sheets on a cold early Mars would have created enough water to carve the ancient valleys and lakebeds seen on the planet today.

- [**A new way to test body armor**](#) [周二, 17 10月 23:43]

In response to several high profile body armor failures, researchers have developed a new and extremely reliable way to test the ballistic fibers used in body armor.

- [**Loops of liquid metal can improve future fusion power plants, scientists say**](#) [周二, 17 10月 23:43]

Researchers have proposed an innovative design to improve the ability

of future fusion power plants to generate safe, clean and abundant energy in a steady state, or constant, manner. The design uses loops of liquid lithium to clean and recycle the tritium, the radioactive hydrogen isotope that fuels fusion reactions, and to protect the divertor plates from intense exhaust heat from the tokamak that contains the reactions.

- [**A new way to harness wasted methane**](#) [周二, 17 10月 23:43]

Scientists have identified a process that could be used to harness methane that is now wasted by being burned off at wellheads.

- [**Single cell level sorting technology uses sound waves**](#) [周二, 17 10月 23:01]

Researchers have developed a highly accurate single cell sorting technology using focused sound waves. This new technology enables rapid and accurate isolation of single cells from complex biological samples, which will facilitate the broad application of single cell analysis toward precision medicine.

- [**Scientists create most powerful micro-scale bio-solar cell yet**](#) [周二, 17 10月 23:01]

Researchers have created a micro-scale biological solar cell that generates a higher power density for longer than any existing cell of its kind.

- [**New method for quantum-mechanical swapping of positions**](#) [周二, 17 10月 23:01]

An international team of researchers has proposed a new way to make atoms or ions indistinguishable by swapping their positions. These particles are then expected to exhibit exotic properties.

- [**Bringing the atomic world into full color**](#) [周二, 17 10月 23:01]

Scientists have developed a new way of visualizing the atomic world by turning data scanned by an atomic force microscope into clear color images. The newly developed method, which enables observation of materials and substances like alloys, semiconductors, and chemical compounds in a relatively short time, holds promise of becoming widely

used in the research and development of surfaces and devices.

- [**Looking for microbe 'fingerprints' on simulated Martian rocks**](#) [周二, 17 10月 23:01]

Scientists are searching for unique bio-signatures left on synthetic extraterrestrial minerals by microbial activity. A new paper describes investigations into these signatures at a miniaturized 'Mars farm' where researchers can observe interactions between the archaeon *Metallosphaera sedula* and Mars-like rocks. These microbes are capable of oxidizing and integrating metals into their metabolism.

- [**Electroplating: The birth of a single nucleus caught in camera**](#) [周二, 17 10月 23:00]

Electroplating, or electrodeposition, is one of the most important processes in chemistry, in which a metal cation in solution can be reduced to its elemental form by applying an electrical potential to an electrode.

- [**Missing link between new topological phases of matter discovered**](#) [周二, 17 10月 23:00]

Physicists have investigated a class of materials that exhibit characteristics of topological insulators. During these studies they discovered a transition between two different topological phases, one of which is ferroelectric.

- [**New techniques boost performance of non-volatile memory systems**](#) [周二, 17 10月 23:00]

Computer engineering researchers have developed new software and hardware designs that should limit programming errors and improve system performance in devices that use non-volatile memory technologies.

- [**Need for speed makes genome editing efficient, if not better**](#) [周二, 17 10月 23:00]

Researchers have developed a computational model to quantify the mechanism by which CRISPR-Cas9 proteins find their genome-editing

targets.

- [**New imaging approach maps whole-brain changes from Alzheimer's disease in mice**](#) [周二, 17 10月 23:00]

A new imaging system that offers a better way to monitor the brain changes indicative of Alzheimer's in mouse models of the disease could help speed new drug development.

- [**World first for reading digitally encoded synthetic molecules**](#) [周二, 17 10月 21:18]

For the first time ever, using mass spectrometry, researchers have successfully read several bytes of data recorded on a molecular scale using synthetic polymers. Their work sets a new benchmark for the amount of data -- stored as a sequence of molecular units (monomers) -- that may be read using this routine method. It also sets the stage for data storage on a scale 100 times smaller than that of current hard drives.

- [**Shaping animal, vegetable and mineral**](#) [周二, 17 10月 07:03]

A new technique to grow any target shape from any starting shape has now been developed by researchers, outlines a new report.

- [**Proteins and polymers: Spinning strands hint at folding dynamics**](#) [周二, 17 10月 07:03]

Scientists have created flexible strings of magnetized beads to model how natural and synthetic strands bend and fold in dynamic conditions. The work could enhance knowledge of how proteins and DNA fold in biological systems and how synthetic fibers interact in fluids.

- [**Portable 3-D scanner assesses patients with elephantiasis**](#) [周二, 17 10月 07:03]

An estimated 120 million people worldwide are infected with lymphatic filariasis, a parasitic, mosquito-borne disease that can cause major swelling and deformity of the legs, a condition known as elephantiasis. Scientists have shown that a portable scanning device can measure limb enlargement and disfigurement faster and more easily in patients with elephantiasis. The research tool makes it easy to obtain accurate

measurements and determine whether treatments to reduce swelling are effective.

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [**Obesity: Engineered proteins lower body weight in mice, rats and primates**](#) [周四, 19 10月 03:18]

Researchers have created engineered proteins that lowered body weight, bloodstream insulin, and cholesterol levels in obese mice, rats, and primates.

- [**Duplications of noncoding DNA may have affected evolution of human-specific traits**](#) [周四, 19 10月 01:32]

Duplications of large segments of noncoding DNA in the human genome may have contributed to the emergence of differences between humans and nonhuman primates, according to new results. Identifying these duplications, which include regulatory sequences, and their effect on traits and behavior may help scientists explain genetic contributions to human disease.

- [**Understanding the coevolving web of life as a network**](#) [周四, 19 10月 01:32]

Coevolution, which occurs when species interact and adapt to each other, is often studied in the context of pair-wise interactions between mutually beneficial symbiotic partners. But many species have mutualistic interactions with multiple partners, leading to complex networks of interacting species.

- [**Nature or nurture? Innate social behaviors in the mouse brain**](#) [周四, 19 10月 01:29]

The brain circuitry that controls innate, or instinctive, behaviors such as

mating and fighting was thought to be genetically hardwired. Not so, neuroscientists now say.

- [**Petals produce a 'blue halo' that helps bees find flowers**](#) [周四, 19 10月 01:28]

Latest research has found that several common flower species have nanoscale ridges on the surface of their petals that meddle with light when viewed from certain angles.

- [**Illinois sportfish recovery a result of 1972 Clean Water Act, scientists report**](#) [周四, 19 10月 00:17]

Populations of largemouth bass, bluegill, catfish and other sportfish are at the highest levels recorded in more than a century in the Illinois River, according to a new report. Their dramatic recovery, from populations close to zero near Chicago throughout much of the 20th century, began just after implementation of the Clean Water Act, the researchers say.

- [**DNA tests on albatross excrement reveal secret diet of top predator**](#) [周三, 18 10月 23:35]

A study that used DNA tests to analyse the scats of one of the world's most numerous albatrosses has revealed surprising results about the top predator's diet. DNA analysis of 1460 scats from breeding sites around the Southern Ocean has shown that the diet of black-browed albatrosses contains a much higher proportion of jellyfish than previously thought.

- [**Competing forces: How molecules maintain their structure**](#) [周三, 18 10月 23:35]

A double helix twisted around itself: this is the distinctive structure of DNA, which is made up of large molecules. Using synthetically produced molecules, chemists and physicists have investigated the forces which are at work inside the molecule to give it its three-dimensional structure.

- [**Ancient, lost, mountains in the Karoo reveals the secrets of massive extinction event**](#) [周三, 18 10月 23:35]

A researcher studied the fossil-rich sediments present in the Karoo, deposited during the tectonic events that created the Gondwanides, and found that the vertebrate animals in the area started to either go extinct or become less common much earlier than what was previously thought.

- [**Hardy corals make their moves to build new reefs from scratch**](#) [周三, 18 10月 23:35]

Resilient species of coral can move to inhospitable areas and lay the foundations for new reefs, a study shows.

- [**Death by a thousand cuts? Not for small populations**](#) [周三, 18 10月 23:35]

New research provides a look at how certain species survive by evolving a greater ability to weed out harmful mutations -- a new concept called 'drift robustness'.

- [**Stiff fibers spun from slime**](#) [周三, 18 10月 23:35]

Nanoparticles from the secretion of velvet worms form recyclable polymer fibers.

- [**Turning brain cells into skin cells**](#) [周三, 18 10月 23:35]

A new study reveals that it is possible to repurpose the function of different mature cells across the body and harvest new tissue and organs from these cells.

- [**Life in the city: Living near a forest keeps your amygdala healthier**](#) [周三, 18 10月 23:35]

A new study examined the relationship between the availability of nature near city dwellers' homes and their brain health. Its findings are relevant for urban planners among others.

- [**Reducing power plants' freshwater consumption with new silica filter**](#) [周三, 18 10月 23:35]

Power plants draw more freshwater than any other consumer in the United States, accounting for more than 50 percent of the nation's freshwater use at about 500 billion gallons daily. To help save this water, researchers have developed a new silica filter for power plant

cooling waters that decreases the amount of freshwater power plants consume by increasing the number of times cooling tower water can be reused and recycled.

- [**The puzzle to plugging the worst natural gas release in history**](#) [周三, 18 10月 21:16]

By the time scientists visited the Aliso Canyon natural gas storage facility in December 2015, the SS-25 well blowout had been leaking natural gas into the air for more than six weeks. The notoriously strong winds at Aliso Canyon carried the natural gas and its added odorant to the nearby Porter Ranch neighborhood, leading to thousands of families evacuating their homes.

- [**Ancient preen oil: Researchers discover 48-million-year-old lipids in a fossil bird**](#) [周三, 18 10月 21:12]

As a rule, soft parts do not withstand the ravages of time; hence, the majority of vertebrate fossils consist only of bones. Under these circumstances, a new discovery from the UNESCO World Heritage Site “Messel Pit” near Darmstadt in Germany comes as an even bigger surprise: a 48-million-year old skin gland from a bird, containing lipids of the same age. The oldest lipids ever recorded in a fossil vertebrate were used by the bird to preen its plumage.

- [**Gene therapy can cure lameness in horses, research finds**](#) [周三, 18 10月 21:11]

Injecting DNA into injured horse tendons and ligaments can cure lameness, new research has found.

- [**Space greens beat the blues**](#) [周三, 18 10月 21:11]

Where people will go in the cosmos, plants will go, say researchers in a new report. Plants may also play a key role in maintaining the psychological well-being of space crews. The next frontier of space plant experimentation is to examine the psychological impact of plant life on astronauts.

- [**Yeast spotlights genetic variation's link to drug**](#)

resistance [周三, 18 10月 21:02]

Researchers have shown that genetic diversity plays a key role in enabling drug resistance to evolve. Scientists show that high genetic diversity can prime new mutations that cause drug resistance. The study has implications for our understanding of the evolution of resistance to antimicrobial and anticancer drugs.

Arsenic in domestic well water could affect 2 million people in the US [周三, 18 10月 21:02]

Clean drinking water can be easy to take for granted if your home taps into treated water sources. But more than 44 million people in the U.S. get their water from private domestic wells, which are largely unregulated. Of those, a new report estimates that about 2 million people could be exposed to high levels of naturally occurring arsenic in their water.

New Amazon threat? Deforestation from mining [周三, 18 10月 21:02]

Sprawling mining operations in Brazil have caused roughly 10 percent of all Amazon rainforest deforestation between 2005 and 2015 -- much higher than previous estimates -- says the first comprehensive study of mining deforestation in the iconic tropical rainforest. Surprisingly, the majority of mining deforestation (a full 90%) occurred outside the mining leases granted by Brazil's government, the new study finds.

Healthy coral populations produce a surprising number of offspring [周三, 18 10月 21:02]

Healthy coral populations can produce up to 200 times more juvenile corals than degraded coral populations nearby, according to a new study.

Nice ice, maybe: Study finds water-repelling surfaces ease ice removal [周三, 18 10月 20:56]

A new study has discovered that ice grows differently on water-absorbent vs. water-repellent surfaces. The research suggests that applying water-repellent coatings to windshields before winter storms -- or engineering surfaces that inherently repel water -- could enable a

strong breeze to handle the burden of ice removal.

- [**'Wasabi receptor' for pain discovered in flatworms**](#) [周三, 18 10月 04:37]

A research team has discovered how scalding heat and tissue injury activate an ancient 'pain' receptor in simple animals. The findings, from a study of flatworms, could lead to new strategies for analgesic drug design for the treatment of humans. That planarian flatworms use the same molecular receptor as flies, mice and humans to detect potentially damaging or noxious stimuli from the environment shows a remarkable level of evolutionary conservation, the researchers say.

- [**Chocolate production linked to increased deforestation in poor nations**](#) [周三, 18 10月 04:36]

Newly published research focuses on the link between cocoa exports and deforestation in developing nations.

- [**Amazonian hunters deplete wildlife but don't empty forests**](#) [周三, 18 10月 03:31]

Conservationists can be 'cautiously optimistic' about the prospect of sustainable subsistence hunting by Amazonian communities, according to new research. The research team spent over a year working with 60 Amazonian communities and hiked for miles through trackless forests to deploy nearly 400 motion-activated camera traps -- in a bid to understand which species are depleted by hunting and where.

- [**Fighting fires before they spark**](#) [周三, 18 10月 03:29]

With warm, dry summers comes a deadly caveat for the western United States: wildfires. Scientists say the hot, dry climates found west of the Mississippi, along with decades of fire suppression efforts, are creating a devastating and destructive combination -- leading to fires like the ones currently burning in California. Now, new research is giving forest and fire management teams across the country the upper hand in reducing the severity of these events.

- [**Study reshapes understanding of climate**](#)

[change's impact on early societies](#) [周三, 18 10月 00:43]

A new study linking paleoclimatology -- the reconstruction of past global climates -- with historical analysis shows a link between environmental stress and its impact on the economy, political stability, and war-fighting capacity of ancient Egypt.

• [Assessment shows metagenomics software has much room for improvement](#) [周三, 18 10月 00:42]

A recent critical assessment of software tools represents a key step toward taming the 'Wild West' nature of the burgeoning field of metagenomics.

• [Scientists determine source of world's largest mud eruption](#) [周二, 17 10月 23:43]

More than 11 years after the Lusi mud volcano first erupted on the Indonesian island of Java, researchers may have figured out why the mudflows haven't stopped: deep underground, Lusi is connected to a nearby volcanic system.

• [Study shows how water could have flowed on 'cold and icy' ancient Mars](#) [周二, 17 10月 23:43]

Research by planetary scientists finds that periodic melting of ice sheets on a cold early Mars would have created enough water to carve the ancient valleys and lakebeds seen on the planet today.

• [A new way to harness wasted methane](#) [周二, 17 10月 23:43]

Scientists have identified a process that could be used to harness methane that is now wasted by being burned off at wellheads.

• [Single cell level sorting technology uses sound waves](#) [周二, 17 10月 23:01]

Researchers have developed a highly accurate single cell sorting technology using focused sound waves. This new technology enables rapid and accurate isolation of single cells from complex biological samples, which will facilitate the broad application of single cell analysis toward precision medicine.

- **Scientists create most powerful micro-scale bio-solar cell yet** [周二, 17 10月 23:01]

Researchers have created a micro-scale biological solar cell that generates a higher power density for longer than any existing cell of its kind.

- **Domestication has not made dogs cooperate more with each other compared to wolves** [周二, 17 10月 23:01]

Following domestication, dogs should be more tolerant and cooperative with conspecifics and humans compared to wolves. But looking at both in more naturalistic living conditions, however, speaks for more cooperative behavior of wolves. Researchers now show that the wild ancestors are excelling their domesticated relatives in teamwork. In an experimental approach dogs but not wolves failed to cooperatively pull the two ends of a rope to obtain a piece of food.

- **Looking for microbe 'fingerprints' on simulated Martian rocks** [周二, 17 10月 23:01]

Scientists are searching for unique bio-signatures left on synthetic extraterrestrial minerals by microbial activity. A new paper describes investigations into these signatures at a miniaturized 'Mars farm' where researchers can observe interactions between the archaeon *Metallosphaera sedula* and Mars-like rocks. These microbes are capable of oxidizing and integrating metals into their metabolism.

- **Electroplating: The birth of a single nucleus caught in camera** [周二, 17 10月 23:00]

Electroplating, or electrodeposition, is one of the most important processes in chemistry, in which a metal cation in solution can be reduced to its elemental form by applying an electrical potential to an electrode.

- **Need for speed makes genome editing efficient, if not better** [周二, 17 10月 23:00]

Researchers have developed a computational model to quantify the

mechanism by which CRISPR-Cas9 proteins find their genome-editing targets.

- [**Rivers carry plastic debris into the sea**](#) [周二, 17 10月 23:00]

Every year, millions of tons of plastic debris ends up in the sea. The path taken by plastic to reach the sea must be elucidated before it will be possible to reduce the volume of plastic input. To date, there was only little information available on this. It has now been followed up by an interdisciplinary research team who were able to show that plastic debris is primarily carried into the sea by large rivers.

- [**'Hiding in plain sight:' Discovery raises questions over scale of overlooked biodiversity**](#) [周二, 17 10月 21:19]

Scientists have used cutting edge DNA technology to demonstrate that one of Europe's top freshwater predators is actually two species rather than one.

- [**Keratin, proteins from 54-million-year-old sea turtle show survival trait evolution**](#) [周二, 17 10月 21:18]

Researchers have retrieved original pigment, beta-keratin and muscle proteins from a 54-million-year-old sea turtle hatchling. The work adds to the growing body of evidence supporting persistence of original molecules over millions of years and also provides direct evidence that a pigment-based survival trait common to modern sea turtles evolved at least 54 million years ago.

- [**Pair of discoveries illuminate new paths to flu and anthrax treatments**](#) [周二, 17 10月 21:18]

Two recent studies have set the research groundwork for new avenues to treat influenza and anthrax poisoning. The studies used a series of experiments to identify key pathways and mechanisms previously unknown or overlooked in the body's defenses, and possible treatments already developed.

- [**Germ-free hatching eggs: An alternative to formaldehyde application**](#) [周二, 17 10月 07:05]

Hatching eggs in large-scale hatcheries are currently treated with formaldehyde to eliminate germs. Researchers have now developed a natural alternative.

- [**Oysters offer hot spot for reducing nutrient pollution**](#) [周二, 17 10月 07:03]

Marine scientists have quantified potentially denitrifying bacteria in the oyster gut and shell, with important implications for efforts to reduce nutrient levels in coastal waters through oyster restoration.

- [**Invasive ladybird species threatens other ladybirds in England**](#) [周二, 17 10月 07:03]

The harlequin ladybird was widely introduced across continental Europe to limit the population of pest insects.

- [**Link between forest fire smoke and pollution events discovered**](#) [周二, 17 10月 02:48]

Smoke from forest fires might contribute to more than half of certain gritty air pollution events in the continental U.S. during the summer, and as much as 20 percent of those events throughout the year, according to new research.

- [**Clues to the Innate Drug Resistance of a Cocoa-Fermenting Pathogen**](#) [周二, 17 10月 02:48]

At first glance, the yeast *Candida krusei* seems as innocuous as microbes come: it's used for fermenting cocoa beans and gives chocolate its pleasant aroma. But it's increasingly being found as a pathogen in immunocompromised patients — and *C. krusei* infections aren't always easy to cure.

- [**Stress might be just as unhealthy as junk food to digestive system**](#) [周二, 17 10月 02:24]

We all know that a poor diet is unhealthy, but a new study finds that stress may just as harmful to our bodies as a really bad diet.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [**For \\$1000, anyone can purchase online ads to track your location and app use**](#) [周四, 19 10月 00:41]

New research finds that for a budget of roughly \$1000, it is possible for someone to track your location and app use by purchasing and targeting mobile ads. The team hopes to raise industry awareness about the potential privacy threat.

- [**Illinois sportfish recovery a result of 1972 Clean Water Act, scientists report**](#) [周四, 19 10月 00:17]

Populations of largemouth bass, bluegill, catfish and other sportfish are at the highest levels recorded in more than a century in the Illinois River, according to a new report. Their dramatic recovery, from populations close to zero near Chicago throughout much of the 20th century, began just after implementation of the Clean Water Act, the researchers say.

- [**Mass killings happen randomly, yet rate has remained steady, study finds**](#) [周三, 18 10月 23:35]

Mass killings may have increasing news coverage, but the events themselves have happened at a steady rate for more than a decade, according to a new study. Furthermore, some types of mass-killing events seem to occur randomly over time, making prediction difficult and response crucial.

- [**Life in the city: Living near a forest keeps your amygdala healthier**](#) [周三, 18 10月 23:35]

A new study examined the relationship between the availability of nature near city dwellers' homes and their brain health. Its findings are relevant for urban planners among others.

- [**Reducing power plants' freshwater consumption with new silica filter**](#) [周三, 18 10月 23:35]

Power plants draw more freshwater than any other consumer in the United States, accounting for more than 50 percent of the nation's freshwater use at about 500 billion gallons daily. To help save this water, researchers have developed a new silica filter for power plant cooling waters that decreases the amount of freshwater power plants consume by increasing the number of times cooling tower water can be reused and recycled.

- [**Workers may 'choke' under pressure of non-monetary incentives**](#) [周三, 18 10月 21:16]

Competition for non-monetary awards can have adverse effects on performance and may cause employees to “choke” under pressure, according to a new study.

- [**High risk of injury in young elite athletes**](#) [周三, 18 10月 21:09]

Every week, an average of three in every ten adolescent elite athletes suffer an injury. Worst affected are young women, and the risk of injury increases with low self-esteem, especially in combination with less sleep and higher training volume and intensity, research from in Sweden shows.

- [**Art advancing science at the nanoscale**](#) [周三, 18 10月 21:02]

Could studying molecular biology ever be as fun as watching a Star Wars movie? Two scientists decided to create their own science film to entertain viewers, and ended up making new scientific discoveries in the process. The researchers-turned-filmmakers used a novel combination of computer animation and simulation softwares to create a scientific model that is accurate down to the atomic scale, and hope that their success inspires more scientists to approach their work like artists.

- [**Arsenic in domestic well water could affect 2**](#)

[million people in the US](#) [周三, 18 10月 21:02]

Clean drinking water can be easy to take for granted if your home taps into treated water sources. But more than 44 million people in the U.S. get their water from private domestic wells, which are largely unregulated. Of those, a new report estimates that about 2 million people could be exposed to high levels of naturally occurring arsenic in their water.

• [New Amazon threat? Deforestation from mining](#)

[周三, 18 10月 21:02]

Sprawling mining operations in Brazil have caused roughly 10 percent of all Amazon rainforest deforestation between 2005 and 2015 -- much higher than previous estimates -- says the first comprehensive study of mining deforestation in the iconic tropical rainforest. Surprisingly, the majority of mining deforestation (a full 90%) occurred outside the mining leases granted by Brazil's government, the new study finds.

• [New simple method determines rate at which we burn calories walking up, down, flat](#) [周三, 18 10月 21:01]

A new way to predict the energy a person expends walking will help predict and monitor the physiological status of walkers, including foot soldiers. Researchers have developed the Army-funded method, which significantly improves on two existing standards, and relies on three readily available variables. Accurate prediction is important because the rate at which people burn calories walking can vary tenfold depending on speed, carried load and whether uphill, at-grade or downhill.

• [Chocolate production linked to increased deforestation in poor nations](#) [周三, 18 10月 04:36]

Newly published research focuses on the link between cocoa exports and deforestation in developing nations.

• [Amazonian hunters deplete wildlife but don't empty forests](#) [周三, 18 10月 03:31]

Conservationists can be 'cautiously optimistic' about the prospect of sustainable subsistence hunting by Amazonian communities, according

to new research. The research team spent over a year working with 60 Amazonian communities and hiked for miles through trackless forests to deploy nearly 400 motion-activated camera traps -- in a bid to understand which species are depleted by hunting and where.

- [**New examination of occupational licensing contradicts decades of research**](#) [周三, 18 10月 03:30]

From doctors to engineers to carpet layers to massage therapists, more than one in three Americans is required to hold a license to work in their occupation. Broad consensus among researchers holds that licensure creates wage premiums by establishing economic monopolies, but according to research, licensure does not limit competition nor does it increase wages.

- [**Preservation for the \(digital\) ages**](#) [周三, 18 10月 00:43]

Researchers working with classicists and computer scientists have developed a method to preserve digital humanities databases. The preservation strategy allows scholars to re-launch a database application in a variety of environments -- from individual computers, to virtual machines, to future web servers -- without compromising its interactive features.

- [**A new way to test body armor**](#) [周二, 17 10月 23:43]

In response to several high profile body armor failures, researchers have developed a new and extremely reliable way to test the ballistic fibers used in body armor.

- [**Nearly half of US medical care comes from emergency rooms**](#) [周二, 17 10月 21:18]

Nearly half of all US medical care is delivered by emergency departments, according to a new study. In recent years, the percentage of care delivered by emergency departments has grown. The paper highlights the major role played by emergency rooms in US health care.

- [**Attending a middle vs K-8 school matters for student outcomes**](#) [周二, 17 10月 07:05]

Students who attend a middle school compared to a K-8 school are

likely to have a lower perception of their reading skills, finds a new study.

• [**During crisis, exposure to conflicting information and stress linked, studies find**](#) [周二, 17 10月 07:05]

Exposure to high rates of conflicting information during an emergency is linked to increased levels of stress, and those who rely on text messages or social media reports from unofficial sources are more frequently exposed to rumors and experience greater distress, according to research.

• [**Tweeting rage: How immigration policies can polarize public discourse**](#) [周二, 17 10月 02:48]

A study of tweets in the months before and after the 2010 passage of Arizona's "show me your papers" law, findings showed that the average tweet about Mexican immigrants and Hispanics, in general, became more negative. Researchers said the social media data was useful in determining whether people had changed their attitudes about immigrants as a result of the law or whether they had begun behaving differently.

• [**Women in science ask fewer questions than men, according to new research**](#) [周二, 17 10月 02:24]

Stereotypes suggest that women love to talk, with some studies even finding that women say three times as much as men. But, new research shows there is an exception to this rule: professional STEM events, which could be indicative of the wider problem of gender inequality in the field.

• [**Break the attachment before selling your stuff**](#) [周二, 17 10月 01:26]

Ever tried to sell something you've owned for a while on Craigslist and found that no one is willing to pony up what you're asking? It's because you're asking too much.

• [**Marketing study examines what types of searches click for car buyers**](#) [周二, 17 10月 00:21]

A new study examines how consumers allocated their time when searching offline and on the internet as they shopped for a new automobile, and what the outcomes were for price satisfaction.

• [**Report identifies factors associated with harassment, abuse in academic fieldwork**](#) [周二, 17 10月 00:21]

College students considering careers in fields like archaeology or geology that require extensive work at remote field sites might want to find out how potential supervisors and advisers conduct themselves in the field. Do they establish clear ground rules for the behavior of everyone on the team? Are the rules consistently enforced? According to a new report, such factors likely influence whether students will witness or experience harassment while working far from home.

• [**Study reveals risk factors for substance use problems, as well as resilience**](#) [周一, 16 10月 22:28]

A new study explores factors increasing the risk for substance use problems among African-American/Black and Latino adults residing in a high-risk urban community, as well as patterns of resilience. It reveals that serious risk factors are highly prevalent and strongly associated with substance misuse; however, a substantial proportion could be characterized as resilient, and evidenced substance use problems at rates comparable to the general U.S. population.

• [**Is rushing your child to the ER the right response?**](#) [周一, 16 10月 20:19]

If a child gets a small burn, starts choking or swallows medication, parents may struggle to decide whether to provide first aid at home or rush them to the hospital, suggests a new national poll.

• [**Making healthier decisions, step by step**](#) [周五, 13 10月 21:52]

For 10 days, scientists posted signs at the bottom of a set of airport stairs and escalators encouraging them to take the stairs. They found when the signs were present, people were about twice as likely to use the stairs.

• [**Wildlife in the ditches need a detox cure**](#) [周五, 13 10月 21:17]

When it's raining on the roads, slops of road dust and contaminants drain into the road trenches. What does it do to wildlife living by the road?

• [**Tweets can help predict the outcome of soccer matches**](#) [周五, 13 10月 08:02]

Twitter activity can help predict the result of soccer matches when combined with betting market prices, new study shows. The tone of Twitter posts can predict when a team is more likely to win and soccer bets are mispriced, the study found.

• [**Fighting racism: Teaching kids to identify individual black people can reduce racial bias**](#) [周五, 13 10月 04:39]

Many times, those who hold racially biased views of other people see them as all the same. Instead of thinking of them as specific individuals, they lump them into a group -- seeing them as 'those people.' Now an international team of researchers suggests one way to reduce racial bias in kids is by teaching them to identify individual faces of those of other races.

• [**Warming seas could lead to 70 percent increase in hurricane-related financial loss**](#) [周五, 13 10月 03:18]

Hurricane-related financial loss could increase more than 70 percent by 2100 if oceans warm at the worst-case-scenario rate predicted by the Intergovernmental Panel on Climate Change, according to a new study. The study used a combination of hurricane modeling and information in FEMA's HAZUS database to reach its conclusions.

• [**Using Facebook data as a real-time census**](#) [周五, 13 10月 00:30]

A new study is believed to be the first to demonstrate how present-day migration statistics can be obtained by compiling the same data that advertisers use to target their audience on Facebook, and by combining that source with information from the Census Bureau.

• [**Climate change may accelerate infectious disease outbreaks, say researchers**](#) [周五, 13 10月 00:28]

Aside from inflicting devastating natural disasters on often vulnerable

communities, climate change can also spur outbreaks of infectious diseases like Zika , malaria and dengue fever, according to a new study.

• [**Scientists begin bold conservation effort to save the vaquita porpoise from extinction**](#) [周四, 12 10月 22:37]

An international team of experts has gathered in San Felipe, Mexico at the request of the Mexican government (SEMARNAT) and has begun a bold, compassionate plan known as VaquitaCPR to save the endangered vaquita porpoise from extinction.

• [**New threat to the ozone layer**](#) [周四, 12 10月 21:10]

'Ozone depletion is a well-known phenomenon and, thanks to the success of the Montreal Protocol, is widely perceived as a problem solved,' say some. But an international team of researchers, has now found an unexpected, growing danger to the ozone layer from substances not regulated by the treaty.

• [**Electric cars can become more eco-friendly through life cycle assessment**](#) [周四, 12 10月 21:09]

It is time to stop discussing whether electric cars are good or bad. Instead industry, authorities and policy-makers need to work together to make them as eco-friendly as possible. One researcher now provides concrete advice and tools showing how life cycle assessment can assist in the development of electric cars.

• [**Lost in translation: When humor kills the message**](#) [周四, 12 10月 21:09]

Getting a laugh may not help get the road safety message across, with a new study showing humorous driver sleepiness advertisements via social media and other means can get lost in translation.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- [**Scientists dig into the origin of organics on dwarf planet Ceres**](#) [周四, 19 10月 03:18]

Since NASA's Dawn spacecraft detected localized organic-rich material on Ceres, scientists have been digging into the data to explore different scenarios for its origin. After considering the viability of comet or asteroid delivery, the preponderance of evidence suggests the organics are most likely native to Ceres.

- [**Petals produce a 'blue halo' that helps bees find flowers**](#) [周四, 19 10月 01:28]

Latest research has found that several common flower species have nanoscale ridges on the surface of their petals that meddle with light when viewed from certain angles.

- [**Solar eruptions could electrify Martian moons**](#) [周四, 19 10月 00:41]

Powerful solar eruptions could electrically charge areas of the Martian moon Phobos to hundreds of volts, presenting a complex electrical environment that could possibly affect sensitive electronics carried by future robotic explorers, according to a new NASA study. The study also considered electrical charges that could develop as astronauts transit the surface on potential human missions to Phobos.

- [**Stiff fibers spun from slime**](#) [周三, 18 10月 23:35]

Nanoparticles from the secretion of velvet worms form recyclable polymer fibers.

- [**Potential human habitat located on the moon**](#) [周三, 18 10月 22:43]

A new study confirms the existence of a large open lava tube in the Marius Hills region of the moon, which could be used to protect astronauts from hazardous conditions on the surface.

• [**Flexible 'skin' can help robots, prosthetics perform everyday tasks by sensing shear force**](#) [周三, 18 10月 00:43]

Engineers have developed a flexible sensor 'skin' that can be stretched over any part of a robot's body or prosthetic to accurately convey information about shear forces and vibration, which are critical to tasks ranging from cooking an egg to dismantling a bomb.

• [**Looking for microbe 'fingerprints' on simulated Martian rocks**](#) [周二, 17 10月 23:01]

Scientists are searching for unique bio-signatures left on synthetic extraterrestrial minerals by microbial activity. A new paper describes investigations into these signatures at a miniaturized 'Mars farm' where researchers can observe interactions between the archaeon *Metallosphaera sedula* and Mars-like rocks. These microbes are capable of oxidizing and integrating metals into their metabolism.

• [**Filling the early universe with knots can explain why the world is three-dimensional**](#) [周二, 17 10月 07:03]

Filling the universe with knots shortly after it popped into existence 13.8 billion years ago provides a neat explanation for why we inhabit a three-dimensional world. That is the basic idea advanced by an out-of-the-box theory developed by an international team of physicists.

• [**Bite on this: Alligators caught eating sharks**](#) [周二, 17 10月 00:21]

Jaws, beware! Alligators may be coming for you. A new study documents American alligators on the Atlantic and Gulf coasts are eating small sharks and stingrays. This is the first scientific documentation of a widespread interaction between the two predators.

• [**Fanged kangaroo research could shed light on extinction**](#) [周一, 16 10月 21:27]

Fanged kangaroos -- an extinct family of small fanged Australian

kangaroos -- might have survived at least five million years longer than previously thought. A new study has found the species might have competed for resources with ancestors of modern kangaroos.

• [**Gutters teem with inconspicuous life**](#) [周六, 14 10月 01:22]

Scientists have shown that Parisian street gutters are oases of microscopic life, home to microalgae, fungi, sponges, and mollusks. Grouped into communities, these microorganisms may help clean rainwater and urban waste by decomposing solid debris and pollutants. A deeper understanding of the role and composition of these communities could help elucidate the services rendered by gutter ecosystems. The researchers' findings are the first to reveal the unsuspected biodiversity of microscopic life i...

• [**New insight into the limits of possible life on Mars**](#) [周五, 13 10月 21:10]

Researchers investigating whether liquid water could exist on Mars have provided new insight into the limits of life on the red planet.

• [**In a first for wearable optics, researchers develop stretchy fiber to capture body motion**](#) [周五, 13 10月 02:33]

New research offers the first demonstration of optical fibers sturdy enough to sense a wide range of human motion.

• [**Engineers develop a programmable 'camouflaging' material inspired by octopus skin**](#) [周五, 13 10月 02:33]

Engineers have invented stretchable surfaces with programmable 3-D texture morphing, a synthetic 'camouflaging skin' inspired by studying and modeling the real thing in octopus and cuttlefish.

• [**Dangerous trend: The placenta is not suitable as a 'superfood'**](#) [周四, 12 10月 21:13]

More and more women want to take their own placenta with them after childbirth in order to eat it for "health reasons". This phenomenon is growing, especially in the USA, but also in Europe, although physicians are increasingly expressing concerns about it.

- [**Scorpions target their venom**](#) [周四, 12 10月 21:10]

In the first study of its kind, scientists have shown scorpions can fine-tune their venom to suit different predators and prey.

- [**Last common ancestor of humans and apes weighed about five kilograms**](#) [周四, 12 10月 21:09]

New research suggests that the last common ancestor of apes -- including great apes and humans -- was much smaller than previously thought, about the size of a gibbon. The findings, published today in the journal Nature Communications, are fundamental to understanding the evolution of the human family tree.

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ScienceDaily

周五, 06 10月 2017

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- [**Pushy or laid back? Economic factors influence parenting style**](#) [周五, 06 10月 07:03]

A new study argues that parenting styles are shaped by economic factors that incentivize one strategy over others.

- [**'Transformative' research unrealistic to predict, scientists tell granting agencies**](#) [周五, 06 10月 07:03]

Research-funding agencies that require scientists to declare at the proposal stage how their projects will be 'transformative' may actually be hindering discovery.

- [**Screen children with reading difficulties for hearing problems**](#) [周五, 06 10月 07:02]

A new study found 25 percent of its young participants who had reading difficulties showed mild or moderate hearing impairment, of which their parents and teachers were unaware.

- [**Old Faithful's geological heart revealed**](#) [周五, 06 10月 07:02]

Scientists have mapped the near-surface geology around Old Faithful, revealing the reservoir of heated water that feeds the geyser's surface vent and how the ground shaking behaves in between eruptions.

- [**Smartphone-controlled smart bandage for**](#)

[**better, faster healing**](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

• [**Multiple research approaches are key to pandemic preparedness**](#) [周五, 06 10月 03:11]

Preparedness in the face of major disease outbreaks can save thousands of lives. A new article examines the multifaceted nature of effective preparedness and the role that biomedical research plays. Specifically, the article examines three approaches to pandemic preparedness: pathogen-specific work, platform-based technologies, and prototype-pathogen efforts.

• [**Interpreting hurricane forecast displays can be difficult for general public**](#) [周五, 06 10月 03:11]

The 2017 hurricane season has highlighted the critical need to communicate a storm's impact path and intensity accurately, but new research shows significant misunderstandings of the two most commonly used storm forecast visualization methods.

• [**Low serum calcium may increase risk of sudden cardiac arrest**](#) [周五, 06 10月 02:18]

In a new study, researchers found that individuals with lower levels of calcium in the blood, which is easily monitored, are more likely to experience SCA than those with higher calcium levels.

• [**Molecule created that could 'kick and kill' HIV**](#) [周五, 06 10月 02:18]

Researchers have been looking for ways to eliminate the 'reservoirs' where the virus hides, and researchers may have developed a solution. Their approach involves sending an agent to 'wake up' the dormant virus, which causes it to begin replicating so that either the immune system or the virus itself would kill the cell harboring HIV.

• [**Cost-effectiveness of guinea worm disease**](#)

[eradication](#) [周五, 06 10月 02:18]

Eradication of guinea worm disease (dracunculiasis), targeted by the World Health Organization (WHO) for the year 2015, is finally within reach, with only 25 reported human transmissions in 2016. Now, researchers have re-asserted the cost-effectiveness of the global Guinea Worm Eradication Programme (GWEP), some 30 years after it started.

[Simulating a brain-cooling treatment that could one day ease epilepsy](#) [周五, 06 10月 02:18]

Using computer simulation techniques, scientists have gained new insights into the mechanism by which lowering the temperature of specific brain regions could potentially treat epileptic seizures.

[3-D quantum gas atomic clock offers new dimensions in measurement](#) [周五, 06 10月 02:18]

Physicists have created an entirely new design for an atomic clock, in which strontium atoms are packed into a tiny three-dimensional cube at 1,000 times the density of previous one-dimensional clocks. In doing so, they are the first to harness the ultra-controlled behavior of a so-called 'quantum gas' to make a practical measurement device.

[Carbon feedback from forest soils to accelerate global warming](#) [周五, 06 10月 02:18]

After 26 years, the world's longest-running experiment to discover how warming temperatures affect forest soils has revealed a surprising, cyclical response: Soil warming stimulates periods of abundant carbon release from the soil to the atmosphere alternating with periods of no detectable loss in soil carbon stores. The study indicates that in a warming world, a self-reinforcing and perhaps uncontrollable carbon feedback will occur between forest soils and the climate system, accelerating global...

[Decision to rescind Waters of the United States rule \(WOTUS\) based on flawed analysis](#) [周五, 06 10月 02:18]

New evidence suggests that the Trump Administration's proposal to

rescind the 2015 Waters of the United States (WOTUS) rule that would limit the scope of the Clean Water Act inappropriately overlooks wetlands-related values.

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [**First cell-type census of mouse brains: Surprises about structure, male-female differences**](#) [周五, 06 10月 02:18]

Neuroscientists have mobilized advanced imaging and computational methods to comprehensively map -- 'count' -- the total populations of specific types of cells throughout the mouse brain. In a new study, they report two highly surprising findings regarding distribution of cell types across the brain as well as male-female brain differences.

- [**Prehistoric humans are likely to have formed mating networks to avoid inbreeding**](#) [周五, 06 10月 02:17]

Early humans seem to have recognized the dangers of inbreeding at least 34,000 years ago, and developed surprisingly sophisticated social and mating networks to avoid it, new research has found.

- [**Scientists solve 3-D structure of key defense protein against Parkinson's disease**](#) [周五, 06 10月 02:17]

Scientists have identified the structure of a key enzyme that protects the brain against Parkinson's disease. The result of a decade of work, the research team said that solving the 3-D structure and inner workings of the PINK1 enzyme represented a major breakthrough.

- [**Better genetic decoding of neurodevelopmental disorders**](#) [周五, 06 10月 02:17]

New research into improving the genetic decoding of neurodevelopmental disorders promises to help future diagnosis of children with such conditions, including intellectual disability, autism or

schizophrenia.

- [**Middle managers may turn to unethical behavior to face unrealistic expectations**](#) [周五, 06 10月 02:17]

While unethical behavior in organizations is often portrayed as flowing down from top management, or creeping up from low-level positions, a team of researchers suggest that middle management also can play a key role in promoting wide-spread unethical behavior among their subordinates.

- [**Why lab researchers should talk with industry counterparts**](#) [周五, 06 10月 02:17]

A research team has found both obstacles and lessons from the process of getting a novel membrane for chemical processing out of the lab into the commercial world.

- [**Delivering bad news? Don't beat around the bush**](#) [周五, 06 10月 02:17]

New research shows that when it comes to receiving bad news, most people prefer directness, candor and very little -- if any -- buffer.

- [**Predicting when a sound will occur relies on the brain's motor system**](#) [周五, 06 10月 02:17]

Whether it is dancing or just tapping one foot to the beat, we all experience how auditory signals like music can induce movement. Now new research suggests that motor signals in the brain actually sharpen sound perception, and this effect is increased when we move in rhythm with the sound.

- [**Road pricing most effective in reducing vehicle emissions**](#) [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have

concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

- [**New test opens path for better 2-D catalysts**](#) [周五, 06 10月 02:17]

Scientists have developed technology for rapid screening of two-dimensional materials for electrocatalysis of hydrogen. The method could accelerate the development of 2-D materials for energy applications.

- [**Something universal occurs in the brain when it processes stories, regardless of language**](#) [周五, 06 10月 02:17]

New brain research shows that reading stories generates activity in the same regions of the brain for speakers of three different languages.

- [**Key plant species may be important for supporting wildflower pollinators**](#) [周五, 06 10月 02:17]

Increased agricultural production has likely led to loss, fragmentation, and degradation of flower-rich habitats for pollinators. To counteract these negative effects of modern agricultural practices, efforts to maintain and restore diverse plants in agricultural landscapes -- called agri-environmental schemes -- have been implemented in numerous European countries.

- [**Heart: No evidence for piezoelectricity or ferroelectricity in the aorta**](#) [周五, 06 10月 02:17]

While some studies have supported the idea that the walls of the aorta are piezoelectric or ferroelectric, the most recent research finds no evidence of these properties. Researchers investigated by testing samples of pig aorta using a traditional setup, known as Sawyer-Tower, to detect ferroelectricity. Their experiments suggest the aorta has no special properties, and instead acts as a standard dielectric material that does not conduct current.

- [**12,000 years ago, Florida hurricanes heated up despite chilly seas**](#) [周五, 06 10月 00:50]

Category 5 hurricanes may have slammed Florida repeatedly during the

chilly Younger Dryas, 12,000 years ago. The cause? Hurricane-suppressing effects of cooler sea surface were out-weighted by side effects of slowed ocean circulation.

- [**Air pollution exposure on home-to-school routes reduces the growth of working memory**](#) [周五, 06 10月 00:50]

A new study has demonstrated that exposure to air pollution on the way to school can have damaging effects on children's cognitive development. The study found an association between a reduction in working memory and exposure to fine particulate matter (PM2.5) and black carbon during the walking commute to and from school.

- [**Liverwort genes and land plant evolution**](#) [周五, 06 10月 00:11]

The common liverwort is a living link to the transition from marine algae to land plants. Biologists have analyzed the genome sequence of the common liverwort (*Marchantia polymorpha*) to identify genes and gene families that were deemed crucial to plant evolution and have been conserved over millions of years and across plant lineages.

- [**Germs in the kitchen: Salmonella better known than Campylobacter**](#) [周五, 06 10月 00:11]

What health risks are consumers aware of? What are they concerned about?

- [**How yellow and blue make green in parrots**](#) [周五, 06 10月 00:11]

Many brightly colored birds get their pigments from the foods that they eat, but that's not true of parrots. Now, researchers reporting a study of familiar pet store parakeets -- also known as budgies -- have new evidence to explain how the birds produce their characteristic yellow, blue, and green feathers.

- [**Once declared extinct, Lord Howe Island stick insects really do live**](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead

Lord Howe Island stick insects have some good news: those rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

- [**More traits associated with your Neanderthal DNA**](#) [周五, 06 10月 00:11]

After humans and Neanderthals met many thousands of years ago, the two species began interbreeding. Recent studies have shown that some of those Neanderthal genes have contributed to human immunity and modern diseases. Now researchers have found that our Neanderthal inheritance has contributed to other characteristics, too, including skin tone, hair color, sleep patterns, mood, and even a person's smoking status.

- [**A candidate genetic factor for effects of prenatal alcohol exposure has been found**](#) [周五, 06 10月 00:10]

Researchers have found a genetic variation, which associates with the damage caused by maternal alcohol consumption. This genetic variation clarifies the role of genetic factors in the alcohol-induced developmental disorders and could be useful in future diagnostics.

- [**'Body-on-a-chip' system to accelerate testing of new drugs**](#) [周五, 06 10月 00:10]

Being able to test new drugs in a 3-D model of the body has the potential to speed up drug discovery, reduce the use of animal testing and advance personalized medicine.

- [**Paper-based supercapacitor uses metal nanoparticles to boost energy density**](#) [周五, 06 10月 00:10]

Using a simple layer-by-layer coating technique, researchers have developed a paper-based flexible supercapacitor that could be used to help power wearable devices. The device uses metallic nanoparticles to coat cellulose fibers in the paper, creating supercapacitor electrodes with high energy and power densities -- and the best performance so far in a textile-based supercapacitor.

- **[Appetizing imagery puts visual perception on fast forward](#)** [周五, 06 10月 00:10]

People rated images containing positive content as fading more smoothly compared with neutral and negative images, even when they faded at the same rate, according to new findings.

- **[Violent helium reaction on white dwarf surface triggers supernova explosion](#)** [周四, 05 10月 23:11]

Astronomers have found solid evidence about what triggered a star to explode, which will contribute to a further understanding of supernova history and behavior.

- **[Novel PET tracer identifies most bacterial infections](#)** [周四, 05 10月 23:11]

Medical scientists have developed a novel imaging agent that could be used to identify most bacterial infections.

- **[Understanding how gastric bypass works: Finding drug targets for obesity and diabetes](#)** [周四, 05 10月 23:11]

Medical researchers have made a technological advancement toward accelerating the discovery of drug targets for obesity, type II diabetes and other metabolic diseases.

- **[Fingerprints lack scientific basis for legal certainty](#)** [周四, 05 10月 23:11]

A new report on the quality of latent fingerprint analysis says that courtroom testimony and reports stating or even implying that fingerprints collected from a crime scene belong to a single person are indefensible and lack scientific foundation.

- **[New 'molecular trap' cleans more radioactive waste from nuclear fuel rods](#)** [周四, 05 10月 23:10]

A new method for capturing radioactive waste from nuclear power plants is cheaper and more effective than current methods, a potential boon for the energy industry, according to new research.

- [**Athletes and health aficionados: The lupine protein beverage**](#) [周四, 05 10月 22:39]

With its intensive colors and many blossoms, the lupine looks like an ornamental plant. Yet, the tall lupine is far too good to be used decoratively as the plant's seeds contain nutritious proteins. However, it is rather complicated to make lupines edible for humans.

- [**Machinery that repairs itself**](#) [周四, 05 10月 22:38]

Scientists are developing maintenance technology capable of forecasting machine downtimes in production before they occur. This allows plant managers to rectify faults before the machine breaks down. The system even corrects some defects automatically.

- [**Safety assistance system warns of dirty bombs**](#) [周四, 05 10月 22:38]

The threat of terrorism has been on the rise in recent years, with experts and politicians particularly worried that terrorists might make use of dirty bombs. Researchers have developed a new system that will be able to detect possible carriers of radioactive substances, even in large crowds of people.

- [**Spray drying: Perfect dosing thanks to drug capsules**](#) [周四, 05 10月 22:38]

Instant coffee and powdered milk are produced by spray drying. Researchers have adapted this technique to the tricky question of incorporating insoluble substances in core-shell particles. The new method helps reduce the concentration of active ingredients in therapeutic medications.

- [**Tracking debris in the Earth's orbit with centimeter precision using efficient laser technology**](#) [周四, 05 10月 22:38]

Uncontrollable flying objects in orbit are a massive risk for modern space travel, and, due to our dependence on satellites today, it is also a risk to global economy. Scientists have now developed a fiber laser that reliably determines the position and direction of the space debris'

movement to mitigate these risks.

• [Mitigating the unpleasant scent of adhesives](#) [周四, 05 10月 22:38]

It is a known fact that adhesives may smell unpleasant. However, as researchers have recently discovered, this doesn't need to be the case. Through extensive research on acrylic adhesives they were able to identify the substances responsible for the offensive odors. So far, very little research has been conducted on the subject, but now manufacturers finally have the opportunity to optimize their production process.

Pushy or laid back? Economic factors influence parenting style -- ScienceDaily

Settling on a parenting style is challenging. Is it better to be strict or more lenient? Have helicopter parents found the right approach to guiding their children's choices?

A new study co-authored by Yale economist Fabrizio Zilibotti argues that parenting styles are shaped by economic factors that incentivize one strategy over others.

Zilibotti and co-author Matthias Doepke, a professor of economics at Northwestern University, assert in a paper published in the journal *Econometrica* that economic conditions, especially inequality and return to education, have influenced child-rearing strategy.

"All parents want their children to succeed, and we argue that the economic environment influences their methods of childrearing," said Zilibotti, the Tuntex

Professor of International and Development Economics at Yale. "For instance, greater occupational mobility and lower inequality today makes an authoritarian approach less effective than generations ago. It's not that parents spare the rod because they are more concerned about their children's wellbeing now than they were 100 years ago. Rather, parenting strategies adapted to the modern economy."

Zilibotti and Doepke assert that parents are driven by a combination of altruism -- a desire for their children to succeed -- and paternalism that leads them to try to influence their children's choices, either by molding their children's preferences or restricting them. These motivations manifest in three parenting styles: A permissive style that affords children the freedom to follow their inclinations and learn from their own experiences; an authoritative style in which parents try to mold their children's preferences to induce choices consistent with the parents' notions of achieving success; and an authoritarian style in which parents impose their will on their children and control their choices.

"There is an element of common interest between parents and children -- a drive for success -- but there is

tension where parents care more about their children's wellbeing as adults," Zilibotti said. "We postulate that socioeconomic conditions drive how much control or monitoring parents exercise on their children's choices."

The researchers apply their model across time periods and between countries. Parenting became more permissive in the 1960s and 1970s when economic inequality reached historic lows in industrialized countries and parents could realize a return on letting children learn from their own experiences, they argue. Across countries, they document a link between parenting, on the one hand, and income inequality and return to education, on the other hand. Using the World Value Survey, where people are asked which attitudes or values they find most important in child rearing, they identify permissive parents with those emphasizing the values of imagination and independence in rearing children, whereas authoritarian and authoritative parents are those who insist on the importance of hard work and obedience, respectively. They show that parents in more unequal countries are less permissive. The same pattern emerges when they consider redistributive policies. In countries with more redistributive taxation, more social expenditure, and

even stronger civil right protection, parents are significantly more permissive.

The researchers assert that their theory can help explain the recent rise of "helicopter parenting," a version of the authoritative style in which parents seek to influence their children's choices with a combination of persuasion and intensive monitoring. They argue that the style gained purchase in the United States as economic inequality increased, inducing a shift to more intensive parenting to strengthen children's drive for achievement and prevent them from risky behaviors. Meanwhile, they argue, more permissive parenting remains popular in Scandinavian countries, where inequality is lower than it is in the United States.

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Materials provided by [Yale University](#). *Note: Content may be edited for style and length.*

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'Transformative' research unrealistic to predict, scientists tell granting agencies -- ScienceDaily

Research-funding agencies that require scientists to declare at the proposal stage how their projects will be "transformative" may actually be hindering discovery, according to a study by Oregon State University ecologists.

The requirement can result in decreased funding for the "incremental" research that often paves the way for paradigm-shifting breakthroughs, the OSU scientists assert.

Their findings, as well as their recommendation for how to best foster transformative research, were published recently in *Trends in Ecology and Evolution*.

Sarah Gravem, postdoctoral scholar in integrative biology in Oregon State's College of Science, was the lead author on the paper, titled "Transformative Research is Not Easily Predicted."

Gravem, integrative biology professor Bruce Menge and the other collaborators note that the National Science Foundation, which funds roughly one-quarter of the federally supported research at U.S. colleges and universities, "has made the pursuit of transformative research a top priority by asking for a transformative research statement in every major research proposal solicited."

The NSF defines transformative research as being "driven by ideas that have the potential to radically change our understanding of an important existing scientific or engineering concept or leading to the creation of a new paradigm Such research is also characterized by its challenge to current understanding or its pathway to new frontiers."

Gravem says asking scientists to attempt to create new paradigms or fields in every proposal is unrealistic and potentially harmful.

The OSU scientists argue that a better approach, and one that was suggested more than a decade ago by the board that oversees the National Science Foundation, would be to create a funding subset: a separate NSF-wide program to solicit and support transformational

research proposals.

"The board had been concerned that the U.S. was lagging behind other countries in scientific advances, concerned that creative and risky research was not getting funding," Menge said. "It concluded that what the NSF should do is set aside some funds for risky research proposals, those defined by reviewers as they may or may not work, the chances are sort of slim, but they could turn out to be pretty cool."

What the NSF did instead, Menge said, was require all proposals to show how the research being proposed would be transformative.

"Instructions to reviewers include the expectation that the reviewer will comment on how transformative the proposed research is," Menge added.

The problem, the Oregon State collaborators say, is that it's rarely possible to know at the proposal stage whether a project will turn out to be transformative; their assertion follows interviews and surveys of 78 highly cited ecologists who began with incremental goals and only later realized the transformative potential of their work.

"To start out with that transformative question is a backward way of thinking," Gravem said. "Surely you have to think big to come up with big answers, and everyone is striving for that, but truly transformative research is an unobtainable standard to place on people at the proposal stage. Trying to make every project paradigm shifting can mean ignoring the incremental and basic science that eventually goes into shifting paradigms. It's a detriment to ignore the building blocks in favor of the building."

Gravem said the necessity of incremental research was also explained recently on Freakonomics Radio.

"Economist Ed Glaeser noted that Nobel Prizes are not typically given for single transformative research papers but are often given for a body of incremental research," she said. "If transformations arise from incremental research, then the transformative criterion is redundant with the solicitation of incremental research. This is reflected by mixed evidence that soliciting transformative research led to increases in transformative outcomes compared with the typical model."

Expanding fields of knowledge, adding to bodies of

evidence, and comparing two fields that haven't been compared before are the types of gains researchers can reasonably predict, Gravem added. Being asked to forecast how a project will turn out to be transformative puts "researchers in an awkward position that nobody likes."

"We're being forced to hype our work at the beginning of a proposal, which doesn't do anything to help science or to help build trust in science," Gravem said. "And it turns the funding process into an essay competition that favors people who take more liberty in predicting what their research might show."

Menge notes that NSF's plan all along was to reassess the transformative research statement requirement at some point, "and now is the time."

"Research funding is effectively decreasing, but the demand for funding is increasing, so they look for ways to prune the field of who gets funded -- I recognize that as a problem," he said. "But making artificial hurdles is just wrong. Funding agencies should concentrate on the goals of the research rather than the unknowable outcome."

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Screen children with reading difficulties for hearing problems -- ScienceDaily

Children with reading difficulties should be more thoroughly screened for hearing problems, a new report by Coventry University academics has said.

The study, funded by the Nuffield Foundation, found 25 per cent of its young participants who had reading difficulties showed mild or moderate hearing impairment, of which their parents and teachers were unaware.

The researchers believe that if there was more awareness of youngsters' hearing problems -- as well as an understanding of what particular aspects of literacy they struggled with -- then the children might be able to receive more structured support that could help them improve their reading and writing skills.

The study by academics at the university's Centre for Advances in Behavioural Science compared children

with dyslexia to youngsters who had a history of repeated ear infections to see if they had a similar pattern of literacy difficulties.

A total of 195 children aged between eight and 10 -- including 36 with dyslexia and 29 with a history of repeated ear infections -- completed a series of tests to establish their reading and writing skills and how they used the structures of words based on their sounds and meanings, in speech and literacy.

They were retested 18 months later, when a hearing screening was also carried out.

None of the parents of the children with dyslexia reported any knowledge of hearing loss before the tests, but the screening showed that nine out of 36 of these children had some form of hearing loss.

Around one third of the children who had repeated ear infections had problems with reading and writing, although the researchers suggest repeat ear infections will only result in reading difficulties when accompanied by weaknesses in other areas.

The results showed that children with dyslexia have

different patterns of literacy difficulties to children with a history of repeat ear infections, although there is some overlap between the groups.

Children with dyslexia had difficulties with literacy activities involving the ability to manipulate speech sounds (known as phonology) and the knowledge of grammatical word structure (called morphology).

The academics said these youngsters need to be taught how to use morphology in a highly-structured step-by-step way to help them improve their literacy skills.

Children with a history of repeated ear infections mainly had problems with the phonology tasks; showing that they still had subtle difficulties with the perception of spoken language.

The academics suggested that teachers should be made aware if youngsters have had a history of repeated ear infections, so they can consider the possibility of any hearing loss and understand how the consequences of these infections may impact on children as they learn about the sound structure of words and begin to read.

Children currently have their hearing tested as babies

and, in some areas of the UK, when they start school. Even so, later onset deafness can occur at any age and GPs can arrange for a child to have a hearing test at any age if a parent or teacher has concerns.

But the academics believe that more regular, detailed tests might help youngsters with literacy problems.

Report author Dr Helen Breadmore said:

"Many children in school may have an undetected mild hearing loss, which makes it harder for them to access the curriculum.

"Current hearing screening procedures are not picking up these children, and we would advise that children have their hearing tested in more detail and more often.

"A mild-moderate hearing loss will make the perception of speech sounds difficult, particularly in a classroom environment with background noise and other distractions. Therefore, children who have suffered repeated ear infections and associated hearing problems have fluctuating access to different speech sounds precisely at the age when this information is crucial in the early stages of learning to read."

Story Source:

Materials provided by [Coventry University](#). *Note: Content may be edited for style and length.*

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Old Faithful's geological heart revealed: Dense seismograph network shows subsurface geyser plumbing structures -- ScienceDaily

Old Faithful is Yellowstone National Park's most famous landmark. Millions of visitors come to the park every year to see the geyser erupt every 44-125 minutes. But despite Old Faithful's fame, relatively little was known about the geologic anatomy of the structure and the fluid pathways that fuel the geyser below the surface. Until now.

University of Utah scientists have mapped the near-surface geology around Old Faithful, revealing the reservoir of heated water that feeds the geyser's surface vent and how the ground shaking behaves in between eruptions. The map was made possible by a dense network of portable seismographs and by new seismic analysis techniques. The results are published in *Geophysical Research Letters*. Doctoral student Sin-Mei Wu is the first author.

For Robert Smith, a long-time Yellowstone researcher and distinguished research professor of geology and geophysics, the study is the culmination of more than a decade of planning and comes as he celebrates his 60th year working in America's first national park.

"Here's the iconic geyser of Yellowstone," Smith says. "It's known around the world, but the complete geologic plumbing of Yellowstone's Upper Geyser Basin has not been mapped nor have we studied how the timing of eruptions is related to precursor ground tremors before eruptions."

Small seismometers

Old Faithful is an iconic example of a hydrothermal feature, and particularly of the features in Yellowstone National Park, which is underlain by two active magma reservoirs at depths of 5 to 40 km depth that provide heat to the overlying near-surface groundwater. In some places within Yellowstone, the hot water manifests itself in pools and springs. In others, it takes the form of explosive geysers.

Dozens of structures surround Old Faithful, including hotels, a gift shop and a visitor's center. Some of these

buildings, the Park Service has found, are built over thermal features that result in excessive heat beneath the built environment. As part of their plan to manage the Old Faithful area, the Park Service asked University of Utah scientists to conduct a geologic survey of the area around the geyser.

For years, study co-authors Jamie Farrell and Fan-Chi Lin, along with Smith, have worked to characterize the magma reservoirs deep beneath Yellowstone. Although geologists can use seismic data from large earthquakes to see features deep in the earth, the shallow subsurface geology of the park has remained a mystery, because mapping it out would require capturing everyday miniature ground movement and seismic energy on a much smaller scale. "We try to use continuous ground shaking produced by humans, cars, wind, water and Yellowstone's hydrothermal boilings and convert it into our signal," Lin says. "We can extract a useful signal from the ambient background ground vibration."

To date, the University of Utah has placed 30 permanent seismometers around the park to record ground shaking and monitor for earthquakes and volcanic events. The cost of these seismometers, however, can easily exceed \$10,000. Small

seismometers, developed by Fairfield Nodal for the oil and gas industry, reduce the cost to less than \$2,000 per unit. They're small white canisters about six inches high and are totally autonomous and self-contained. "You just take it out and stick it in the ground," Smith says.

In 2015, with the new instruments, the Utah team deployed 133 seismometers in the Old Faithful and Geyser Hill areas for a two-week campaign.

The sensors picked up bursts of intense seismic tremors around Old Faithful, about 60 minutes long, separated by about 30 minutes of quiet. When Farrell presents these patterns, he often asks audiences at what point they think the eruption of Old Faithful takes place. Surprisingly, it's not at the peak of shaking. It's at the end, just before everything goes quiet again.

After an eruption, the geyser's reservoir fills again with hot water, Farrell explains. "As that cavity fills up, you have a lot of hot pressurized bubbles," he says. "When they come up, they cool off really rapidly and they collapse and implode." The energy released by those implosions causes the tremors leading up to an eruption.

One scientist's noise is another scientist's signal

Typically, researchers create a seismic signal by swinging a hammer onto a metal plate on the ground. Lin and Wu developed the computational tools that would help find useful signals among the seismic noise without disturbing the sensitive environment in the Upper Geyser Basin. Wu says she was able to use the hydrothermal features themselves as a seismic source, to study how seismic energy propagates by correlating signals recorded at the sensor close to a persistent source to other sensors. "It's amazing that you can use the hydrothermal source to observe the structure here," she says.

When analyzing data from the seismic sensors, the researchers noticed that tremor signals from Old Faithful were not reaching the western boardwalk. Seismic waves extracted from another hydrothermal feature in the north slowed down and scattered significantly in nearly the same area suggesting somewhere west of Old Faithful was an underground feature that affects the seismic waves in an anomalous way. With a dense network of seismometers, the team could determine the shape, size, and location of the feature, which they believe is Old Faithful's

hydrothermal reservoir.

Wu estimates that the reservoir, a network of cracks and fractures through which water flows, has a diameter of around 200 meters, a little larger than the University of Utah's Rice-Eccles Stadium, and can hold approximately 300,000 cubic meters of water, or more than 79 million gallons. By comparison, each eruption of Old Faithful releases around 30 m³ of water, or nearly 8,000 gallons. "Although it's a rough estimation, we were surprised that it was so large," Wu says.

Further work

The team is far from done answering questions about Yellowstone. They returned for another seismic survey in November 2016 and are planning their 2017 deployment, to begin after the park roads close for the winter. Wu is looking at how air temperature might change the subsurface structure and affect the propagation of seismic waves. Farrell is using the team's seismic data to predict how earthquake waves might reverberate through the region. Smith is looking forward to conducting similar analysis in Norris Geyser Basin, the hottest geothermal area of the park. Lin says that the University of Utah's research program

in Yellowstone owes much to Smith's decades-long relationship with the park, enabling new discoveries. "You need new techniques," Lin says, "but also those long-term relationships."

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Smartphone-controlled smart bandage for better, faster healing -- ScienceDaily

Researchers from the University of Nebraska-Lincoln, Harvard Medical School and MIT have designed a smart bandage that could eventually heal chronic wounds or battlefield injuries with every fiber of its being.

The bandage consists of electrically conductive fibers coated in a gel that can be individually loaded with infection-fighting antibiotics, tissue-regenerating growth factors, painkillers or other medications.

A microcontroller no larger than a postage stamp, which could be triggered by a smartphone or other wireless device, sends small amounts of voltage through a chosen fiber. That voltage heats the fiber and its hydrogel, releasing whatever cargo it contains.

A single bandage could accommodate multiple medications tailored to a specific type of wound, the

researchers said, while offering the ability to precisely control the dose and delivery schedule of those medications. That combination of customization and control could substantially improve or accelerate the healing process, said Ali Tamayol, assistant professor of mechanical and materials engineering at Nebraska.

"This is the first bandage that is capable of dose-dependent drug release," Tamayol said. "You can release multiple drugs with different release profiles. That's a big advantage in comparison with other systems. What we did here was come up with a strategy for building a bandage from the bottom up.

"This is a platform that can be applied to many different areas of biomedical engineering and medicine."

The team envisions its smart bandage being used initially to treat chronic skin wounds that stem from diabetes. More than 25 million Americans -- and more than 25 percent of U.S. adults 65 and older -- could suffer from such wounds. The Centers for Disease Control and Prevention has estimated that diabetes cases will double or triple by the year 2050.

"The medical cost associated with these types of wounds is tremendous," Tamayol said. "So there is a big need to find solutions for that."

Those wounded in combat might also benefit from the bandage's versatility and customizability, Tamayol said, whether to stimulate faster healing of bullet and shrapnel wounds or prevent the onset of infection in remote environments.

"Soldiers on the battlefield may be suffering from a number of different injuries or infections," he said. "They might be dealing with a number of different pathogens. Imagine that you have a variable patch that has antidotes or drugs targeted toward specific hazards in the environment."

Existing bandages range from basic dry patches to more advanced designs that can passively release an embedded medication over time. To evaluate the potential advantages of their smart bandage, Tamayol and his colleagues at Harvard ran a series of experiments.

In one, the researchers applied a smart bandage loaded with growth factor to wounded mice. When compared

with a dry bandage, the team's version regrew three times as much of the blood-rich tissue critical to the healing process.

Another experiment showed that an antibiotic-loaded version of the bandage could eradicate infection-causing bacteria. Collectively, Tamayol said, the experiments also demonstrated that the heat needed to release the medications did not affect their potency.

Though the researchers have patented their design, it will need to undergo further animal and then human testing before going to market. That could take several years, though the fact that most of the design's components are already approved by the Food and Drug Administration should streamline the process, Tamayol said.

In the meantime, he said, the researchers are also working to incorporate thread-based sensors that can measure glucose, pH and other health-related indicators of skin tissue. Integrating that capability would allow the team to create a bandage that could autonomously deliver proper treatments.

The authors detailed their design and findings in the

journal *Advanced Functional Materials*. Tamayol authored the study with Harvard's Ali Khademhosseini, Pooria Mostafalu, Gita Kiaee, Giorgio Giatsidis, Akbar Khalilpour, Mahboobeh Nabavinia, Mehmet Dokmeci and Dennis Orgill, along with Sameer Sonkusale of Tufts University.

Video: <https://www.youtube.com/watch?v=3d6uFlRuPZY>

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All Top News

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- [Old Faithful's geological heart revealed](#) [周五, 06 10月 07:02]

Scientists have mapped the near-surface geology around Old Faithful, revealing the reservoir of heated water that feeds the geyser's surface vent and how the ground shaking behaves in between eruptions.

- [Smartphone-controlled smart bandage for better, faster healing](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [3-D quantum gas atomic clock offers new dimensions in measurement](#) [周五, 06 10月 02:18]

Physicists have created an entirely new design for an atomic clock, in which strontium atoms are packed into a tiny three-dimensional cube at 1,000 times the density of previous one-dimensional clocks. In doing so, they are the first to harness the ultra-controlled behavior of a so-called 'quantum gas' to make a practical measurement device.

- [Carbon feedback from forest soils to accelerate global warming](#) [周五, 06 10月 02:18]

After 26 years, the world's longest-running experiment to discover how warming temperatures affect forest soils has revealed a surprising, cyclical response: Soil warming stimulates periods of abundant carbon release from the soil to the atmosphere alternating with periods of no detectable loss in soil carbon stores. The study indicates that in a warming world, a self-reinforcing and perhaps uncontrollable carbon

feedback will occur between forest soils and the climate system, accelerating global...

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [**Prehistoric humans are likely to have formed mating networks to avoid inbreeding**](#) [周五, 06 10月 02:17]

Early humans seem to have recognized the dangers of inbreeding at least 34,000 years ago, and developed surprisingly sophisticated social and mating networks to avoid it, new research has found.

- [**12,000 years ago, Florida hurricanes heated up despite chilly seas**](#) [周五, 06 10月 00:50]

Category 5 hurricanes may have slammed Florida repeatedly during the chilly Younger Dryas, 12,000 years ago. The cause? Hurricane-suppressing effects of cooler sea surface were out-weighed by side effects of slowed ocean circulation.

- [**Once declared extinct, Lord Howe Island stick insects really do live**](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead Lord Howe Island stick insects have some good news: those rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

- [**More traits associated with your Neanderthal DNA**](#) [周五, 06 10月 00:11]

After humans and Neanderthals met many thousands of years ago, the two species began interbreeding. Recent studies have shown that some

of those Neanderthal genes have contributed to human immunity and modern diseases. Now researchers have found that our Neanderthal inheritance has contributed to other characteristics, too, including skin tone, hair color, sleep patterns, mood, and even a person's smoking status.

- [**Violent helium reaction on white dwarf surface triggers supernova explosion**](#) [周四, 05 10月 23:11]

Astronomers have found solid evidence about what triggered a star to explode, which will contribute to a further understanding of supernova history and behavior.

- [**'Squirtable' elastic surgical glue seals wounds in 60 seconds**](#) [周四, 05 10月 22:27]

A highly elastic and adhesive surgical glue that quickly seals wounds without the need for common staples or sutures could transform how surgeries are performed.

- [**Did Teddy Evans fatally undermine Scott of the Antarctic?**](#) [周四, 05 10月 22:26]

Scientists have uncovered documents and diary entries that suggest a team member stole food Scott needed, failed to pass on orders that would have sent out a dog team to meet the men and then changed his story over time to cover up his role in their deaths.

- [**Too much sugar? Even 'healthy people' are at risk of developing heart disease**](#) [周四, 05 10月 08:20]

Healthy people who consume high levels of sugar are at an increased risk of developing cardiovascular disease.

- [**Milky Way's 'most-mysterious star' continues to confound**](#) [周四, 05 10月 07:05]

In 2015, a star called KIC 8462852 caused quite a stir in and beyond the astronomy community due to a series of rapid, unexplained dimming events. The latest findings from astronomers take a longer look at the star, going back to 2006 -- before its strange behavior was detected by

Kepler.

- [**No clear evidence that most new cancer drugs extend or improve life**](#) [周四, 05 10月 07:04]

The majority of cancer drugs approved in Europe between 2009 and 2013 entered the market without clear evidence that they improved survival or quality of life for patients, finds a study.

- [**Sunlight and 'right' microbes convert Arctic carbon into carbon dioxide**](#) [周四, 05 10月 04:38]

A new study outlines the mechanisms and points to the importance of both sunlight and the right microbial community as keys to converting permafrost carbon to CO₂.

- [**New nanomaterial can extract hydrogen fuel from seawater**](#) [周四, 05 10月 04:20]

A new hybrid nanomaterial harvests solar energy and uses it to extract hydrogen from seawater, cheaply and efficiently. Future commercialization could mean a new source of environmentally friendly fuel and less dependence on fossil fuels.

- [**Ancient humans left Africa to escape drying climate**](#) [周四, 05 10月 03:12]

Humans migrated out of Africa as the climate shifted from wet to dry about 60,000 years ago, according to new paleoclimate research. What the northeast Africa climate was like when people migrated from Africa into Eurasia between 70,000 and 55,000 years ago is still uncertain. The new research shows around 70,000 years ago, the Horn of Africa climate shifted from a wet phase called 'Green Sahara' to even drier than the region is now.

- [**Why does divorce run in families? The answer may be genetics**](#) [周四, 05 10月 03:12]

Children of divorced parents are more likely to get divorced when compared to those who grew up in two-parent families -- and genetic factors are the primary explanation, according to a new study.

• [**The super-Earth that came home for dinner**](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire solar system to one side. It is a possible "Planet Nine" -- a world perhaps 10 times the mass of Earth and 20 times farther from the sun than Neptune.

• [**Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

• [**Bumblebees shed light on why some individuals are smarter than others**](#) [周四, 05 10月 01:28]

By examining the brains of bees trained to different tasks, the researchers found that the number of connections between nerve cells may hold the answer to questions about individual cognitive differences. Bees with a greater density of nerve connections (known as synaptic complexes) in a specific part of their brains had better memories and learned faster than bees with fewer connections in these areas.

• [**In Iceland stream, possible glimpse of warming future**](#) [周四, 05 10月 01:26]

When a normally cold stream in Iceland was warmed, the make-up of life inside changed as larger organisms thrived while smaller ones struggled. The findings carry implications for life in a warming climate.

• [**Anxiety and depression caused by childhood bullying decline over time**](#) [周四, 05 10月 00:05]

A new study has provided the strongest evidence to date that exposure to bullying causes mental health issues such as anxiety years later.

- [**Flights worldwide face increased risk of severe turbulence due to climate change**](#) [周四, 05 10月 00:04]

Flights all around the world could be encountering lots more turbulence in the future, according to the first ever global projections of in-flight bumpiness.

- [**Hurricane exposes and washes away thousands of sea turtle nests**](#) [周四, 05 10月 00:04]

Marine biologists have released estimates of sea turtle nests lost to Hurricane Irma, finding that 56 percent of green turtle nests and 24 percent of loggerhead nests were lost within Archie Carr National Wildlife Refuge. Both are endangered species. The losses put a damper on what had been a record year for green turtle nesting.

- [**Nobel Prize in Chemistry 2017: Cryo-electron microscopy**](#) [周三, 04 10月 21:02]

The Nobel Prize in Chemistry 2017 goes to Jacques Dubochet, Joachim Frank, and Richard Henderson "for developing cryo-electron microscopy for the high-resolution structure determination of biomolecules in solution."

- [**'CRISPR-Gold' fixes Duchenne muscular dystrophy mutation in mice**](#) [周三, 04 10月 08:29]

Scientists have engineered a new way to deliver CRISPR-Cas9 gene-editing technology inside cells and have demonstrated in mice that the technology can repair the mutation that causes Duchenne muscular dystrophy, a severe muscle-wasting disease.

- [**Livestock grazing harming giant panda habitat**](#) [周三, 04 10月 00:54]

One third of the giant panda habitat in China's Wanglang National Nature Reserve has been degraded and lost to livestock grazing, a new study finds. Livestock numbers in the park have increased ninefold in the last 15 years.

- [**First evidence of the body's waste system in the**](#)

[human brain discovered](#) [周二, 03 10月 23:11]

By scanning the brains of healthy volunteers, researchers saw the first, long-sought evidence that our brains may drain some waste out through lymphatic vessels, the body's sewer system. The results further suggest the vessels could act as a pipeline between the brain and the immune system.

• [Large volcanic eruptions in Tropics can trigger El Niño events](#) [周二, 03 10月 23:11]

Explosive volcanic eruptions in the tropics can lead to El Niño events, those notorious warming periods in the Pacific Ocean with dramatic global impacts on the climate, according to a new study.

• [House sparrow decline linked to air pollution and poor diet](#) [周二, 03 10月 23:10]

House sparrows are well-adapted to living in urban areas, so it is surprising their numbers have fallen significantly over the past decades. An investigation into this worrying trend finds that sparrows living in urban areas are adversely affected by pollution and poor nutrition. The study also finds the birds suffer more during the breeding season, when resources are needed to produce healthy eggs.

• [To breed or not to breed? Migratory female butterflies face a monsoonal dilemma](#) [周二, 03 10月 23:10]

Female butterflies make smart investments, finds a new study.

• [Astronomers reveal evidence of dynamical dark energy](#) [周二, 03 10月 23:10]

Astronomers found that the nature of dark energy may not be the cosmological constant introduced by Albert Einstein 100 years ago. This is crucial for the study of dark energy.

• [Nobel Prize in Physics 2017: Gravitational waves](#) [周二, 03 10月 21:58]

The Nobel Prize in Physics 2017 goes to Rainer Weiss, Barry C. Barish, and Kip S. Thorne "for decisive contributions to the LIGO detector and

the observation of gravitational waves."

- [**Earth's tectonic plates are weaker than once thought**](#) [周二, 03 10月 21:40]

A long-standing question regarding the strength of olivine, the primary component of Earth's mantle, has now been answered. This study has implications for how we understand now tectonic plates form and move.

- [**An algorithm that explains how ants create and repair trail networks**](#) [周二, 03 10月 21:40]

Observing ants in the trees of a tropical forest, researchers recorded how, without a plan, the ants make and maintain their networks -- and how they repair the network when it is ruptured.

- [**Prehistoric squid was last meal of newborn ichthyosaur 200 million years ago**](#) [周二, 03 10月 21:39]

Scientists have identified the smallest and youngest specimen of *Ichthyosaurus communis* on record and found an additional surprise preserved in its stomach.

- [**Ancient petrified salamander reveals its last meal**](#) [周二, 03 10月 21:39]

A new study on an exceptionally preserved salamander from the Eocene of France reveals that its soft organs are conserved under its skin and bones. Organs preserved in three dimensions include the lung, nerves, gut, and within it, the last meal of the animal, according to a new study.

- [**Monstrous crocodile fossil points to early rise of ancient reptiles**](#) [周二, 03 10月 08:22]

A newly identified prehistoric marine predator has shed light on the origins of the distant relatives of modern crocodiles.

- [**New source of radioactivity from Fukushima disaster**](#) [周二, 03 10月 04:12]

Scientists have found a previously unsuspected place where radioactive material from the Fukushima Dai-ichi nuclear power plant disaster has

accumulated -- in sands and brackish groundwater beneath beaches up to 60 miles away. The sands took up and retained radioactive cesium originating from the disaster in 2011 and have been slowly releasing it back to the ocean.

- [**Meteorite tells us that Mars had a dense atmosphere 4 billion years ago**](#) [周一, 02 10月 23:42]

Exploration missions have suggested that Mars once had a warm climate, which sustained oceans on its surface. To keep Mars warm requires a dense atmosphere with a sufficient greenhouse effect, while the present-day Mars has a thin atmosphere whose surface pressure is only 0.006 bar, resulting in the cold climate it has today. It has been a big mystery as to when and how Mars lost its dense atmosphere.

- [**ALMA and Rosetta detect Freon-40 in space dashing hopes that molecule may be marker of life**](#) [周一, 02 10月 23:28]

Observations made with the Atacama Large Millimeter/submillimeter Array (ALMA) and ESA's Rosetta mission, have revealed the presence of the organohalogen Freon-40 in gas around both an infant star and a comet. Organohalogens are formed by organic processes on Earth, but this is the first ever detection of them in interstellar space. This discovery suggests that organohalogens may not be as good markers of life as had been hoped, but that they may be significant components of the material from whi...

- [**First look at electrons escaping atoms**](#) [周一, 02 10月 23:27]

Researchers have taken a first step toward controlling electrons' behavior inside matter -- and thus the first step down a long and complicated road that could eventually lead to the ability to create new states of matter at will.

- [**Mini-kidneys grown in lab reveal renal disease secrets**](#) [周一, 02 10月 23:27]

By creating and manipulating mini-kidney organoids that contain a realistic micro-anatomy, researchers can now track the early stages of

polycystic kidney disease. The organoids are grown from human stem cells.

- [**Siberian volcanic eruptions caused extinction 250 million years ago, new evidence shows**](#) [周一, 02 10月 22:52]

The Great Permian Extinction, which occurred approximately 250 million years ago, was caused by massive volcanic eruptions that led to significant environmental changes, new evidence shows.

- [**DNA: The next hot material in photonics?**](#) [周一, 02 10月 22:52]

Using DNA from salmon, researchers in South Korea hope to make better biomedical and other photonic devices based on organic thin films.

- [**Animals that play with objects learn how to use them as tools**](#) [周一, 02 10月 22:52]

New Caledonian crows and kea parrots can learn about the usefulness of objects by playing with them -- similar to human baby behavior.

- [**New approach for AIDS: Lock HIV in reservoir cells, to die through apoptosis**](#) [周一, 02 10月 21:34]

With the successful suppression of the AIDS virus (HIV) through medication, the focus turns toward its eradication. Researchers have developed a new compound that is key to the destruction of HIV. When the compound is introduced into infected cells, viral budding is suppressed thereby confining it within the host cells. The cell then dies naturally through apoptosis. This treatment is hoped to lead to the complete recovery from AIDS in the near future.

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Health News

Top stories featured on ScienceDaily's Health & Medicine, Mind & Brain, and Living Well sections.

- [**Pushy or laid back? Economic factors influence parenting style**](#) [周五, 06 10月 07:03]

A new study argues that parenting styles are shaped by economic factors that incentivize one strategy over others.

- [**Screen children with reading difficulties for hearing problems**](#) [周五, 06 10月 07:02]

A new study found 25 percent of its young participants who had reading difficulties showed mild or moderate hearing impairment, of which their parents and teachers were unaware.

- [**Smartphone-controlled smart bandage for better, faster healing**](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [**Multiple research approaches are key to pandemic preparedness**](#) [周五, 06 10月 03:11]

Preparedness in the face of major disease outbreaks can save thousands of lives. A new article examines the multifaceted nature of effective preparedness and the role that biomedical research plays. Specifically, the article examines three approaches to pandemic preparedness: pathogen-specific work, platform-based technologies, and prototype-pathogen efforts.

- [**Low serum calcium may increase risk of sudden cardiac arrest**](#) [周五, 06 10月 02:18]

In a new study, researchers found that individuals with lower levels of calcium in the blood, which is easily monitored, are more likely to experience SCA than those with higher calcium levels.

- [**Molecule created that could 'kick and kill' HIV**](#) [周五, 06 10月 02:18]

Researchers have been looking for ways to eliminate the 'reservoirs' where the virus hides, and researchers may have developed a solution. Their approach involves sending an agent to 'wake up' the dormant virus, which causes it to begin replicating so that either the immune system or the virus itself would kill the cell harboring HIV.

- [**Cost-effectiveness of guinea worm disease eradication**](#) [周五, 06 10月 02:18]

Eradication of guinea worm disease (dracunculiasis), targeted by the World Health Organization (WHO) for the year 2015, is finally within reach, with only 25 reported human transmissions in 2016. Now, researchers have re-asserted the cost-effectiveness of the global Guinea Worm Eradication Programme (GWEP), some 30 years after it started.

- [**Simulating a brain-cooling treatment that could one day ease epilepsy**](#) [周五, 06 10月 02:18]

Using computer simulation techniques, scientists have gained new insights into the mechanism by which lowering the temperature of specific brain regions could potentially treat epileptic seizures.

- [**First cell-type census of mouse brains: Surprises about structure, male-female differences**](#) [周五, 06 10月 02:18]

Neuroscientists have mobilized advanced imaging and computational methods to comprehensively map -- 'count' -- the total populations of specific types of cells throughout the mouse brain. In a new study, they report two highly surprising findings regarding distribution of cell types across the brain as well as male-female brain differences.

- **[Prehistoric humans are likely to have formed mating networks to avoid inbreeding](#)** [周五, 06 10月 02:17]

Early humans seem to have recognized the dangers of inbreeding at least 34,000 years ago, and developed surprisingly sophisticated social and mating networks to avoid it, new research has found.

- **[Scientists solve 3-D structure of key defense protein against Parkinson's disease](#)** [周五, 06 10月 02:17]

Scientists have identified the structure of a key enzyme that protects the brain against Parkinson's disease. The result of a decade of work, the research team said that solving the 3-D structure and inner workings of the PINK1 enzyme represented a major breakthrough.

- **[Better genetic decoding of neurodevelopmental disorders](#)** [周五, 06 10月 02:17]

New research into improving the genetic decoding of neurodevelopmental disorders promises to help future diagnosis of children with such conditions, including intellectual disability, autism or schizophrenia.

- **[Middle managers may turn to unethical behavior to face unrealistic expectations](#)** [周五, 06 10月 02:17]

While unethical behavior in organizations is often portrayed as flowing down from top management, or creeping up from low-level positions, a team of researchers suggest that middle management also can play a key role in promoting wide-spread unethical behavior among their subordinates.

- **[Delivering bad news? Don't beat around the bush](#)** [周五, 06 10月 02:17]

New research shows that when it comes to receiving bad news, most people prefer directness, candor and very little -- if any -- buffer.

- **[Predicting when a sound will occur relies on the brain's motor system](#)** [周五, 06 10月 02:17]

Whether it is dancing or just tapping one foot to the beat, we all experience how auditory signals like music can induce movement. Now new research suggests that motor signals in the brain actually sharpen sound perception, and this effect is increased when we move in rhythm with the sound.

- [**Something universal occurs in the brain when it processes stories, regardless of language**](#) [周五, 06 10月 02:17]

New brain research shows that reading stories generates activity in the same regions of the brain for speakers of three different languages.

- [**Heart: No evidence for piezoelectricity or ferroelectricity in the aorta**](#) [周五, 06 10月 02:17]

While some studies have supported the idea that the walls of the aorta are piezoelectric or ferroelectric, the most recent research finds no evidence of these properties. Researchers investigated by testing samples of pig aorta using a traditional setup, known as Sawyer-Tower, to detect ferroelectricity. Their experiments suggest the aorta has no special properties, and instead acts as a standard dielectric material that does not conduct current.

- [**Air pollution exposure on home-to-school routes reduces the growth of working memory**](#) [周五, 06 10月 00:50]

A new study has demonstrated that exposure to air pollution on the way to school can have damaging effects on children's cognitive development. The study found an association between a reduction in working memory and exposure to fine particulate matter (PM2.5) and black carbon during the walking commute to and from school.

- [**Germs in the kitchen: Salmonella better known than Campylobacter**](#) [周五, 06 10月 00:11]

What health risks are consumers aware of? What are they concerned about?

- [**More traits associated with your Neanderthal DNA**](#) [周五, 06 10月 00:11]

After humans and Neanderthals met many thousands of years ago, the two species began interbreeding. Recent studies have shown that some of those Neanderthal genes have contributed to human immunity and modern diseases. Now researchers have found that our Neanderthal inheritance has contributed to other characteristics, too, including skin tone, hair color, sleep patterns, mood, and even a person's smoking status.

- [**A candidate genetic factor for effects of prenatal alcohol exposure has been found**](#) [周五, 06 10月 00:10]

Researchers have found a genetic variation, which associates with the damage caused by maternal alcohol consumption. This genetic variation clarifies the role of genetic factors in the alcohol-induced developmental disorders and could be useful in future diagnostics.

- [**'Body-on- a-chip' system to accelerate testing of new drugs**](#) [周五, 06 10月 00:10]

Being able to test new drugs in a 3-D model of the body has the potential to speed up drug discovery, reduce the use of animal testing and advance personalized medicine.

- [**Appetizing imagery puts visual perception on fast forward**](#) [周五, 06 10月 00:10]

People rated images containing positive content as fading more smoothly compared with neutral and negative images, even when they faded at the same rate, according to new findings.

- [**Novel PET tracer identifies most bacterial infections**](#) [周四, 05 10月 23:11]

Medical scientists have developed a novel imaging agent that could be used to identify most bacterial infections.

- [**Understanding how gastric bypass works: Finding drug targets for obesity and diabetes**](#) [周四, 05 10月 23:11]

Medical researchers have made a technological advancement toward accelerating the discovery of drug targets for obesity, type II diabetes

and other metabolic diseases.

- [**Fingerprints lack scientific basis for legal certainty**](#) [周四, 05 10月 23:11]

A new report on the quality of latent fingerprint analysis says that courtroom testimony and reports stating or even implying that fingerprints collected from a crime scene belong to a single person are indefensible and lack scientific foundation.

- [**Athletes and health aficionados: The lupine protein beverage**](#) [周四, 05 10月 22:39]

With its intensive colors and many blossoms, the lupine looks like an ornamental plant. Yet, the tall lupine is far too good to be used decoratively as the plant's seeds contain nutritious proteins. However, it is rather complicated to make lupines edible for humans.

- [**Spray drying: Perfect dosing thanks to drug capsules**](#) [周四, 05 10月 22:38]

Instant coffee and powdered milk are produced by spray drying. Researchers have adapted this technique to the tricky question of incorporating insoluble substances in core-shell particles. The new method helps reduce the concentration of active ingredients in therapeutic medications.

- [**Largest twin study pins nearly 80% of schizophrenia risk on heritability**](#) [周四, 05 10月 22:33]

In the largest study of twins in schizophrenia research to date, researchers have estimated that as much as 79% of schizophrenia risk may be explained by genetic factors. The estimate indicates that genetics have a substantial influence on risk for the disorder.

- [**Key component of respiratory center identified**](#) [周四, 05 10月 22:33]

Star-shaped cells called astrocytes are much more than simple support cells in the brain. In a new study on mice, researchers demonstrate that they also play a key part in the respiratory center of the brainstem and release inflammatory molecules that regulate breathing. The results can

provide important clues as to the causes of respiratory disease and the sudden unexpected postnatal collapse of newborn infants (SUPC).

- **[Beer brands popular among youth violate code with youth-appealing ads](#)** [周四, 05 10月 22:27]

Alcohol brands popular among underage drinkers are more likely to air television advertisements that violate the industry's voluntary code by including youth-appealing content, according to a new study.

- **['Squirtable' elastic surgical glue seals wounds in 60 seconds](#)** [周四, 05 10月 22:27]

A highly elastic and adhesive surgical glue that quickly seals wounds without the need for common staples or sutures could transform how surgeries are performed.

- **[Completing the drug design jigsaw](#)** [周四, 05 10月 22:27]

A powerful new way of analysing how drugs interact with molecules in the body could aid the design of better treatments with fewer side-effects.

- **[Newborns with congenital heart disease show signs of brain impairment even before cardiac surgery](#)** [周四, 05 10月 22:27]

Using a novel imaging technique, researchers demonstrate for the first time that the brains of high-risk infants with congenital heart disease already show signs of functional impairment even before they undergo corrective open heart surgery.

- **[Earlier school start times may increase risk of adolescent depression and anxiety](#)** [周四, 05 10月 22:27]

Teenagers with school starting times before 8:30 a.m. may be at particular risk of experiencing depression and anxiety due to compromised sleep quality, according to a recent study.

- **[Low-cost, high-volume services make up big portion of spending on unneeded health care](#)** [周四, 05 10月 22:27]

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Low-cost, high-volume health services account for a high percentage of unnecessary health spending, adding strain to the health care system.

• [**How much can watching hockey stress your heart?**](#) [周四, 05 10月 22:27]

A new study suggests that both the thrill of victory and the agony of defeat can have a substantial effect on the cardiovascular system. Investigators took the pulse of fans during a hockey game and found that on average, their heart rate increased by 75 percent when watching on TV, and by a whopping 110 percent (more than doubled, equivalent to the cardiac stress with vigorous exercise) when watching in person.

• [**A need for bananas? Dietary potassium regulates calcification of arteries**](#) [周四, 05 10月 22:27]

Researchers have shown, for the first time, that reduced dietary potassium promotes elevated aortic stiffness in a mouse model. Such arterial stiffness in humans is predictive of heart disease and death from heart disease, and it represents an important health problem for the nation. The researchers also found that increased dietary potassium levels lessened vascular calcification and aortic stiffness. Furthermore, they unraveled the molecular mechanism underlying the effects of low or high dietary potassium.

• [**Caution ahead: The growing challenge for drivers' attention**](#) [周四, 05 10月 22:27]

Many of the infotainment features in most 2017 vehicles are so distracting they should not be enabled while a vehicle is in motion, according to a new study. The study found In-Vehicle Information Systems take drivers' attention off the road for too long to be safe.

• [**Folding of the cerebral cortex: Identification of important neurons**](#) [周四, 05 10月 22:27]

Folds in the cerebral cortex in mammals are believed to be indispensable for higher brain functions but the mechanisms underlying cortical folding remain unknown. By using the latest genome editing tools, we succeeded in establishing a technique and discovered important neurons

for fold formation and the importance of the Cdk5 gene in those neurons. Some patients suffer from lissencephaly, whose cortical fold formation is impaired. Our study may provide clues to diseases including lissencephaly.

[A novel textile material that keeps itself germ-free](#) [周四, 05 10月 22:27]

Scientists have developed a novel weapon in the battle against deadly hospital-acquired infections -- a textile that disinfects itself. And independent tests show it can reduce bacteria levels by more than 90 per cent. By incorporating the specially-engineered textile in a device designed to be used on hospital doors instead of the traditional aluminum door plate, that part of the door that people push to open it -- they aim to bolster hand hygiene.

['Increased risk' donor organs a tough sell to transplant patients](#) [周四, 05 10月 22:26]

The opioid epidemic has created a tragic surge in donor organs. But despite their safety record, hundreds of the organs, labeled as 'increased risk,' go unused.

[Nanopatch polio vaccine delivers](#) [周四, 05 10月 22:26]

Efforts to rid the world of polio have taken another significant step. A fresh study of the Nanopatch -- a microscopic vaccine delivery platform -- has shown the device more effectively combats poliovirus than needles and syringes.

[Vertigo and understanding the body's balance system](#) [周四, 05 10月 22:26]

Finding out what's happening in the brains of people with balance disorders, such as vertigo, might be one step closer following new research on the vestibular system, which controls balance and movement. An interdisciplinary team of optical physicists and biologists has found a novel way, using optical tweezers, or focused beams of light, to understand the vestibular system while animals are still, not moving.

• [**How cells adapt to help repair damage**](#) [周四, 05 10月 22:26]

Genetic processes that allow cells to transform so they can mend damaged nerves have been identified by scientists.

• [**Women can be just as daring and risk-taking as men**](#) [周四, 05 10月 22:26]

Women can be just as risky as men -- or even riskier -- when the conventional macho measures of daring -- such as betting vast sums on a football game -- are replaced by less stereotypical criteria, according to new research.

• [**Simplifying information aids fight against childhood obesity, study finds**](#) [周四, 05 10月 22:26]

Providing simplified health information designed for parents with low health literacy helps all families in childhood obesity treatment programs regardless of their ability to understand health information, according to a new study.

• [**Brain wiring affects how people perform specific tasks**](#) [周四, 05 10月 22:26]

The way a person's brain is 'wired' directly impacts how well they perform simple and complex tasks, according to a new study.

• [**Discovery of a new fusion gene class may affect the development of cancer**](#) [周四, 05 10月 22:26]

Cancer researchers have discovered a new class of fusion genes with properties that affect and may drive the development of cancer.

• [**Too much sugar? Even 'healthy people' are at risk of developing heart disease**](#) [周四, 05 10月 08:20]

Healthy people who consume high levels of sugar are at an increased risk of developing cardiovascular disease.

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [**'Transformative' research unrealistic to predict, scientists tell granting agencies**](#) [周五, 06 10月 07:03]

Research-funding agencies that require scientists to declare at the proposal stage how their projects will be 'transformative' may actually be hindering discovery.

- [**Smartphone-controlled smart bandage for better, faster healing**](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [**Simulating a brain-cooling treatment that could one day ease epilepsy**](#) [周五, 06 10月 02:18]

Using computer simulation techniques, scientists have gained new insights into the mechanism by which lowering the temperature of specific brain regions could potentially treat epileptic seizures.

- [**3-D quantum gas atomic clock offers new dimensions in measurement**](#) [周五, 06 10月 02:18]

Physicists have created an entirely new design for an atomic clock, in which strontium atoms are packed into a tiny three-dimensional cube at 1,000 times the density of previous one-dimensional clocks. In doing so, they are the first to harness the ultra-controlled behavior of a so-called 'quantum gas' to make a practical measurement device.

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [**Why lab researchers should talk with industry counterparts**](#) [周五, 06 10月 02:17]

A research team has found both obstacles and lessons from the process of getting a novel membrane for chemical processing out of the lab into the commercial world.

- [**Road pricing most effective in reducing vehicle emissions**](#) [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

- [**New test opens path for better 2-D catalysts**](#) [周五, 06 10月 02:17]

Scientists have developed technology for rapid screening of two-dimensional materials for electrocatalysis of hydrogen. The method could accelerate the development of 2-D materials for energy applications.

- [**Heart: No evidence for piezoelectricity or ferroelectricity in the aorta**](#) [周五, 06 10月 02:17]

While some studies have supported the idea that the walls of the aorta are piezoelectric or ferroelectric, the most recent research finds no evidence of these properties. Researchers investigated by testing samples of pig aorta using a traditional setup, known as Sawyer-Tower, to detect ferroelectricity. Their experiments suggest the aorta has no

special properties, and instead acts as a standard dielectric material that does not conduct current.

- **'Body-on-a-chip' system to accelerate testing of new drugs** [周五, 06 10月 00:10]

Being able to test new drugs in a 3-D model of the body has the potential to speed up drug discovery, reduce the use of animal testing and advance personalized medicine.

- **Paper-based supercapacitor uses metal nanoparticles to boost energy density** [周五, 06 10月 00:10]

Using a simple layer-by-layer coating technique, researchers have developed a paper-based flexible supercapacitor that could be used to help power wearable devices. The device uses metallic nanoparticles to coat cellulose fibers in the paper, creating supercapacitor electrodes with high energy and power densities -- and the best performance so far in a textile-based supercapacitor.

- **Violent helium reaction on white dwarf surface triggers supernova explosion** [周四, 05 10月 23:11]

Astronomers have found solid evidence about what triggered a star to explode, which will contribute to a further understanding of supernova history and behavior.

- **Fingerprints lack scientific basis for legal certainty** [周四, 05 10月 23:11]

A new report on the quality of latent fingerprint analysis says that courtroom testimony and reports stating or even implying that fingerprints collected from a crime scene belong to a single person are indefensible and lack scientific foundation.

- **New 'molecular trap' cleans more radioactive waste from nuclear fuel rods** [周四, 05 10月 23:10]

A new method for capturing radioactive waste from nuclear power plants is cheaper and more effective than current methods, a potential boon for the energy industry, according to new research.

- [**Machinery that repairs itself**](#) [周四, 05 10月 22:38]

Scientists are developing maintenance technology capable of forecasting machine downtimes in production before they occur. This allows plant managers to rectify faults before the machine breaks down. The system even corrects some defects automatically.

- [**Safety assistance system warns of dirty bombs**](#) [周四, 05 10月 22:38]

The threat of terrorism has been on the rise in recent years, with experts and politicians particularly worried that terrorists might make use of dirty bombs. Researchers have developed a new system that will be able to detect possible carriers of radioactive substances, even in large crowds of people.

- [**Spray drying: Perfect dosing thanks to drug capsules**](#) [周四, 05 10月 22:38]

Instant coffee and powdered milk are produced by spray drying. Researchers have adapted this technique to the tricky question of incorporating insoluble substances in core-shell particles. The new method helps reduce the concentration of active ingredients in therapeutic medications.

- [**Tracking debris in the Earth's orbit with centimeter precision using efficient laser technology**](#) [周四, 05 10月 22:38]

Uncontrollable flying objects in orbit are a massive risk for modern space travel, and, due to our dependence on satellites today, it is also a risk to global economy. Scientists have now developed a fiber laser that reliably determines the position and direction of the space debris' movement to mitigate these risks.

- [**Mitigating the unpleasant scent of adhesives**](#) [周四, 05 10月 22:38]

It is a known fact that adhesives may smell unpleasant. However, as researchers have recently discovered, this doesn't need to be the case. Through extensive research on acrylic adhesives they were able to identify the substances responsible for the offensive odors. So far, very

little research has been conducted on the subject, but now manufacturers finally have the opportunity to optimize their production process.

• [Using elastomer films to generate electricity](#) [周四, 05 10月 22:35]

Water is still the most important source of renewable energy in Bavaria, Germany, accounting for some 33 percent of all renewable energy produced in the region, as showed by the Bavarian Energy Map. But conventional hydroelectric plants, especially micro hydro generators, are a subject of controversy due to their low output volumes and their interference with the ecosystem. Researchers are working on an environmentally friendly alternative: in the future, innovative elastomer materials are set to...

• ['Squirtable' elastic surgical glue seals wounds in 60 seconds](#) [周四, 05 10月 22:27]

A highly elastic and adhesive surgical glue that quickly seals wounds without the need for common staples or sutures could transform how surgeries are performed.

• [Completing the drug design jigsaw](#) [周四, 05 10月 22:27]

A powerful new way of analysing how drugs interact with molecules in the body could aid the design of better treatments with fewer side-effects.

• [Computer model unravels knotty problems in DNA](#) [周四, 05 10月 22:27]

If you've ever tried to untangle a pair of earbuds, you'll understand how loops and cords can get twisted up. DNA can get tangled in the same way, and in some cases, has to be cut and reconnected to resolve the knots. Now a team of mathematicians, biologists and computer scientists has unraveled how E. coli bacteria can unlink tangled DNA by a local reconnection process. The math behind the research could have implications far beyond biology.

• [Mars' moon Phobos examined in a different light](#) [周四, 05 10月 22:27]

NASA's longest-lived mission to Mars has gained its first look at the Martian moon Phobos, pursuing a deeper understanding by examining it in infrared wavelengths.

• [How much can watching hockey stress your heart?](#) [周四, 05 10月 22:27]

A new study suggests that both the thrill of victory and the agony of defeat can have a substantial effect on the cardiovascular system. Investigators took the pulse of fans during a hockey game and found that on average, their heart rate increased by 75 percent when watching on TV, and by a whopping 110 percent (more than doubled, equivalent to the cardiac stress with vigorous exercise) when watching in person.

• [Caution ahead: The growing challenge for drivers' attention](#) [周四, 05 10月 22:27]

Many of the infotainment features in most 2017 vehicles are so distracting they should not be enabled while a vehicle is in motion, according to a new study. The study found In-Vehicle Information Systems take drivers' attention off the road for too long to be safe.

• [A novel textile material that keeps itself germ-free](#) [周四, 05 10月 22:27]

Scientists have developed a novel weapon in the battle against deadly hospital-acquired infections -- a textile that disinfects itself. And independent tests show it can reduce bacteria levels by more than 90 per cent. By incorporating the specially-engineered textile in a device designed to be used on hospital doors instead of the traditional aluminum door plate, that part of the door that people push to open it -- they aim to bolster hand hygiene.

• [Vertigo and understanding the body's balance system](#) [周四, 05 10月 22:26]

Finding out what's happening in the brains of people with balance disorders, such as vertigo, might be one step closer following new research on the vestibular system, which controls balance and movement. An interdisciplinary team of optical physicists and biologists

has found a novel way, using optical tweezers, or focused beams of light, to understand the vestibular system while animals are still, not moving.

- [**Milky Way's 'most-mysterious star' continues to confound**](#) [周四, 05 10月 07:05]

In 2015, a star called KIC 8462852 caused quite a stir in and beyond the astronomy community due to a series of rapid, unexplained dimming events. The latest findings from astronomers take a longer look at the star, going back to 2006 -- before its strange behavior was detected by Kepler.

- [**Impacts of ride-hailing on crashes differ from city to city**](#) [周四, 05 10月 07:05]

Ride-hailing services reduce drunk-driving crashes in some cities, reports a new study. The research is the first to look at the specific effects of ride-hailing, or 'ride-sharing,' within specific cities, rather than averaging data across multiple cities.

- [**New nanomaterial can extract hydrogen fuel from seawater**](#) [周四, 05 10月 04:20]

A new hybrid nanomaterial harvests solar energy and uses it to extract hydrogen from seawater, cheaply and efficiently. Future commercialization could mean a new source of environmentally friendly fuel and less dependence on fossil fuels.

- [**The super-Earth that came home for dinner**](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire solar system to one side. It is a possible "Planet Nine" -- a world perhaps 10 times the mass of Earth and 20 times farther from the sun than Neptune.

- [**Teleoperating robots with virtual reality: Making it easier for factory workers to**](#)

[**telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

• [**Light-activated nanoparticles can supercharge current antibiotics**](#) [周四, 05 10月 02:26]

Light-activated nanoparticles, also known as quantum dots, can provide a crucial boost in effectiveness for antibiotic treatments used to combat drug-resistant superbugs such as E. coli and Salmonella, new research shows.

• [**A new way to produce clean hydrogen fuel from water using sunlight**](#) [周四, 05 10月 02:01]

Researchers combined graphitic carbon nitride and black phosphorous to make a new metal-free composite photocatalyst capable of producing hydrogen from water. The photocatalyst featured good photocatalytic production of hydrogen, even when powered by low-energy near infrared light.

• [**Surface helium detonation spells end for white dwarf**](#) [周四, 05 10月 02:01]

Researchers have found evidence that the brightest stellar explosions in our Universe could be triggered by helium nuclear detonation near the surface of a white dwarf star.

• [**Nanoscale islands dot light-driven catalyst**](#) [周四, 05 10月 00:22]

Scientists have combined aluminum nanoparticles and smaller metal particles to create a versatile nanostructure that could lead to new applications for plasmonics. The technique allows for customizable surface chemistry and reactivity in one material.

• [**NASA's Webb Telescope to witness galactic infancy**](#) [周四, 05 10月 00:04]

Scientists will use NASA's James Webb Space Telescope to study

sections of the sky previously observed by NASA's Great Observatories, including the Hubble Space Telescope and the Spitzer Space Telescope, to understand the creation of the universe's first galaxies and stars.

- [**Flights worldwide face increased risk of severe turbulence due to climate change**](#) [周四, 05 10月 00:04]

Flights all around the world could be encountering lots more turbulence in the future, according to the first ever global projections of in-flight bumpiness.

- [**Tungsten offers nano-interconnects a path of least resistance**](#) [周三, 04 10月 22:14]

As microchips become smaller, the shrinking size of their copper interconnects leads to increased electrical resistivity at the nanoscale. Finding a solution to this technical bottleneck is a problem for the semiconductor industry; one possibility involves reducing the resistivity size effect by altering the crystalline orientation of interconnect materials. Researchers conducted electron transport measurements in epitaxial single-crystal layers of tungsten as one potential solution.

- [**Smart pump: small but powerful**](#) [周三, 04 10月 21:53]

Particulate matter harms the heart and lungs. In the future, a smartphone with an inbuilt gas sensor could be used to warn of heavy exposure. To help the sensor respond quickly and provide accurate measurements, researchers have developed a powerful micro diaphragm pump for delivering ambient air to the sensor.

- [**Nobel Prize in Chemistry 2017: Cryo-electron microscopy**](#) [周三, 04 10月 21:02]

The Nobel Prize in Chemistry 2017 goes to Jacques Dubochet, Joachim Frank, and Richard Henderson "for developing cryo-electron microscopy for the high-resolution structure determination of biomolecules in solution."

- [**Two intelligent vehicles are better than one**](#) [周三, 04 10月 20:49]

Researchers are working to improve the reliability and fault tolerance of

intelligent vehicle systems by combining the data they gather with that from other vehicles. This can, for example, extend the field of view of a car that is behind another car. Using simulators and road tests, the team has developed a flexible software framework for networking intelligent vehicles so that they can interact.

- [**Monitoring microbes to keep Marsonauts healthy**](#) [周三, 04 10月 08:29]

To guarantee a safe environment for astronauts on long-duration space missions such as a journey to Mars, it is important to monitor how microorganisms such as bacteria adapt to the confined conditions onboard spacecraft, according to a study.

- [**Surrounded by potential: New science in converting biomass**](#) [周三, 04 10月 08:29]

To take full advantage of biomass, lignin needs to be processed into usable components along with the plant cellulose. Currently, that process requires an acid plus high heat, or pyrolysis -- treating with high heat in the absence of oxygen. Besides being energy-consuming processing methods, the results are less than optimal. Scientists are now working to develop a method to deconstruct lignin in a way that is economically feasible and into stable, readily useful components.

- [**Visualizing life in silico**](#) [周三, 04 10月 02:45]

Programming a molecular biology experiment can be similar to playing Sudoku; both are simple if you're working with only a few molecules or a small grid, but explode in complexity as they grow. Now, researchers have made it far easier for molecular biologists to make complex biological models.

- [**New cardiac catheter combines light and ultrasound to measure plaques**](#) [周三, 04 10月 02:45]

Biomedical engineers have combined intravascular ultrasound with fluorescence lifetime imaging in a single catheter probe that can image the tiny arteries of a living heart. The new catheter can simultaneously retrieve structural and biochemical information about arterial plaque that

could more reliably predict heart attacks.

• [**Designer biosensor can detect antibiotic production by microbes**](#) [周三, 04 10月 02:45]

Researchers from North Carolina State University have engineered designer biosensors that can detect antibiotic molecules of interest. The biosensors are a first step toward creating antibiotic-producing 'factories' within microbes such as E. coli.

• [**New portable blood analyzer could improve anemia detection worldwide**](#) [周三, 04 10月 01:32]

To reduce the burden of anemia, health officials need a better picture of the disease's global impact, an understanding made viable by a portable and affordable way to analyze blood. Researchers have now developed a device smaller than a toaster that can detect the level of hemoglobin in whole blood samples using optical absorbance.

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [Old Faithful's geological heart revealed](#) [周五, 06 10月 07:02]

Scientists have mapped the near-surface geology around Old Faithful, revealing the reservoir of heated water that feeds the geyser's surface vent and how the ground shaking behaves in between eruptions.

- [Interpreting hurricane forecast displays can be difficult for general public](#) [周五, 06 10月 03:11]

The 2017 hurricane season has highlighted the critical need to communicate a storm's impact path and intensity accurately, but new research shows significant misunderstandings of the two most commonly used storm forecast visualization methods.

- [Cost-effectiveness of guinea worm disease eradication](#) [周五, 06 10月 02:18]

Eradication of guinea worm disease (dracunculiasis), targeted by the World Health Organization (WHO) for the year 2015, is finally within reach, with only 25 reported human transmissions in 2016. Now, researchers have re-asserted the cost-effectiveness of the global Guinea Worm Eradication Programme (GWEP), some 30 years after it started.

- [Carbon feedback from forest soils to accelerate global warming](#) [周五, 06 10月 02:18]

After 26 years, the world's longest-running experiment to discover how warming temperatures affect forest soils has revealed a surprising, cyclical response: Soil warming stimulates periods of abundant carbon release from the soil to the atmosphere alternating with periods of no detectable loss in soil carbon stores. The study indicates that in a

warming world, a self-reinforcing and perhaps uncontrollable carbon feedback will occur between forest soils and the climate system, accelerating global...

- [**Decision to rescind Waters of the United States rule \(WOTUS\) based on flawed analysis**](#) [周五, 06 10月 02:18]

New evidence suggests that the Trump Administration's proposal to rescind the 2015 Waters of the United States (WOTUS) rule that would limit the scope of the Clean Water Act inappropriately overlooks wetlands-related values.

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [**Road pricing most effective in reducing vehicle emissions**](#) [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

- [**Key plant species may be important for supporting wildflower pollinators**](#) [周五, 06 10月 02:17]

Increased agricultural production has likely led to loss, fragmentation, and degradation of flower-rich habitats for pollinators. To counteract these negative effects of modern agricultural practices, efforts to maintain and restore diverse plants in agricultural landscapes -- called agri-environmental schemes -- have been implemented in numerous European countries.

- [**12,000 years ago, Florida hurricanes heated up despite chilly seas**](#) [周五, 06 10月 00:50]

Category 5 hurricanes may have slammed Florida repeatedly during the chilly Younger Dryas, 12,000 years ago. The cause? Hurricane-suppressing effects of cooler sea surface were out-weighed by side effects of slowed ocean circulation.

- [**Air pollution exposure on home-to-school routes reduces the growth of working memory**](#) [周五, 06 10月 00:50]

A new study has demonstrated that exposure to air pollution on the way to school can have damaging effects on children's cognitive development. The study found an association between a reduction in working memory and exposure to fine particulate matter (PM2.5) and black carbon during the walking commute to and from school.

- [**Liverwort genes and land plant evolution**](#) [周五, 06 10月 00:11]

The common liverwort is a living link to the transition from marine algae to land plants. Biologists have analyzed the genome sequence of the common liverwort (*Marchantia polymorpha*) to identify genes and gene families that were deemed crucial to plant evolution and have been conserved over millions of years and across plant lineages.

- [**Germs in the kitchen: Salmonella better known than Campylobacter**](#) [周五, 06 10月 00:11]

What health risks are consumers aware of? What are they concerned about?

- [**How yellow and blue make green in parrots**](#) [周五, 06 10月 00:11]

Many brightly colored birds get their pigments from the foods that they eat, but that's not true of parrots. Now, researchers reporting a study of familiar pet store parakeets -- also known as budgies -- have new evidence to explain how the birds produce their characteristic yellow, blue, and green feathers.

- [**Once declared extinct, Lord Howe Island stick**](#)

[**insects really do live**](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead Lord Howe Island stick insects have some good news: those rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

[**Novel PET tracer identifies most bacterial infections**](#) [周四, 05 10月 23:11]

Medical scientists have developed a novel imaging agent that could be used to identify most bacterial infections.

[**New 'molecular trap' cleans more radioactive waste from nuclear fuel rods**](#) [周四, 05 10月 23:10]

A new method for capturing radioactive waste from nuclear power plants is cheaper and more effective than current methods, a potential boon for the energy industry, according to new research.

[**Athletes and health aficionados: The lupine protein beverage**](#) [周四, 05 10月 22:39]

With its intensive colors and many blossoms, the lupine looks like an ornamental plant. Yet, the tall lupine is far too good to be used decoratively as the plant's seeds contain nutritious proteins. However, it is rather complicated to make lupines edible for humans.

[**Tracking debris in the Earth's orbit with centimeter precision using efficient laser technology**](#) [周四, 05 10月 22:38]

Uncontrollable flying objects in orbit are a massive risk for modern space travel, and, due to our dependence on satellites today, it is also a risk to global economy. Scientists have now developed a fiber laser that reliably determines the position and direction of the space debris' movement to mitigate these risks.

- **[Lake water mixing: The might of the microorganism?](#)** [周四, 05 10月 22:32]

Can microorganisms cause lake water to be mixed? The answer given by previous studies is no, since the movement of small, slow-swimming bacteria is not sufficient to disturb the stratification of lake water induced by differences in, for example, temperature or salinity.

- **[Modified peptides could boost plant growth and development](#)** [周四, 05 10月 22:27]

A new study of peptide hormones critical for plant development could result in wide-ranging benefits for agriculture, tissue culture, and related industries, and even improve knowledge of peptides in humans. The study synthesized and examined the function of CLE peptides, a relatively new class of the peptide hormone family in plants.

- **[A need for bananas? Dietary potassium regulates calcification of arteries](#)** [周四, 05 10月 22:27]

Researchers have shown, for the first time, that reduced dietary potassium promotes elevated aortic stiffness in a mouse model. Such arterial stiffness in humans is predictive of heart disease and death from heart disease, and it represents an important health problem for the nation. The researchers also found that increased dietary potassium levels lessened vascular calcification and aortic stiffness. Furthermore, they unraveled the molecular mechanism underlying the effects of low or high dietary potassium.

- **[Climate solution in soil?](#)** [周四, 05 10月 22:26]

The land under our feet and the plant matter it contains could offset a significant amount of carbon emissions if managed properly. More research is needed to unlock soil's potential to mitigate global warming, improve crop yields and increase resilience, say researchers.

- **[Did Teddy Evans fatally undermine Scott of the Antarctic?](#)** [周四, 05 10月 22:26]

Scientists have uncovered documents and diary entries that suggest a

team member stole food Scott needed, failed to pass on orders that would have sent out a dog team to meet the men and then changed his story over time to cover up his role in their deaths.

- [**Vertigo and understanding the body's balance system**](#) [周四, 05 10月 22:26]

Finding out what's happening in the brains of people with balance disorders, such as vertigo, might be one step closer following new research on the vestibular system, which controls balance and movement. An interdisciplinary team of optical physicists and biologists has found a novel way, using optical tweezers, or focused beams of light, to understand the vestibular system while animals are still, not moving.

- [**How cells adapt to help repair damage**](#) [周四, 05 10月 22:26]

Genetic processes that allow cells to transform so they can mend damaged nerves have been identified by scientists.

- [**Supervolcanoes: Magma chambers have a sponge-like structure**](#) [周四, 05 10月 22:26]

Researchers show that magma chambers under supervolcanoes are more like soggy sponges than reservoirs of molten rock. Before a volcano of this kind erupts, such mush must slowly be reactivated by heat input following deep magma recharge ultimately derived from the Earth's mantle.

- [**Sunlight and 'right' microbes convert Arctic carbon into carbon dioxide**](#) [周四, 05 10月 04:38]

A new study outlines the mechanisms and points to the importance of both sunlight and the right microbial community as keys to converting permafrost carbon to CO₂.

- [**Climate change, population growth may lead to open ocean aquaculture**](#) [周四, 05 10月 04:37]

A new analysis suggests that open-ocean aquaculture for three species of finfish is a viable option for industry expansion under most climate

change scenarios -- an option that may provide a new source of protein for the world's growing population.

- [**Are we at a tipping point with weed control?**](#) [周四, 05 10月 04:20]

Imagine walking the cereal aisle at your favorite grocery store. Are you reading labels? Scanning prices? Thinking about weeds? If you're like most American consumers, weeds probably aren't at the forefront of your mind when buying food. But if farmers could no longer control weeds with existing herbicides, Americans would take notice pretty quickly.

- [**New nanomaterial can extract hydrogen fuel from seawater**](#) [周四, 05 10月 04:20]

A new hybrid nanomaterial harvests solar energy and uses it to extract hydrogen from seawater, cheaply and efficiently. Future commercialization could mean a new source of environmentally friendly fuel and less dependence on fossil fuels.

- [**Ancient humans left Africa to escape drying climate**](#) [周四, 05 10月 03:12]

Humans migrated out of Africa as the climate shifted from wet to dry about 60,000 years ago, according to new paleoclimate research. What the northeast Africa climate was like when people migrated from Africa into Eurasia between 70,000 and 55,000 years ago is still uncertain. The new research shows around 70,000 years ago, the Horn of Africa climate shifted from a wet phase called 'Green Sahara' to even drier than the region is now.

- [**Test reveals antibiotic-resistant bacteria in a half hour**](#) [周四, 05 10月 02:26]

A new test can identify whether bacteria are resistant to antibiotics in a mere half hour, giving medical professionals a new tool for fighting infections and superbug bacteria.

- [**Ornamented artifact may indicate long-distance exchange between Mesolithic communities**](#) [周四, 05 10月 02:26]

An ornamented bâton percé found in Central Poland may provide evidence of exchange between Mesolithic communities, according to a study.

- [**Light-activated nanoparticles can supercharge current antibiotics**](#) [周四, 05 10月 02:26]

Light-activated nanoparticles, also known as quantum dots, can provide a crucial boost in effectiveness for antibiotic treatments used to combat drug-resistant superbugs such as E. coli and Salmonella, new research shows.

- [**Meet Madagascar's oldest animal lineage, a whirligig beetle with 206-million-year-old origins**](#) [周四, 05 10月 02:01]

A new study suggests the Malagasy striped whirligig beetle *Heterogyrus milloti* boasts a genetic pedigree stretching back to the late Triassic period.

- [**Win-win for spotted owls and forest management**](#) [周四, 05 10月 02:01]

Remote sensing technology has detected what could be a win for both spotted owls and forestry management, according to a study.

- [**A new way to produce clean hydrogen fuel from water using sunlight**](#) [周四, 05 10月 02:01]

Researchers combined graphitic carbon nitride and black phosphorous to make a new metal-free composite photocatalyst capable of producing hydrogen from water. The photocatalyst featured good photocatalytic production of hydrogen, even when powered by low-energy near infrared light.

- [**Accurately transcribing DNA overrides DNA repair, researchers find**](#) [周四, 05 10月 01:36]

Researchers found that in the model organism E. coli, the fidelity of transcribing DNA comes at the expense of DNA repair.

• [**Cell stress response sheds light on treating inflammation-related cancer, aging**](#) [周四, 05 10月 01:35]

Stress -- defined broadly -- can have a profoundly deleterious effect on the human body. Even individual cells have their own way of dealing with environmental strains such as ultraviolet radiation from the sun or germs. One response to stress -- called senescence -- can trigger cells to stop dividing in cases of cancer and aging. This may hold promise for treating inflammation-related disorders.

• [**In warmer climates, Greenlandic deltas have grown**](#) [周四, 05 10月 01:35]

Unlike most other deltas worldwide, Greenland's are growing -- a trend with major consequences for both fishing and tourism.

• [**A tubular structure to stop cell growth**](#) [周四, 05 10月 01:35]

TORC1 is an enzyme complex that controls the normal growth of our cells; but, when too active, it can promote diseases such as cancer. A new study describes how sugar regulates the activity of TORC1, through a surprising mechanism. In the absence of sugar, TORC1s assemble into a tubular structure, rendering them inactive and thus cell growth stops.

• [**Fish shrinking as ocean temperatures rise**](#) [周四, 05 10月 01:35]

One of the most economically important fish is shrinking in body weight, length and overall physical size as ocean temperatures rise, according to new research by LSU Boyd Professor R. Eugene Turner published today. The average body size of Menhaden -- a small, silver fish -- caught off the coasts from Maine to Texas -- has shrunk by about 15 percent over the past 65 years.

• [**Bumblebees shed light on why some individuals are smarter than others**](#) [周四, 05 10月 01:28]

By examining the brains of bees trained to different tasks, the researchers found that the number of connections between nerve cells may hold the answer to questions about individual cognitive differences. Bees with a greater density of nerve connections (known as synaptic

complexes) in a specific part of their brains had better memories and learned faster than bees with fewer connections in these areas.

- [**In Iceland stream, possible glimpse of warming future**](#) [周四, 05 10月 01:26]

When a normally cold stream in Iceland was warmed, the make-up of life inside changed as larger organisms thrived while smaller ones struggled. The findings carry implications for life in a warming climate.

- [**New fundamental insight into the battle against bacteria**](#) [周四, 05 10月 01:25]

The intestinal bacterium *E. coli* can adapt to changes in its surroundings. Scientists have discovered how the H-NS protein makes this possible. This new knowledge can be an important starting point in combating bacteria and diseases such as peritonitis.

- [**The vitamin ergothioneine: an antioxidant for oxygen-free areas?**](#) [周四, 05 10月 00:05]

Chemists have been able to show for the first time that anaerobic bacteria can produce the vitamin ergothioneine in the absence of oxygen. This suggests that bacteria were forming this compound even before there was oxygen in the Earth's atmosphere. The vitamin's function therefore remains a mystery, as it was previously ascribed a role in oxygen-dependent processes.

- [**Research rethinks the evolutionary importance of variability in a population**](#) [周四, 05 10月 00:05]

It's been long thought that variability within a population is key to population's growth and survival but new research questions that assumption. Researchers found that variability can actually lower population growth in single-cell organisms. This insight is important for characterizing the fitness of a population, which is useful, for instance, in understanding how bacteria respond to antibiotics.

- [**Antifungals and probiotics may play a key role in the development of treatment for Crohn's**](#)

[disease](#) [周四, 05 10月 00:05]

Scientists have determined that fungus may play a key role in chronic intestinal inflammation disorders. They found that patients with Crohn's disease tend to have much higher levels of the fungus *Candida tropicalis* compared to their healthy family members. A new review looks at these findings and provides insights into potential new therapeutic approaches using antifungals and probiotics in the treatment of inflammatory bowel diseases (IBD) such as Crohn's disease (CD).

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [**Pushy or laid back? Economic factors influence parenting style**](#) [周五, 06 10月 07:03]

A new study argues that parenting styles are shaped by economic factors that incentivize one strategy over others.

- [**'Transformative' research unrealistic to predict, scientists tell granting agencies**](#) [周五, 06 10月 07:03]

Research-funding agencies that require scientists to declare at the proposal stage how their projects will be 'transformative' may actually be hindering discovery.

- [**Screen children with reading difficulties for hearing problems**](#) [周五, 06 10月 07:02]

A new study found 25 percent of its young participants who had reading difficulties showed mild or moderate hearing impairment, of which their parents and teachers were unaware.

- [**Multiple research approaches are key to pandemic preparedness**](#) [周五, 06 10月 03:11]

Preparedness in the face of major disease outbreaks can save thousands of lives. A new article examines the multifaceted nature of effective preparedness and the role that biomedical research plays. Specifically, the article examines three approaches to pandemic preparedness: pathogen-specific work, platform-based technologies, and prototype-pathogen efforts.

- [**Interpreting hurricane forecast displays can be**](#)

[difficult for general public](#) [周五, 06 10月 03:11]

The 2017 hurricane season has highlighted the critical need to communicate a storm's impact path and intensity accurately, but new research shows significant misunderstandings of the two most commonly used storm forecast visualization methods.

• **[Decision to rescind Waters of the United States rule \(WOTUS\) based on flawed analysis](#)** [周五, 06 10月 02:18]

New evidence suggests that the Trump Administration's proposal to rescind the 2015 Waters of the United States (WOTUS) rule that would limit the scope of the Clean Water Act inappropriately overlooks wetlands-related values.

• **[Middle managers may turn to unethical behavior to face unrealistic expectations](#)** [周五, 06 10月 02:17]

While unethical behavior in organizations is often portrayed as flowing down from top management, or creeping up from low-level positions, a team of researchers suggest that middle management also can play a key role in promoting wide-spread unethical behavior among their subordinates.

• **[Why lab researchers should talk with industry counterparts](#)** [周五, 06 10月 02:17]

A research team has found both obstacles and lessons from the process of getting a novel membrane for chemical processing out of the lab into the commercial world.

• **[Delivering bad news? Don't beat around the bush](#)** [周五, 06 10月 02:17]

New research shows that when it comes to receiving bad news, most people prefer directness, candor and very little -- if any -- buffer.

• **[Road pricing most effective in reducing vehicle emissions](#)** [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside

advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

- [**Something universal occurs in the brain when it processes stories, regardless of language**](#) [周五, 06 10月 02:17]

New brain research shows that reading stories generates activity in the same regions of the brain for speakers of three different languages.

- [**Air pollution exposure on home-to-school routes reduces the growth of working memory**](#) [周五, 06 10月 00:50]

A new study has demonstrated that exposure to air pollution on the way to school can have damaging effects on children's cognitive development. The study found an association between a reduction in working memory and exposure to fine particulate matter (PM2.5) and black carbon during the walking commute to and from school.

- [**Fingerprints lack scientific basis for legal certainty**](#) [周四, 05 10月 23:11]

A new report on the quality of latent fingerprint analysis says that courtroom testimony and reports stating or even implying that fingerprints collected from a crime scene belong to a single person are indefensible and lack scientific foundation.

- [**Beer brands popular among youth violate code with youth-appealing ads**](#) [周四, 05 10月 22:27]

Alcohol brands popular among underage drinkers are more likely to air television advertisements that violate the industry's voluntary code by including youth-appealing content, according to a new study.

- [**Low-cost, high-volume services make up big portion of spending on unneeded health care**](#) [周四, 05 10月 22:27]

Low-cost, high-volume health services account for a high percentage of unnecessary health spending, adding strain to the health care system.

- [**Caution ahead: The growing challenge for drivers' attention**](#) [周四, 05 10月 22:27]

Many of the infotainment features in most 2017 vehicles are so distracting they should not be enabled while a vehicle is in motion, according to a new study. The study found In-Vehicle Information Systems take drivers' attention off the road for too long to be safe.

- [**DNA-based Zika vaccine is safe and effective at inducing immune response**](#) [周四, 05 10月 07:05]

A new generation DNA-based Zika vaccine demonstrated both safety and ability to elicit an immune response against Zika in humans in a phase 1 clinical trial.

- [**Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

- [**Parole violations, not new crimes, help drive prison's revolving door**](#) [周四, 05 10月 02:27]

Failing a drug test, associating with felons and other technical parole violations are among the key drivers of prison's 'revolving door,' according to new American research.

- [**Win-win for spotted owls and forest management**](#) [周四, 05 10月 02:01]

Remote sensing technology has detected what could be a win for both spotted owls and forestry management, according to a study.

- [**In warmer climates, Greenlandic deltas have grown**](#) [周四, 05 10月 01:35]

Unlike most other deltas worldwide, Greenland's are growing -- a trend

with major consequences for both fishing and tourism.

- [**Assessing regional earthquake risk and hazards in the age of exascale**](#) [周四, 05 10月 00:05]

Researchers are building the first-ever end-to-end simulation code to precisely capture the geology and physics of regional earthquakes, and how the shaking impacts buildings.

- [**Albatross feces show diet of fishery discards**](#) [周四, 05 10月 00:04]

The first-ever analysis of fish DNA in albatross scat indicates a high level of interaction between seabirds and commercial fisheries. This non-invasive method could be used to assess whether fisheries are complying with discard policies. Extending the analysis to other marine predators could help monitor marine biodiversity and broader marine ecosystem changes.

- [**Safe motherhood campaign associated with more prenatal visits, birth planning, study finds**](#) [周四, 05 10月 00:04]

In Tanzania, pregnant women who were exposed to a national safe motherhood campaign designed to get them to visit health facilities for prenatal care and delivery were more likely to create birth plans and to attend more prenatal appointments.

- [**Rampant consumption of hippo teeth**](#) [周三, 04 10月 22:14]

Investigators have examined the case of hippo teeth and revealed discordance in trade volumes declared between importers and exporters -- a scenario that could threaten the survival of the species.

- [**Doing homework is associated with change in students' personality**](#) [周三, 04 10月 22:07]

Homework may have a positive influence on students' conscientiousness. Students who do more homework than their peers show positive changes in conscientiousness, according to new research. Thus, schools may be doing more than contributing to students' learning, but they may also be effecting changes of their students' personality.

- [**What is STEM education?**](#) [周三, 04 10月 21:51]

Everyone needs a good teacher -- including teachers. Two new studies show how digging deeper into what STEM education means and strategically designing online classrooms can enhance teaching science, technology, engineering, and math.

- [**Too little is known about wildfire smoke**](#) [周三, 04 10月 21:29]

How do fire-suppression chemicals and pesticides affect wildfire smoke and the health of those who breathe it? New research has discovered that this question cannot be answered based on current scientific evidence, say investigators.

- [**Neighborhood affluence linked to positive birth outcomes**](#) [周三, 04 10月 02:48]

It's not uncommon for new parents to relocate in search of neighborhoods with better schools, safer streets and healthier, more kid-friendly activities. But a new study has found that living in such neighborhoods before a baby is born protects against the risks of poor birth outcomes.

- [**Women firefighters can improve safety, but department culture must change**](#) [周三, 04 10月 02:45]

A new study has discerned that gender may be a unique contributor to safety, but hypermasculine fire service culture creates barriers.

- [**Twitter a hotbed of anti-vaccine sentiment**](#) [周二, 03 10月 23:11]

Anti-vaccine sentiment is alive and growing on social media, with California, Connecticut, Massachusetts, New York and Pennsylvania showing the most negative tweets, according to a new 5-year study.

- [**Social action may give youth a career edge, education faculty research suggests**](#) [周二, 03 10月 23:11]

When disadvantaged youth engage in social activism, they tend to have high-status occupations in adulthood, according to researchers. The findings also suggest there's a place for more discussion of social issues in our educational systems.

- [**New method to quantify life cycle land use of natural gas**](#) [周二, 03 10月 23:10]

A case study of the Barnett Shale region in Texas, where hydraulic fracturing was first implemented, for the first time provides quantifiable information on the life cycle land use of generating electricity from natural gas based on physical measurements instead of using assumptions and averages that were previously used for evaluation.

- [**U.S. breast cancer death rates dropped 39 percent between 1989 and 2015**](#) [周二, 03 10月 23:10]

Breast cancer death rates dropped 39 percent between 1989 and 2015, averting 322,600 breast cancer deaths during those 26 years. Death rates in several states are now statistically equivalent, perhaps reflecting an elimination of disparities in those states.

- [**Incidence of measles in the United States**](#) [周二, 03 10月 23:10]

From 2001 to 2015, the overall annual incidence of measles in the United States remained extremely low (less than 1 case/million population) compared with incidence worldwide (40 cases/million population). Relative increases in measles rates were observed over the period, and the findings suggest that failure to vaccinate may be the main driver of measles transmission, according to a study.

- [**European sea bass show chronic impairment after exposure to crude oil**](#) [周二, 03 10月 21:46]

We may be underestimating the long-term impact of oil spills on fish, particularly their ability to tolerate low oxygen environments, according to research.

- [**New method could help disrupt opioid crisis**](#) [周二, 03 10月 21:40]

Researchers have zeroed in on a unique component of heroin that could help zero in on the locations of origin for individual batches.

- [**Program for parents improves ADHD behaviors in young children**](#) [周二, 03 10月 21:39]

Effective early intervention is crucial for young children with ADHD, due to the unfavorable short-term and long-term outcomes associated with the disorder.

- [**Cutting absenteeism in primary schools**](#) [周二, 03 10月 08:23]

A pilot program reduced absenteeism in elementary schools by an average of 10 percent, according to a new study.

- [**Breakthrough cancer treatment brings hope and challenges**](#) [周二, 03 10月 08:23]

The first gene therapy for cancer will transform approaches to cancer treatments, but it poses ethical challenges for policy-makers.

- [**New source of radioactivity from Fukushima disaster**](#) [周二, 03 10月 04:12]

Scientists have found a previously unsuspected place where radioactive material from the Fukushima Dai-ichi nuclear power plant disaster has accumulated -- in sands and brackish groundwater beneath beaches up to 60 miles away. The sands took up and retained radioactive cesium originating from the disaster in 2011 and have been slowly releasing it back to the ocean.

- [**Firearm-related injuries account for \\$2.8 billion on emergency room and inpatient charges each year**](#) [周二, 03 10月 04:12]

A new study of more than 704,000 people who arrived alive at a United States emergency room for treatment of a firearm-related injury between 2006 and 2014 finds decreasing incidence of such injury in some age groups, increasing trends in others, and affirmation of the persistently high cost of gunshot wounds in dollars and human suffering.

- [**Most Americans want the government to combat climate change, some willing to pay a high amount**](#) [周二, 03 10月 02:49]

Sixty-one percent of Americans think climate change is a problem that the government needs to address, including 43 percent of Republicans

and 80 percent of Democrats, according to a new survey.

- [**Win-win strategies for climate and food security**](#)

[周一, 02 10月 20:48]

Efforts to reduce greenhouse gas emissions from the agriculture and forestry sectors could lead to increased food prices -- but new research identifies strategies that could help mitigate climate change while avoiding steep hikes in food prices.

- [**Adulteration of proprietary Chinese medicines and health products poses severe health risks**](#)

[周一, 02 10月 20:48]

Traditional Chinese medicine is widely used as a form of complementary medicine all over the world for various indications and for improving general health. Various reports have documented the adulteration of pCMs and health products with undeclared agents, including prescription drugs, drug analogues, and banned drugs. Such adulteration can have serious and even fatal consequences.

- [**Who's judging you based on brand choices?**](#)

[周六, 30 9月 03:22]

People with a flexible mindset do not tend to judge others based on the brands they use, while people with a fixed mindset use brands to judge another person's character, a new study shows.

- [**Physical abuse and punishment impact children's academic performance**](#)

[周六, 30 9月 03:22]

Scientists have found that physical abuse was associated with decreases in children's cognitive performance, while non-abusive forms of physical punishment were independently associated with reduced school engagement and increased peer isolation.

- [**Compound from oilseeds may be high-value product**](#)

[周六, 30 9月 01:35]

Extracting a substance called glucosinolate from camelina and carinata seeds may help bring these promising sources of biofuel one stop closer to reality.

- [**Video gamers have an advantage in learning**](#)

[周六, 30 9月 00:51]

[周六, 30

Neuropsychologists let video gamers compete against non-gamers in a learning competition. During the test, the video gamers performed significantly better and showed an increased brain activity in the brain areas that are relevant for learning.

· [**Helium found in coal seams could aid safe shale gas extraction**](#) [周六, 30 9月 00:50]

Natural deposits of helium gas found in UK coal seams could help scientists monitor the secure recovery of coal or shale gas from underground sites, according to research.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- [**Smartphone-controlled smart bandage for better, faster healing**](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [**How yellow and blue make green in parrots**](#) [周五, 06 10月 00:11]

Many brightly colored birds get their pigments from the foods that they eat, but that's not true of parrots. Now, researchers reporting a study of familiar pet store parakeets -- also known as budgies -- have new evidence to explain how the birds produce their characteristic yellow, blue, and green feathers.

- [**Once declared extinct, Lord Howe Island stick insects really do live**](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead Lord Howe Island stick insects have some good news: those

rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

• [More traits associated with your Neanderthal DNA](#) [周五, 06 10月 00:11]

After humans and Neanderthals met many thousands of years ago, the two species began interbreeding. Recent studies have shown that some of those Neanderthal genes have contributed to human immunity and modern diseases. Now researchers have found that our Neanderthal inheritance has contributed to other characteristics, too, including skin tone, hair color, sleep patterns, mood, and even a person's smoking status.

• [How much can watching hockey stress your heart?](#) [周四, 05 10月 22:27]

A new study suggests that both the thrill of victory and the agony of defeat can have a substantial effect on the cardiovascular system. Investigators took the pulse of fans during a hockey game and found that on average, their heart rate increased by 75 percent when watching on TV, and by a whopping 110 percent (more than doubled, equivalent to the cardiac stress with vigorous exercise) when watching in person.

• [Milky Way's 'most-mysterious star' continues to confound](#) [周四, 05 10月 07:05]

In 2015, a star called KIC 8462852 caused quite a stir in and beyond the astronomy community due to a series of rapid, unexplained dimming events. The latest findings from astronomers take a longer look at the star, going back to 2006 -- before its strange behavior was detected by Kepler.

• [The super-Earth that came home for dinner](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire solar system to one side. It is a possible "Planet Nine" -- a world perhaps

10 times the mass of Earth and 20 times farther from the sun than Neptune.

- [**Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

- [**Female fish like males who sing**](#) [周四, 05 10月 00:05]

Noisier seas seem to hamper fish reproduction. New research shows that noise pollution impedes reproduction in sand and common gobies, both of which are important food sources for juvenile cod.

- [**Burmese python's hungry escapades may have consequences for human health**](#) [周三, 04 10月 22:12]

As the large, invasive Burmese python eats its way through south Florida's mammals, the mosquitoes in the area have fewer types of animals to bite. Now, more mosquitoes are drawing blood from a rat that carries a virus dangerous to humans.

- [**Prehistoric squid was last meal of newborn ichthyosaur 200 million years ago**](#) [周二, 03 10月 21:39]

Scientists have identified the smallest and youngest specimen of *Ichthyosaurus communis* on record and found an additional surprise preserved in its stomach.

- [**Ancient petrified salamander reveals its last meal**](#) [周二, 03 10月 21:39]

A new study on an exceptionally preserved salamander from the Eocene of France reveals that its soft organs are conserved under its skin and bones. Organs preserved in three dimensions include the lung, nerves, gut, and within it, the last meal of the animal, according to a new study.

- [**Monstrous crocodile fossil points to early rise of ancient reptiles**](#) [周二, 03 10月 08:22]

A newly identified prehistoric marine predator has shed light on the origins of the distant relatives of modern crocodiles.

- [**Immature flies in Central Park subsist on duck droppings**](#) [周二, 03 10月 04:12]

Introducing *Themira lohmanus*, a fly like no other, and the most recently discovered species in the popular Manhattan urban oasis of Central Park. The immature insects subsist on duck droppings.

- [**Meteorite tells us that Mars had a dense atmosphere 4 billion years ago**](#) [周一, 02 10月 23:42]

Exploration missions have suggested that Mars once had a warm climate, which sustained oceans on its surface. To keep Mars warm requires a dense atmosphere with a sufficient greenhouse effect, while the present-day Mars has a thin atmosphere whose surface pressure is only 0.006 bar, resulting in the cold climate it has today. It has been a big mystery as to when and how Mars lost its dense atmosphere.

- [**First look at electrons escaping atoms**](#) [周一, 02 10月 23:27]

Researchers have taken a first step toward controlling electrons' behavior inside matter -- and thus the first step down a long and complicated road that could eventually lead to the ability to create new states of matter at will.

- [**Asphalt helps lithium batteries charge faster**](#) [周一, 02 10月 22:52]

A touch of asphalt may be the secret to high-capacity lithium batteries that charge up to 20 times faster than commercial lithium-ion batteries, according to scientists.

- [**DNA: The next hot material in photonics?**](#) [周一, 02 10月 22:52]

Using DNA from salmon, researchers in South Korea hope to make better biomedical and other photonic devices based on organic thin films.

- **[Animals that play with objects learn how to use them as tools](#)** [周一, 02 10月 22:52]

New Caledonian crows and kea parrots can learn about the usefulness of objects by playing with them -- similar to human baby behavior.

- **[Ellectricity produced from tears](#)** [周一, 02 10月 22:51]

A team of scientists has discovered that applying pressure to a protein found in egg whites and tears can generate electricity. The researchers observed that crystals of lysozyme, a model protein that is abundant in egg whites of birds as well as in the tears, saliva and milk of mammals can generate electricity when pressed.

- **[Body energy as a power source](#)** [周一, 02 10月 20:56]

Smartphones, MP3 players, sports electronics devices such as pulse meters or trackers, medical equipment such as tonometers, pacemakers of the heart, or insulin pumps: An increasing number of electronic companions make daily life easier for us. But as useful these smart helpers may be: Their constant hunger for electricity is a problem. The solution: power supply by means of energy produced by body movements.

- **[A sea of spinning electrons](#)** [周一, 02 10月 20:48]

Picture two schools of fish swimming in clockwise and counterclockwise circles. It's enough to make your head spin, and now scientists have discovered the 'chiral spin mode' -- a sea of electrons spinning in opposing circles.

- **['Revolutionary' new gesture control tech turns any object into a TV remote](#)** [周一, 02 10月 10:53]

Imagine changing the channel of your TV simply by moving your cup of tea, adjusting the volume on a music player by rolling a toy car, or rotating a spatula to pause a cookery video on your tablet. New gesture control technology that can turn everyday objects into remote controls could revolutionize how we interact with televisions, and other screens - - ending frustrating searches for remotes that have slipped down the side of sofa cushions.

- [**Small collisions make big impact on Mercury's thin atmosphere**](#) [周五, 29 9月 23:29]

Mercury, our smallest planetary neighbor, has very little to call an atmosphere, but it does have a strange weather pattern: morning micro-meteor showers.

- [**New clues from brain structures of mantis shrimp**](#) [周五, 29 9月 21:33]

New research sheds new light on the evolution of some of the earliest brain structures, and stirs up new, intriguing questions about the origins of centers that support learning and memory.

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- [**NASA's MAVEN mission finds Mars has a twisted magnetic tail**](#) [周五, 20 10月 06:18]

Mars has an invisible magnetic 'tail' that is twisted by interaction with the solar wind, according to new research using data from NASA's MAVEN spacecraft.

- [**New NASA study improves search for habitable worlds**](#) [周五, 20 10月 06:18]

New NASA research is helping to refine our understanding of candidate planets beyond our solar system that might support life.

- [**Be concerned about how apps collect, share health data, expert says**](#) [周五, 20 10月 05:16]

Americans should be concerned about how health and wellness apps collect, save and share their personal health data, a medical media expert says.

- [**Climate shifts shorten marine food chain off California**](#) [周五, 20 10月 05:16]

Environmental disturbances such as El Niño shake up the marine food web off Southern California, new research shows, countering conventional thinking that the hierarchy of who-eats-who in the ocean

remains largely constant over time.

- [**Three million Americans carry loaded handguns daily, study finds**](#) [周五, 20 10月 04:42]

An estimated 3 million adult American handgun owners carry a firearm loaded and on their person on a daily basis, and 9 million do so on a monthly basis, new research indicates. The vast majority cited protection as their primary reason for carrying a firearm. It is the first research in more than 20 years to scrutinize why, how often, and in what manner US adults carry loaded handguns.

- [**Field trips of the future?**](#) [周五, 20 10月 04:42]

A biologist examines the benefits and drawbacks of virtual and augmented reality in teaching environmental science.

- [**Newly discovered viral marker could help predict flu severity in infected patients**](#) [周五, 20 10月 04:42]

Flu viruses contain defective genetic material that may activate the immune system in infected patients, and new research published in PLOS Pathogens suggests that lower levels of these molecules could increase flu severity.

- [**The blob that ate the tokamak: Physicists gain understanding of bubbles at edge of plasmas**](#) [周五, 20 10月 03:05]

Scientists have completed new simulations that could provide insight into how blobs at the plasma edge behave. The simulations performed kinetic simulations of two different regions of the plasma edge simultaneously.

- [**Using optical chaos to control the momentum of light**](#) [周五, 20 10月 03:05]

Controlling and moving light poses serious challenges. One major hurdle is that light travels at different speeds and in different phases in different components of an integrated circuit. For light to couple between optical components, it needs to be moving at the same momentum. Now, a team of researchers has demonstrated a new way to

control the momentum of broadband light in a widely-used optical component known as a whispering gallery microcavity (WGM).

- [**New tyrannosaur fossil is most complete found in Southwestern US**](#) [周五, 20 10月 02:30]

A fossilized skeleton of a tyrannosaur discovered in Utah's Grand Staircase-Escalante National Monument was airlifted by helicopter Oct 15, and delivered to the Natural History Museum of Utah where it will be uncovered, prepared, and studied. The fossil is approximately 76 million years old and is likely an individual of the species *Teratophoneus curriei*.

- [**Studying insect behavior? Make yourself an ethoscope!**](#) [周五, 20 10月 02:30]

Fruit flies have surprising similarities to humans. The mysteries of a broad range of human conditions can be studied in detail in these organisms, however this often requires the use of expensive custom equipment. team of scientists now present the ethoscope -- a cheap, easy-to-use and self-made customizable piece of equipment of their invention that can be used to study flies' behavior.

- [**Flu simulations suggest pandemics more likely in spring, early summer**](#) [周五, 20 10月 02:30]

New statistical simulations suggest that Northern Hemisphere flu pandemics are most likely to emerge in late spring or early summer at the tail end of the normal flu season, according to a new study.

- [**Brain training can improve our understanding of speech in noisy places**](#) [周五, 20 10月 02:30]

For many people with hearing challenges, trying to follow a conversation in a crowded restaurant or other noisy venue is a major struggle, even with hearing aids. Now researchers have some good news: time spent playing a specially designed, brain-training audiogame could help.

- [**Ancient DNA offers new view on saber-toothed**](#)

[cats' past](#) [周五, 20 10月 02:30]

Researchers who've analyzed the complete mitochondrial genomes from ancient samples representing two species of saber-toothed cats have a new take on the animals' history over the last 50,000 years. The data suggest that the saber-toothed cats shared a common ancestor with all living cat-like species about 20 million years ago. The two saber-toothed cat species under study diverged from each other about 18 million years ago.

• [Gut bacteria from wild mice boost health in lab mice](#) [周五, 20 10月 02:30]

Laboratory mice that are given the gut bacteria of wild mice can survive a deadly flu virus infection and fight colorectal cancer dramatically better than laboratory mice with their own gut bacteria, researchers report.

• [Evolution in your back garden: Great tits may be adapting their beaks to birdfeeders](#) [周五, 20 10月 02:30]

A British enthusiasm for feeding birds may have caused UK great tits to have evolved longer beaks than their European counterparts, according to new research. The findings identify for the first time the genetic differences between UK and Dutch great tits which researchers were then able to link to longer beaks in UK birds.

• [H7N9 influenza is both lethal and transmissible in animal model for flu](#) [周五, 20 10月 02:30]

In 2013, an influenza virus began circulating among poultry in China. It caused several waves of human infection and as of late July 2017, nearly 1,600 people had tested positive for avian H7N9. Nearly 40 percent of those infected had died. In 2017, a medical researcher received a sample of H7N9 virus isolated from a patient in China who had died of the flu. He and his research team subsequently began work to characterize and understand it.

• [Liquid metal discovery ushers in new wave of](#)

[chemistry and electronics](#) [周五, 20 10月 02:30]

Researchers use liquid metal to create atom-thick 2-D never before seen in nature. The research could transform how we do chemistry and could also be applied to enhance data storage and make faster electronics.

[Tracing cell death pathway points to drug targets for brain damage, kidney injury, asthma](#)

[周五, 20 10月 02:29]

Scientists are unlocking the complexities of a recently discovered cell death process that plays a key role in health and disease, and new findings link their discovery to asthma, kidney injury and brain trauma. The results are the early steps toward drug development that could transform emergency and critical care treatment.

[Water striders illustrate evolutionary processes](#) [周

五, 20 10月 02:29]

How do new species arise and diversify in nature? Natural selection offers an explanation, but the genetic and environmental conditions behind this mechanism are still poorly understood. Researchers have just figured out how water striders (family Veliidae) of the genus Rhagovelia developed fan-like structures at the tips of their legs. These structures allow them to move upstream against the current, a feat beyond the abilities of other water striders that don't have fans.

[Discovery lights path for Alzheimer's research](#) [周

五, 20 10月 02:29]

A metallic probe invented at Rice University that lights up when it binds to a misfolded amyloid beta peptide has identified a binding site that could facilitate better drugs to treat Alzheimer's disease. When the probe is illuminated, it catalyzes oxidation of the protein in a way that might keep it from aggregating in the brains of patients.

[Gene circuit switches on inside cancer cells, triggers immune attack](#) [周五, 20 10月 02:29]

Researchers have developed a synthetic gene circuit that triggers the body's immune system to attack cancers when it detects signs of the disease.

[Renewable resource: To produce vital lipoid](#)

[acid, sulfur is used, then replenished](#) [周五, 20 10月 02:29]

New research shows how a protein is consumed, then reconstituted, during the production of a compound required for converting energy from food into a form that can be used by our cells. The results could help scientists to understand why humans with a fatal condition -- defects in an iron-sulfur carrier gene -- have deficiencies in this lipoic acid compound.

• [One to 10 mutations are needed to drive cancer, scientists find](#) [周五, 20 10月 02:29]

For the first time, scientists have provided unbiased estimates of the number of mutations needed for cancers to develop, in a study of more than 7,500 tumors across 29 cancer types. Researchers have adapted a technique from the field of evolution to confirm that, on average, one to ten driver mutations are needed for cancer to emerge.

• [Key psychiatric drug target comes into focus](#) [周五, 20 10月 02:29]

One way or another, many psychiatric drugs work by binding to receptor molecules in the brain that are sensitive to the neurotransmitter dopamine, a chemical signal that is central to how our experiences shape our behavior. But because scientists still don't understand the differences between the many kinds of dopamine receptors present on brain cells, most of these drugs are 'messy,' binding to multiple different dopamine receptor molecules and leading to serious side effects ranging from moveme...

• [Gut bacterium indirectly causes symptoms by altering fruit fly microbiome](#) [周五, 20 10月 02:27]

CagA, a protein produced by the bacterium *Helicobacter pylori*, can alter the population of microbes living in the fruit fly gut, leading to disease symptoms, according to new research.

• [New machine learning system can automatically identify shapes of red blood cells](#) [周五, 20 10月 02:26]

Using a computational approach known as deep learning, scientists have

developed a new system to classify the shapes of red blood cells in a patient's blood. The findings, published in PLOS Computational Biology, could potentially help doctors monitor people with sickle cell disease.

- [**Key molecular link in major cell growth pathway**](#) [周五, 20 10月 01:45]

A team of scientists has uncovered a surprising molecular link that connects how cells regulate growth with how they sense and make available the nutrients required for growth. The researchers' findings also implicate a new protein, SLC38A9, as a potential drug target in pancreatic cancer.

- [**Extreme light trapping**](#) [周五, 20 10月 00:38]

Physicists have built a nanostructure whose crystal lattice bends light as it enters the material and directs it in a path parallel to the surface, known as "parallel to interface refraction."

- [**Psychologists develop new model that links emotions and mental health**](#) [周五, 20 10月 00:18]

For decades psychologists have studied how people regulate emotions using a multitude of ways to conceptualize and assess emotion regulation. Now a recent study shows how a new assessment model can give clinicians an exciting new way to think about clinical diagnoses including anxiety, mood, and developmental disorders.

- [**Creating a better RNA switch**](#) [周五, 20 10月 00:18]

Researchers have developed a new RNA switch that activates genes thousands of times better than nature and has applications in diagnostics and metabolic engineering.

- [**Rheumatoid arthritis linked to an increased risk of COPD**](#) [周五, 20 10月 00:18]

New research suggests that rheumatoid arthritis may increase the risk of developing chronic obstructive pulmonary disease (COPD).

- [**Strange but true: Turning a material upside**](#)

[down can sometimes make it softer](#) [周四, 19 10月 23:10]

Through the combined effect of flexoelectricity and piezoelectricity, researchers have found that polar materials can be made more or less resistant to dents when they are turned upside down... or when a voltage is applied to switch their polarization. This research points to the future development of 'smart mechanical materials' for use in smart coatings and ferroelectric memories.

• [Scientists solve a magnesium mystery in rechargeable battery performance](#) [周四, 19 10月 23:10]

Scientists have discovered a surprising set of chemical reactions involving magnesium that degrade battery performance even before the battery can be charged up. The findings could steer the design of next-gen batteries.

• [Six degrees of separation: Why it is a small world after all](#) [周四, 19 10月 23:10]

This study examines how small-world networks occur within bigger and more complex structures.

• [Help sought from complementary, alternative medicine to remedy health problems](#) [周四, 19 10月 23:10]

It found that complementary and alternative medicine is being used in connection with various health problems, particularly in situations where help provided by conventional medicine is considered by the patient to be inadequate.

• [International patients increasingly seek in vitro fertilization treatment in US](#) [周四, 19 10月 23:10]

The use of assisted reproductive technology (ART) in the US by non-US residents is growing, research shows. These 'reproductive tourists' are more likely, compared to Americans, to use egg donors and carriers and genetically screen early embryos.

• [A mosquito's secret weapon: a light touch and strong wings](#) [周四, 19 10月 22:10]

How do mosquitoes land and take off without our noticing? Using high-speed video cameras, researchers have found part of the answer: mosquitoes' long legs allow them to slowly and gently push off, but their wings provide the majority of the lift, even when fully laden with a blood meal. For comparison, mosquitoes push off with forces much less than those of an escaping fruit fly.

- [**Noxious ice cloud on Saturn's moon Titan**](#) [周四, 19 10月 22:10]

Researchers with NASA's Cassini mission found evidence of a toxic hybrid ice in a wispy cloud high above the south pole of Saturn's largest moon, Titan.

- [**Maintaining fish biomass the key to conserving reef fish biodiversity**](#) [周四, 19 10月 22:10]

A new study has found that conserving fish diversity in Madagascar's coral reef systems may depend on maintaining fish biomass above critical levels.

- [**Declining baby songbirds need forests to survive drought**](#) [周四, 19 10月 22:10]

A new study aimed to identify characteristics that promote healthy wood thrush populations on US Department of Defense land.

- [**Scientists see order in complex patterns of river deltas**](#) [周四, 19 10月 22:10]

River deltas, with their intricate networks of waterways, coastal barrier islands, wetlands and estuaries, often appear to have been formed by random processes, but scientists see order in the apparent chaos.

- [**Researchers watch in real time as fat-encased drug nanoparticles invade skin cells**](#) [周四, 19 10月 22:10]

A new study describes the use of cutting-edge microscopy technology to visualize how liposomes escape from blood vessels into surrounding cells in a living mouse, offering clues that may help researchers design better drug delivery systems.

- [**Breast cancer cells recycle their own ammonia waste as fuel**](#) [周四, 19 10月 22:10]

Breast cancer cells recycle ammonia, a waste byproduct of cell metabolism, and use it as a source of nitrogen to fuel tumor growth, report scientists. The insights shed light on the biological role of ammonia in cancer and may inform the design of new therapeutic strategies to slow tumor growth.

- [**How female immune cells keep their second X chromosome shut off**](#) [周四, 19 10月 22:10]

Medical researchers describe how X chromosome inactivation is regulated in the immune system's B cells as they develop in bone marrow and when they encounter antigens.

- [**Scientists pinpoint jealousy in the monogamous mind**](#) [周四, 19 10月 22:10]

Scientists find that in male titi monkeys, jealousy is associated with heightened activity in the cingulate cortex, an area of the brain associated with social pain in humans, and the lateral septum, associated with pair bond formation in primates. A better understanding of jealousy may provide important clues on how to approach health and welfare problems such as addiction and domestic violence, as well as autism.

- [**The best hedge fund managers are not psychopaths or narcissists, according to new study**](#) [周四, 19 10月 22:10]

When it comes to financial investments, hedge fund managers higher in 'dark triad' personality traits -- psychopathy, narcissism, and Machiavellianism -- perform more poorly than their peers, according to new personality psychology research. The difference is a little less than 1 percent annually compared to their peers, but with large investments over several years that slight underperformance can add up.

- [**Slow Internet? New technology to speed up home broadband dramatically**](#) [周四, 19 10月 22:10]

Slow internet speeds and the Internet 'rush hour' -- the peak time when data speeds drop by up to 30 percent -- could be history with new hardware that provides consistently high-speed broadband connectivity.

. **[Fossil coral reefs show sea level rose in bursts during last warming](#)** [周四, 19 10月 22:09]

Scientists have discovered that Earth's sea level did not rise steadily when the planet's glaciers last melted during a period of global warming; rather, sea level rose sharply in punctuated bursts.

NASA's MAVEN mission finds Mars has a twisted magnetic tail -- ScienceDaily

Mars has an invisible magnetic "tail" that is twisted by interaction with the solar wind, according to new research using data from NASA's MAVEN spacecraft.

NASA's Mars Atmosphere and Volatile Evolution Mission (MAVEN) spacecraft is in orbit around Mars gathering data on how the Red Planet lost much of its atmosphere and water, transforming from a world that could have supported life billions of years ago into a cold and inhospitable place today. The process that creates the twisted tail could also allow some of Mars' already thin atmosphere to escape to space, according to the research team.

"We found that Mars' magnetic tail, or magnetotail, is unique in the solar system," said Gina DiBraccio of NASA's Goddard Space Flight Center in Greenbelt, Maryland. "It's not like the magnetotail found at Venus, a planet with no magnetic field of its own, nor

is it like Earth's, which is surrounded by its own internally generated magnetic field. Instead, it is a hybrid between the two." DiBraccio is project scientist for MAVEN and is presenting this research at a press briefing Thursday, Oct. 19 at 12:15pm MDT during the 49th annual meeting of the American Astronomical Society's Division for Planetary Sciences in Provo, Utah.

The team found that a process called "magnetic reconnection" must have a big role in creating the Martian magnetotail because, if reconnection were occurring, it would put the twist in the tail.

"Our model predicted that magnetic reconnection will cause the Martian magnetotail to twist 45 degrees from what's expected based on the direction of the magnetic field carried by the solar wind," said DiBraccio. "When we compared those predictions to MAVEN data on the directions of the Martian and solar wind magnetic fields, they were in very good agreement."

Mars lost its global magnetic field billions of years ago and now just has remnant "fossil" magnetic fields embedded in certain regions of its surface. According to the new work, Mars' magnetotail is formed when

magnetic fields carried by the solar wind join with the magnetic fields embedded in the Martian surface in a process called magnetic reconnection. The solar wind is a stream of electrically conducting gas continuously blowing from the Sun's surface into space at about one million miles (1.6 million kilometers) per hour. It carries magnetic fields from the Sun with it. If the solar wind field happens to be oriented in the opposite direction to a field in the Martian surface, the two fields join together in magnetic reconnection.

The magnetic reconnection process also might propel some of Mars' atmosphere into space. Mars' upper atmosphere has electrically charged particles (ions). Ions respond to electric and magnetic forces and flow along magnetic field lines. Since the Martian magnetotail is formed by linking surface magnetic fields to solar wind fields, ions in the Martian upper atmosphere have a pathway to space if they flow down the magnetotail. Like a stretched rubber band suddenly snapping to a new shape, magnetic reconnection also releases energy, which could actively propel ions in the Martian atmosphere down the magnetotail into space.

Since Mars has a patchwork of surface magnetic fields, scientists had suspected that the Martian magnetotail

would be a complex hybrid between that of a planet with no magnetic field at all and that found behind a planet with a global magnetic field. Extensive MAVEN data on the Martian magnetic field allowed the team to be the first to confirm this. MAVEN's orbit continually changes its orientation with respect to the Sun, allowing measurements to be made covering all of the regions surrounding Mars and building up a map of the magnetotail and its interaction with the solar wind.

Magnetic fields are invisible but their direction and strength can be measured by the magnetometer instrument on MAVEN, which the team used to make the observations. They plan to examine data from other instruments on MAVEN to see if escaping particles map to the same regions where they see reconnected magnetic fields to confirm that reconnection is contributing to Martian atmospheric loss and determine how significant it is. They also will gather more magnetometer data over the next few years to see how the various surface magnetic fields affect the tail as Mars rotates. This rotation, coupled with an ever-changing solar wind magnetic field, creates an extremely dynamic Martian magnetotail. "Mars is really complicated but really interesting at the same time," said DiBraccio.

The research was funded by the MAVEN mission. MAVEN began its primary science mission on November 2014, and is the first spacecraft dedicated to understanding Mars' upper atmosphere. MAVEN's principal investigator is based at the University of Colorado's Laboratory for Atmospheric and Space Physics, Boulder. The university provided two science instruments and leads science operations, as well as education and public outreach, for the mission. NASA Goddard manages the MAVEN project and provided two science instruments for the mission, including the magnetometer. Lockheed Martin built the spacecraft and is responsible for mission operations. The University of California at Berkeley's Space Sciences Laboratory also provided four science instruments for the mission. NASA's Jet Propulsion Laboratory in Pasadena, California, provides navigation and Deep Space Network support, as well as the Electra telecommunications relay hardware and operations.

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New NASA study improves search for habitable worlds -- ScienceDaily

New NASA research is helping to refine our understanding of candidate planets beyond our solar system that might support life.

"Using a model that more realistically simulates atmospheric conditions, we discovered a new process that controls the habitability of exoplanets and will guide us in identifying candidates for further study," said Yuka Fujii of NASA's Goddard Institute for Space Studies (GISS), New York, New York and the Earth-Life Science Institute at the Tokyo Institute of Technology, Japan, lead author of a paper on the research published in the *Astrophysical Journal* Oct. 17.

Previous models simulated atmospheric conditions along one dimension, the vertical. Like some other recent habitability studies, the new research used a model that calculates conditions in all three dimensions, allowing the team to simulate the circulation of the atmosphere and the special features

of that circulation, which one-dimensional models cannot do. The new work will help astronomers allocate scarce observing time to the most promising candidates for habitability.

Liquid water is necessary for life as we know it, so the surface of an alien world (e.g. an exoplanet) is considered potentially habitable if its temperature allows liquid water to be present for sufficient time (billions of years) to allow life to thrive. If the exoplanet is too far from its parent star, it will be too cold, and its oceans will freeze. If the exoplanet is too close, light from the star will be too intense, and its oceans will eventually evaporate and be lost to space. This happens when water vapor rises to a layer in the upper atmosphere called the stratosphere and gets broken into its elemental components (hydrogen and oxygen) by ultraviolet light from the star. The extremely light hydrogen atoms can then escape to space. Planets in the process of losing their oceans this way are said to have entered a "moist greenhouse" state because of their humid stratospheres.

In order for water vapor to rise to the stratosphere, previous models predicted that long-term surface temperatures had to be greater than anything

experienced on Earth -- over 150 degrees Fahrenheit (66 degrees Celsius). These temperatures would power intense convective storms; however, it turns out that these storms aren't the reason water reaches the stratosphere for slowly rotating planets entering a moist greenhouse state.

"We found an important role for the type of radiation a star emits and the effect it has on the atmospheric circulation of an exoplanet in making the moist greenhouse state," said Fujii. For exoplanets orbiting close to their parent stars, a star's gravity will be strong enough to slow a planet's rotation. This may cause it to become tidally locked, with one side always facing the star -- giving it eternal day -- and one side always facing away -giving it eternal night.

When this happens, thick clouds form on the dayside of the planet and act like a sun umbrella to shield the surface from much of the starlight. While this could keep the planet cool and prevent water vapor from rising, the team found that the amount of near-Infrared radiation (NIR) from a star could provide the heat needed to cause a planet to enter the moist greenhouse state. NIR is a type of light invisible to the human eye. Water as vapor in air and water droplets or ice crystals

in clouds strongly absorbs NIR light, warming the air. As the air warms, it rises, carrying the water up into the stratosphere where it creates the moist greenhouse.

This process is especially relevant for planets around low-mass stars that are cooler and much dimmer than the Sun. To be habitable, planets must be much closer to these stars than our Earth is to the Sun. At such close range, these planets likely experience strong tides from their star, making them rotate slowly. Also, the cooler a star is, the more NIR it emits. The new model demonstrated that since these stars emit the bulk of their light at NIR wavelengths, a moist greenhouse state will result even in conditions comparable to or somewhat warmer than Earth's tropics. For exoplanets closer to their stars, the team found that the NIR-driven process increased moisture in the stratosphere gradually. So, it's possible, contrary to old model predictions, that an exoplanet closer to its parent star could remain habitable.

This is an important observation for astronomers searching for habitable worlds, since low-mass stars are the most common in the galaxy. Their sheer numbers increase the odds that a habitable world may be found among them, and their small size increases

the chance to detect planetary signals.

The new work will help astronomers screen the most promising candidates in the search for planets that could support life. "As long as we know the temperature of the star, we can estimate whether planets close to their stars have the potential to be in the moist greenhouse state," said Anthony Del Genio of GISS, a co-author of the paper. "Current technology will be pushed to the limit to detect small amounts of water vapor in an exoplanet's atmosphere. If there is enough water to be detected, it probably means that planet is in the moist greenhouse state."

In this study, researchers assumed a planet with an atmosphere like Earth, but entirely covered by oceans. These assumptions allowed the team to clearly see how changing the orbital distance and type of stellar radiation affected the amount of water vapor in the stratosphere. In the future, the team plans to vary planetary characteristics such as gravity, size, atmospheric composition, and surface pressure to see how they affect water vapor circulation and habitability.

The research was funded by the NASA Astrobiology

Program through the Nexus for Exoplanet System Science; the NASA Postdoctoral Program, administered by Oak Ridge Affiliated Universities, Oak Ridge, Tennessee, and Universities Space Research Association, Columbia, Maryland; and a Grant-in-Aid from the Japan Society for the Promotion of Science, Tokyo, Japan (No.15K17605).

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Be concerned about how apps collect, share health data, expert says -- ScienceDaily

As of 2016 there were more than 165,000 health and wellness apps available through the Apple App Store alone. According to Rice University medical media expert Kirsten Ostherr, the Food and Drug Administration (FDA) regulates only a fraction of those. Americans should be concerned about how these apps collect, save and share their personal health data, she said.

On Oct. 26 the U.S. Department of Health and Human Services will host a gathering of national experts to discuss "Data Privacy in the Digital Age." Ostherr, who is a professor of English and director of Rice's Medical Futures Lab, has been doing research on health and medical media for over 20 years, from "old" media like celluloid films used for medical education to "new" media like smartphone apps. She will present "Trust and Privacy in the Ecosystems of User-Generated Health and Medical Data" during a panel

discussion.

"Members of the general public, including patients, have begun to play a newly important role in collecting data about health and disease," Ostherr said. "With the rise of mobile apps and the growth of smartphone and wearable-device use, people's daily lives have become experiments 'in the wild.'"

The data collected through these devices offer new opportunities and challenges to researchers who want to gather information about human behavior outside the controlled settings of lab-based studies, she said. However, what the researchers can achieve with the user-generated health data relies heavily on participants' willingness to share their data, even when doing so may not serve their own best interests.

"Part of my research is looking at ways the boundaries between medical and nonmedical environments are dissolving through the proliferation of apps that allow people to manage their own care outside of clinical settings," she said. "In some ways those boundaries are breaking down because a lot of things that used to only happen inside of hospitals can happen outside of them now."

Federal and state policy regulations that shape how personal health data is shared are currently in place. They set rigid boundaries between traditional clinical settings or "medical domains" and domains outside of traditional clinical settings, Ostherr said. But depending on how an app is classified by the FDA, the health-related data an app collects might not be protected.

She said apps that make medical or therapeutic claims are considered a medical device and must go through the FDA procedures for approval and regulation. For some companies, that process is worth the time and effort, because their product could become covered by insurance.

But the vast majority of apps provide "helpful hints" in response to user-entered data, such as ideas for alleviating symptoms of a migraine.

"If your app carefully sidesteps claiming any kind of medical intervention, then it's a health and wellness app and not a medical device -- and it is not regulated," Ostherr said.

Regardless of whether an app is regulated, Ostherr

said, they are all "capturing tons of personal data, some of which would be classified as personal health information if it were subject to oversight by the Health Insurance Portability and Accountability Act."

And, she said, the likelihood that the data from the unregulated health apps makes its way back into a medical setting where a patient could benefit from a physician's review of that data is "almost nil."

Ostherr has a forthcoming book on the topic, "Quantified Health: Learning From Patient Stories in the Age of Big Data."

Story Source:

[Materials](#) provided by [Rice University](#). *Note: Content may be edited for style and length.*

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Climate shifts shorten marine food chain off California: Research counters earlier thinking that food chains remain constant through time -- ScienceDaily

Environmental disturbances such as El Niño shake up the marine food web off Southern California, new research shows, countering conventional thinking that the hierarchy of who-eats-who in the ocean remains largely constant over time.

The new research published in the journal *Science Advances* examined the skin cells of common dolphins for chemical clues about the length of the marine food chain, which begins with tiny plankton and continues as species eat them, and other species eat those species. Large predators such as dolphins occupy the top of the food chain, their cells carrying chemical information from all the species beneath them.

Many scientists have long considered the length of the food chain in the open sea to be relatively stable, with

roughly the same animal species feeding on each other through time. But the chemical signatures in the skin of Southern California dolphins collected over two decades now show otherwise, report scientists from NOAA Fisheries, Moss Landing Marine Laboratories and the Scripps Institution of Oceanography.

"We documented for first time marked changes in the pelagic food web length in response to various natural and anthropogenic related stressors," said lead author Rocio I. Ruiz-Cooley, formerly of NOAA Fisheries' Southwest Fisheries Science Center and now at Moss Landing Marine Laboratories. "This tells us that the food web is very dynamic, and reveals changes with the ecosystem around it."

The finding helps scientists understand the health and resilience of the ecosystem, she said. A longer food chain is more typical, and reflects a relatively diverse community, while shorter chains occur during extreme environmental conditions and suggest a decline in that diversity.

During strong climate perturbations such as the 1997-1999 El Niño Southern Oscillation that included the most intense El Niño event of the century, which

brought unusual warming to the U.S. West Coast, the food chain in the California Current shortened sharply, the scientists found. That coincided with declines in ocean productivity such as reduced growth of plankton, declines of some fish and birds and expanded ranges of some species such as jumbo squid, perhaps as they searched for scarce food or followed favorable temperatures.

"These changes in life history traits and population dynamics likely reduced and/or removed populations of many species, including important components of the food web," in turn shrinking the food chain, scientists wrote in the new report. Predators may have exacerbated this impact as they fed on what was left and reduced the length of the food chain that supported them. Although some species such as jellyfish and tunicates such as salp may multiply quickly to fill such gaps, they provide so little nutrition that most predators do not pursue them and the food chain remains short.

The research demonstrates that top predators such as the common dolphin can serve as important indicators of the length of the food chain, which in turn provides insight into the ecosystem, Ruiz-Cooley said. The study drew upon the Southwest Fisheries Science

Center's collection of skin tissue samples gathered from dolphins inadvertently entangled in gillnets off Southern California from 1991 to 2008, highlighting the value of that collection over time.

"This research, and the results it has produced, illustrate the great value of this time series reflected in the cell samples," said Lisa Ballance, director of the Science Center's Marine Mammal and Turtle Division, and coauthor on this paper. "As technology advances, we can extract even more information from the time series as a window into the past, and a baseline to address tomorrow's emerging issues."

Story Source:

[Materials](#) provided by [NOAA Fisheries West Coast Region](#). *Note: Content may be edited for style and length.*

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Three million Americans carry loaded handguns daily, study finds: Most are male, and cite protection as primary reason; 'significant' public health implications, researchers say -- ScienceDaily

An estimated 3 million adult American handgun owners carry a firearm loaded and on their person on a daily basis, and 9 million do so on a monthly basis, new research indicates. The vast majority cited protection as their primary reason for carrying a firearm.

Researchers from the University of Washington School of Public Health, the University of Colorado, the Harvard School of Public Health, and Northeastern University produced the study, to be published October 19, 2017, in the *American Journal of Public Health*.

It is the first research in more than 20 years to scrutinize why, how often, and in what manner U.S.

adults carry loaded handguns. It also examines how concealed handgun-carrying behavior differs across states, depending on their laws.

"Carrying firearms in public places can have significant implications for public health and public safety," said lead author Dr. Ali Rowhani-Rahbar, an associate professor of epidemiology at the UW School of Public Health. "An important first step to examining the consequences of firearm carrying at the national level is an accurate measurement of the occurrence of this behavior and characterization of those who engage in it."

Compared with handgun owners who did not carry, those who did report carrying handguns tended to be younger, and more often male, live in the southern United States, have grown up in firearm-owning households, self-identify as politically conservative, and own more than one type of firearm.

Rowhani-Rahbar and doctoral student Vivian Lyons collaborated with Drs. Matthew Miller of Northeastern, Deborah Azrael of Harvard, and Joseph Simonetti of Colorado. They reviewed handgun-carrying behavior of 1,444 gun owners, using data from a 2015 nationally

representative survey designed by Miller and Azrael.

"It was important to study handgun carrying because about 90 percent of all firearm homicides and nonfatal firearm crimes for which the type of firearm is known are committed with a handgun," said Rowhani-Rahbar, who is also an adjunct assistant professor of pediatrics at the University of Washington School of Medicine.

Among the findings: 80 percent of surveyed handgun owners who carried their handgun had a concealed-carry permit, and 66 percent said they always carried their handguns concealed, compared with 10 percent who said they always carry their weapons openly.

When comparing handgun-carrying behavior with corresponding states' laws, researchers found that proportionally fewer handgun owners carried a concealed handgun if they lived in a state whose laws afforded greater discretion to issuing agencies in the review of concealed-carry applications. Some owners nevertheless reported carrying a concealed handgun without a permit in states in which doing so was illegal.

State laws on handgun carrying have become less

restrictive over the last 30 years. Many states that formerly gave local governing bodies the authority to review applications have moved to constrain local authorities' discretion, thereby easing the permit process for adult residents.

In this same time period, the number of U.S. concealed-carry permit holders has increased significantly.

Rowhani-Rahbar said more research is needed to comprehensively evaluate the impact of increasingly permissive firearm-carry laws. Future studies should focus on analyzing how different concealed-carry laws influence carrying, and characterizing illegal carrying behavior among those who have been denied permits.

The study was funded by the Fund for a Safer Future and the Joyce Foundation.

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All Top News

Top science stories featured on ScienceDaily's home page.

- [**NASA's MAVEN mission finds Mars has a twisted magnetic tail**](#) [周五, 20 10月 06:18]

Mars has an invisible magnetic 'tail' that is twisted by interaction with the solar wind, according to new research using data from NASA's MAVEN spacecraft.

- [**New NASA study improves search for habitable worlds**](#) [周五, 20 10月 06:18]

New NASA research is helping to refine our understanding of candidate planets beyond our solar system that might support life.

- [**Climate shifts shorten marine food chain off California**](#) [周五, 20 10月 05:16]

Environmental disturbances such as El Niño shake up the marine food web off Southern California, new research shows, countering conventional thinking that the hierarchy of who-eats-who in the ocean remains largely constant over time.

- [**Field trips of the future?**](#) [周五, 20 10月 04:42]

A biologist examines the benefits and drawbacks of virtual and augmented reality in teaching environmental science.

- [**New tyrannosaur fossil is most complete found in Southwestern US**](#) [周五, 20 10月 02:30]

A fossilized skeleton of a tyrannosaur discovered in Utah's Grand Staircase-Escalante National Monument was airlifted by helicopter Oct 15, and delivered to the Natural History Museum of Utah where it will be uncovered, prepared, and studied. The fossil is approximately 76

million years old and is likely an individual of the species *Teratophoneus curriei*.

- [**Ancient DNA offers new view on saber-toothed cats' past**](#) [周五, 20 10月 02:30]

Researchers who've analyzed the complete mitochondrial genomes from ancient samples representing two species of saber-toothed cats have a new take on the animals' history over the last 50,000 years. The data suggest that the saber-toothed cats shared a common ancestor with all living cat-like species about 20 million years ago. The two saber-toothed cat species under study diverged from each other about 18 million years ago.

- [**Evolution in your back garden: Great tits may be adapting their beaks to birdfeeders**](#) [周五, 20 10月 02:30]

A British enthusiasm for feeding birds may have caused UK great tits to have evolved longer beaks than their European counterparts, according to new research. The findings identify for the first time the genetic differences between UK and Dutch great tits which researchers were then able to link to longer beaks in UK birds.

- [**H7N9 influenza is both lethal and transmissible in animal model for flu**](#) [周五, 20 10月 02:30]

In 2013, an influenza virus began circulating among poultry in China. It caused several waves of human infection and as of late July 2017, nearly 1,600 people had tested positive for avian H7N9. Nearly 40 percent of those infected had died. In 2017, a medical researcher received a sample of H7N9 virus isolated from a patient in China who had died of the flu. He and his research team subsequently began work to characterize and understand it.

- [**Liquid metal discovery ushers in new wave of chemistry and electronics**](#) [周五, 20 10月 02:30]

Researchers use liquid metal to create atom-thick 2-D never before seen in nature. The research could transform how we do chemistry and could also be applied to enhance data storage and make faster electronics.

- [**Six degrees of separation: Why it is a small world after all**](#) [周四, 19 10月 23:10]

This study examines how small-world networks occur within bigger and more complex structures.

- [**A mosquito's secret weapon: a light touch and strong wings**](#) [周四, 19 10月 22:10]

How do mosquitoes land and take off without our noticing? Using high-speed video cameras, researchers have found part of the answer: mosquitoes' long legs allow them to slowly and gently push off, but their wings provide the majority of the lift, even when fully laden with a blood meal. For comparison, mosquitoes push off with forces much less than those of an escaping fruit fly.

- [**Noxious ice cloud on Saturn's moon Titan**](#) [周四, 19 10月 22:10]

Researchers with NASA's Cassini mission found evidence of a toxic hybrid ice in a wispy cloud high above the south pole of Saturn's largest moon, Titan.

- [**Scientists see order in complex patterns of river deltas**](#) [周四, 19 10月 22:10]

River deltas, with their intricate networks of waterways, coastal barrier islands, wetlands and estuaries, often appear to have been formed by random processes, but scientists see order in the apparent chaos.

- [**Scientists pinpoint jealousy in the monogamous mind**](#) [周四, 19 10月 22:10]

Scientists find that in male titi monkeys, jealousy is associated with heightened activity in the cingulate cortex, an area of the brain associated with social pain in humans, and the lateral septum, associated with pair bond formation in primates. A better understanding of jealousy may provide important clues on how to approach health and welfare problems such as addiction and domestic violence, as well as autism.

- [**Slow Internet? New technology to speed up**](#)

[home broadband dramatically](#) [周四, 19 10月 22:10]

Slow internet speeds and the Internet 'rush hour' -- the peak time when data speeds drop by up to 30 percent -- could be history with new hardware that provides consistently high-speed broadband connectivity.

• [Fossil coral reefs show sea level rose in bursts during last warming](#) [周四, 19 10月 22:09]

Scientists have discovered that Earth's sea level did not rise steadily when the planet's glaciers last melted during a period of global warming; rather, sea level rose sharply in punctuated bursts.

• [Dogs are more expressive when someone is looking](#) [周四, 19 10月 22:09]

Dogs produce more facial expressions when humans are looking at them, according to new research.

• [More than 75 percent decrease in total flying insect biomass over 27 years across Germany](#) [周四, 19 10月 22:09]

The total flying insect biomass decreased by more than 75 percent over 27 years in protected areas in Germany, according to a new study.

• [Salmon sex linked to geological change](#) [周四, 19 10月 22:08]

It turns out that sex can move mountains. Researchers have found that the mating habits of salmon can alter the profile of stream beds, affecting the evolution of an entire watershed. The study is one of the first to quantitatively show that salmon can influence the shape of the land.

• [Want to control your dreams? Here's how you can](#) [周四, 19 10月 22:08]

New research has found that a specific combination of techniques will increase people's chances of having lucid dreams, in which the dreamer is aware they're dreaming while it's still happening and can control the experience.

• [Scientists dig into the origin of organics on](#)

[dwarf planet Ceres](#) [周四, 19 10月 03:18]

Since NASA's Dawn spacecraft detected localized organic-rich material on Ceres, scientists have been digging into the data to explore different scenarios for its origin. After considering the viability of comet or asteroid delivery, the preponderance of evidence suggests the organics are most likely native to Ceres.

• [Understanding the coevolving web of life as a network](#) [周四, 19 10月 01:32]

Coevolution, which occurs when species interact and adapt to each other, is often studied in the context of pair-wise interactions between mutually beneficial symbiotic partners. But many species have mutualistic interactions with multiple partners, leading to complex networks of interacting species.

• [Nature or nurture? Innate social behaviors in the mouse brain](#) [周四, 19 10月 01:29]

The brain circuitry that controls innate, or instinctive, behaviors such as mating and fighting was thought to be genetically hardwired. Not so, neuroscientists now say.

• [Inflammation trains the skin to heal faster](#) [周四, 19 10月 01:28]

Stem cells in the skin remember an injury, helping them close recurring wounds faster, researchers have found. The discovery could advance research and treatment of psoriasis and other inflammatory diseases.

• [Petals produce a 'blue halo' that helps bees find flowers](#) [周四, 19 10月 01:28]

Latest research has found that several common flower species have nanoscale ridges on the surface of their petals that meddle with light when viewed from certain angles.

• [Solar eruptions could electrify Martian moons](#) [周四, 19 10月 00:41]

Powerful solar eruptions could electrically charge areas of the Martian moon Phobos to hundreds of volts, presenting a complex electrical environment that could possibly affect sensitive electronics carried by

future robotic explorers, according to a new NASA study. The study also considered electrical charges that could develop as astronauts transit the surface on potential human missions to Phobos.

- [**Stiff fibers spun from slime**](#) [周三, 18 10月 23:35]

Nanoparticles from the secretion of velvet worms form recyclable polymer fibers.

- [**Potential human habitat located on the moon**](#) [周三, 18 10月 22:43]

A new study confirms the existence of a large open lava tube in the Marius Hills region of the moon, which could be used to protect astronauts from hazardous conditions on the surface.

- [**Ancient preen oil: Researchers discover 48-million-year-old lipids in a fossil bird**](#) [周三, 18 10月 21:12]

As a rule, soft parts do not withstand the ravages of time; hence, the majority of vertebrate fossils consist only of bones. Under these circumstances, a new discovery from the UNESCO World Heritage Site “Messel Pit” near Darmstadt in Germany comes as an even bigger surprise: a 48-million-year old skin gland from a bird, containing lipids of the same age. The oldest lipids ever recorded in a fossil vertebrate were used by the bird to preen its plumage.

- [**Battling flames increases firefighters' exposure to carcinogens**](#) [周三, 18 10月 21:02]

The threat of getting burned by roaring flames is an obvious danger of firefighting, but other health risks are more subtle. For example, firefighters have been found to develop cancer at higher rates than the general population. Now researchers have measured how much firefighters' exposure to carcinogens and other harmful compounds increases when fighting fires. Their study also points to one possible way to reduce that exposure.

- [**Navigational view of the brain thanks to powerful X-rays**](#) [周三, 18 10月 04:37]

Imagine Google Earth with only the street view and a far-away satellite

view but not much of a map view. Brain imaging, for the most part, has been missing just that, and a lot of research on how the brain computes happens on that map-like level. New imaging tackles this special view of the brain with the highest-energy X-rays in the country that illuminate thick sections of a mouse brain.

- [**New research opens the door to 'functional cure' for HIV**](#) [周三, 18 10月 03:30]

Scientists have for the first time shown that a novel compound effectively suppresses production of the virus in chronically infected cells.

- [**How we determine who's to blame**](#) [周三, 18 10月 00:44]

Using eye-tracking technology, cognitive scientists have obtained the first direct evidence that people use a process called counterfactual simulation to imagine how a situation could have played out differently to assign responsibility for an outcome.

- [**Flexible 'skin' can help robots, prosthetics perform everyday tasks by sensing shear force**](#) [周三, 18 10月 00:43]

Engineers have developed a flexible sensor 'skin' that can be stretched over any part of a robot's body or prosthetic to accurately convey information about shear forces and vibration, which are critical to tasks ranging from cooking an egg to dismantling a bomb.

- [**Study reshapes understanding of climate change's impact on early societies**](#) [周三, 18 10月 00:43]

A new study linking paleoclimatology -- the reconstruction of past global climates -- with historical analysis shows a link between environmental stress and its impact on the economy, political stability, and war-fighting capacity of ancient Egypt.

- [**Scientists determine source of world's largest mud eruption**](#) [周二, 17 10月 23:43]

More than 11 years after the Lusi mud volcano first erupted on the Indonesian island of Java, researchers may have figured out why the

mudflows haven't stopped: deep underground, Lusi is connected to a nearby volcanic system.

- [**Study shows how water could have flowed on 'cold and icy' ancient Mars**](#) [周二, 17 10月 23:43]

Research by planetary scientists finds that periodic melting of ice sheets on a cold early Mars would have created enough water to carve the ancient valleys and lakebeds seen on the planet today.

- [**What training exercise boosts brain power best? New research finds out**](#) [周二, 17 10月 23:43]

One of the two brain-training methods most scientists use in research is significantly better in improving memory and attention. It also results in more significant changes in brain activity.

- [**Domestication has not made dogs cooperate more with each other compared to wolves**](#) [周二, 17 10月 23:01]

Following domestication, dogs should be more tolerant and cooperative with conspecifics and humans compared to wolves. But looking at both in more naturalistic living conditions, however, speaks for more cooperative behavior of wolves. Researchers now show that the wild ancestors are excelling their domesticated relatives in teamwork. In an experimental approach dogs but not wolves failed to cooperatively pull the two ends of a rope to obtain a piece of food.

- [**Keratin, proteins from 54-million-year-old sea turtle show survival trait evolution**](#) [周二, 17 10月 21:18]

Researchers have retrieved original pigment, beta-keratin and muscle proteins from a 54-million-year-old sea turtle hatchling. The work adds to the growing body of evidence supporting persistence of original molecules over millions of years and also provides direct evidence that a pigment-based survival trait common to modern sea turtles evolved at least 54 million years ago.

- [**Filling the early universe with knots can explain why the world is three-dimensional**](#) [周二, 17 10月 07:03]

Filling the universe with knots shortly after it popped into existence 13.8 billion years ago provides a neat explanation for why we inhabit a three-dimensional world. That is the basic idea advanced by an out-of-the-box theory developed by an international team of physicists.

- [**Whales and dolphins have rich 'human-like' cultures and societies**](#) [周二, 17 10月 00:22]

Whales and dolphins (cetaceans) live in tightly-knit social groups, have complex relationships, talk to each other and even have regional dialects -- much like human societies. A major new study has linked the complexity of Cetacean culture and behavior to the size of their brains.

- [**Bite on this: Alligators caught eating sharks**](#) [周二, 17 10月 00:21]

Jaws, beware! Alligators may be coming for you. A new study documents American alligators on the Atlantic and Gulf coasts are eating small sharks and stingrays. This is the first scientific documentation of a widespread interaction between the two predators.

- [**Hubble observes source of gravitational waves for the first time**](#) [周二, 17 10月 00:21]

The NASA/ESA Hubble Space Telescope has observed for the first time the source of a gravitational wave, created by the merger of two neutron stars. This merger created a kilonova -- an object predicted by theory decades ago -- that ejects heavy elements such as gold and platinum into space. This event also provides the strongest evidence yet that short duration gamma-ray bursts are caused by mergers of neutron stars.

- [**Radio 'eyes' unlocking secrets of neutron-star collision**](#) [周一, 16 10月 22:28]

When a pair of superdense neutron stars collided and potentially formed a black hole in a galaxy 130 million light-years from Earth, they unleashed not only a train of gravitational waves but also an ongoing torrent of radio waves that are answering some of the biggest questions about the nature of such a cataclysmic event.

- [**Astronomers strike cosmic gold, confirm origin**](#)

[of precious metals in neutron star mergers](#) [周一, 16 10月 22:28]

What many thought would be a long way off, the detection of gravitational waves from the merger of binary neutron stars, actually happened on Aug. 17. The observation of a blue and then red glow from the radioactive debris cloud left behind matched simulations of what the merger should look like, proving that such mergers are the source of most of the very heavy elements in the universe, including gold.

• [Harvey runoff menaces Texas' coral reefs](#) [周一, 16 10月 22:28]

The more than 13 trillion gallons of floodwater from Hurricane Harvey have created a massive plume of freshwater in the Gulf of Mexico that is threatening the coral reefs of the Flower Garden Banks National Marine Sanctuary about 100 miles offshore of Galveston.

• [First observations of merging neutron stars mark a new era in astronomy](#) [周一, 16 10月 22:28]

After LIGO detected gravitational waves from the merger of two neutron stars, the race was on to detect a visible counterpart, because unlike the colliding black holes responsible for LIGO's four previous detections, this event was expected to produce an explosion of visible light. Researchers have now found the source of the gravitational waves, capturing the first images of the event with the Swope Telescope in Chile.

• [Fanged kangaroo research could shed light on extinction](#) [周一, 16 10月 21:27]

Fanged kangaroos -- an extinct family of small fanged Australian kangaroos -- might have survived at least five million years longer than previously thought. A new study has found the species might have competed for resources with ancestors of modern kangaroos.

• [Melting ice makes the sea around Greenland less saline](#) [周五, 13 10月 23:30]

For the first time, ocean data from Northeast Greenland reveals the long-term impact of the melting of the Greenland ice sheet. The observed

increase in freshwater content will affect the conditions in all Greenland fjords and may ultimately affect the global ocean currents that keep Europe warm.

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Health News

Top stories featured on ScienceDaily's Health & Medicine, Mind & Brain, and Living Well sections.

- [**Be concerned about how apps collect, share health data, expert says**](#) [周五, 20 10月 05:16]

Americans should be concerned about how health and wellness apps collect, save and share their personal health data, a medical media expert says.

- [**Three million Americans carry loaded handguns daily, study finds**](#) [周五, 20 10月 04:42]

An estimated 3 million adult American handgun owners carry a firearm loaded and on their person on a daily basis, and 9 million do so on a monthly basis, new research indicates. The vast majority cited protection as their primary reason for carrying a firearm. It is the first research in more than 20 years to scrutinize why, how often, and in what manner US adults carry loaded handguns.

- [**Newly discovered viral marker could help predict flu severity in infected patients**](#) [周五, 20 10月 04:42]

Flu viruses contain defective genetic material that may activate the immune system in infected patients, and new research published in PLOS Pathogens suggests that lower levels of these molecules could increase flu severity.

- [**Flu simulations suggest pandemics more likely in spring, early summer**](#) [周五, 20 10月 02:30]

New statistical simulations suggest that Northern Hemisphere flu pandemics are most likely to emerge in late spring or early summer at

the tail end of the normal flu season, according to a new study.

- [**Brain training can improve our understanding of speech in noisy places**](#) [周五, 20 10月 02:30]

For many people with hearing challenges, trying to follow a conversation in a crowded restaurant or other noisy venue is a major struggle, even with hearing aids. Now researchers have some good news: time spent playing a specially designed, brain-training audiogame could help.

- [**H7N9 influenza is both lethal and transmissible in animal model for flu**](#) [周五, 20 10月 02:30]

In 2013, an influenza virus began circulating among poultry in China. It caused several waves of human infection and as of late July 2017, nearly 1,600 people had tested positive for avian H7N9. Nearly 40 percent of those infected had died. In 2017, a medical researcher received a sample of H7N9 virus isolated from a patient in China who had died of the flu. He and his research team subsequently began work to characterize and understand it.

- [**Tracing cell death pathway points to drug targets for brain damage, kidney injury, asthma**](#) [周五, 20 10月 02:29]

Scientists are unlocking the complexities of a recently discovered cell death process that plays a key role in health and disease, and new findings link their discovery to asthma, kidney injury and brain trauma. The results are the early steps toward drug development that could transform emergency and critical care treatment.

- [**Discovery lights path for Alzheimer's research**](#) [周五, 20 10月 02:29]

A metallic probe invented at Rice University that lights up when it binds to a misfolded amyloid beta peptide has identified a binding site that could facilitate better drugs to treat Alzheimer's disease. When the probe is illuminated, it catalyzes oxidation of the protein in a way that might keep it from aggregating in the brains of patients.

- [**Gene circuit switches on inside cancer cells,**](#)

[**triggers immune attack**](#) [周五, 20 10月 02:29]

Researchers have developed a synthetic gene circuit that triggers the body's immune system to attack cancers when it detects signs of the disease.

• [**Renewable resource: To produce vital lipoic acid, sulfur is used, then replenished**](#) [周五, 20 10月 02:29]

New research shows how a protein is consumed, then reconstituted, during the production of a compound required for converting energy from food into a form that can be used by our cells. The results could help scientists to understand why humans with a fatal condition -- defects in an iron-sulfur carrier gene -- have deficiencies in this lipoic acid compound.

• [**One to 10 mutations are needed to drive cancer, scientists find**](#) [周五, 20 10月 02:29]

For the first time, scientists have provided unbiased estimates of the number of mutations needed for cancers to develop, in a study of more than 7,500 tumors across 29 cancer types. Researchers have adapted a technique from the field of evolution to confirm that, on average, one to ten driver mutations are needed for cancer to emerge.

• [**Key psychiatric drug target comes into focus**](#) [周五, 20 10月 02:29]

One way or another, many psychiatric drugs work by binding to receptor molecules in the brain that are sensitive to the neurotransmitter dopamine, a chemical signal that is central to how our experiences shape our behavior. But because scientists still don't understand the differences between the many kinds of dopamine receptors present on brain cells, most of these drugs are 'messy,' binding to multiple different dopamine receptor molecules and leading to serious side effects ranging from moveme...

• [**Gut bacterium indirectly causes symptoms by altering fruit fly microbiome**](#) [周五, 20 10月 02:27]

CagA, a protein produced by the bacterium *Helicobacter pylori*, can alter

the population of microbes living in the fruit fly gut, leading to disease symptoms, according to new research.

- [**New machine learning system can automatically identify shapes of red blood cells**](#) [周五, 20 10月 02:26]

Using a computational approach known as deep learning, scientists have developed a new system to classify the shapes of red blood cells in a patient's blood. The findings, published in PLOS Computational Biology, could potentially help doctors monitor people with sickle cell disease.

- [**Fundamental research enhances understanding of major cancer gene**](#) [周五, 20 10月 02:21]

Scientists have provided new insights into the role of PTEN, a major cancer gene, in controlling cell growth and behavior. PTEN is the second most commonly altered gene in human cancers, particularly prostate cancers, and this work could help to develop and target new treatments.

- [**Key molecular link in major cell growth pathway**](#) [周五, 20 10月 01:45]

A team of scientists has uncovered a surprising molecular link that connects how cells regulate growth with how they sense and make available the nutrients required for growth. The researchers' findings also implicate a new protein, SLC38A9, as a potential drug target in pancreatic cancer.

- [**Psychologists develop new model that links emotions and mental health**](#) [周五, 20 10月 00:18]

For decades psychologists have studied how people regulate emotions using a multitude of ways to conceptualize and assess emotion regulation. Now a recent study shows how a new assessment model can give clinicians an exciting new way to think about clinical diagnoses including anxiety, mood, and developmental disorders.

- [**Creating a better RNA switch**](#) [周五, 20 10月 00:18]

Researchers have developed a new RNA switch that activates genes thousands of times better than nature and has applications in diagnostics and metabolic engineering.

- [**Rheumatoid arthritis linked to an increased risk of COPD**](#) [周五, 20 10月 00:18]

New research suggests that rheumatoid arthritis may increase the risk of developing chronic obstructive pulmonary disease (COPD).

- [**Six degrees of separation: Why it is a small world after all**](#) [周四, 19 10月 23:10]

This study examines how small-world networks occur within bigger and more complex structures.

- [**Help sought from complementary, alternative medicine to remedy health problems**](#) [周四, 19 10月 23:10]

It found that complementary and alternative medicine is being used in connection with various health problems, particularly in situations where help provided by conventional medicine is considered by the patient to be inadequate.

- [**International patients increasingly seek in vitro fertilization treatment in US**](#) [周四, 19 10月 23:10]

The use of assisted reproductive technology (ART) in the US by non-US residents is growing, research shows. These 'reproductive tourists' are more likely, compared to Americans, to use egg donors and carriers and genetically screen early embryos.

- [**Researchers watch in real time as fat-encased drug nanoparticles invade skin cells**](#) [周四, 19 10月 22:10]

A new study describes the use of cutting-edge microscopy technology to visualize how liposomes escape from blood vessels into surrounding cells in a living mouse, offering clues that may help researchers design better drug delivery systems.

- [**Breast cancer cells recycle their own ammonia**](#)

waste as fuel [周四, 19 10月 22:10]

Breast cancer cells recycle ammonia, a waste byproduct of cell metabolism, and use it as a source of nitrogen to fuel tumor growth, report scientists. The insights shed light on the biological role of ammonia in cancer and may inform the design of new therapeutic strategies to slow tumor growth.

• **How female immune cells keep their second X chromosome shut off** [周四, 19 10月 22:10]

Medical researchers describe how X chromosome inactivation is regulated in the immune system's B cells as they develop in bone marrow and when they encounter antigens.

• **Scientists pinpoint jealousy in the monogamous mind** [周四, 19 10月 22:10]

Scientists find that in male titi monkeys, jealousy is associated with heightened activity in the cingulate cortex, an area of the brain associated with social pain in humans, and the lateral septum, associated with pair bond formation in primates. A better understanding of jealousy may provide important clues on how to approach health and welfare problems such as addiction and domestic violence, as well as autism.

• **The best hedge fund managers are not psychopaths or narcissists, according to new study** [周四, 19 10月 22:10]

When it comes to financial investments, hedge fund managers higher in 'dark triad' personality traits -- psychopathy, narcissism, and Machiavellianism -- perform more poorly than their peers, according to new personality psychology research. The difference is a little less than 1 percent annually compared to their peers, but with large investments over several years that slight underperformance can add up.

• **Yoga and aerobic exercise together may improve heart disease risk factors** [周四, 19 10月 22:09]

Heart disease patients who practice yoga in addition to aerobic exercise

saw twice the reduction in blood pressure, body mass index and cholesterol levels when compared to patients who practiced either Indian yoga or aerobic exercise alone, according to new research.

- [**Phenogenetic map created for stem cells models of neurological diseases**](#) [周四, 19 10月 22:09]

In an effort to better understand neurological diseases like Alzheimer's, Parkinson's and ALS -- and develop new ways to treat them -- researchers have performed the first meta-analysis of all induced pluripotent stem cell models for neurological and neurodegenerative diseases, and created an atlas of how cell characteristics are linked to their genotype.

- [**Superbug's artillery revealed: nanomachine secretes toxins**](#) [周四, 19 10月 22:09]

Researchers have created the first high-resolution structure depicting a crucial part of the 'superbug' *Pseudomonas aeruginosa*, classified by the WHO as having the highest level threat to human health. The image identifies the 'nanomachine' used by the highly virulent bacteria to secrete toxins, pointing the way for drug design targeting this.

- [**Is HPV vaccination safe for adult women?**](#) [周四, 19 10月 22:09]

In a new study of more than 3 million Danish and Swedish adult women, human papillomavirus (HPV) vaccination was not linked with 44 serious chronic diseases.

- [**When new players learn slot-machine tricks, they avoid gambling addiction**](#) [周四, 19 10月 22:08]

Novice gamblers who watched a short video about how slot machines disguise losses as wins have a better chance of avoiding gambling problems, according to new research.

- [**Phones keeping students from concentrating during lectures**](#) [周四, 19 10月 22:08]

Daily, people spend over three hours on their phones. While ever-smarter digital devices have made many aspects of our lives more

efficient, a growing body of evidence suggests that, by continuously distracting us, they are harming our ability to concentrate. Studies across the world show that students constantly use their phones when they are in class. A strong body of evidence suggests that media use during lectures is associated with lower academic performance.

• [**Want to control your dreams? Here's how you can**](#) [周四, 19 10月 22:08]

New research has found that a specific combination of techniques will increase people's chances of having lucid dreams, in which the dreamer is aware they're dreaming while it's still happening and can control the experience.

• [**What characteristics do school shooters share?**](#) [周四, 19 10月 22:07]

Boys involved in school shootings often struggle to live up to what they perceive as their school's ideals surrounding masculinity. When socially shunned at school, they develop deep-set grudges against their classmates and teachers. The shooters become increasingly angry, depressed, and more violent in their gendered practice. A shooting rampage is their ultimate performance, according to experts.

• [**Mutant gene found to fuel cancer-promoting effects of inflammation**](#) [周四, 19 10月 22:03]

A new mechanism has been uncovered linking a human gene's function to chronic inflammation. Through large-scale genomic analyses, the researchers discovered that 'mutant p53' amplifies the impact of inflammation, leading to increases in the invasive behavior of cancer. Thus, rather than fighting tumor growth, mutant forms of p53 appear to be tapping into the body's immune response system to fuel pro-inflammatory responses that increase cancer growth.

• [**Individual receptors caught at work**](#) [周四, 19 10月 03:18]

Using a revolutionary live-cell microscopy technique, an international team of scientist has observed for the first time individual receptors for hormones and widely used drugs at work in intact cells.

• [**Genetic testing recommended for children**](#)

[considered at risk for most common eye cancer](#) [周四, 19 10月 03:18]

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Children who are considered to be at risk of developing eye cancer should receive genetic counseling and testing as soon as possible to clarify risk for the disease. This is the consensus of leading ophthalmologists, pathologists and geneticists, who worked for two years to develop the first U.S. guidelines on how to screen for the most common eye tumor affecting children.

• [Obesity: Engineered proteins lower body weight in mice, rats and primates](#) [周四, 19 10月 03:18]

Researchers have created engineered proteins that lowered body weight, bloodstream insulin, and cholesterol levels in obese mice, rats, and primates.

• [Duplications of noncoding DNA may have affected evolution of human-specific traits](#) [周四, 19 10月 01:32]

01:32]

Duplications of large segments of noncoding DNA in the human genome may have contributed to the emergence of differences between humans and nonhuman primates, according to new results. Identifying these duplications, which include regulatory sequences, and their effect on traits and behavior may help scientists explain genetic contributions to human disease.

• [Online resource enables open data sharing for rare Mendelian diseases](#) [周四, 19 10月 01:32]

MyGene2, a new open data resource, helps patients with rare genetic conditions, clinicians, and researchers share information, connect with one another, and enable faster gene discovery.

• [Inflammation trains the skin to heal faster](#) [周四, 19 10月 01:28]

01:28]

Stem cells in the skin remember an injury, helping them close recurring wounds faster, researchers have found. The discovery could advance research and treatment of psoriasis and other inflammatory diseases.

• [New findings explain how UV rays trigger skin](#)

cancer [周四, 19 10月 00:16]

Melanoma, a cancer of skin pigment cells called melanocytes, will strike an estimated 87,110 people in the US in 2017, according to the Centers for Disease Control and Prevention. A fraction of those melanomas come from pre-existing moles, but the majority of them come from sources unknown -- until now.

• **Rare cancer linked with textured breast implants may be underreported, misunderstood**

[周三, 18 10月 23:35]

A rare cancer in patients with breast implants may be on the rise, but not all patients and physicians may be aware of the risks associated with the procedure, according to a group of researchers.

• **Dutch courage: Alcohol improves foreign language skills**

[周三, 18 10月 23:35]

A new study shows that bilingual speakers' ability to speak a second language is improved after they have consumed a low dose of alcohol.

• **One step closer toward a treatment for Alzheimer's disease?**

[周三, 18 10月 23:35]

Scientists have characterized a new class of drugs as potential therapeutics for Alzheimer's disease and discovered a piece in the puzzle of how they would work.

• **New clues to treat Alagille Syndrome from zebrafish**

[周三, 18 10月 23:35]

A new study identifies potential new therapeutic avenues for patients with Alagille syndrome, a rare genetic disorder caused by mutations primarily in the JAGGED1 gene.

• **Turning brain cells into skin cells**

[周三, 18 10月 23:35]

A new study reveals that it is possible to repurpose the function of different mature cells across the body and harvest new tissue and organs from these cells.

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [**NASA's MAVEN mission finds Mars has a twisted magnetic tail**](#) [周五, 20 10月 06:18]

Mars has an invisible magnetic 'tail' that is twisted by interaction with the solar wind, according to new research using data from NASA's MAVEN spacecraft.

- [**New NASA study improves search for habitable worlds**](#) [周五, 20 10月 06:18]

New NASA research is helping to refine our understanding of candidate planets beyond our solar system that might support life.

- [**Be concerned about how apps collect, share health data, expert says**](#) [周五, 20 10月 05:16]

Americans should be concerned about how health and wellness apps collect, save and share their personal health data, a medical media expert says.

- [**Field trips of the future?**](#) [周五, 20 10月 04:42]

A biologist examines the benefits and drawbacks of virtual and augmented reality in teaching environmental science.

- [**The blob that ate the tokamak: Physicists gain understanding of bubbles at edge of plasmas**](#) [周五, 20 10月 03:05]

Scientists have completed new simulations that could provide insight into how blobs at the plasma edge behave. The simulations performed kinetic simulations of two different regions of the plasma edge

simultaneously.

- [**Using optical chaos to control the momentum of light**](#) [周五, 20 10月 03:05]

Controlling and moving light poses serious challenges. One major hurdle is that light travels at different speeds and in different phases in different components of an integrated circuit. For light to couple between optical components, it needs to be moving at the same momentum. Now, a team of researchers has demonstrated a new way to control the momentum of broadband light in a widely-used optical component known as a whispering gallery microcavity (WGM).

- [**Studying insect behavior? Make yourself an ethoscope!**](#) [周五, 20 10月 02:30]

Fruit flies have surprising similarities to humans. The mysteries of a broad range of human conditions can be studied in detail in these organisms, however this often requires the use of expensive custom equipment. team of scientists now present the ethoscope -- a cheap, easy-to-use and self-made customizable piece of equipment of their invention that can be used to study flies' behavior.

- [**Liquid metal discovery ushers in new wave of chemistry and electronics**](#) [周五, 20 10月 02:30]

Researchers use liquid metal to create atom-thick 2-D never before seen in nature. The research could transform how we do chemistry and could also be applied to enhance data storage and make faster electronics.

- [**Extreme light trapping**](#) [周五, 20 10月 00:38]

Physicists have built a nanostructure whose crystal lattice bends light as it enters the material and directs it in a path parallel to the surface, known as "parallel to interface refraction."

- [**Strange but true: Turning a material upside down can sometimes make it softer**](#) [周四, 19 10月 23:10]

Through the combined effect of flexoelectricity and piezoelectricity, researchers have found that polar materials can be made more or less

resistant to dents when they are turned upside down... or when a voltage is applied to switch their polarization. This research points to the future development of 'smart mechanical materials' for use in smart coatings and ferroelectric memories.

- [**Scientists solve a magnesium mystery in rechargeable battery performance**](#) [周四, 19 10月 23:10]

Scientists have discovered a surprising set of chemical reactions involving magnesium that degrade battery performance even before the battery can be charged up. The findings could steer the design of next-gen batteries.

- [**Noxious ice cloud on Saturn's moon Titan**](#) [周四, 19 10月 22:10]

Researchers with NASA's Cassini mission found evidence of a toxic hybrid ice in a wispy cloud high above the south pole of Saturn's largest moon, Titan.

- [**Researchers watch in real time as fat-encased drug nanoparticles invade skin cells**](#) [周四, 19 10月 22:10]

A new study describes the use of cutting-edge microscopy technology to visualize how liposomes escape from blood vessels into surrounding cells in a living mouse, offering clues that may help researchers design better drug delivery systems.

- [**Slow Internet? New technology to speed up home broadband dramatically**](#) [周四, 19 10月 22:10]

Slow internet speeds and the Internet 'rush hour' -- the peak time when data speeds drop by up to 30 percent -- could be history with new hardware that provides consistently high-speed broadband connectivity.

- [**New ways to achieve selectivity for biomarkers in bioelectronics**](#) [周四, 19 10月 22:09]

Materials science and engineering researchers have experimentally verified the electrochemical processes that control charge transfer rate from an organic polymer to a biomarker molecule. Their findings may enhance selectivity for biomarkers in bioelectronic devices.

- [**Superbug's artillery revealed: nanomachine secretes toxins**](#) [周四, 19 10月 22:09]

Researchers have created the first high-resolution structure depicting a crucial part of the 'superbug' *Pseudomonas aeruginosa*, classified by the WHO as having the highest level threat to human health. The image identifies the 'nanomachine' used by the highly virulent bacteria to secrete toxins, pointing the way for drug design targeting this.

- [**Physics boosts artificial intelligence methods**](#) [周四, 19 10月 03:47]

Despite the central role of physics in quantum computing, until now, no problem of interest for physics researchers has been resolved by quantum computing techniques. Now, researchers report the first application of quantum computing to a physics problem.

- [**Research demonstrates method to alter coherence of light**](#) [周四, 19 10月 03:19]

In a finding that could have broad applications in optical devices, researchers have shown that they can transform incoherent light to almost fully coherent and vice versa.

- [**Scientists dig into the origin of organics on dwarf planet Ceres**](#) [周四, 19 10月 03:18]

Since NASA's Dawn spacecraft detected localized organic-rich material on Ceres, scientists have been digging into the data to explore different scenarios for its origin. After considering the viability of comet or asteroid delivery, the preponderance of evidence suggests the organics are most likely native to Ceres.

- [**New material for digital memories of the future**](#) [周四, 19 10月 01:32]

Scientists have developed the first material with conductivity properties that can be switched on and off using ferroelectric polarization.

- [**At tremendous precision, the proton and antiproton still seem identical**](#) [周四, 19 10月 01:29]

Using a novel two-particle measurement method, a group of researchers

measured the magnetic moment of the antiproton at a precision 350 times higher than any previous measurement. The result shows that the magnetic moments of the proton and antiproton are tremendously close, meaning that so-called CPT asymmetry -- a key factor in the lack of antimatter -- must be very small if it exists at all.

- [**Riddle of matter remains unsolved: Proton and antiproton share fundamental properties**](#) [周四, 19 10月 01:28]

Physicists have been able to measure the magnetic force of antiprotons with almost unbelievable precision.

- [**Solar eruptions could electrify Martian moons**](#) [周四, 19 10月 00:41]

Powerful solar eruptions could electrically charge areas of the Martian moon Phobos to hundreds of volts, presenting a complex electrical environment that could possibly affect sensitive electronics carried by future robotic explorers, according to a new NASA study. The study also considered electrical charges that could develop as astronauts transit the surface on potential human missions to Phobos.

- [**For \\$1000, anyone can purchase online ads to track your location and app use**](#) [周四, 19 10月 00:41]

New research finds that for a budget of roughly \$1000, it is possible for someone to track your location and app use by purchasing and targeting mobile ads. The team hopes to raise industry awareness about the potential privacy threat.

- [**Competing forces: How molecules maintain their structure**](#) [周三, 18 10月 23:35]

A double helix twisted around itself: this is the distinctive structure of DNA, which is made up of large molecules. Using synthetically produced molecules, chemists and physicists have investigated the forces which are at work inside the molecule to give it its three-dimensional structure.

- [**Stiff fibers spun from slime**](#) [周三, 18 10月 23:35]

Nanoparticles from the secretion of velvet worms form recyclable

polymer fibers.

- [**Nanoelectronics breakthrough could lead to more efficient quantum devices**](#) [周三, 18 10月 23:35]

Researchers have made a breakthrough that could help your electronic devices get even smarter. Their findings examine electron behavior within nanoelectronics, as outlined in a new article.

- [**Customizing catalysts to boost product yields, decrease separation costs**](#) [周三, 18 10月 23:35]

For some crystalline catalysts, what you see on the surface is not always what you get in the bulk. Investigators discovered that treating a complex oxide crystal with either heat or chemicals caused different atoms to segregate on the surface, i.e., surface reconstruction. Those differences created catalysts with dissimilar behaviors, which encouraged different reaction pathways and ultimately yielded distinct products.

- [**Reducing power plants' freshwater consumption with new silica filter**](#) [周三, 18 10月 23:35]

Power plants draw more freshwater than any other consumer in the United States, accounting for more than 50 percent of the nation's freshwater use at about 500 billion gallons daily. To help save this water, researchers have developed a new silica filter for power plant cooling waters that decreases the amount of freshwater power plants consume by increasing the number of times cooling tower water can be reused and recycled.

- [**A mission to Mars could make its own oxygen thanks to plasma technology**](#) [周三, 18 10月 23:33]

Plasma technology could hold the key to creating a sustainable oxygen supply on Mars, a new study has found. It suggests that Mars, with its 96 per cent carbon dioxide atmosphere, has nearly ideal conditions for creating oxygen from CO₂ through a process known as decomposition.

- [**Electrode materials from the microwave oven**](#) [周三, 18 10月 23:31]

Power on the go is in demand: The higher the battery capacity, the larger the range of electric cars and the longer the operating time of cell phones and laptops. Researchers have now developed a process that allows a fast, simple, and cost-effective production of the promising cathode material lithium cobalt phosphate in high quality.

• [**Potential human habitat located on the moon**](#) [周三, 18 10月 22:43]

A new study confirms the existence of a large open lava tube in the Marius Hills region of the moon, which could be used to protect astronauts from hazardous conditions on the surface.

• [**Force field analysis provides clues to protein-ion interaction**](#) [周三, 18 10月 21:22]

The importance of proteins and metal ion interactions is well understood, but the mechanistic interactions between the two are still far from a complete picture. Researchers are working to quantitatively describe protein-ion interactions using what is called an atomic multipole optimized energetics for biomolecular applications force field.

• [**Water droplet physics: The drop that's good to the very end**](#) [周三, 18 10月 21:22]

Two researchers, using laser-flash photography of microscopic droplet-particle collisions, have discovered that water droplets still have liquid tricks to reveal. Previous research has primarily examined droplet collisions with flat surfaces, such as a wall, but this research team examined the less studied case of a droplet having a head-on collision with a solid, spherical particle.

• [**Active sieving could improve dialysis and water purification filters**](#) [周三, 18 10月 21:22]

Physicists have proven theoretically that active sieving, as opposed to its passive counterpart, can improve the separation abilities of filtration systems. Active sieving also has the potential to filter molecules based on movement dynamics, opening up a whole new avenue in the field of membrane science based on the ability to tune osmotic pressure.

- [**Origami lattice paves the way for new noise-dampening barriers on the road**](#) [周三, 18 10月 21:22]

Researchers have brought a new method into the sound-dampening fold, demonstrating an origami lattice prototype that can potentially reduce acoustic noise on roadways. The technique allows researchers to selectively dampen noise at various frequencies by adjusting the distance between noise-diffusing elements.

- [**The puzzle to plugging the worst natural gas release in history**](#) [周三, 18 10月 21:16]

By the time scientists visited the Aliso Canyon natural gas storage facility in December 2015, the SS-25 well blowout had been leaking natural gas into the air for more than six weeks. The notoriously strong winds at Aliso Canyon carried the natural gas and its added odorant to the nearby Porter Ranch neighborhood, leading to thousands of families evacuating their homes.

- [**Space greens beat the blues**](#) [周三, 18 10月 21:11]

Where people will go in the cosmos, plants will go, say researchers. Plants may also play a key role in maintaining the psychological well-being of space crews. The next frontier of space plant experimentation is to examine the psychological impact of plant life on astronauts.

- [**Bridging the terahertz gap**](#) [周三, 18 10月 21:02]

Researchers are exploring the possibility of using an infrared frequency comb to generate elusive terahertz frequencies. These frequencies -- which lie in the electromagnetic spectrum between radio waves and infrared light -- have long promised to transform communications and sensing but are very challenging to source. By harnessing a recently discovered laser state, researchers have discovered an infrared frequency comb in a quantum cascade laser that offers a new way to generate terahertz frequ...

- [**Art advancing science at the nanoscale**](#) [周三, 18 10月 21:02]

Could studying molecular biology ever be as fun as watching a Star Wars movie? Two scientists decided to create their own science film to

entertain viewers, and ended up making new scientific discoveries in the process. The researchers-turned-filmmakers used a novel combination of computer animation and simulation softwares to create a scientific model that is accurate down to the atomic scale, and hope that their success inspires more scientists to approach their work like artists.

- [**New membrane makes separating methane and carbon dioxide more efficient**](#) [周三, 18 10月 21:01]

To make natural gas and biogas suitable for use, the methane has to be separated from the carbon dioxide. This involves the use of membranes: filters that stop the methane and let the CO₂ pass through. Researchers in Belgium have developed a new membrane that makes the separation process much more effective.

- [**Machine learning identifies breast lesions likely to become cancer**](#) [周三, 18 10月 21:01]

A machine learning tool can help identify which high-risk breast lesions are likely to become cancerous, according to a new study. Researchers said the technology has the potential to reduce unnecessary surgeries.

- [**Nice ice, maybe: Study finds water-repelling surfaces ease ice removal**](#) [周三, 18 10月 20:56]

A new study has discovered that ice grows differently on water-absorbent vs. water-repellent surfaces. The research suggests that applying water-repellent coatings to windshields before winter storms -- or engineering surfaces that inherently repel water -- could enable a strong breeze to handle the burden of ice removal.

- [**Navigational view of the brain thanks to powerful X-rays**](#) [周三, 18 10月 04:37]

Imagine Google Earth with only the street view and a far-away satellite view but not much of a map view. Brain imaging, for the most part, has been missing just that, and a lot of research on how the brain computes happens on that map-like level. New imaging tackles this special view of the brain with the highest-energy X-rays in the country that illuminate thick sections of a mouse brain.

- [**How bright is the moon, really?**](#) [周三, 18 10月 04:37]

The National Institute of Standards and Technology (NIST) is planning to take new measurements of the Moon's brightness, a highly useful property that satellites rely upon every day.

- [**Wearables to boost security of voice-based log-in**](#)

[周三, 18 10月 00:44]

A security-token necklace, ear buds or eyeglasses developed by researchers could eliminate vulnerabilities in voice authentication -- the practice of logging in to a device or service with your voice alone.

- [**To keep Saturn's A ring contained, its moons stand united**](#) [周三, 18 10月 00:43]

For three decades, astronomers thought that only Saturn's moon Janus confined the planet's A ring -- the largest and farthest of the visible rings. But after poring over NASA's Cassini mission data, astronomers now conclude that the teamwork of seven moons keeps this ring corralled.

- [**Flexible 'skin' can help robots, prosthetics perform everyday tasks by sensing shear force**](#) [周三, 18 10月 00:43]

Engineers have developed a flexible sensor 'skin' that can be stretched over any part of a robot's body or prosthetic to accurately convey information about shear forces and vibration, which are critical to tasks ranging from cooking an egg to dismantling a bomb.

- [**Preservation for the \(digital\) ages**](#) [周三, 18 10月 00:43]

Researchers working with classicists and computer scientists have developed a method to preserve digital humanities databases. The preservation strategy allows scholars to re-launch a database application in a variety of environments -- from individual computers, to virtual machines, to future web servers -- without compromising its interactive features.

- [**Assessment shows metagenomics software has much room for improvement**](#) [周三, 18 10月 00:42]

A recent critical assessment of software tools represents a key step

toward taming the 'Wild West' nature of the burgeoning field of metagenomics.

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [**New NASA study improves search for habitable worlds**](#) [周五, 20 10月 06:18]

New NASA research is helping to refine our understanding of candidate planets beyond our solar system that might support life.

- [**Climate shifts shorten marine food chain off California**](#) [周五, 20 10月 05:16]

Environmental disturbances such as El Niño shake up the marine food web off Southern California, new research shows, countering conventional thinking that the hierarchy of who-eats-who in the ocean remains largely constant over time.

- [**Field trips of the future?**](#) [周五, 20 10月 04:42]

A biologist examines the benefits and drawbacks of virtual and augmented reality in teaching environmental science.

- [**New tyrannosaur fossil is most complete found in Southwestern US**](#) [周五, 20 10月 02:30]

A fossilized skeleton of a tyrannosaur discovered in Utah's Grand Staircase-Escalante National Monument was airlifted by helicopter Oct 15, and delivered to the Natural History Museum of Utah where it will be uncovered, prepared, and studied. The fossil is approximately 76 million years old and is likely an individual of the species *Teratophoneus curriei*.

- [**Studying insect behavior? Make yourself an ethoscope!**](#) [周五, 20 10月 02:30]

Fruit flies have surprising similarities to humans. The mysteries of a broad range of human conditions can be studied in detail in these organisms, however this often requires the use of expensive custom equipment. team of scientists now present the ethoscope -- a cheap, easy-to-use and self-made customizable piece of equipment of their invention that can be used to study flies' behavior.

- [**Flu simulations suggest pandemics more likely in spring, early summer**](#) [周五, 20 10月 02:30]

New statistical simulations suggest that Northern Hemisphere flu pandemics are most likely to emerge in late spring or early summer at the tail end of the normal flu season, according to a new study.

- [**Ancient DNA offers new view on saber-toothed cats' past**](#) [周五, 20 10月 02:30]

Researchers who've analyzed the complete mitochondrial genomes from ancient samples representing two species of saber-toothed cats have a new take on the animals' history over the last 50,000 years. The data suggest that the saber-toothed cats shared a common ancestor with all living cat-like species about 20 million years ago. The two saber-toothed cat species under study diverged from each other about 18 million years ago.

- [**Gut bacteria from wild mice boost health in lab mice**](#) [周五, 20 10月 02:30]

Laboratory mice that are given the gut bacteria of wild mice can survive a deadly flu virus infection and fight colorectal cancer dramatically better than laboratory mice with their own gut bacteria, researchers report.

- [**Evolution in your back garden: Great tits may be adapting their beaks to birdfeeders**](#) [周五, 20 10月 02:30]

A British enthusiasm for feeding birds may have caused UK great tits to have evolved longer beaks than their European counterparts, according to new research. The findings identify for the first time the genetic differences between UK and Dutch great tits which researchers were

then able to link to longer beaks in UK birds.

- [**H7N9 influenza is both lethal and transmissible in animal model for flu**](#) [周五, 20 10月 02:30]

In 2013, an influenza virus began circulating among poultry in China. It caused several waves of human infection and as of late July 2017, nearly 1,600 people had tested positive for avian H7N9. Nearly 40 percent of those infected had died. In 2017, a medical researcher received a sample of H7N9 virus isolated from a patient in China who had died of the flu. He and his research team subsequently began work to characterize and understand it.

- [**Water striders illustrate evolutionary processes**](#) [周五, 20 10月 02:29]

How do new species arise and diversify in nature? Natural selection offers an explanation, but the genetic and environmental conditions behind this mechanism are still poorly understood. Researchers have just figured out how water striders (family Veliidae) of the genus Rhagovelia developed fan-like structures at the tips of their legs. These structures allow them to move upstream against the current, a feat beyond the abilities of other water striders that don't have fans.

- [**Gut bacterium indirectly causes symptoms by altering fruit fly microbiome**](#) [周五, 20 10月 02:27]

CagA, a protein produced by the bacterium *Helicobacter pylori*, can alter the population of microbes living in the fruit fly gut, leading to disease symptoms, according to new research.

- [**A mosquito's secret weapon: a light touch and strong wings**](#) [周四, 19 10月 22:10]

How do mosquitoes land and take off without our noticing? Using high-speed video cameras, researchers have found part of the answer: mosquitoes' long legs allow them to slowly and gently push off, but their wings provide the majority of the lift, even when fully laden with a blood meal. For comparison, mosquitoes push off with forces much less than those of an escaping fruit fly.

- [**Maintaining fish biomass the key to conserving reef fish biodiversity**](#) [周四, 19 10月 22:10]

A new study has found that conserving fish diversity in Madagascar's coral reef systems may depend on maintaining fish biomass above critical levels.

- [**Declining baby songbirds need forests to survive drought**](#) [周四, 19 10月 22:10]

A new study aimed to identify characteristics that promote healthy wood thrush populations on US Department of Defense land.

- [**Scientists see order in complex patterns of river deltas**](#) [周四, 19 10月 22:10]

River deltas, with their intricate networks of waterways, coastal barrier islands, wetlands and estuaries, often appear to have been formed by random processes, but scientists see order in the apparent chaos.

- [**Researchers watch in real time as fat-encased drug nanoparticles invade skin cells**](#) [周四, 19 10月 22:10]

A new study describes the use of cutting-edge microscopy technology to visualize how liposomes escape from blood vessels into surrounding cells in a living mouse, offering clues that may help researchers design better drug delivery systems.

- [**Scientists pinpoint jealousy in the monogamous mind**](#) [周四, 19 10月 22:10]

Scientists find that in male titi monkeys, jealousy is associated with heightened activity in the cingulate cortex, an area of the brain associated with social pain in humans, and the lateral septum, associated with pair bond formation in primates. A better understanding of jealousy may provide important clues on how to approach health and welfare problems such as addiction and domestic violence, as well as autism.

- [**Fossil coral reefs show sea level rose in bursts during last warming**](#) [周四, 19 10月 22:09]

Scientists have discovered that Earth's sea level did not rise steadily when the planet's glaciers last melted during a period of global warming; rather, sea level rose sharply in punctuated bursts.

- [**Dogs are more expressive when someone is looking**](#) [周四, 19 10月 22:09]

Dogs produce more facial expressions when humans are looking at them, according to new research.

- [**Superbug's artillery revealed: nanomachine secretes toxins**](#) [周四, 19 10月 22:09]

Researchers have created the first high-resolution structure depicting a crucial part of the 'superbug' *Pseudomonas aeruginosa*, classified by the WHO as having the highest level threat to human health. The image identifies the 'nanomachine' used by the highly virulent bacteria to secrete toxins, pointing the way for drug design targeting this.

- [**Living mulch builds profits, soil**](#) [周四, 19 10月 22:09]

Living mulch functions like mulch on any farm or garden except -- it's alive. No, it's not out of the latest horror movie; living mulch is a system farmers can use to benefit both profits and the soil. While the system has been around for a while, scientists are making it more efficient and sustainable.

- [**More than 75 percent decrease in total flying insect biomass over 27 years across Germany**](#) [周四, 19 10月 22:09]

The total flying insect biomass decreased by more than 75 percent over 27 years in protected areas in Germany, according to a new study.

- [**Salmon sex linked to geological change**](#) [周四, 19 10月 22:08]

It turns out that sex can move mountains. Researchers have found that the mating habits of salmon can alter the profile of stream beds, affecting the evolution of an entire watershed. The study is one of the first to quantitatively show that salmon can influence the shape of the land.

- [**Surprise new butterflyfish from the Philippine**](#)

['twilight zone'](#) [周四, 19 10月 22:08]

A new species of striped Philippine butterflyfish -- the charismatic *Roarumsfeldi* -- made a fantastic, 7,000-mile journey before surprising scientists with its unknown status. Live specimens collected from a depth of 360 feet escaped special notice until a single black fin spine tipped off aquarium biologists back in San Francisco.

• [Ice stream retreats under a cold climate](#) [周四, 19 10月 22:08]

Warmer ocean surface triggered the ice retreat during The Younger Dryas.

• [New light shed on early turquoise mining in Southwest](#) [周四, 19 10月 03:18]

Researchers are blending archaeology and geochemistry to get a more complete picture of turquoise's mining and distribution in the pre-Hispanic Southwest.

• [Obesity: Engineered proteins lower body weight in mice, rats and primates](#) [周四, 19 10月 03:18]

Researchers have created engineered proteins that lowered body weight, bloodstream insulin, and cholesterol levels in obese mice, rats, and primates.

• [Duplications of noncoding DNA may have affected evolution of human-specific traits](#) [周四, 19 10月 01:32]

Duplications of large segments of noncoding DNA in the human genome may have contributed to the emergence of differences between humans and nonhuman primates, according to new results. Identifying these duplications, which include regulatory sequences, and their effect on traits and behavior may help scientists explain genetic contributions to human disease.

• [Understanding the coevolving web of life as a network](#) [周四, 19 10月 01:32]

Coevolution, which occurs when species interact and adapt to each other, is often studied in the context of pair-wise interactions between

mutually beneficial symbiotic partners. But many species have mutualistic interactions with multiple partners, leading to complex networks of interacting species.

- [**Nature or nurture? Innate social behaviors in the mouse brain**](#) [周四, 19 10月 01:29]

The brain circuitry that controls innate, or instinctive, behaviors such as mating and fighting was thought to be genetically hardwired. Not so, neuroscientists now say.

- [**Petals produce a 'blue halo' that helps bees find flowers**](#) [周四, 19 10月 01:28]

Latest research has found that several common flower species have nanoscale ridges on the surface of their petals that meddle with light when viewed from certain angles.

- [**Illinois sportfish recovery a result of 1972 Clean Water Act, scientists report**](#) [周四, 19 10月 00:17]

Populations of largemouth bass, bluegill, catfish and other sportfish are at the highest levels recorded in more than a century in the Illinois River, according to a new report. Their dramatic recovery, from populations close to zero near Chicago throughout much of the 20th century, began just after implementation of the Clean Water Act, the researchers say.

- [**DNA tests on albatross excrement reveal secret diet of top predator**](#) [周三, 18 10月 23:35]

A study that used DNA tests to analyse the scats of one of the world's most numerous albatrosses has revealed surprising results about the top predator's diet. DNA analysis of 1460 scats from breeding sites around the Southern Ocean has shown that the diet of black-browed albatrosses contains a much higher proportion of jellyfish than previously thought.

- [**Competing forces: How molecules maintain their structure**](#) [周三, 18 10月 23:35]

A double helix twisted around itself: this is the distinctive structure of

DNA, which is made up of large molecules. Using synthetically produced molecules, chemists and physicists have investigated the forces which are at work inside the molecule to give it its three-dimensional structure.

- [**Ancient, lost, mountains in the Karoo reveals the secrets of massive extinction event**](#) [周三, 18 10月 23:35]

A researcher studied the fossil-rich sediments present in the Karoo, deposited during the tectonic events that created the Gondwanides, and found that the vertebrate animals in the area started to either go extinct or become less common much earlier than what was previously thought.

- [**Hardy corals make their moves to build new reefs from scratch**](#) [周三, 18 10月 23:35]

Resilient species of coral can move to inhospitable areas and lay the foundations for new reefs, a study shows.

- [**Death by a thousand cuts? Not for small populations**](#) [周三, 18 10月 23:35]

New research provides a look at how certain species survive by evolving a greater ability to weed out harmful mutations -- a new concept called 'drift robustness'.

- [**Stiff fibers spun from slime**](#) [周三, 18 10月 23:35]

Nanoparticles from the secretion of velvet worms form recyclable polymer fibers.

- [**Turning brain cells into skin cells**](#) [周三, 18 10月 23:35]

A new study reveals that it is possible to repurpose the function of different mature cells across the body and harvest new tissue and organs from these cells.

- [**Life in the city: Living near a forest keeps your amygdala healthier**](#) [周三, 18 10月 23:35]

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- [**The puzzle to plugging the worst natural gas release in history**](#) [周三, 18 10月 21:16]

By the time scientists visited the Aliso Canyon natural gas storage facility in December 2015, the SS-25 well blowout had been leaking natural gas into the air for more than six weeks. The notoriously strong winds at Aliso Canyon carried the natural gas and its added odorant to the nearby Porter Ranch neighborhood, leading to thousands of families evacuating their homes.

- [**Ancient preen oil: Researchers discover 48-million-year-old lipids in a fossil bird**](#) [周三, 18 10月 21:12]

As a rule, soft parts do not withstand the ravages of time; hence, the majority of vertebrate fossils consist only of bones. Under these circumstances, a new discovery from the UNESCO World Heritage Site “Messel Pit” near Darmstadt in Germany comes as an even bigger surprise: a 48-million-year old skin gland from a bird, containing lipids of the same age. The oldest lipids ever recorded in a fossil vertebrate were used by the bird to preen its plumage.

- [**Gene therapy can cure lameness in horses, research finds**](#) [周三, 18 10月 21:11]

Injecting DNA into injured horse tendons and ligaments can cure lameness, new research has found.

- [**Space greens beat the blues**](#) [周三, 18 10月 21:11]

Where people will go in the cosmos, plants will go, say researchers. Plants may also play a key role in maintaining the psychological well-being of space crews. The next frontier of space plant experimentation is to examine the psychological impact of plant life on astronauts.

- [**Yeast spotlights genetic variation's link to drug resistance**](#) [周三, 18 10月 21:02]

Researchers have shown that genetic diversity plays a key role in enabling drug resistance to evolve. Scientists show that high genetic diversity can prime new mutations that cause drug resistance. The study has implications for our understanding of the evolution of resistance to antimicrobial and anticancer drugs.

- [**How many golden eagles are there?**](#) [周三, 18 10月 21:02]

For conservation to be effective, wildlife managers need to know how many individuals of a species are out there. When species are spread out over large areas and occur at low densities, this can be tricky. However, a new study applies an old technique called 'mark-recapture' in a novel way to count golden eagles, eliminating the need to actually capture and mark eagles with math that allows scientists to turn individual observations into population estimates.

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Clean drinking water can be easy to take for granted if your home taps into treated water sources. But more than 44 million people in the U.S. get their water from private domestic wells, which are largely unregulated. Of those, a new report estimates that about 2 million people could be exposed to high levels of naturally occurring arsenic in their water.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [**Be concerned about how apps collect, share health data, expert says**](#) [周五, 20 10月 05:16]

Americans should be concerned about how health and wellness apps collect, save and share their personal health data, a medical media expert says.

- [**Three million Americans carry loaded handguns daily, study finds**](#) [周五, 20 10月 04:42]

An estimated 3 million adult American handgun owners carry a firearm loaded and on their person on a daily basis, and 9 million do so on a monthly basis, new research indicates. The vast majority cited protection as their primary reason for carrying a firearm. It is the first research in more than 20 years to scrutinize why, how often, and in what manner US adults carry loaded handguns.

- [**Field trips of the future?**](#) [周五, 20 10月 04:42]

A biologist examines the benefits and drawbacks of virtual and augmented reality in teaching environmental science.

- [**Six degrees of separation: Why it is a small world after all**](#) [周四, 19 10月 23:10]

This study examines how small-world networks occur within bigger and more complex structures.

- [**The best hedge fund managers are not psychopaths or narcissists, according to new**](#)

[study](#) [周四, 19 10月 22:10]

When it comes to financial investments, hedge fund managers higher in 'dark triad' personality traits -- psychopathy, narcissism, and Machiavellianism -- perform more poorly than their peers, according to new personality psychology research. The difference is a little less than 1 percent annually compared to their peers, but with large investments over several years that slight underperformance can add up.

• [Phones keeping students from concentrating during lectures](#) [周四, 19 10月 22:08]

Daily, people spend over three hours on their phones. While ever-smarter digital devices have made many aspects of our lives more efficient, a growing body of evidence suggests that, by continuously distracting us, they are harming our ability to concentrate. Studies across the world show that students constantly use their phones when they are in class. A strong body of evidence suggests that media use during lectures is associated with lower academic performance.

• [What characteristics do school shooters share?](#) [周四, 19 10月 22:07]

Boys involved in school shootings often struggle to live up to what they perceive as their school's ideals surrounding masculinity. When socially shunned at school, they develop deep-set grudges against their classmates and teachers. The shooters become increasingly angry, depressed, and more violent in their gendered practice. A shooting rampage is their ultimate performance, according to experts.

• [New light shed on early turquoise mining in Southwest](#) [周四, 19 10月 03:18]

Researchers are blending archaeology and geochemistry to get a more complete picture of turquoise's mining and distribution in the pre-Hispanic Southwest.

• [For \\$1000, anyone can purchase online ads to track your location and app use](#) [周四, 19 10月 00:41]

New research finds that for a budget of roughly \$1000, it is possible for

someone to track your location and app use by purchasing and targeting mobile ads. The team hopes to raise industry awareness about the potential privacy threat.

- [**Illinois sportfish recovery a result of 1972 Clean Water Act, scientists report**](#) [周四, 19 10月 00:17]

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- [**Mass killings happen randomly, yet rate has remained steady, study finds**](#) [周三, 18 10月 23:35]

Mass killings may have increasing news coverage, but the events themselves have happened at a steady rate for more than a decade, according to a new study. Furthermore, some types of mass-killing events seem to occur randomly over time, making prediction difficult and response crucial.

- [**Life in the city: Living near a forest keeps your amygdala healthier**](#) [周三, 18 10月 23:35]

A new study examined the relationship between the availability of nature near city dwellers' homes and their brain health. Its findings are relevant for urban planners among others.

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- [**Workers may 'choke' under pressure of non-monetary incentives**](#) [周三, 18 10月 21:16]

Competition for non-monetary awards can have adverse effects on performance and may cause employees to “choke” under pressure, according to a new study.

- [**High risk of injury in young elite athletes**](#) [周三, 18 10月 21:09]

Every week, an average of three in every ten adolescent elite athletes suffer an injury. Worst affected are young women, and the risk of injury increases with low self-esteem, especially in combination with less sleep and higher training volume and intensity, research from in Sweden shows.

- [**Art advancing science at the nanoscale**](#) [周三, 18 10月 21:02]

Could studying molecular biology ever be as fun as watching a Star Wars movie? Two scientists decided to create their own science film to entertain viewers, and ended up making new scientific discoveries in the process. The researchers-turned-filmmakers used a novel combination of computer animation and simulation softwares to create a scientific model that is accurate down to the atomic scale, and hope that their success inspires more scientists to approach their work like artists.

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mining deforestation in the iconic tropical rainforest. Surprisingly, the majority of mining deforestation (a full 90%) occurred outside the mining leases granted by Brazil's government, the new study finds.

- [**New simple method determines rate at which we burn calories walking up, down, flat**](#) [周三, 18 10月 21:01]

A new way to predict the energy a person expends walking will help predict and monitor the physiological status of walkers, including foot soldiers. Researchers have developed the Army-funded method, which significantly improves on two existing standards, and relies on three readily available variables. Accurate prediction is important because the rate at which people burn calories walking can vary tenfold depending on speed, carried load and whether uphill, at-grade or downhill.

- [**Chocolate production linked to increased deforestation in poor nations**](#) [周三, 18 10月 04:36]

Newly published research focuses on the link between cocoa exports and deforestation in developing nations.

- [**Amazonian hunters deplete wildlife but don't empty forests**](#) [周三, 18 10月 03:31]

Conservationists can be 'cautiously optimistic' about the prospect of sustainable subsistence hunting by Amazonian communities, according to new research. The research team spent over a year working with 60 Amazonian communities and hiked for miles through trackless forests to deploy nearly 400 motion-activated camera traps -- in a bid to understand which species are depleted by hunting and where.

- [**New examination of occupational licensing contradicts decades of research**](#) [周三, 18 10月 03:30]

From doctors to engineers to carpet layers to massage therapists, more than one in three Americans is required to hold a license to work in their occupation. Broad consensus among researchers holds that licensure creates wage premiums by establishing economic monopolies, but according to research, licensure does not limit competition nor does it increase wages.

- [**Preservation for the \(digital\) ages**](#) [周三, 18 10月 00:43]

Researchers working with classicists and computer scientists have developed a method to preserve digital humanities databases. The preservation strategy allows scholars to re-launch a database application in a variety of environments -- from individual computers, to virtual machines, to future web servers -- without compromising its interactive features.

- [**A new way to test body armor**](#) [周二, 17 10月 23:43]

In response to several high profile body armor failures, researchers have developed a new and extremely reliable way to test the ballistic fibers used in body armor.

- [**Nearly half of US medical care comes from emergency rooms**](#) [周二, 17 10月 21:18]

Nearly half of all US medical care is delivered by emergency departments, according to a new study. In recent years, the percentage of care delivered by emergency departments has grown. The paper highlights the major role played by emergency rooms in US health care.

- [**Attending a middle vs K-8 school matters for student outcomes**](#) [周二, 17 10月 07:05]

Students who attend a middle school compared to a K-8 school are likely to have a lower perception of their reading skills, finds a new study.

- [**During crisis, exposure to conflicting information and stress linked, studies find**](#) [周二, 17 10月 07:05]

Exposure to high rates of conflicting information during an emergency is linked to increased levels of stress, and those who rely on text messages or social media reports from unofficial sources are more frequently exposed to rumors and experience greater distress, according to research.

- [**Tweeting rage: How immigration policies can polarize public discourse**](#) [周二, 17 10月 02:48]

A study of tweets in the months before and after the 2010 passage of Arizona's "show me your papers" law, findings showed that the average tweet about Mexican immigrants and Hispanics, in general, became more negative. Researchers said the social media data was useful in determining whether people had changed their attitudes about immigrants as a result of the law or whether they had begun behaving differently.

• [**Women in science ask fewer questions than men, according to new research**](#) [周二, 17 10月 02:24]

Stereotypes suggest that women love to talk, with some studies even finding that women say three times as much as men. But, new research shows there is an exception to this rule: professional STEM events, which could be indicative of the wider problem of gender inequality in the field.

• [**Break the attachment before selling your stuff**](#) [周二, 17 10月 01:26]

Ever tried to sell something you've owned for a while on Craigslist and found that no one is willing to pony up what you're asking? It's because you're asking too much.

• [**Marketing study examines what types of searches click for car buyers**](#) [周二, 17 10月 00:21]

A new study examines how consumers allocated their time when searching offline and on the internet as they shopped for a new automobile, and what the outcomes were for price satisfaction.

• [**Report identifies factors associated with harassment, abuse in academic fieldwork**](#) [周二, 17 10月 00:21]

College students considering careers in fields like archaeology or geology that require extensive work at remote field sites might want to find out how potential supervisors and advisers conduct themselves in the field. Do they establish clear ground rules for the behavior of everyone on the team? Are the rules consistently enforced? According to a new report, such factors likely influence whether students will witness

or experience harassment while working far from home.

- [**Study reveals risk factors for substance use problems, as well as resilience**](#) [周一, 16 10月 22:28]

A new study explores factors increasing the risk for substance use problems among African-American/Black and Latino adults residing in a high-risk urban community, as well as patterns of resilience. It reveals that serious risk factors are highly prevalent and strongly associated with substance misuse; however, a substantial proportion could be characterized as resilient, and evidenced substance use problems at rates comparable to the general U.S. population.

- [**Is rushing your child to the ER the right response?**](#) [周一, 16 10月 20:19]

If a child gets a small burn, starts choking or swallows medication, parents may struggle to decide whether to provide first aid at home or rush them to the hospital, suggests a new national poll.

- [**Making healthier decisions, step by step**](#) [周五, 13 10月 21:52]

For 10 days, scientists posted signs at the bottom of a set of airport stairs and escalators encouraging them to take the stairs. They found when the signs were present, people were about twice as likely to use the stairs.

- [**Wildlife in the ditches need a detox cure**](#) [周五, 13 10月 21:17]

When it's raining on the roads, slops of road dust and contaminants drain into the road trenches. What does it do to wildlife living by the road?

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- [**NASA's MAVEN mission finds Mars has a twisted magnetic tail**](#) [周五, 20 10月 06:18]

Mars has an invisible magnetic 'tail' that is twisted by interaction with the solar wind, according to new research using data from NASA's MAVEN spacecraft.

- [**The blob that ate the tokamak: Physicists gain understanding of bubbles at edge of plasmas**](#) [周五, 20 10月 03:05]

Scientists have completed new simulations that could provide insight into how blobs at the plasma edge behave. The simulations performed kinetic simulations of two different regions of the plasma edge simultaneously.

- [**Using optical chaos to control the momentum of light**](#) [周五, 20 10月 03:05]

Controlling and moving light poses serious challenges. One major hurdle is that light travels at different speeds and in different phases in different components of an integrated circuit. For light to couple between optical components, it needs to be moving at the same momentum. Now, a team of researchers has demonstrated a new way to control the momentum of broadband light in a widely-used optical component known as a whispering gallery microcavity (WGM).

- [**Studying insect behavior? Make yourself an ethoscope!**](#) [周五, 20 10月 02:30]

Fruit flies have surprising similarities to humans. The mysteries of a

broad range of human conditions can be studied in detail in these organisms, however this often requires the use of expensive custom equipment. team of scientists now present the ethoscope -- a cheap, easy-to-use and self-made customizable piece of equipment of their invention that can be used to study flies' behavior.

- [**Evolution in your back garden: Great tits may be adapting their beaks to birdfeeders**](#) [周五, 20 10月 02:30]

A British enthusiasm for feeding birds may have caused UK great tits to have evolved longer beaks than their European counterparts, according to new research. The findings identify for the first time the genetic differences between UK and Dutch great tits which researchers were then able to link to longer beaks in UK birds.

- [**Liquid metal discovery ushers in new wave of chemistry and electronics**](#) [周五, 20 10月 02:30]

Researchers use liquid metal to create atom-thick 2-D never before seen in nature. The research could transform how we do chemistry and could also be applied to enhance data storage and make faster electronics.

- [**Gut bacterium indirectly causes symptoms by altering fruit fly microbiome**](#) [周五, 20 10月 02:27]

CagA, a protein produced by the bacterium *Helicobacter pylori*, can alter the population of microbes living in the fruit fly gut, leading to disease symptoms, according to new research.

- [**Extreme light trapping**](#) [周五, 20 10月 00:38]

Physicists have built a nanostructure whose crystal lattice bends light as it enters the material and directs it in a path parallel to the surface, known as "parallel to interface refraction."

- [**Strange but true: Turning a material upside down can sometimes make it softer**](#) [周四, 19 10月 23:10]

Through the combined effect of flexoelectricity and piezoelectricity, researchers have found that polar materials can be made more or less resistant to dents when they are turned upside down... or when a voltage

is applied to switch their polarization. This research points to the future development of 'smart mechanical materials' for use in smart coatings and ferroelectric memories.

- [**Six degrees of separation: Why it is a small world after all**](#) [周四, 19 10月 23:10]

This study examines how small-world networks occur within bigger and more complex structures.

- [**A mosquito's secret weapon: a light touch and strong wings**](#) [周四, 19 10月 22:10]

How do mosquitoes land and take off without our noticing? Using high-speed video cameras, researchers have found part of the answer: mosquitoes' long legs allow them to slowly and gently push off, but their wings provide the majority of the lift, even when fully laden with a blood meal. For comparison, mosquitoes push off with forces much less than those of an escaping fruit fly.

- [**Scientists pinpoint jealousy in the monogamous mind**](#) [周四, 19 10月 22:10]

Scientists find that in male titi monkeys, jealousy is associated with heightened activity in the cingulate cortex, an area of the brain associated with social pain in humans, and the lateral septum, associated with pair bond formation in primates. A better understanding of jealousy may provide important clues on how to approach health and welfare problems such as addiction and domestic violence, as well as autism.

- [**The best hedge fund managers are not psychopaths or narcissists, according to new study**](#) [周四, 19 10月 22:10]

When it comes to financial investments, hedge fund managers higher in 'dark triad' personality traits -- psychopathy, narcissism, and Machiavellianism -- perform more poorly than their peers, according to new personality psychology research. The difference is a little less than 1 percent annually compared to their peers, but with large investments

over several years that slight underperformance can add up.

- [**Salmon sex linked to geological change**](#) [周四, 19 10月 22:08]

It turns out that sex can move mountains. Researchers have found that the mating habits of salmon can alter the profile of stream beds, affecting the evolution of an entire watershed. The study is one of the first to quantitatively show that salmon can influence the shape of the land.

- [**Want to control your dreams? Here's how you can**](#) [周四, 19 10月 22:08]

New research has found that a specific combination of techniques will increase people's chances of having lucid dreams, in which the dreamer is aware they're dreaming while it's still happening and can control the experience.

- [**Scientists dig into the origin of organics on dwarf planet Ceres**](#) [周四, 19 10月 03:18]

Since NASA's Dawn spacecraft detected localized organic-rich material on Ceres, scientists have been digging into the data to explore different scenarios for its origin. After considering the viability of comet or asteroid delivery, the preponderance of evidence suggests the organics are most likely native to Ceres.

- [**Petals produce a 'blue halo' that helps bees find flowers**](#) [周四, 19 10月 01:28]

Latest research has found that several common flower species have nanoscale ridges on the surface of their petals that meddle with light when viewed from certain angles.

- [**Solar eruptions could electrify Martian moons**](#) [周四, 19 10月 00:41]

Powerful solar eruptions could electrically charge areas of the Martian moon Phobos to hundreds of volts, presenting a complex electrical environment that could possibly affect sensitive electronics carried by future robotic explorers, according to a new NASA study. The study also considered electrical charges that could develop as astronauts transit

the surface on potential human missions to Phobos.

- [**Stiff fibers spun from slime**](#) [周三, 18 10月 23:35]

Nanoparticles from the secretion of velvet worms form recyclable polymer fibers.

- [**Potential human habitat located on the moon**](#) [周三, 18 10月 22:43]

A new study confirms the existence of a large open lava tube in the Marius Hills region of the moon, which could be used to protect astronauts from hazardous conditions on the surface.

- [**Flexible 'skin' can help robots, prosthetics perform everyday tasks by sensing shear force**](#) [周三, 18 10月 00:43]

Engineers have developed a flexible sensor 'skin' that can be stretched over any part of a robot's body or prosthetic to accurately convey information about shear forces and vibration, which are critical to tasks ranging from cooking an egg to dismantling a bomb.

- [**Looking for microbe 'fingerprints' on simulated Martian rocks**](#) [周二, 17 10月 23:01]

Scientists are searching for unique bio-signatures left on synthetic extraterrestrial minerals by microbial activity. A new paper describes investigations into these signatures at a miniaturized 'Mars farm' where researchers can observe interactions between the archaeon *Metallosphaera sedula* and Mars-like rocks. These microbes are capable of oxidizing and integrating metals into their metabolism.

- [**Liquid metal brings soft robotics a step closer**](#) [周二, 17 10月 21:19]

Scientists have invented a way to morph liquid metal into physical shapes. Researchers have applied electrical charges to manipulate liquid metal into 2-D shapes such as letters and a heart.

- [**Filling the early universe with knots can explain why the world is three-dimensional**](#) [周二, 17 10月 07:03]

Filling the universe with knots shortly after it popped into existence 13.8 billion years ago provides a neat explanation for why we inhabit a three-

dimensional world. That is the basic idea advanced by an out-of-the-box theory developed by an international team of physicists.

• [**Dinosaur dung fertilizes planet, new research shows**](#) [周二, 17 10月 00:44]

Dinosaurs were, and large animals are, important not for the quantity of dung they produce, but for their ability to move long distances across landscapes, effectively mixing the nutrients, outline researchers in a new report.

• [**Bite on this: Alligators caught eating sharks**](#) [周二, 17 10月 00:21]

Jaws, beware! Alligators may be coming for you. A new study documents American alligators on the Atlantic and Gulf coasts are eating small sharks and stingrays. This is the first scientific documentation of a widespread interaction between the two predators.

• [**Fanged kangaroo research could shed light on extinction**](#) [周一, 16 10月 21:27]

Fanged kangaroos -- an extinct family of small fanged Australian kangaroos -- might have survived at least five million years longer than previously thought. A new study has found the species might have competed for resources with ancestors of modern kangaroos.

• [**Gutters teem with inconspicuous life**](#) [周六, 14 10月 01:22]

Scientists have shown that Parisian street gutters are oases of microscopic life, home to microalgae, fungi, sponges, and mollusks. Grouped into communities, these microorganisms may help clean rainwater and urban waste by decomposing solid debris and pollutants. A deeper understanding of the role and composition of these communities could help elucidate the services rendered by gutter ecosystems. The researchers' findings are the first to reveal the unsuspected biodiversity of microscopic life i...

• [**New insight into the limits of possible life on Mars**](#) [周五, 13 10月 21:10]

Researchers investigating whether liquid water could exist on Mars have

provided new insight into the limits of life on the red planet.

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [**Envisioning a new engineering field: Understanding atomic-scale patterns**](#) [周五, 27 10月 03:22]

The phenomenon that forms interference patterns on television displays when a camera focuses on a pattern like a person wearing stripes has inspired a new way to conceptualize electronic devices. Researchers are showing how the atomic-scale version of this phenomenon may hold the secrets to help advance electronics design to the limits of size and speed.
- [**Learning from mussels: New way to make stronger, more stretchy polymers**](#) [周五, 27 10月 02:23]

A wide range of polymer-based materials, from tire rubber and wetsuit neoprene to Lycra clothing and silicone, are elastomers valued for their ability to flex and stretch without breaking and return to their original form.
- [**Global road-building explosion could be disastrous for people and nature, say scientists**](#) [周五, 27 10月 02:23]

The global explosion of new roads is rife with economic, social, and environmental dangers, according to a new study.
- [**First close-ups of finger-like growths that trigger battery fires**](#) [周五, 27 10月 02:23]

Scientists have captured the first atomic-level images of finger-like growths called dendrites that can pierce the barrier between battery compartments and trigger short circuits or fires. Dendrites and the problems they cause have been a stumbling block on the road to

developing new types of batteries that store more energy so electric cars, cell phones, laptops and other devices can go longer between charges.

• [**Astronomers discover sunscreen snow falling on hot exoplanet**](#) [周五, 27 10月 01:53]

Astronomers have used the Hubble Space Telescope to find a blistering-hot giant planet outside our solar system where the atmosphere 'snows' titanium dioxide -- the active ingredient in sunscreen. These observations are the first detections of this 'snow-out' process, called a 'cold trap,' on an exoplanet. The research provides insight into the complexity of weather and atmospheric composition on exoplanets, and may someday be useful for gauging the habitability of Earth-size planets.

• [**Scientists detect comets outside our solar system**](#) [周五, 27 10月 01:53]

Scientists, working closely with amateur astronomers, have spotted the dusty tails of six exocomets -- comets outside our solar system -- orbiting a faint star 800 light years from Earth.

• [**The Bakhshali manuscript: The world's oldest zero?**](#) [周五, 27 10月 01:53]

Last month, the Bodleian Library at Oxford University announced that a Sanskrit manuscript housed in the library for the last century contains the oldest known written zero, although not a 'true' zero. An international group of historians of Indian mathematics has now challenged those findings.

• [**Wobbling galaxies: New evidence for dark matter makes it even more exotic**](#) [周四, 26 10月 22:31]

Astronomers have discovered that the brightest galaxies within galaxy clusters 'wobble' relative to the cluster's center of mass. This unexpected result is inconsistent with predictions made by the current standard model of dark matter. With further analysis it may provide insights into the nature of dark matter, perhaps even indicating that new physics is at work.

- [**Dynamic catalytic converters for clean air in the city**](#) [周四, 26 10月 22:31]

Reducing pollutant emission of vehicles and meeting stricter exhaust gas standards are major challenges when developing catalytic converters. A new concept might help to efficiently treat exhaust gases after the cold start of engines and in urban traffic and to reduce the consumption of expensive noble metal.

- [**Mimicking biological process, hydrogel signals and releases proteins**](#) [周四, 26 10月 20:58]

An artificial system using a DNA-laced hydrogel can receive a chemical signal and release the appropriate protein, according to researchers. Further stimulation by the chemical signal continues to trigger a response.

- [**New property found in unusual crystalline materials**](#) [周四, 26 10月 02:11]

Researchers have discovered an unexpected property of some nanostructured metals, could lead to new ways of 'tuning' their properties.

- [**Precise DNA editing made easy: New enzyme to rewrite the genome**](#) [周四, 26 10月 02:05]

A new type of DNA editing enzyme lets scientists directly and permanently change single base pairs of DNA from A*T to G*C. The process could one day enable precise DNA surgery to correct mutations that cause human diseases.

- [**It's all about the mix: Plastic and metal-organic frameworks partner for sensing, storage**](#) [周四, 26 10月 02:05]

A marriage between 3-D printer plastic and a versatile hybrid material for detecting and storing gases could lead to inexpensive sensors and fuel cell batteries alike.

- [**New RoboBee flies, dives, swims and explodes**](#)

[out the of water](#) [周四, 26 10月 02:05]

A new, hybrid RoboBee can fly, dive into water, swim, propel itself back out of water, and safely land. Floating devices allow this multipurpose air-water microrobot to stabilize on the water's surface before an internal combustion system ignites to propel it back into the air. This latest-generation RoboBee, which is 1,000 times lighter than any previous aerial-to-aquatic robot, could be used for numerous applications, from search-and-rescue operations to environmental monitoring and biological ...

• [Models clarify physics at photocathode surfaces](#)

[周四, 26 10月 02:04]

Advances in materials science have improved the composition of materials used in photocathode production that can operate at visible wavelengths and produce a beam with reduced transverse electron momentum spread; however, the surface roughness of the photocathode continues to limit beam properties. Researchers created computer models to bridge the gap to provide a better picture of the physics at the surface of the photocathode.

• [Piezoelectrics stretch their potential with a method for flexible sticking](#) [周四, 26 10月 02:04]

Thin-film piezoelectrics, with dimensions on the scale of micrometers or smaller, offer potential for new applications where smaller dimensions or a lower voltage operation are required. Researchers have demonstrated a new technique for making piezoelectric microelectromechanical systems by connecting a sample of lead zirconate titanate piezoelectric thin films to flexible polymer substrates.

• [Comet mission reveals 'missing link' in our understanding of planet formation](#) [周四, 26 10月 02:04]

The missing link in our understanding of planet formation has been revealed by the first ever spacecraft to orbit and land on a comet, say scientists.

• [Machine learning detects marketing and sale of](#)

[opioids on Twitter](#) [周四, 26 10月 00:27]

Using advanced machine learning, a cross disciplinary team of researchers developed technology that mined Twitter to identify entities illegally selling prescription opioids online.

[New fractal-like concentrating solar power receivers are better at absorbing sunlight](#) [周四, 26 10月 00:24]

Engineers have developed new fractal-like, concentrating solar power receivers for small- to medium-scale use that are up to 20 percent more effective at absorbing sunlight than current technology.

[New software lets your car tell you what it needs](#) [周四, 26 10月 00:24]

New software could tell drivers when their cars need a tuneup, a new air filter, wheel balancing or a tire replacement, just by using a smartphone.

[Students fortify concrete by adding recycled plastic](#) [周四, 26 10月 00:24]

By exposing plastic flakes to small, harmless doses of gamma radiation, then pulverizing the flakes into a fine powder, scientists can mix the plastic with cement paste to produce concrete that is up to 20 percent stronger than conventional concrete.

[Secure payment without leaving a trace](#) [周四, 26 10月 00:24]

Whether paying for public transport via a smartphone app or whether using a prepaid card for the public swimming pool, many people open 'electronic purses' every day. However, most of them are not aware of the fact that by doing so, they largely lose privacy. Researchers have now developed a secure and anonymous system for daily use.

[Technique offers advance in testing micro-scale compressive strength of cement](#) [周三, 25 10月 22:50]

Researchers have, for the first time, used a 'micropillar compression' technique to characterize the micro-scale strength of cement, allowing for the development of cement with desirable strength properties for civil engineering applications.

- [**Among 'green' energy, hydropower is the most dangerous**](#) [周三, 25 10月 22:31]

Many governments are promoting a move away from fossil fuels towards renewable energy sources. However, in a new study, scientists highlight some of the ecological dangers this wave of 'green' energy poses.

- [**Highly stable perovskite solar cells developed**](#) [周三, 25 10月 22:31]

Researchers have developed highly stable perovskite solar cells (PSCs), using edged-selectively fluorine (F) functionalized graphene nanoplatelets (EFGnPs). The breakthrough is especially significant since the cells are made out of fluorine, a low-cost alternative to gold.

- [**Novel catalyst for rechargeable metal-air batteries**](#) [周三, 25 10月 22:31]

Scientists have introduced a novel catalyst to accelerate the commercialization of metal-air batteries. The new catalyst possesses the structure of nanofiber-based perovskite materials and exhibits excellent electrochemical performance, close to that of today's precious metal catalysts, yet it is still inexpensive.

- [**Galactic secrets revealed**](#) [周三, 25 10月 21:05]

Countless galaxies vie for attention in this monster image of the Fornax Galaxy Cluster, some appearing only as pinpricks of light while others dominate the foreground. One of these is the lenticular galaxy NGC 1316. The turbulent past of this much-studied galaxy has left it with a delicate structure of loops, arcs and rings that astronomers have now imaged in greater detail than ever before with the VLT Survey Telescope.

- [**Rapid cellphone charging getting closer to reality**](#) [周三, 25 10月 21:05]

The ability to charge cellphones in seconds is one step closer after researchers used nanotechnology to significantly improve energy-storage devices known as supercapacitors.

- [**Looking for errors in a 'black box'**](#) [周三, 25 10月 21:05]

Researchers are shining a light into the black box of deep learning systems with DeepXplore, the first automated white-box testing of such systems. Evaluating DeepXplore on real-world datasets, the researchers were able to expose thousands of unique incorrect corner-case behaviors.

- [**Energy firm branding not deals influences customer switching**](#) [周三, 25 10月 11:32]

Energy companies in the UK are using specific branding approaches instead of product innovation to keep customers, according to new research.

- [**Novel nanoparticle to remove cadmium from freshwater**](#) [周三, 25 10月 11:28]

Researchers have tested the capability of a novel nanoparticle to remove cadmium toxicity from a freshwater system.

- [**Fireworks in space**](#) [周三, 25 10月 11:28]

Some of the most exciting things that we've seen from looking at gene expression in space is that we really see an explosion, like fireworks taking off, as soon as the human body gets into space.

- [**Earliest known marine navigation tool revealed with scanning technology**](#) [周三, 25 10月 02:39]

Details of the earliest known marine navigation tool, discovered in a shipwreck, have been revealed thanks to state-of-the-art scanning technology.

- [**Raton Basin earthquakes linked to oil and gas fluid injections**](#) [周三, 25 10月 02:17]

A rash of earthquakes in southern Colorado and northern New Mexico recorded between 2008 and 2010 was likely due to fluids pumped deep underground during oil and gas wastewater disposal, suggests a new study.

- [**Supercomputers help scientists improve seismic forecasts for California**](#) [周三, 25 10月 01:37]

Researchers have used the Stampede1 and 2 supercomputers to complete one of the world's largest earthquake simulation models: The Uniform California Earthquake Rupture Forecast (UCERF3). The simulations showed that in the week following a magnitude 7.0 earthquake, the likelihood of another magnitude 7.0 quake in California would be up to 300 times greater than the week before.

- [**Electronic entropy enhances water splitting**](#) [周三, 25 10月 01:37]

An electron transitioning from state to state increases cerium's entropy, making it ideal for hydrogen production, researchers have found.

- [**Spots on supergiant star drive spirals in stellar wind**](#) [周二, 24 10月 23:56]

Astronomers have recently discovered that spots on the surface of a supergiant star are driving huge spiral structures in its stellar wind.

- [**Comparison of outcomes for robotic-assisted vs. laparoscopic surgical procedures**](#) [周二, 24 10月 23:07]

Two studies compare certain outcomes of robotic-assisted vs. laparoscopic surgery for kidney removal or rectal cancer.

- [**Jumping nanoparticles**](#) [周二, 24 10月 23:06]

Transitions occurring in nanoscale systems, such as a chemical reaction or the folding of a protein, are strongly affected by friction and thermal noise. Almost 80 years ago, the Dutch physicist Hendrik Kramers predicted that such transitions occur most frequently at intermediate friction, an effect known as Kramers turnover. Now, a team of scientists have measured this effect for a laser-trapped particle, directly confirming Kramers' prediction in an experiment for the first time.

- [**Using sound waves for biomedical breakthroughs**](#) [周二, 24 10月 22:49]

Sound waves could be the future of biomedical research, diagnosing and treatment, according to a chemistry professor. A data analyst is using an

acoustic device to separate extracellular vesicles to get a deeper look at their properties.

- [**Smart Ring: Mobile on-body devices can be precisely and discreetly controlled using a tiny sensor**](#) [周二, 24 10月 22:48]

Mobile end-user devices, such as the new version of the “Apple Watch”, have a drawback: their small screen size makes them difficult to use. Computer scientists have now developed an alternative, which they call “DeformWear”. A tiny switch, no larger than the head of a pin, is built into a ring for example, and worn on the body. It can be moved in all directions, pressed, pinched, and pushed toward the right, left, up, and down.

- [**Adhesives and composite materials made from Swiss tree bark**](#) [周二, 24 10月 22:36]

Studies show that tannins extracted from native tree bark can be used to produce adhesives and composite materials. An additional area of application might be 3D printing.

- [**Many planned roads in the tropics shouldn't be built**](#) [周二, 24 10月 22:33]

We are living in the most dramatic era of road expansion in human history, but many planned roads should not be built, concludes a major study.

- [**Self-esteem mapped in the human brain**](#) [周二, 24 10月 22:33]

A team of researchers has devised a mathematical equation that can explain how our self-esteem is shaped by what other people think of us.

- [**New self-regulating nanoparticles could treat cancer**](#) [周二, 24 10月 22:33]

Scientists have developed 'intelligent' nanoparticles which heat up to a temperature high enough to kill cancerous cells -- but which then self-regulate and lose heat before they get hot enough to harm healthy tissue.

[**Noninvasive brain imaging shows readiness of trainees to perform operations**](#) [周二, 24 10月 22:33]

While simulation platforms have been used to train surgeons before they enter an actual operating room (OR), few studies have evaluated how well trainees transfer those skills from the simulator to the OR. Now, a study that used noninvasive brain imaging to evaluate brain activity has found that simulator-trained medical students successfully transferred those skills to operating on cadavers and were faster than peers who had no simulator training.

[**A quantum spin liquid**](#) [周二, 24 10月 22:31]

Researchers report creating a metal oxide with a honeycomb lattice that scientists have sought to advance quantum computing research.

[**Single nanoparticle mapping paves the way for better nanotechnology**](#) [周二, 24 10月 22:31]

Researchers have developed a method that makes it possible to map the individual responses of nanoparticles in different situations and contexts. The results pave the way for better nanomaterials and safer nanotechnology.

[**Underwater sound waves help scientists locate ocean impacts**](#) [周二, 24 10月 22:30]

A new method to locate the precise time and location that objects fall into our oceans has now been developed.

Envisioning a new engineering field: Understanding atomic-scale patterns -- ScienceDaily

The phenomenon that forms interference patterns on television displays when a camera focuses on a pattern like a person wearing stripes has inspired a new way to conceptualize electronic devices. Researchers at the University of Illinois are showing how the atomic-scale version of this phenomenon may hold the secrets to help advance electronics design to the limits of size and speed.

In their new study, mechanical science and engineering professor Harley Johnson his co-authors recast a detail previously seen as a defect in nanomaterial design to a concept that could reshape the way engineers design electronics. The team, which also includes mechanical science and engineering graduate student Brian McGuigan and French collaborators Pascal Pochet and Johann Coraux, published its findings in the journal *Applied Materials Today*.

On display screens, moire patterns occur when the pixelation is at almost the same scale as a photographed pattern, Johnson said, or when two thin layers of a material with a periodic structure, like sheer fabrics and window screens, are placed on top of each other slightly askew.

At the macro scale, moires are optical phenomena that do not form tangible objects. However, when these patterns occur at the atomic level, arrangements of electrons are locked into place by atomic forces to form nanoscale wires capable of transmitting electricity, the researchers said.

"Two-dimensional materials -- thin films engineered to be of single-atom thickness -- create moire patterns when stacked on top of each other and are skewed, stretched, compressed or twisted," Johnson said. "The moire emerges as atoms form linear areas of high electron density. The resulting lines create what is essentially an extremely thin wire."

For decades, physicists observed microscope images of atomic arrangements of 2-D thin films and recognized them as periodic arrays of small defects known as dislocations, but Johnson's group is the first to note that

these are also common moire patterns.

"A moire pattern is simply an array of dislocations, and an array of dislocations is a moire pattern -- it goes both ways," Johnson said. This realization opened the door to what Johnson's group refers to as moire engineering -- what could lead to a new way to manufacture the smallest, lightest and fastest electronics.

By manipulating the orientation of stacked layers of 2-D thin films like graphene, wires of single-atom thickness can be assembled, building the foundation to write nanocircuitry. A wire of single-atom thickness is the limit of thinness. The thinner the wire, the faster electrons can travel, meaning this technology has the potential to produce the quickest transmitting wires and circuits possible, the researchers said.

"There is always the question of how to connect to a circuit that small," Johnson said. "There is still a lot of work to be done in finding ways to stitch together 2-D materials in a way that could produce a device."

In the meantime, Johnson's group is focusing on types of devices that can be made using moire engineering.

"Being able to engineer the moire pattern itself is a path to new lightweight and less-intrusive devices that could have applications in the biomedical and space industries," he said. "The possibilities are limited only by the imagination of engineers."

Story Source:

[Materials](#) provided by [University of Illinois at Urbana-Champaign](#). Original written by Lois Yoksoulian. *Note: Content may be edited for style and length.*

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Learning from mussels: New way to make stronger, more stretchy polymers -- ScienceDaily

A wide range of polymer-based materials, from tire rubber and wetsuit neoprene to Lycra clothing and silicone, are elastomers valued for their ability to flex and stretch without breaking and return to their original form.

Making such materials stronger usually means making them more brittle. That's because, structurally, elastomers are rather shapeless networks of polymer strands -- often compared to a bundle of disorganized spaghetti noodles -- held together by a few chemical cross-links. Strengthening a polymer requires increasing the density of cross-links between the strands by creating more links. This causes the elastomer's strands to resist stretching away from each other, giving the material a more organized structure but also making it stiffer and more prone to failure.

Inspired by the tough, flexible polymeric byssal threads

that marine mussels use to secure themselves to surfaces in the rugged intertidal zone, a team of researchers affiliated with UC Santa Barbara's Materials Research Laboratory (MRL) has developed a method for overcoming the inherent trade-off between strength and flexibility in elastomeric polymers. The group's findings appear in the journal *Science*.

"In the past decade, we have made tremendous advances in understanding how biological materials maintain strength under loading," said corresponding author Megan Valentine, an associate professor in UCSB's Department of Mechanical Engineering. "In this paper, we demonstrate our ability to use that understanding to develop useful humanmade materials. This work opens exciting lanes of discovery for many commercial and industrial applications."

Previous efforts also inspired by the mussel's cuticle chemistry have been limited to wet, soft systems such as hydrogels. By contrast, the UCSB researchers incorporated the mussel-inspired iron coordination bonds into a dry polymeric system. This is important because such a dry polymer could potentially be substituted for stiff but brittle materials, especially in impact- and torsion-related applications.

"We found that the wet network was 25 times less stiff and broke at five times shorter elongation than a similarly constructed dry network," explained co-lead author Emmanouela Filippidi, a postdoctoral researcher in the Valentine Lab at UCSB. "That's an interesting result, but an expected one. What's really striking is what happened when we compared the dry network before and after adding iron. Not only did it maintain its stretchiness but it also became 800 times stiffer and 100 times tougher in the presence of these reconfigurable iron-catechol bonds. That was unexpected."

To achieve networks having architecture and performance similar to those of the mussel byssal cuticle, the team synthesized an amorphous, loosely cross-linked epoxy network and then treated it with iron to form dynamic iron-catechol cross-links. In the absence of iron, when one of the covalent cross-links breaks, it is broken forever, because no mechanism for self-healing exists. But when the reversible iron-catechol coordination bonds are present, any of those iron-containing broken cross-links can reform, not necessarily in exactly the same place but nearby, thus maintaining the material's resiliency even as its strength increases. The material is both stiffer and

tougher than similar networks lacking iron-containing coordination bonds.

As the iron-catechol network is stretched, it doesn't store the energy, so when the tension is released, the material doesn't bounce back like a rubber band but, rather, dissipates the energy. The material then slowly recovers to reassume its original shape, in much the same way a viscoelastic material such as memory foam does after the pressure on it is released.

"A material having that characteristic, called an 'energy-dissipative plastic,' is useful for coatings," said co-lead author Thomas Cristiani, a UCSB graduate student in the Israelachvili Group. "It would make a great cellphone case because it would absorb a large amount of energy, so the phone would be less likely to break upon impact with the floor and would be protected."

The dry system the researchers used is important for two reasons. In a wet system, the network absorbs water, causing the polymer chains to stretch, so there is not much extra flexibility left. But with a dry material, the amorphous spaghetti-like strands are initially very compact, with a lot of room to stretch. When the iron

cross-links are added to strengthen the polymer, the stretchiness of the dry material is not compromised, because those bonds can break, so the polymer chains are not locked in place. Additionally, removing the water from the network results in the catechol and iron being closer together and able to form regions of high connectivity, which improves the mechanical properties.

"This difference between response in wet and dry systems is huge and makes our approach a game-changer in terms of synthesizing useful engineering materials for high-impact applications," Valentine said.

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Global road-building explosion could be disastrous for people and nature, say scientists -- ScienceDaily

The global explosion of new roads is rife with economic, social, and environmental dangers, according to a study in *Science* led by Professor William Laurance from James Cook University.

"We've scrutinized major roads and infrastructure projects around the world," said Laurance, "and it's remarkable how many have serious hidden costs and risks."

The study was co-authored by Irene Burgués Arrea, an economist with the Alliance of Leading Environmental Researchers & Thinkers (ALERT) in Costa Rica, who has studied road-building costs and benefits throughout Latin America and Africa.

The most urgent priority, say the researchers, is limiting millions of kilometers of new roads being planned or built in high-rainfall areas, mostly in

developing nations of the Asia-Pacific, Africa, and Latin America.

"This is where ambition for quick profits meets nearly impossible engineering," said Laurance.

"Rainfall-drenched roads develop pot-holes, giant cracks and landslides so fast it's nearly unbelievable," said Laurance. "They can quickly turn into giant money-losers."

"Many roads that are planned for wet, swampy or mountainous regions shouldn't be built, and that's based only on economic criteria," said Laurance.

"If you add in environmental and social costs, then the pendulum swings even harder against new roads, especially in forested areas with high environmental values," said Burgués Arrea.

By the year 2050, it is projected that there will be an additional 25 million kilometers of new paved roads on Earth -- enough to encircle the planet more than 600 times.

And in just the next three years, paved roads are expected to double in length in Asia's developing

nations.

"The public often ends up with major debts from failed roads. A few road developers and politicians get rich, but vital development opportunities are easily squandered," said Laurance.

"It's remarkable how many nations, investors, and lenders are failing to see the profound risks of road expansion in wet tropical environments, which are also the world's biologically richest ecosystems," said Laurance.

Story Source:

Materials provided by [James Cook University](#). *Note: Content may be edited for style and length.*

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First close-ups of finger-like growths that trigger battery fires: Remarkable cryo-EM images of dendrites show details down to the individual atom, and will yield new insights into why high-energy batteries fail -- ScienceDaily

Scientists from Stanford University and the Department of Energy's SLAC National Accelerator Laboratory have captured the first atomic-level images of finger-like growths called dendrites that can pierce the barrier between battery compartments and trigger short circuits or fires. Dendrites and the problems they cause have been a stumbling block on the road to developing new types of batteries that store more energy so electric cars, cell phones, laptops and other devices can go longer between charges.

This is the first study to examine the inner lives of batteries with cryo-electron microscopy, or cryo-EM, a technique whose ability to image delicate, flash-frozen

proteins and other "biological machines" in atomic detail was honored with the 2017 Nobel Prize in chemistry.

The new images reveal that each lithium metal dendrite is a long, beautifully formed six-sided crystal -- not the irregular, pitted shape depicted in previous electron microscope shots. The ability to see this level of detail for the first time with cryo-EM will give scientists a powerful tool for understanding how batteries and their components work at the most fundamental level and for investigating why high-energy batteries used in laptops, cell phones, airplanes and electric cars sometimes fail, the researchers said. They reported their findings in *Science* today.

"This is super exciting and opens up amazing opportunities," said Yi Cui, a professor at SLAC and Stanford and investigator with the Stanford Institute for Materials and Energy Sciences (SIMES) whose group did the research.

"With cryo-EM, you can look at a material that's fragile and chemically unstable and you can preserve its pristine state -- what it looks like in a real battery - and look at it under high resolution," he said. "This

includes all kinds of battery materials. The lithium metal we studied here is just one example, but it's an exciting and very challenging one."

Fickle Fingers of Failure

Cui's lab is one of many developing strategies to prevent damage from dendrites, like adding chemicals to the electrolyte to keep them from growing or developing a "smart" battery that automatically shuts off when it senses that dendrites are invading the barrier between the battery's chambers.

But until now, scientists have not been able to get atomic-scale images of dendrites or other sensitive battery parts. The method of choice -- transmission electron microscopy, or TEM -- was too harsh for many materials, including lithium metal.

"TEM sample preparation is carried out in air, but lithium metal corrodes very quickly in air," said Yuzhang Li, a Stanford graduate student who led the work with fellow grad student Yanbin Li. "Every time we tried to view lithium metal at high magnification with an electron microscope the electrons would drill holes in the dendrite or even melt it altogether."

"It's like focusing sunlight onto a leaf with a magnifying glass. But if you cool the leaf at the same time you focus the light on it, the heat will be dissipated and the leaf will be unharmed. That's what we do with cryo-EM. When it comes to imaging these battery materials, the difference is very stark."

Batteries Take a Freezing Dip

In cryo-EM, samples are flash-frozen by dipping them into liquid nitrogen, then sliced for examination under the microscope. You can freeze a whole coin-cell battery at a particular point in its charge-discharge cycle, remove the component you're interested in and see what is happening inside that component at an atom-by-atom scale. You could even create a stop-action movie of battery activity by stringing together images made at different points in the cycle.

For this study, the team used a cryo-EM instrument at Stanford School of Medicine to examine thousands of lithium metal dendrites that had been exposed to various electrolytes. They looked not only at the metal part of the dendrite, but also at a coating called SEI, or solid electrolyte interphase, that develops as the dendrite reacts with the surrounding electrolyte. This

same coating also forms on metal electrodes as a battery charges and discharges, and controlling its growth and stability are crucial for efficient battery operation.

They discovered, to their surprise, that the dendrites are crystalline, faceted nanowires that prefer to grow in certain directions. Some of them developed kinks as they grew, but their crystal structure remained surprisingly intact in spite of the kinks.

A Zoom Lens for Atoms

Zooming in, they used a different technique to look at the way electrons bounced off the atoms in the dendrite, revealing the locations of individual atoms in both the crystal and its SEI coating. When they added a chemical commonly used to improve battery performance, the atomic structure of the SEI coating became more orderly, and they think this may help explain why the additive works.

"We were really excited. This was the first time we were able to get such detailed images of a dendrite, and we also saw the nanostructure of the SEI layer for the first time," said Yanbin Li. "This tool can help us

understand what different electrolytes do and why certain ones work better than others."

Going forward, the researchers say they plan to focus on learning more about the chemistry and structure of the SEI layer.

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Astronomers discover sunscreen snow falling on hot exoplanet -- ScienceDaily

Astronomers at Penn State have used the Hubble Space Telescope to find a blistering-hot giant planet outside our solar system where the atmosphere "snows" titanium dioxide -- the active ingredient in sunscreen. These Hubble observations are the first detections of this "snow-out" process, called a "cold trap," on an exoplanet. This discovery, and other observations made by the Penn State team, provide insight into the complexity of weather and atmospheric composition on exoplanets, and may someday be useful for gauging the habitability of Earth-size planets.

"In many ways, the atmospheric studies we're doing now on these gaseous 'hot Jupiter' kinds of planets are test beds for how we're going to do atmospheric studies of terrestrial, Earth-like planets," said Thomas Beatty, assistant research professor of astronomy at Penn State and the lead author of the study. "Understanding more about the atmospheres of these planets and how they work will help us when we study smaller planets that

are harder to see and have more complicated features in their atmospheres." The team's results are published in October 2017 issue of *The Astronomical Journal*.

Beatty's team targeted planet Kepler-13Ab because it is one of the hottest of the known exoplanets. Its dayside temperature is nearly 5,000 degrees Fahrenheit.

Kepler-13Ab is so close to its parent star that it is tidally locked, so one side always faces the star while the other side is in permanent darkness. The team discovered that the sunscreen snowfall happens only on the planet's permanent nighttime side. Any visitors to this exoplanet would need to bottle up some of that sunscreen, because they won't find it on the sizzling-hot daytime side.

The astronomers didn't go looking for titanium oxide specifically. Instead, their studies revealed that this giant planet's atmosphere is cooler at higher altitudes -- which was surprising because it is the opposite of what happens on other hot Jupiters. Titanium oxide in the atmospheres of other hot Jupiters absorbs light and reradiates it as heat, making the atmosphere grow warmer at higher altitudes. Even at their much colder temperatures, most of our solar system's gas giants also have warmer temperatures at higher altitudes.

Intrigued by this surprising discovery, researchers concluded that the light-absorbing gaseous form of titanium oxide has been removed from the dayside of planet Kepler-13Ab's atmosphere. Without the titanium oxide gas to absorb incoming starlight on the daytime side, the atmospheric temperature there grows colder with increasing altitude.

The astronomers suggest that powerful winds on Kepler-13Ab carry the titanium oxide gas around, condensing it into crystalline flakes that form clouds. Kepler-13Ab's strong surface gravity -- six times greater than Jupiter's -- then pulls the titanium oxide snow out of the upper atmosphere and traps it in the lower atmosphere on the nighttime side of the planet.

"Understanding what sets the climates of other worlds has been one of the big puzzles of the last decade," said Jason Wright, associate professor of astronomy at Penn State, and one of the study's co-authors. "Seeing this cold-trap process in action provides us with a long sought and important piece of that puzzle."

The team's observations confirm a theory from several years ago that this kind of precipitation could occur on massive, hot planets with powerful gravity.

"Presumably, this precipitation process is happening on most of the observed hot Jupiters, but those gas giants all have lower surface gravities than Kepler-13Ab," Beatty explained. "The titanium oxide snow doesn't fall far enough in those atmospheres, and then it gets swept back to the hotter dayside, revaporizes, and returns to a gaseous state."

The researchers used Hubble's Wide Field Camera 3 to conduct spectroscopic observations of the exoplanet's atmosphere in near-infrared light. Hubble made the observations as the distant world traveled behind its star, a transit event called a secondary eclipse. This type of transit yields information on the temperature of the components of the atmosphere on the exoplanet's dayside.

"These observations of Kepler-13Ab are telling us how condensates and clouds form in the atmospheres of very hot Jupiters, and how gravity will affect the composition of an atmosphere," Beatty explained. "When looking at these planets, you need to know not only how hot they are, but also what their gravity is like."

Story Source:

[Materials](#) provided by [Penn State](#). *Note: Content may be edited for style and length.*

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Environment News

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- [**Learning from mussels: New way to make stronger, more stretchy polymers**](#) [周五, 27 10月 02:23]

A wide range of polymer-based materials, from tire rubber and wetsuit neoprene to Lycra clothing and silicone, are elastomers valued for their ability to flex and stretch without breaking and return to their original form.

- [**Global road-building explosion could be disastrous for people and nature, say scientists**](#) [周五, 27 10月 02:23]

The global explosion of new roads is rife with economic, social, and environmental dangers, according to a new study.

- [**Bacteria have a sense of touch**](#) [周五, 27 10月 02:23]

Although bacteria have no sensory organs in the classical sense, they are still masters in perceiving their environment. A research group has now discovered that bacteria not only respond to chemical signals, but also possess a sense of touch. The researchers demonstrate how bacteria recognize surfaces and respond to this mechanical stimulus within seconds. This mechanism is also used by pathogens to colonize and attack their host cells.

- [**Manipulating mitochondrial networks could promote healthy aging**](#) [周五, 27 10月 02:23]

Manipulating mitochondrial networks inside cells -- either by dietary restriction or by genetic manipulation that mimics it -- may increase lifespan and promote health, according to new research.

• [**Discovery of a potential therapeutic target to combat trypanosomes**](#) [周五, 27 10月 01:53]

Using cryo-electron microscopy, researchers have analyzed the structure of trypanosomes parasites in details and revealed one of their potential weak points, which has remained undetected until now. This discovery opens the path to the development of new safer therapies that are less toxic and more specific against trypanosomes, the parasites causing the Chagas disease and the African sleeping sickness.

• [**The Bakhshali manuscript: The world's oldest zero?**](#) [周五, 27 10月 01:53]

Last month, the Bodleian Library at Oxford University announced that a Sanskrit manuscript housed in the library for the last century contains the oldest known written zero, although not a 'true' zero. An international group of historians of Indian mathematics has now challenged those findings.

• [**'Bandit-masked' feathered dinosaur hid from predators using multiple types of camouflage**](#) [周五, 27 10月 01:52]

Researchers have revealed how a small feathered dinosaur used its color patterning, including a bandit mask-like stripe across its eyes, to avoid being detected by its predators and prey.

• [**The sea turtle that refused to be beaten by the storm**](#) [周五, 27 10月 01:52]

When Eleanor the sea turtle was caught in a tropical storm off the coast of Florida, she coped surprisingly well. In fact, she hardly needed to use any extra energy during the four days the storm raged -- and neither was she injured.

• [**Outpatient antibiotics raise risk for acquiring C. difficile infection in the community**](#) [周四, 26 10月 22:31]

Outpatient antibiotic use is a primary risk factor for acquiring Clostridium difficile infection in the community, reinforcing the need for appropriate prescribing in this setting, a new study confirms.

- [**Dynamic catalytic converters for clean air in the city**](#) [周四, 26 10月 22:31]

Reducing pollutant emission of vehicles and meeting stricter exhaust gas standards are major challenges when developing catalytic converters. A new concept might help to efficiently treat exhaust gases after the cold start of engines and in urban traffic and to reduce the consumption of expensive noble metal.

- [**Mimicking biological process, hydrogel signals and releases proteins**](#) [周四, 26 10月 20:58]

An artificial system using a DNA-laced hydrogel can receive a chemical signal and release the appropriate protein, according to researchers. Further stimulation by the chemical signal continues to trigger a response.

- [**Yellowstone spawned twin super-eruptions that altered global climate**](#) [周四, 26 10月 20:58]

A new geological record of the Yellowstone supervolcano's last catastrophic eruption is rewriting the story of what happened 630,000 years ago and how it affected Earth's climate. This eruption formed the vast Yellowstone caldera observed today, the second largest on Earth.

- [**The oceans were colder than we thought**](#) [周四, 26 10月 20:57]

A team of researchers has discovered a flaw in the way past ocean temperatures have been estimated up to now. Their findings could mean that the current period of climate change is unparalleled over the last 100 million years.

- [**A drier south: Europe's drought trends match climate change projections**](#) [周四, 26 10月 20:56]

Researchers published new findings that suggest European drought trends are lining up with climate change projections, pointing to decreases in drought frequency in the north and increases in drought frequency in the south.

- [**'Mega-carnivore' dinosaur roamed southern**](#)

[**Africa 200 million years ago**](#) [周四, 26 10月 03:06]

An international team of scientists has discovered the first evidence that a huge carnivorous dinosaur roamed southern Africa 200 million year ago.

• [**6,000-year-old skull could be from the world's earliest known tsunami victim**](#) [周四, 26 10月 03:06]

Scientists have discovered what they believe is the skull of the earliest known tsunami victim, a person who lived 6,000 years ago in Papua New Guinea. The skull itself was found almost a hundred years ago, but recent analysis of the sediments found with the skull reveals that they bear distinctive hallmarks of tsunami activity.

• [**Investing in conservation pays off, study finds**](#) [周四, 26 10月 02:11]

Governments and donors have spent billions of dollars since the 1992 Rio Earth Summit attempting to slow the pace of species extinctions around the world. Now, a new article provides the first clear evidence that those efforts are working.

• [**Oysters close their shells in response to low-frequency sounds**](#) [周四, 26 10月 02:05]

Oysters rapidly close their shells in response to low-frequency sounds characteristic of marine noise pollution, according to a study.

• [**Alvarezsaurid dinosaur from the late Cretaceous found in Uzbekistan**](#) [周四, 26 10月 02:05]

Bones from an Alvarezsaurid dinosaur were discovered in Uzbekistan and could shed light on the evolution and origin of the species, according to a new study.

• [**First Jurassic ichthyosaur fossil found in India**](#) [周四, 26 10月 02:05]

A new near-complete fossilized skeleton is thought to represent the first Jurassic ichthyosaur found in India.

• [**'Scars' left by icebergs record West Antarctic ice retreat**](#) [周四, 26 10月 02:04]

Thousands of marks on the Antarctic seafloor, caused by icebergs which broke free from glaciers more than ten thousand years ago, show how part of the Antarctic Ice Sheet retreated rapidly at the end of the last ice age as it balanced precariously on sloping ground and became unstable.

- [**Hacking the bacterial social network**](#) [周四, 26 10月 00:27]

Scientists have determined the molecular structures of a highly specialized set of proteins that are used by a strain of E. coli bacteria to communicate and defend their turf.

- [**Marine microbiology: Scavenging to survive below the seafloor**](#) [周四, 26 10月 00:26]

Microorganisms living in the sediments buried below the seafloor obtain their nutrients by using secreted enzymes to degrade adsorbed detritus. A new study shows that in order to survive for long time scales, microorganisms eat one another after they die.

- [**New fractal-like concentrating solar power receivers are better at absorbing sunlight**](#) [周四, 26 10月 00:24]

Engineers have developed new fractal-like, concentrating solar power receivers for small- to medium-scale use that are up to 20 percent more effective at absorbing sunlight than current technology.

- [**Side-effect after antibiotics: Bacterial toxins can be made in the gut**](#) [周四, 26 10月 00:24]

You get an infection, you are given penicillin -- and then you could get hemorrhagic diarrhea. This rare but extremely unpleasant side reaction can be related to the enterotoxin tilivalline produced by a regular intestinal bacterium. Scientists have now scrutinized the toxin's biosynthetic pathway.

- [**Among 'green' energy, hydropower is the most dangerous**](#) [周三, 25 10月 22:31]

Many governments are promoting a move away from fossil fuels towards renewable energy sources. However, in a new study, scientists highlight some of the ecological dangers this wave of 'green' energy

poses.

- [**Marine species threatened by deep-sea mining**](#) [周三, 25 10月 22:31]

Underwater mining poses a great danger to animals inhabiting the seafloors. A new research study describes the most abundant species, a sponge, which can now be used to regulate mining operations and help us better understand their environmental impacts.

- [**Role of gut microbiome in posttraumatic stress disorder: More than a gut feeling**](#) [周三, 25 10月 22:31]

The bacteria in your gut could hold clues to whether or not you will develop posttraumatic stress disorder (PTSD) after experiencing a traumatic event.

- [**Living close to green spaces is associated with better attention in children**](#) [周三, 25 10月 22:31]

How do green spaces affect cognitive development in children? A new study concludes that children with more greenness around their homes may develop better attention capacities.

- [**Could squirrel fur trade have contributed to England's medieval leprosy outbreak?**](#) [周三, 25 10月 22:31]

Genetic analysis of a pre-Norman skull unearthed in a garden in Suffolk has added to a growing body of evidence that East Anglia may have been the epicentre of an epidemic of leprosy that spread through medieval England. The authors of the new study suggest that an explanation for the prevalence of leprosy in medieval East Anglia may possibly be found in the sustained Scandinavian trade in squirrel fur -- an animal known to carry the disease.

- [**Non-native species do not make native fish more vulnerable to pollution in Mediterranean rivers**](#)

[周三, 25 10月 22:06]

The presence of exotic fish in rivers does not alter the native fish response to the environmental pollution, according to an article.

- [**Deforestation linked to palm oil production is**](#)

[making Indonesia warmer, study finds](#) [周三, 25 10月 21:05]

In the past decades, large areas of forest in Sumatra, Indonesia, have been replaced by cash crops like oil palm and rubber plantations. New research shows that these changes in land use increase temperatures in the region. The added warming could affect plants and animals and make parts of the country more vulnerable to wildfires.

• [Determining when humans started impacting the planet on a large scale](#) [周三, 25 10月 21:05]

Humans have so profoundly altered the Earth that, some scientists argue, our current geologic epoch requires a new name: the Anthropocene. But defining the precise start of the era is tricky. Would it begin with the spread of domesticated farm animals or the appearance of radioactive elements from nuclear bomb tests? Scientists report a method to measure levels of human-made contaminants in sediments that could help pinpoint the Anthropocene's onset.

• [Some infant rice cereals contain elevated levels of methylmercury](#) [周三, 25 10月 21:04]

Eating large amounts of certain fish can expose consumers to methylmercury, which can potentially cause health problems. But recent research has shown that rice grown in polluted conditions can also have raised levels -- including the rice found in some infant cereals.

• [Translocated hawks thrive in Hispaniola](#) [周三, 25 10月 21:04]

Species translocation -- capturing animals in one place and releasing them in another -- is a widely used conservation method for establishing or reestablishing populations of threatened species. However, translocation projects often fail when the transplanted animals fail to thrive in their new home. A new study demonstrates how close monitoring of the animals being released into a new area is helping wildlife managers gauge the success of their effort to save the Ridgway's hawk of Hispaniola.

• [A better way to wash pesticides off apples](#) [周三, 25 10月 21:02]

Polishing an apple with your shirt might remove some dust and dirt, but getting rid of pesticide residues could take a little more work.

Researchers now report that washing apples with a common household product -- baking soda -- could do the trick for residues on the surfaces of the fruit.

- [**Weak social ties a killer for male whales**](#) [周三, 25 10月 11:28]

Male killer whales are more likely to die if they are not at the center of their social group, new research suggests.

- [**Novel nanoparticle to remove cadmium from freshwater**](#) [周三, 25 10月 11:28]

Researchers have tested the capability of a novel nanoparticle to remove cadmium toxicity from a freshwater system.

- [**Siletzia's origin along an oceanic spreading center: What's Bremerton got to do with it?**](#) [周三, 25 10月 04:01]

Fifty million years ago, Bremerton, Washington, may have looked a lot like Iceland: hot new land atop an oceanic spreading center. That land was part of the Siletzia terrane, a thick wedge of basaltic crust that extends from Oregon to British Columbia.

- [**New method for monitoring Indian Summer Monsoon**](#) [周三, 25 10月 02:40]

Researchers have created a tool for objectively defining the onset and demise of the Indian Summer Monsoon -- a colossal weather system that affects billions of people annually.

- [**Earliest known marine navigation tool revealed with scanning technology**](#) [周三, 25 10月 02:39]

Details of the earliest known marine navigation tool, discovered in a shipwreck, have been revealed thanks to state-of-the-art scanning technology.

- [**Raton Basin earthquakes linked to oil and gas fluid injections**](#) [周三, 25 10月 02:17]

A rash of earthquakes in southern Colorado and northern New Mexico recorded between 2008 and 2010 was likely due to fluids pumped deep underground during oil and gas wastewater disposal, suggests a new study.

- [**A quarter of problematic pot users have anxiety disorders, many since childhood**](#) [周三, 25 10月 02:17]

About a quarter of adults whose marijuana use is problematic in early adulthood have anxiety disorders in childhood and late adolescence, according to new data.

- [**Taste, not appearance, drives corals to eat plastics**](#) [周三, 25 10月 02:17]

Scientists have long known that marine animals mistakenly eat plastic debris because tiny bits of floating plastic look like prey. But a new study of plastic ingestion by corals suggests there may be an additional reason for the potentially harmful behavior: The plastic simply tastes good. Chemical additives in the plastic may be acting as a feeding stimulant.

- [**Supercomputers help scientists improve seismic forecasts for California**](#) [周三, 25 10月 01:37]

Researchers have used the Stampede1 and 2 supercomputers to complete one of the world's largest earthquake simulation models: The Uniform California Earthquake Rupture Forecast (UCERF3). The simulations showed that in the week following a magnitude 7.0 earthquake, the likelihood of another magnitude 7.0 quake in California would be up to 300 times greater than the week before.

- [**'Wing prints' may identify individual bats as effectively as fingerprints identify people**](#) [周三, 25 10月 01:06]

For decades, bats have defied scientists' best ideas for keeping track of individuals, a critical element in wildlife research. Biologists have now discovered a means of identifying individual bats that may be as universal, distinctive, permanent and collectable as fingerprints: bats'

wings.

- [**No magic wand required: Scientists propose way to turn any cell into any other cell type**](#) [周三, 25 10月 01:06]

In fairy tales, all it takes to transform a frog into a prince or a mouse into a horse is the wave of a magic wand. But in the real world, transforming one living thing into another isn't so easy. A new paper grounded in both math and biology lays out a way to do it with individual cells. If it works, it could have applications from regenerating diseased or lost tissue to fighting cancer.

- [**How Neanderthals influenced human genetics at the crossroads of Asia and Europe**](#) [周三, 25 10月 01:06]

A new study explores the genetic legacy of ancient trysts between Neanderthals and the ancestors of modern humans, with a focus on Western Asia, the region where the first relations may have occurred.

- [**Arsenic can cause cancer decades after exposure ends**](#) [周二, 24 10月 23:56]

Arsenic in drinking water may have one of the longest dormancy periods of any carcinogen. By tracking the mortality rates of people exposed to arsenic-contaminated drinking water in a region in Chile, the researchers provide evidence of increases in lung, bladder, and kidney cancer even 40 years after high arsenic exposures ended.

- [**Pollutant emitted by forest fire causes DNA damage and lung cell death**](#) [周二, 24 10月 23:56]

Scientists performed tests with particles from forest and crop fires in the Amazon. Not only did they induce inflammation, oxidative stress and genetic damage in human lung cells, but they also drove one-third of the cultured cells to death.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [**Global road-building explosion could be disastrous for people and nature, say scientists**](#) [周五, 27 10月 02:23]

The global explosion of new roads is rife with economic, social, and environmental dangers, according to a new study.

- [**Dynamic catalytic converters for clean air in the city**](#) [周四, 26 10月 22:31]

Reducing pollutant emission of vehicles and meeting stricter exhaust gas standards are major challenges when developing catalytic converters. A new concept might help to efficiently treat exhaust gases after the cold start of engines and in urban traffic and to reduce the consumption of expensive noble metal.

- [**Can open and honest scientists win public trust?**](#) [周四, 26 10月 03:06]

With the increased politicization of science, more and more people continue to be skeptical of research, especially when it comes to hot-button topics such as climate change and vaccines. Now researchers wondered whether it would be better for scientists to acknowledge some of their personal or social values up front when reporting on their studies in order to gain trust.

- [**Immigrant parents, refugees face greater mental health challenges; Kids' learning at risk**](#) [周四, 26 10月 02:11]

Canadian immigrant parents, refugees, women and minorities are at greater risk of mental health issues and socioeconomic challenges, with their children more likely to suffer learning setbacks before

kindergarten, a pair of studies have shown.

• [**Investing in conservation pays off, study finds**](#) [周四, 26 10月 02:11]

Governments and donors have spent billions of dollars since the 1992 Rio Earth Summit attempting to slow the pace of species extinctions around the world. Now, a new article provides the first clear evidence that those efforts are working.

• [**Flu forecasting tool uses evolution to make earlier predictions**](#) [周四, 26 10月 02:05]

A new flu forecasting tool aims to make better predictions by combining data about how the virus spreads with an estimate of how much the current virus evolved compared to recent years. The new model accurately predicted the total number of cases for each season in the US from 2002 to 2016, and produced an accurate, real-time prediction for the 2016-17 season before it started last year.

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How do green spaces affect cognitive development in children? A new study concludes that children with more greenness around their homes may develop better attention capacities.

- **[Non-native species do not make native fish more vulnerable to pollution in Mediterranean rivers](#)** [周三, 25 10月 22:06]

The presence of exotic fish in rivers does not alter the native fish response to the environmental pollution, according to an article.

- **[Large declines seen in teen substance abuse, delinquency](#)** [周三, 25 10月 21:05]

In recent years, teens have become far less likely to abuse alcohol, nicotine and illicit drugs, according to researchers. Teens also are less likely to engage in behaviors like fighting and stealing, and the researchers believe the declines in substance use and delinquency are connected.

- **[Determining when humans started impacting the planet on a large scale](#)** [周三, 25 10月 21:05]

Humans have so profoundly altered the Earth that, some scientists argue, our current geologic epoch requires a new name: the Anthropocene. But defining the precise start of the era is tricky. Would it begin with the spread of domesticated farm animals or the appearance of radioactive elements from nuclear bomb tests? Scientists report a method to measure levels of human-made contaminants in sediments that could help pinpoint the Anthropocene's onset.

- **[Energy firm branding not deals influences customer switching](#)** [周三, 25 10月 11:32]

Energy companies in the UK are using specific branding approaches instead of product innovation to keep customers, according to new research.

- [**National security implications of gene editing**](#) [周三, 25 10月 11:28]

A trio of scientists have participated in an international think tank this month on the intersection of genome editing technology and national security.

- [**Universities should actively support open scholarship, expert urges**](#) [周三, 25 10月 02:17]

Universities should take action to support the sharing of educational resources, argues author Erin McKiernan. Open scholarship not only benefits society at large, but also fulfills universities' core missions of knowledge dissemination, community engagement, and public good. It may also increase institutions' visibility, funding, and recruitment power, and lead to better learning outcomes.

- [**Raton Basin earthquakes linked to oil and gas fluid injections**](#) [周三, 25 10月 02:17]

A rash of earthquakes in southern Colorado and northern New Mexico recorded between 2008 and 2010 was likely due to fluids pumped deep underground during oil and gas wastewater disposal, suggests a new study.

- [**The problem with being pretty**](#) [周三, 25 10月 01:06]

While good-looking people are generally believed to receive more favorable treatment in the hiring process, when it comes to applying for less desirable jobs, such as those with low pay or uninteresting work, attractiveness may be a liability, according to research.

- [**Daydreaming is good: It means you're smart**](#) [周二, 24 10月 23:28]

A new study suggests that daydreaming during meetings isn't necessarily a bad thing. It might be a sign that you're really smart and creative. People with efficient brains may have too much brain capacity to stop their minds from wandering.

- [**How to predict high school dropouts**](#) [周二, 24 10月 22:57]

Teenagers who do not access healthcare when needed are at greater risk of dropping out of high school. Dropouts are more likely to have

combinations of the following traits: low conscientiousness, neuroticism and introversion. The study examined data from the US National Longitudinal Study of Adolescents to Adult Health, a nationally representative sample of 90,000 students in grades 7 to 12 at 132 schools.

- **[Brain region that motivates behavior change discovered](#)** [周二, 24 10月 22:56]

Ever been stuck in a rut? Researchers found that stimulating a region of the brain called the posterior cingulate cortex can lead to changes in routine behavior. Neurons there ramp up their firing rates, then peak just before a pattern shifts. Knowing this could help businesses better understand how to spur employee innovation, exploration and creativity.

- **[Disaster makes people with depression less healthy](#)** [周二, 24 10月 22:33]

People who exhibit even a few depressive symptoms before a major life stressor, such as a disaster, may experience an increase in inflammation -- a major risk factor for heart disease and other negative health conditions -- after the event.

- **[Value of acknowledging adolescents' perspectives](#)** [周二, 24 10月 22:33]

Across very different cultures -- Ghana and the United States -- when parents acknowledge the perspectives of their adolescent children and encourage them to express themselves, the youths have a stronger sense of self-worth, intrinsic motivation, and engagement, and also have less depression. Yet having the latitude to make decisions appears to function differently in the two cultures, with positive outcomes for youths in the United States but not in Ghana.

- **[Starting at age 6, children spontaneously practice skills to prepare for the future](#)** [周二, 24 10月 22:33]

Deliberate practice is essential for improving a wide range of skills important for everyday life, from tying shoelaces to reading and writing. Yet despite its importance for developing basic skills, academic success,

and expertise, we know little about the development of deliberate practice. A new study from Australia found that children spontaneously practice skills to prepare for the future starting at the age of 6.

- [**Self-esteem mapped in the human brain**](#) [周二, 24 10月 22:33]

A team of researchers has devised a mathematical equation that can explain how our self-esteem is shaped by what other people think of us.

- [**'Choosing Wisely' movement: Off to a good start, but change needed for continued success**](#) [周二, 24 10月 22:33]

Five years ago, a group of medical organizations did something they'd never done before: give doctors a list of things they shouldn't do for their patients. The momentum behind this campaign, called 'Choosing Wisely,' has snowballed, but it needs to evolve in order to eliminate unnecessary care.

- [**Sacrificing one life to save others: Psychopaths' force for 'greater good'**](#) [周二, 24 10月 22:33]

New research shows that people would sacrifice one person to save a larger group of people -- and in addition, the force with which they carry out these actions could be predicted by psychopathic traits.

- [**What we call postdoctoral researchers matters, scientists say**](#) [周二, 24 10月 22:33]

Eight scientists and science policy experts make the case for standardizing how postdoctoral researchers are categorized by human resources offices and provide a framework that institutions can follow.

- [**New research highlights worldwide risk of HIV, Hepatitis C epidemics**](#) [周二, 24 10月 22:33]

Two reviews studied the global prevalence of injecting drug use and of interventions to prevent the spread of blood borne viruses among people who inject drugs.

- [**Gun deaths, injuries in California spike following Nevada gun shows**](#) [周二, 24 10月 06:27]

When gun shows are held in Nevada, gun-related deaths and injuries spike across the state line in California for at least the next two weeks. A new study examined gun deaths and injuries in California before and after gun shows in California and Nevada, and their results show a nearly 70 percent increase in deaths and injuries from firearms in California communities within convenient driving distance of Nevada gun shows.

- [**To grasp water scarcity, researchers probe links between human and natural systems**](#) [周二, 24 10月 06:26]

Understanding the fine-level interactions between nature and people is essential in determining whether a region will suffer water scarcity in the future.

- [**Air pollution cuts solar energy potential in China**](#) [周二, 24 10月 06:26]

Severe air pollution in northern and eastern China blocks about 20 percent of sunlight from reaching solar panel arrays in winter, according to a new study.

- [**Sea-level rise, not stronger storm surge, will cause future NYC flooding**](#) [周二, 24 10月 06:25]

Rising sea levels caused by a warming climate threaten greater future storm damage to New York City, but the paths of stronger future storms may shift offshore, changing the coastal risk for the city, according to a team of climate scientists.

- [**Fresh look at fresh water: Researchers create a 50,000-lake database**](#) [周二, 24 10月 06:25]

Countless numbers of vacationers spent this summer enjoying lakes for swimming, fishing and boating. But are they loving these lakes to death?

- [**The many reverberations of colonialism: A Native American language facing extinction**](#) [周二, 24 10月 06:13]

We tend to view colonialism in the past tense and to see it as an unfortunate precursor to our modern world. However, for many,

colonialism is not something that died and went away, but something that shapes their entire world, especially when it comes to language.

- [**Shallow soils promote savannas in South**](#)

- [**America**](#) [周二, 24 10月 06:07]

The boundary between South American tropical rainforests and savannas is influenced by the depth to which plants can root, research indicates. Shallow rooting depth promotes the establishment of savannas. Previous research has shown that precipitation and fire mediate tropical forest and savanna distributions. The study shows that below ground conditions need to be considered to understand the distribution of terrestrial vegetation both historically and in the face of future climate change. The s...

- [**EPA regulation on arsenic in US public water systems likely prevented over 200 cancer cases per year**](#) [周二, 24 10月 06:05]

A new study highlights the critical role of federal drinking water regulations in reducing toxic exposure and protecting human health.

- [**Stephen Hawking's PhD thesis goes online for the first time**](#) [周二, 24 10月 02:09]

Stephen Hawking's PhD thesis, 'Properties of expanding universes', has been made freely available to anyone, anywhere in the world, after being made accessible via the University of Cambridge's Open Access repository, Apollo.

- [**Rethinking well-being and sustainability measurements from local to global scales**](#) [周二, 24 10月 01:20]

A new study suggests that standard ways of measuring well-being and sustainability in communities used by global organizations may be missing critical information and could lead to missteps in management actions. The article suggests alternative and complementary approaches that use indicators grounded in the values of a particular community.

- [**Support for populist ideologies linked to feelings**](#)

[of disadvantage and national narcissism](#) [周二, 24 10月 01:19]

People who perceive they are part of a disadvantaged group are more likely to have an unrealistic belief in the greatness of their nation and support populist ideologies, new research shows.

• [Reduced impact logging still harms biodiversity in tropical rainforests](#) [周二, 24 10月 00:35]

Even low levels of logging in the Amazon rainforest may lead to great losses in biodiversity, new research has found. The research looked at 34 different plots in the state of Pará -- a focal point for Amazon protection efforts in the last decades. They found that even low levels of logging led to negative effects on dung beetle diversity and rates of dung beetle-mediated

• [Transparent solar technology represents 'wave of the future'](#) [周二, 24 10月 00:35]

See-through solar materials that can be applied to windows represent a massive source of untapped energy and could harvest as much power as bigger, bulkier rooftop solar units, scientists report.

• [College labor market remains strong](#) [周二, 24 10月 00:29]

Employers will face tough competition for talent in the 2017-18 job market, thanks to a seven-year growth streak in the college labor market.

• [Consumers see 'organic' and 'non-GM' food labels as synonymous](#) [周一, 23 10月 22:22]

What are the best ways to communicate whether a food has GM ingredients? To gauge consumers' willingness to pay for food labeled as GM vs. non-GM, researchers conducted a national survey of 1,132 respondents.

• [Teams work better with a little help from your friends](#) [周一, 23 10月 21:50]

Here's something both you and your boss can agree on: Workplace teams are better when they include your friends. Researchers analyzed the results of 26 different studies (called a meta-analysis) and found that

teams composed of friends performed better on some tasks than groups of acquaintances or strangers.

- [**Geophysicist finds teaching opportunities in movie mistakes**](#) [周一, 23 10月 21:46]

Few scientists regard the 1997 movie Volcano, in which flaming magma suddenly spews from the La Brea tar pits and incinerates much of Los Angeles, as a means to foster scientific literacy. After all, Southern California has no magma to spew. But one geophysicist sees it differently.

- [**Biosimilar drugs could cut US health spending by \\$54 billion over next decade**](#) [周一, 23 10月 21:46]

Biosimilar drugs have been touted as one strategy to help curb the runaway costs of biologics that have advanced the treatment of illness such as rheumatoid arthritis and many cancers. A new study finds biosimilars could cut health care spending in the United States by \$54 billion over the next decade. The savings are about 20 percent larger than a similar, widely cited analysis done three years ago by the same researchers.

- [**Electricity from shale gas vs. coal: Lifetime toxic releases from coal much higher**](#) [周一, 23 10月 21:43]

Despite widespread concern about potential human health impacts from hydraulic fracturing, the lifetime toxic chemical releases associated with coal-generated electricity are 10 to 100 times greater than those from electricity generated with natural gas obtained via fracking, according to a new study.

- [**After skyrocketing, opioid abuse plateaus but remains too high, national U.S. analysis shows**](#) [周一, 23 10月 05:49]

While the breakneck upswing in opioid abuse has leveled off, it remains disturbingly high and does not appear to continue its decline, according to an analysis of national data.

- [**Pollution responsible for 16 percent of early**](#)

deaths globally [周六, 21 10月 06:25]

Diseases caused by pollution were responsible in 2015 for an estimated 9 million premature deaths -- 16 percent of all deaths worldwide, according to a report.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- ['Bandit-masked' feathered dinosaur hid from predators using multiple types of camouflage](#) [周五, 27 10月 01:52]

Researchers have revealed how a small feathered dinosaur used its color patterning, including a bandit mask-like stripe across its eyes, to avoid being detected by its predators and prey.

- [Wobbling galaxies: New evidence for dark matter makes it even more exotic](#) [周四, 26 10月 22:31]

Astronomers have discovered that the brightest galaxies within galaxy clusters 'wobble' relative to the cluster's center of mass. This unexpected result is inconsistent with predictions made by the current standard model of dark matter. With further analysis it may provide insights into the nature of dark matter, perhaps even indicating that new physics is at work.

- ['Mega-carnivore' dinosaur roamed southern Africa 200 million years ago](#) [周四, 26 10月 03:06]

An international team of scientists has discovered the first evidence that a huge carnivorous dinosaur roamed southern Africa 200 million year ago.

- [6,000-year-old skull could be from the world's earliest known tsunami victim](#) [周四, 26 10月 03:06]

Scientists have discovered what they believe is the skull of the earliest known tsunami victim, a person who lived 6,000 years ago in Papua New Guinea. The skull itself was found almost a hundred years ago, but

recent analysis of the sediments found with the skull reveals that they bear distinctive hallmarks of tsunami activity.

- [**New property found in unusual crystalline materials**](#) [周四, 26 10月 02:11]

Researchers have discovered an unexpected property of some nanostructured metals, could lead to new ways of 'tuning' their properties.

- [**New RoboBee flies, dives, swims and explodes out the of water**](#) [周四, 26 10月 02:05]

A new, hybrid RoboBee can fly, dive into water, swim, propel itself back out of water, and safely land. Floating devices allow this multipurpose air-water microrobot to stabilize on the water's surface before an internal combustion system ignites to propel it back into the air. This latest-generation RoboBee, which is 1,000 times lighter than any previous aerial-to-aquatic robot, could be used for numerous applications, from search-and-rescue operations to environmental monitoring and biological ...

- [**Could squirrel fur trade have contributed to England's medieval leprosy outbreak?**](#) [周三, 25 10月 22:31]

Genetic analysis of a pre-Norman skull unearthed in a garden in Suffolk has added to a growing body of evidence that East Anglia may have been the epicentre of an epidemic of leprosy that spread through medieval England. The authors of the new study suggest that an explanation for the prevalence of leprosy in medieval East Anglia may possibly be found in the sustained Scandinavian trade in squirrel fur -- an animal known to carry the disease.

- [**Why arched backs are attractive**](#) [周三, 25 10月 22:31]

Researchers have provided scientific evidence for what lap dancers and those who twerk probably have known all along -- men are captivated by the arched back of a woman. A team used 3-D models and eye-tracking technology to show how the subsequent slight thrusting out of a woman's hips can hold a man's gaze.

- [**Skin found to play a role in controlling blood pressure**](#) [周三, 25 10月 22:31]

Skin plays a surprising role in helping regulate blood pressure and heart rate, according to scientists. While this discovery was made in mice, the researchers believe it is likely to be true also in humans.

- [**Taste, not appearance, drives corals to eat plastics**](#) [周三, 25 10月 02:17]

Scientists have long known that marine animals mistakenly eat plastic debris because tiny bits of floating plastic look like prey. But a new study of plastic ingestion by corals suggests there may be an additional reason for the potentially harmful behavior: The plastic simply tastes good. Chemical additives in the plastic may be acting as a feeding stimulant.

- [**'Wing prints' may identify individual bats as effectively as fingerprints identify people**](#) [周三, 25 10月 01:06]

For decades, bats have defied scientists' best ideas for keeping track of individuals, a critical element in wildlife research. Biologists have now discovered a means of identifying individual bats that may be as universal, distinctive, permanent and collectable as fingerprints: bats' wings.

- [**Spots on supergiant star drive spirals in stellar wind**](#) [周二, 24 10月 23:56]

Astronomers have recently discovered that spots on the surface of a supergiant star are driving huge spiral structures in its stellar wind.

- [**'Mind-reading' brain-decoding tech**](#) [周二, 24 10月 01:20]

Researchers have demonstrated how to decode what the human brain is seeing by using artificial intelligence to interpret fMRI scans from people watching videos, representing a sort of mind-reading technology.

- [**Smart birds: Canada geese give hunters the slip by hiding out in Chicago**](#) [周二, 24 10月 01:20]

It's open season for Canada geese in Illinois from mid-October to mid-January. Unfortunately for hunters, Canada geese are finding a new way to stay out of the line of fire. Rather than being 'sitting ducks' in a rural pond, they're setting up residence in the city. Ornithologists conducted a recent study to try to find out why there were so many Canada geese in Chicago in the winter.

• [These shrews have heads that shrink with the season](#) [周二, 24 10月 00:36]

If any part of the body would seem ill equipped to shrink, it would probably be the head and skull. And, yet, researchers have found that the skulls of red-toothed shrews do shrink in anticipation of winter, by up to 20 percent. As spring approaches, their heads grow again to approach their previous size.

• [Psychedelic drugs may reduce criminal behavior](#) [周一, 23 10月 22:17]

Newly published research suggests that common psychedelic drugs -- such as 'magic mushrooms', LSD and mescaline (a substance derived from the peyote cactus) -- may reduce criminal offenses. The new study found that psychedelic drugs are associated with a decreased likelihood of antisocial criminal behavior.

• [Prozac in ocean water a possible threat to sea life](#) [周六, 21 10月 00:58]

Oregon shore crabs exhibit risky behavior when they're exposed to the antidepressant Prozac, making it easier for predators to catch them, according to a new study.

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• [**US Olympians at 2016 Rio Games were infected with West Nile virus, not Zika**](#) [周日, 08 10月 05:29]

US Olympic and Paralympic athletes and staff who traveled to Rio de Janeiro, Brazil, for the 2016 Summer Games did not become infected with Zika virus but did test positive for other tropical, mosquito-borne viral infections, including West Nile Virus, Dengue Fever and Chikungunya.

• [**New electro-organic synthesis allows sustainable and green production of fine chemicals**](#) [周六, 07 10月 04:49]

Scientists have succeeded in developing a state-of-the-art and innovative electro-organic synthesis.

• [**Cannabis consumption increases violent behavior in young people in psychiatric care**](#) [周六, 07 10月 04:48]

A new study on cannabis use that involved 1,136 patients (from 18 to 40 years of age) with mental illnesses who had been seen five times during the year after discharge from a psychiatric hospital demonstrates that sustained use of cannabis is associated with an increase in violent behavior in young people. Moreover, the association between persistent cannabis use and violence is stronger than that associated with alcohol or cocaine.

- [**Antibiotics for dental procedures linked to superbug infection**](#) [周六, 07 10月 04:48]

Dental procedures are an overlooked source of antibiotic prescribing, which is a concern as these medications increase the risk of developing *C. difficile*.

- [**DNA barcoding technology helping monitor health of all-important boreal forest**](#) [周六, 07 10月 04:48]

The Boreal forest is essential to Canada and the world, storing carbon, purifying water and air and regulating climate. But keeping tabs on the health of this vulnerable biome has proven to be a painstaking and time-consuming undertaking - until now. Cutting-edge DNA metabarcoding technology can help speed up and improve the monitoring process, according to a new study.

- [**Genetic body/brain connection identified in genomic region linked to autism**](#) [周六, 07 10月 04:48]

For the first time, scientists have documented a direct link between deletions in two genes--*fam57ba* and *doc2a*--in zebrafish and certain brain and body traits, such as seizures, hyperactivity, large head size, and increased fat content. Both genes reside in the 16p11.2 region of the genome, which has been linked to multiple brain and body disorders in humans, including autism spectrum disorder, developmental delays, seizures, and obesity.

- [**Mars study yields clues to possible cradle of life**](#) [周六, 07 10月 03:49]

The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth. The research offers evidence that these deposits were formed by heated water from a volcanically active part of the planet's crust entering the bottom of a large sea long ago.

- [**Ebola vaccine tested in adults and children in Africa hailed a success**](#) [周六, 07 10月 02:23]

Experts have reported that an Ebola vaccine is safe for children as well

as adults and produces an immune response.

- [**A dash of gold improves microlasers**](#) [周六, 07 10月 02:22]

By attaching gold nanoparticles to the surface of a microlaser, researchers demonstrated a frequency comb that takes up less space and requires 1000 times less power than current comb technology.

- [**DNA damage caused by cancer treatment reversed by ZATT protein**](#) [周六, 07 10月 02:22]

An international team has discovered a new way that cells fix an important and dangerous type of DNA damage known as a DNA-protein cross-link (DPC). The researchers found that a protein named ZATT can eliminate DPCs with the help of another protein, TDP2.

- [**Preeclampsia triggered by an overdose of gene activity**](#) [周六, 07 10月 02:22]

Preeclampsia, the most dangerous form of hypertension during a pregnancy, is known to originate in the placenta. But the root causes remain largely a mystery. Findings reveal that it is not a single disease caused solely by genetic factors: Epigenetically regulated genes play an important role. The research team also developed an in vitro model of the disorder which demonstrates the dysregulation of an important transcription factor.

- [**New telescope attachment allows ground-based observations of new worlds**](#) [周六, 07 10月 02:22]

A new, low-cost attachment to telescopes allows previously unachievable precision in ground-based observations of planets beyond our solar system. With it, ground-based telescopes can produce measurements of light intensity that rival the highest quality photometric observations from space.

- [**Asymmetric sound absorption lets in the light**](#) [周六, 07 10月 02:22]

Many asymmetric absorbers are currently based on a single-port system, where sound enters one side and is absorbed before a rigid wall. In this design, however, light and air are unable to pass through the system. But

new research shows that asymmetric absorption can be realized within a straight transparent waveguide.

- [**Deer prefer native plants leaving lasting damage on forests**](#) [周六, 07 10月 02:21]

When rampant white-tailed deer graze in forests, they prefer to eat native plants over certain unpalatable invasive plants, such as garlic mustard and Japanese stiltgrass. These eating habits lower native plant diversity and abundance, while increasing the proportion of plant communities made up of non-native species, according to a new study.

- [**Breakthrough in direct activation of CO₂ and CH₄ into liquid fuels and chemicals**](#) [周六, 07 10月 00:40]

Researchers have made a significant breakthrough in the direct conversion of carbon dioxide (CO₂) and methane (CH₄) into liquid fuels and chemicals which could help industry to reduce greenhouse gas emissions whilst producing valuable chemical feedstocks.

- [**Gluten intolerance appears largely undiagnosed in Canada**](#) [周六, 07 10月 00:40]

Research on a large sample of Canadians suggests that most people with celiac disease don't know they have it.

- [**Breast cancer linked to bacterial imbalances**](#) [周六, 07 10月 00:40]

Researchers have uncovered differences in the bacterial composition of breast tissue of healthy women vs. women with breast cancer. The research team has discovered for the first time that healthy breast tissue contains more of the bacterial species *Methylobacterium*, a finding which could offer a new perspective in the battle against breast cancer.

- [**Energy against the current on a quantum scale, without contradicting the laws of physics**](#) [周五, 06 10月 23:23]

In a classical thermodynamic system, the heat current flows from the hotter body to the colder one, or electricity from the higher voltage to the lower one. The same thing happens in quantum systems, but this state can be changed, and the flow of energy and particles can be

reversed if a quantum observer is inserted into the system.

- [**Sensitivity to time improves performance at remotely controlling devices**](#) [周五, 06 10月 23:23]

A new study finds that people who are more sensitive to the passage of time are better at accounting for the latency -- or time lag -- inherent in remotely controlling robots or other tools.

- [**'Lost chapel' of Westminster Palace revealed in new 3-D model**](#) [周五, 06 10月 23:23]

The first dedicated House of Commons chamber, destroyed in the 1834 Palace of Westminster fire, has been reconstructed with the help of 3-D visualization technology.

- [**Predicting insect feeding preferences after deforestation**](#) [周五, 06 10月 22:18]

Understanding how parasitoids and hosts interact, and how their interactions change with human influence, is critically important to understanding ecosystems. New research finds mathematical models can predict complex insect behavioral changes using a simple description of insect preferences.

- [**Segregation-induced ordered superstructures at general grain boundaries in a Ni-Bi alloy**](#) [周五, 06 10月 22:18]

Randomly selected, high-angle, general grain boundaries in a nickel-bismuth (Ni-Bi) polycrystalline alloy can undergo interfacial reconstruction to form ordered superstructures, a discovery that enriches the theories and fundamental understandings of both grain boundary segregation and liquid metal embrittlement in physical metallurgy.

- [**Plant cells survive but stop dividing upon DNA damage**](#) [周五, 06 10月 22:18]

The cell cycle is how a cell passes its DNA but ceases if the DNA is damaged, as otherwise it risks passing this damage to daughter cells. Scientists report a new molecular mechanism that explains how this cessation occurs. The study shows that the transcription factor family

MYB3R is normally degraded, but accumulates upon DNA damage to prevent cell cycle progression.

- [**New antifungal drug**](#) [周五, 06 10月 22:18]

Medical researchers have developed a new antifungal drug to help in the treatment of life threatening invasive fungal infections such as invasive aspergillosis.

- [**New study analyzes volcanic fatalities in more detail than ever before**](#) [周五, 06 10月 22:18]

Building on existing information and databases relating to volcanic fatalities, scientists have, for the first time, been able to classify victims by activity or occupation and look at the distance of their death from the volcano.

- [**Exotic quantum particle observed in bilayer graphene**](#) [周五, 06 10月 21:22]

Physicists have definitively observed an intensely studied anomaly in condensed matter physics -- the even-denominator fractional quantum Hall state -- via transport measurement in bilayer graphene.

- [**Beyond bullying: Study shows damaging affects of multiple forms of victimization on school climate**](#) [周五, 06 10月 21:04]

School officials focused exclusively on bullying prevention efforts might want to consider the findings of a new study showing the highly damaging effects of multiple forms of victimization on school climate.

- [**Microbes dictate regime shifts causing anoxia in lakes and seas**](#) [周五, 06 10月 21:03]

Gradual environmental changes due to eutrophication and global warming can cause a rapid depletion of oxygen levels in lakes and coastal waters. A new study shows that microorganisms play a key role in these disastrous regime shifts.

- [**Electron behavior under extreme conditions**](#)

described for the first time [周五, 06 10月 21:02]

Researchers have modeled the actions of electrons under extreme temperatures and densities, such as those found within planets and stars.

Social acceptance more important than economic factors in fertility treatment availability [周五, 06 10月 20:59]

A new British study has shed light on some of the reasons why Assisted Reproductive Technologies (ART) usage varies across Europe -- pinpointing moral and social acceptance of the treatment and religion as key. Scientists have, for the first time, assessed the relative importance of the role that economic, demographic and cultural normative factors play in the process.

Is your partner's hearing loss driving you mad? [周五, 06 10月 20:59]

The impact of a person's hearing loss on their nearest and dearest should be considered when personalizing rehabilitation plans for patients with deafness, suggest researchers.

How seemingly acute viral infections can persist [周五, 06 10月 20:59]

Scientists have resolved a paradox of viral infection. They've identified how a viral product can both trigger an immune response aimed at eliminating the virus or, conversely, allow the virus to survive and persist.

Engineers invent breakthrough millimeter-wave circulator IC [周五, 06 10月 20:59]

Researchers continue to break new ground in developing magnet-free non-reciprocal components in modern semiconductor processes. They have built the first magnet-free non-reciprocal circulator on a silicon chip that operates at millimeter-wave frequencies, enabling circulators to be built in conventional semiconductor chips and operate at millimeter-wave frequencies, enabling full-duplex or two-way wireless.

Discovery advances understanding of

[**inflammatory bowel disease**](#) [周五, 06 10月 07:06]

New findings could help guide doctors to determine how best to treat patients with Crohn's disease, outlines a new report.

• [**Shrinking the proton again**](#) [周五, 06 10月 07:04]

Scientists, using high precision laser spectroscopy of atomic hydrogen, confirm the surprisingly small value of the proton radius determined from muonic hydrogen.

• [**Pushy or laid back? Economic factors influence parenting style**](#) [周五, 06 10月 07:03]

A new study argues that parenting styles are shaped by economic factors that incentivize one strategy over others.

• [**'Transformative' research unrealistic to predict, scientists tell granting agencies**](#) [周五, 06 10月 07:03]

Research-funding agencies that require scientists to declare at the proposal stage how their projects will be 'transformative' may actually be hindering discovery.

• [**How to decrease the discard rate of donated organs**](#) [周五, 06 10月 07:02]

From 2008-2015, the number of kidneys donated after circulatory death that were obtained by the country's 58 donor service areas varied substantially. The outcomes associated with these organs were generally excellent. The use of these organs could be increased if 'cold ischemia times' are limited.

• [**Women who get frequent UTIs may reduce risk by drinking plenty of water**](#) [周五, 06 10月 07:02]

Women who suffer from recurrent urinary tract infections may reduce their risk by drinking more water, according to a new study.

• [**Screen children with reading difficulties for hearing problems**](#) [周五, 06 10月 07:02]

A new study found 25 percent of its young participants who had reading

difficulties showed mild or moderate hearing impairment, of which their parents and teachers were unaware.

- [**Old Faithful's geological heart revealed**](#) [周五, 06 10月 07:02]

Scientists have mapped the near-surface geology around Old Faithful, revealing the reservoir of heated water that feeds the geyser's surface vent and how the ground shaking behaves in between eruptions.

- [**Study challenges long-standing concept in cancer metabolism**](#) [周五, 06 10月 04:11]

Scientists have discovered that lactate provides a fuel for growing tumors, challenging a nearly century-old observation known as the Warburg effect.

- [**New research to combat pancreatic cancer**](#) [周五, 06 10月 04:11]

New research is underway that could help scientists combat the most lethal of cancers: pancreatic cancer. In a recent study, scientists demonstrated that bacteria in pancreatic tumors degrade a chemotherapy drug -- Gemcitabine -- most commonly used to treat patients who have pancreatic cancer.

- [**Bariatric surgery lowers cancer risk for severely obese patients**](#) [周五, 06 10月 04:11]

Bariatric surgery lowers the risk of cancer for severely obese patients. The risks drop most for postmenopausal breast cancer, endometrial cancer, pancreatic cancer and colon cancer.

- [**Smartphone-controlled smart bandage for better, faster healing**](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [**Multiple research approaches are key to pandemic preparedness**](#) [周五, 06 10月 03:11]

Preparedness in the face of major disease outbreaks can save thousands of lives. A new article examines the multifaceted nature of effective preparedness and the role that biomedical research plays. Specifically, the article examines three approaches to pandemic preparedness: pathogen-specific work, platform-based technologies, and prototype-pathogen efforts.

- [**Interpreting hurricane forecast displays can be difficult for general public**](#) [周五, 06 10月 03:11]

The 2017 hurricane season has highlighted the critical need to communicate a storm's impact path and intensity accurately, but new research shows significant misunderstandings of the two most commonly used storm forecast visualization methods.

- [**Do earthquakes have a 'tell'?**](#) [周五, 06 10月 03:11]

Data scientists and seismologists could potentially forecast strong earthquakes through algorithms designed to detect and monitor 'deep tremor.'

- [**Good-guy bacteria may help cancer immunotherapies do their job**](#) [周五, 06 10月 02:42]

Individuals with certain types of bacteria in their gut may be more likely to respond well to cancer immunotherapy, researchers found in a study of patients with metastatic melanoma.

- [**Low serum calcium may increase risk of sudden cardiac arrest**](#) [周五, 06 10月 02:18]

In a new study, researchers found that individuals with lower levels of calcium in the blood, which is easily monitored, are more likely to experience SCA than those with higher calcium levels.

US Olympians at 2016 Rio Games were infected with West Nile virus, not Zika -- ScienceDaily

U.S. Olympic and Paralympic athletes and staff who traveled to Rio de Janeiro, Brazil, for the 2016 Summer Games did not become infected with Zika virus but did test positive for other tropical, mosquito-borne viral infections, including West Nile Virus, Dengue Fever and Chikungunya. Results from the University of Utah Health-led study will be reported at IDWeek, a national infectious disease conference being held in San Diego.

None of the infected travelers became seriously ill, say the study's investigators. But the findings are a reminder that amidst the frenzy over Zika, travelers were also susceptible to other, long-standing public health risks that did not receive the same level of scrutiny.

"Everyone was concentrating on Zika and ignoring that there could be other infections caused by mosquito bites. We did not expect to find so many with these

other infections," says U of U Health infectious disease specialist Krow Ampofo, MBChB., who will be presenting the study's results on Oct. 7. "That is one of the reasons why we think that being vigilant about monitoring for infectious diseases after travel to at-risk areas is so important."

Other sources have indicated that there were no Zika cases reported during the Rio Olympics. But the U of U Health investigation is the first to examine a large cohort for viruses that cause other tropical infectious diseases.

Of the 457 athletes and staff who provided blood samples after returning from Brazil, testing found that 32 (7%) had become infected with mosquito-borne viruses while abroad. Twenty-seven had West Nile Virus, three had Chikungunya, and two had Dengue. None had signs of Zika.

Twelve of the individuals who tested positive filled out post-travel surveys. From those, only three -- two with Chikungunya and one with West Nile Virus -- reported having symptoms that can include body aches and rash. Symptoms emerged within two weeks after travel and resolved shortly thereafter.

"We were thrilled that there were no cases of Zika," says lead investigator Carrie Byington, M.D., who began the study while at U of U Health and is now at Texas A&M; Health Science Center. "One of the reasons we think that post travel diagnostics is really important is because multiple things can cause a similar picture and it's important to know what you had."

In general, most people infected with one of the other three viruses tested in the study -- West Nile Virus, Chikangunya or Dengue -- either had no symptoms or, when ill, had mild symptoms. In rare cases, these infections can be severely disabling or lethal.

At the time the study began, organizers were particularly concerned about Zika, which can also spread through sexual transmission and cause debilitating birth defects in unborn babies.

The 2016 Olympic and Paralympic Summer Games were held not long after the height of the Zika epidemic. The U of U Health study was mounted as a rapid response to monitor the health of U.S. athletes and staff traveling to Brazil, the epicenter of the outbreak. Of the estimated 2,000 travelers, 950

enrolled in the study, and just under half submitted samples for testing upon return. Participants who tested positive were sent letters explaining their results and recommending they consult with their health care provider.

"We all had our Hollywood sunglasses on, and they blinded us to other possibilities," says Marc Couturier, Ph.D., a medical director at ARUP Laboratories who led the testing. "We can't forget that West Nile Virus has been around for a while, and is still here."

Story Source:

Materials provided by [University of Utah Health](#).

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New electro-organic synthesis allows sustainable and green production of fine chemicals: Innovative contribution to the energy transition -- ScienceDaily

In the cooperative EPSYLON research project funded by the German Federal Ministry of Education and Research, scientists from Johannes Gutenberg University Mainz (JGU) and Evonik Performance Materials GmbH have succeeded in developing a state-of-the-art and innovative electro-organic synthesis. The results of their research, presented in last week's issue of *Science Advances*, allow the use of electrosynthesis as a trend-setting and sustainable green chemistry for technical applications. The method developed allows the operator to react flexibly to the available supply of electricity. Moreover, the operator no longer has to rely on customized electrolysis apparatuses and can use a wide variety of different equipment.

The method of carrying out chemical reactions using electricity was developed more than 160 years ago by German chemist Hermann Kolbe. Although

electrochemical syntheses are used in the chemical industry, this has so far been a niche technology. One reason is that the electrolysis conditions must be very finely controlled and uniform current input is essential. Due to the sophisticated technical infrastructure, the option of electrosynthesis remained unknown to most chemists. Now, in the 21st century, the green potential of electrochemistry has been rediscovered. It makes sustainable and eco-friendly chemistry possible with very simple means, particularly with the use of surplus power from renewable sources, such as wind or solar energy.

Electrochemistry is a versatile and powerful method that can be used to produce various chemical compounds or to effect chemical changes in molecules. To put it simply, electrons replace costly and toxic reagents. Unnecessary wastes can be avoided and the reaction can be halted at any time by simply switching off the power. Another advantage over classical synthesis is that many individual steps are more easily implemented by electrochemistry. In some cases, this can shorten a synthesis by several steps. However, electrolyses often require a narrow current-density window and long reaction times. In addition, selectivity and scalability are more difficult or even

impossible.

The key to the success of the research group headed by Professor Siegfried Waldvogel of the Institute of Organic Chemistry at Johannes Gutenberg University Mainz is the use of a unique electrolyte system. The electrolyses here have extremely high stability to variation in current density, allowing operation in a current-density window with a width extending over more than two orders of magnitude, with no loss of productivity or selectivity. If the supply of current permits, the electrolysis may be carried out in a short time with very high current density.

Story Source:

Materials provided by [Johannes Gutenberg Universitaet Mainz](#). *Note: Content may be edited for style and length.*

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Cannabis consumption increases violent behavior in young people in psychiatric care -- ScienceDaily

A new study by researchers at the Institut en santé mentale de Montréal demonstrates that sustained use of cannabis is associated with an increase in violent behaviour in young people after discharge from a psychiatric hospital.

The research by Dr. Alexandre Dumais (MD, PhD, FRCPC, psychiatrist at the Institut Philippe Pinel) and Dr. Stéphane Potvin (PhD, professor at the Université de Montréal), which studied 1,136 patients (from 18 to 40 years of age) with mental illnesses who had been seen five times during the year after discharge, took into account substance use and the onset of violent behaviour.

Previous research has already shown that a cannabis use disorder is associated with violent behaviour. According to this new study published in *Frontiers in Psychiatry*, users who reported at each follow-up visit

that they continued to smoke cannabis presented an increased risk (+144%) of violent behaviour.

These results also confirm the detrimental role of chronic cannabis use in patients with mental illness. According to the principal researcher Alexandre Dumais (MD, PhD, FRCPC): "an interesting feature of our results is that the association between persistent cannabis use and violence is stronger than that associated with alcohol or cocaine."

Indicator for external follow-up

Persistent cannabis use should therefore be considered as an indicator of future violent behaviour in patients who leave a psychiatric hospital for follow-up in an outpatient clinic, although the researcher points out that this behaviour tends to fade with time.

"This decrease could be explained by better adherence to treatment (the patient becomes more involved in their treatment over time) and by better support from their entourage. Even though we observed that violent behaviour tended to decrease during follow-up periods, the association remained statistically significant," noted Dr. Dumais.

The research results also suggest that there is no reciprocal relationship, that is, the use of cannabis resulted in future violent behaviour and not the reverse (for example, a violent person might use cannabis following an episode of violent behaviour to reduce their tension), as was suggested by previous studies.

The effects of cannabis on the brain

A recent meta-analysis of neuroimaging studies demonstrated that chronic cannabis users have deficits in the prefrontal cortex, a part of the brain that inhibits impulsive behaviour.

These results are important because they offer additional information to young adults, who can evaluate the risks of cannabis before deciding whether or not to use it. They will also serve as a tool to develop strategies to prevent the risk of violence associated with cannabis, since these risks have important consequences, both socially and for the health of young adults and for society in general.

This study was funded by the Fonds de la recherche du Québec-Santé.

Story Source:

[Materials](#) provided by [University of Montreal](#). *Note: Content may be edited for style and length.*

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Antibiotics for dental procedures linked to superbug infection -- ScienceDaily

Taking antibiotics can put patients at risk for developing *C. diff* and illustrates the importance of using the medications only when needed. The Minnesota Department of Health (MDH) tracked community-associated *C. diff* infections -- meaning those in patients who did not have an overnight stay in a hospital or nursing home -- in five counties in the state. During the six-year period, researchers determined 15 percent of those with the infection who had taken antibiotics had them prescribed for dental procedures.

But one-third of those patients' medical charts included no mention of receiving dental procedure-related antibiotics, researchers determined. An earlier survey conducted by the MDH found 36 percent of dentists prescribed antibiotics in situations that are generally not recommended by the American Dental Association (ADA) and reported challenges to making appropriate

antibiotic prescribing decisions, including confusion about or perceived conflicts among prescribing guidelines.

"Dentists have been overlooked as a source of antibiotic prescribing, which can potentially delay treatment when doctors are trying to determine what is causing a patient's illness," said Stacy Holzbauer, DVM, MPH, lead author of the study and career epidemiology field officer for the CDC and MDH. "It's important to educate dentists about the potential complications of antibiotic prescribing, including *C. diff*. Dentists write more than 24.5 million prescriptions for antibiotics a year. It is essential that they be included in efforts to improve antibiotic prescribing."

Dentists appropriately prescribe antibiotics in certain situations, such as to treat infections stemming from a tooth abscess. However, some dentists prescribe antibiotics prophylactically before a dental procedure to prevent a heart infection in patients with heart conditions, or to prevent an infection of an artificial joint, such as a hip or knee replacement. The ADA no longer recommends preventive antibiotics in most of those cases, as it once did. "It is possible some dentists aren't aware of the updated recommendations or are

being asked by other healthcare providers to continue preventive antibiotics despite the change," said Dr. Holzbauer. Current recommendations note the risk of taking antibiotics -- such as developing *C. diff* -- is greater than the risk of an infection in those cases. Further, the inappropriate use of antibiotics helps fuel the creation of drug-resistant bacteria, which are very difficult to treat and are an increasing public health threat.

In the study, MDH researchers interviewed 1,626 people with community-associated *C. diff* between 2009 and 2015. Of those, 926 (57 percent) reported they had been prescribed antibiotics, 136 (15 percent) of those for dental procedures. The study found patients who were prescribed antibiotics for dental procedures tended to be older and more likely to receive clindamycin, an antibiotic that is associated with *C. diff* infection. Of those who had received antibiotics for a dental procedure, 34 percent had no mention of antibiotics in their medical charts, illustrating the disconnect between dental and medical care. During routine medical appointments, patients should bring up dental visits and medications, including antibiotics -- they have taken. In addition, healthcare providers should ask patients about dental

visits and medications taken for dental reasons.

Antibiotics kill bad and good bacteria in the gastrointestinal (GI) system. Wiping out the protective bacteria can allow the growth of *C. diff* bacteria, leading to severe and potentially deadly diarrhea. *C. diff* can occur after just one dose of antibiotics and is one of the top three most urgent antibiotic-resistant threats identified by the CDC. It caused almost half a million infections and led to 15,000 deaths in a single year, according to CDC estimates.

"Research has shown that reducing outpatient antibiotic prescribing by 10 percent could decrease *C. diff* rates outside of hospitals by 17 percent," said Dr. Holzbauer. "Limiting the use of inappropriate antibiotics in dentistry could also have a profound impact."

While the ADA has expressed a commitment to and is an active partner in antibiotic stewardship, a 2015 MDH survey of dentists found fewer than half were concerned about adverse drug effects, antibiotic resistance or *C. diff* as factors that influenced their prescribing decisions. That's likely because they are unaware when their patients develop *C. diff*, Dr. Holzbauer said. Better communication between dental

and medical communities and improved history taking by all prescribers would help, she said.

Story Source:

Materials provided by [Infectious Diseases Society of America](#). *Note: Content may be edited for style and length.*

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DNA barcoding technology helping monitor health of all-important boreal forest -- ScienceDaily

The Boreal forest is essential to Canada and the world, storing carbon, purifying water and air and regulating climate. But keeping tabs on the health of this vulnerable biome has proven to be a painstaking and time-consuming undertaking -- until now.

Cutting-edge DNA metabarcoding technology developed by the University of Guelph can help speed up and improve the monitoring process, according to a new study published today in *Scientific Reports*.

"We get a lot more information out of DNA, and we were able to reproduce the data and the interpretations of the data that the standard morphology approach provided," said study co-author Mehrdad Hajibabaei, a professor in U of G's Department of Integrative Biology.

In the study, researchers compared use of advanced

DNA meta-barcoding technology -- identifying DNA from many aquatic organisms at once -- with hands-on identification of invertebrate specimens, used for decades to assess ecosystem biodiversity.

Accurate and timely information about the boreal ecosystem has never been more urgently needed, according to forest scientists. Rising temperatures in the boreal region are leading to degradation of permafrost, as well as more intense droughts and wildfires. Climate change is causing wildfires to burn more fiercely, pumping more greenhouse gases into the atmosphere.

However, federal scientists have been challenged by the sheer volume of bio-monitoring needed for Canada's forest integrity program, Hajibabaei said.

"They need to assess the health of this forest, and one way to do that is to look at the presence of invertebrates in the streams."

Stream health is an indicator of overall forest health and biodiversity. The time-tested but time-consuming approach was to manually collect specimens by hand and then identify indicator organisms.

"Natural Resources Canada wanted to get into using the approach -- DNA metabarcoding -- that my lab has been researching for quite some time," Hajibabaei said.

"They approached us and we initiated this collaboration. The importance of this work is both in terms of taking this approach into a real-world scenario and helping to address the needs of Canadian Forest Service for timely monitoring."

Metabarcoding is quick and highly effective at detecting many different aquatic organisms in water, Hajibabaei said.

Identifying invertebrates manually takes time and requires experts, whose results may not always be consistent, he added.

Another important aspect of the work is that it can be applied to an environmental gradient, measuring fluctuations in conditions based on various stressors and processes, Hajibabaei said.

The study involved scientists from U of G's Centre for Biodiversity Genomics and Natural Resources Canada's Great Lakes Forestry Centre in Sault Ste.

Marie.

The study calls metabarcoding "a potentially transformative approach to biomonitoring, biodiversity discovery and ecosystem health assessments."

The findings give Natural Resources Canada more confidence in DNA monitoring, Hajibabaei said. "Obviously if they want to mitigate any type of impact, faster and more high throughput approaches are always in demand."

Story Source:

[Materials](#) provided by [University of Guelph](#). *Note: Content may be edited for style and length.*

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All Top News

Top science stories featured on ScienceDaily's home page.

• [Mars study yields clues to possible cradle of life](#) [周六, 07 10月 03:49]

The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth. The research offers evidence that these deposits were formed by heated water from a volcanically active part of the planet's crust entering the bottom of a large sea long ago.

• [New telescope attachment allows ground-based observations of new worlds](#) [周六, 07 10月 02:22]

A new, low-cost attachment to telescopes allows previously unachievable precision in ground-based observations of planets beyond our solar system. With it, ground-based telescopes can produce measurements of light intensity that rival the highest quality photometric observations from space.

• [Breast cancer linked to bacterial imbalances](#) [周六, 07 10月 00:40]

Researchers have uncovered differences in the bacterial composition of breast tissue of healthy women vs. women with breast cancer. The research team has discovered for the first time that healthy breast tissue contains more of the bacterial species *Methylobacterium*, a finding which could offer a new perspective in the battle against breast cancer.

• [Exotic quantum particle observed in bilayer graphene](#) [周五, 06 10月 21:22]

Physicists have definitively observed an intensely studied anomaly in condensed matter physics -- the even-denominator fractional quantum Hall state -- via transport measurement in bilayer graphene.

. [**Old Faithful's geological heart revealed**](#) [周五, 06 10月 07:02]

Scientists have mapped the near-surface geology around Old Faithful, revealing the reservoir of heated water that feeds the geyser's surface vent and how the ground shaking behaves in between eruptions.

. [**3-D quantum gas atomic clock offers new dimensions in measurement**](#) [周五, 06 10月 02:18]

Physicists have created an entirely new design for an atomic clock, in which strontium atoms are packed into a tiny three-dimensional cube at 1,000 times the density of previous one-dimensional clocks. In doing so, they are the first to harness the ultra-controlled behavior of a so-called 'quantum gas' to make a practical measurement device.

. [**Carbon feedback from forest soils to accelerate global warming**](#) [周五, 06 10月 02:18]

After 26 years, the world's longest-running experiment to discover how warming temperatures affect forest soils has revealed a surprising, cyclical response: Soil warming stimulates periods of abundant carbon release from the soil to the atmosphere alternating with periods of no detectable loss in soil carbon stores. The study indicates that in a warming world, a self-reinforcing and perhaps uncontrollable carbon feedback will occur between forest soils and the climate system, accelerating global...

. [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

. [**Prehistoric humans are likely to have formed mating networks to avoid inbreeding**](#) [周五, 06 10月 02:17]

Early humans seem to have recognized the dangers of inbreeding at least 34,000 years ago, and developed surprisingly sophisticated social and mating networks to avoid it, new research has found.

- [**12,000 years ago, Florida hurricanes heated up despite chilly seas**](#) [周五, 06 10月 00:50]

Category 5 hurricanes may have slammed Florida repeatedly during the chilly Younger Dryas, 12,000 years ago. The cause? Hurricane-suppressing effects of cooler sea surface were out-weighed by side effects of slowed ocean circulation.

- [**Brain study reveals how insects make beeline for home**](#) [周五, 06 10月 00:50]

Scientists have discovered how the wiring of bees' brains helps them plot the most direct route back to their hive.

- [**Once declared extinct, Lord Howe Island stick insects really do live**](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead Lord Howe Island stick insects have some good news: those rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

- [**More traits associated with your Neanderthal DNA**](#) [周五, 06 10月 00:11]

After humans and Neanderthals met many thousands of years ago, the two species began interbreeding. Recent studies have shown that some of those Neanderthal genes have contributed to human immunity and modern diseases. Now researchers have found that our Neanderthal inheritance has contributed to other characteristics, too, including skin tone, hair color, sleep patterns, mood, and even a person's smoking status.

- [**Violent helium reaction on white dwarf surface triggers supernova explosion**](#) [周四, 05 10月 23:11]

Astronomers have found solid evidence about what triggered a star to

explode, which will contribute to a further understanding of supernova history and behavior.

- [**'Squirtable' elastic surgical glue seals wounds in 60 seconds**](#) [周四, 05 10月 22:27]

A highly elastic and adhesive surgical glue that quickly seals wounds without the need for common staples or sutures could transform how surgeries are performed.

- [**Who fatally undermined Scott's Antarctic expedition?**](#) [周四, 05 10月 22:26]

What doomed Captain Robert Falcon Scott's British Antarctic Expedition in 1912? Scientists have uncovered documents and diary entries that suggest a team member stole food Scott needed, failed to pass on orders that would have sent out a dog team to meet the men and then changed his story over time to cover up his role in their deaths.

- [**Too much sugar? Even 'healthy people' are at risk of developing heart disease**](#) [周四, 05 10月 08:20]

Healthy people who consume high levels of sugar are at an increased risk of developing cardiovascular disease.

- [**Milky Way's 'most-mysterious star' continues to confound**](#) [周四, 05 10月 07:05]

In 2015, a star called KIC 8462852 caused quite a stir in and beyond the astronomy community due to a series of rapid, unexplained dimming events. The latest findings from astronomers take a longer look at the star, going back to 2006 -- before its strange behavior was detected by Kepler.

- [**No clear evidence that most new cancer drugs extend or improve life**](#) [周四, 05 10月 07:04]

The majority of cancer drugs approved in Europe between 2009 and 2013 entered the market without clear evidence that they improved survival or quality of life for patients, finds a study.

- [**Sunlight and 'right' microbes convert Arctic carbon into carbon dioxide**](#) [周四, 05 10月 04:38]

A new study outlines the mechanisms and points to the importance of both sunlight and the right microbial community as keys to converting permafrost carbon to CO₂.

- [**New nanomaterial can extract hydrogen fuel from seawater**](#) [周四, 05 10月 04:20]

A new hybrid nanomaterial harvests solar energy and uses it to extract hydrogen from seawater, cheaply and efficiently. Future commercialization could mean a new source of environmentally friendly fuel and less dependence on fossil fuels.

- [**Ancient humans left Africa to escape drying climate**](#) [周四, 05 10月 03:12]

Humans migrated out of Africa as the climate shifted from wet to dry about 60,000 years ago, according to new paleoclimate research. What the northeast Africa climate was like when people migrated from Africa into Eurasia between 70,000 and 55,000 years ago is still uncertain. The new research shows around 70,000 years ago, the Horn of Africa climate shifted from a wet phase called 'Green Sahara' to even drier than the region is now.

- [**Why does divorce run in families? The answer may be genetics**](#) [周四, 05 10月 03:12]

Children of divorced parents are more likely to get divorced when compared to those who grew up in two-parent families -- and genetic factors are the primary explanation, according to a new study.

- [**The super-Earth that came home for dinner**](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire solar system to one side. It is a possible "Planet Nine" -- a world perhaps 10 times the mass of Earth and 20 times farther from the sun than

Neptune.

- [**Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

- [**Bumblebees shed light on why some individuals are smarter than others**](#) [周四, 05 10月 01:28]

By examining the brains of bees trained to different tasks, the researchers found that the number of connections between nerve cells may hold the answer to questions about individual cognitive differences. Bees with a greater density of nerve connections (known as synaptic complexes) in a specific part of their brains had better memories and learned faster than bees with fewer connections in these areas.

- [**In Iceland stream, possible glimpse of warming future**](#) [周四, 05 10月 01:26]

When a normally cold stream in Iceland was warmed, the make-up of life inside changed as larger organisms thrived while smaller ones struggled. The findings carry implications for life in a warming climate.

- [**Anxiety and depression caused by childhood bullying decline over time**](#) [周四, 05 10月 00:05]

A new study has provided the strongest evidence to date that exposure to bullying causes mental health issues such as anxiety years later.

- [**Flights worldwide face increased risk of severe turbulence due to climate change**](#) [周四, 05 10月 00:04]

Flights all around the world could be encountering lots more turbulence in the future, according to the first ever global projections of in-flight bumpiness.

- [**Hurricane exposes and washes away thousands of sea turtle nests**](#) [周四, 05 10月 00:04]

Marine biologists have released estimates of sea turtle nests lost to Hurricane Irma, finding that 56 percent of green turtle nests and 24 percent of loggerhead nests were lost within Archie Carr National Wildlife Refuge. Both are endangered species. The losses put a damper on what had been a record year for green turtle nesting.

- [**Nobel Prize in Chemistry 2017: Cryo-electron microscopy**](#) [周三, 04 10月 21:02]

The Nobel Prize in Chemistry 2017 goes to Jacques Dubochet, Joachim Frank, and Richard Henderson "for developing cryo-electron microscopy for the high-resolution structure determination of biomolecules in solution."

- [**'CRISPR-Gold' fixes Duchenne muscular dystrophy mutation in mice**](#) [周三, 04 10月 08:29]

Scientists have engineered a new way to deliver CRISPR-Cas9 gene-editing technology inside cells and have demonstrated in mice that the technology can repair the mutation that causes Duchenne muscular dystrophy, a severe muscle-wasting disease.

- [**Livestock grazing harming giant panda habitat**](#) [周三, 04 10月 00:54]

One third of the giant panda habitat in China's Wanglang National Nature Reserve has been degraded and lost to livestock grazing, a new study finds. Livestock numbers in the park have increased ninefold in the last 15 years.

- [**First evidence of the body's waste system in the human brain discovered**](#) [周二, 03 10月 23:11]

By scanning the brains of healthy volunteers, researchers saw the first, long-sought evidence that our brains may drain some waste out through lymphatic vessels, the body's sewer system. The results further suggest the vessels could act as a pipeline between the brain and the immune system.

- [**Large volcanic eruptions in Tropics can trigger El Niño events**](#) [周二, 03 10月 23:11]

Explosive volcanic eruptions in the tropics can lead to El Niño events, those notorious warming periods in the Pacific Ocean with dramatic global impacts on the climate, according to a new study.

- [**House sparrow decline linked to air pollution and poor diet**](#) [周二, 03 10月 23:10]

House sparrows are well-adapted to living in urban areas, so it is surprising their numbers have fallen significantly over the past decades. An investigation into this worrying trend finds that sparrows living in urban areas are adversely affected by pollution and poor nutrition. The study also finds the birds suffer more during the breeding season, when resources are needed to produce healthy eggs.

- [**To breed or not to breed? Migratory female butterflies face a monsoonal dilemma**](#) [周二, 03 10月 23:10]

Female butterflies make smart investments, finds a new study.

- [**Astronomers reveal evidence of dynamical dark energy**](#) [周二, 03 10月 23:10]

Astronomers found that the nature of dark energy may not be the cosmological constant introduced by Albert Einstein 100 years ago. This is crucial for the study of dark energy.

- [**Nobel Prize in Physics 2017: Gravitational waves**](#) [周二, 03 10月 21:58]

The Nobel Prize in Physics 2017 goes to Rainer Weiss, Barry C. Barish, and Kip S. Thorne "for decisive contributions to the LIGO detector and the observation of gravitational waves."

- [**Earth's tectonic plates are weaker than once thought**](#) [周二, 03 10月 21:40]

A long-standing question regarding the strength of olivine, the primary component of Earth's mantle, has now been answered. This study has

implications for how we understand now tectonic plates form and move.

- [**An algorithm that explains how ants create and repair trail networks**](#) [周二, 03 10月 21:40]

Observing ants in the trees of a tropical forest, researchers recorded how, without a plan, the ants make and maintain their networks -- and how they repair the network when it is ruptured.

- [**Prehistoric squid was last meal of newborn ichthyosaur 200 million years ago**](#) [周二, 03 10月 21:39]

Scientists have identified the smallest and youngest specimen of *Ichthyosaurus communis* on record and found an additional surprise preserved in its stomach.

- [**Ancient petrified salamander reveals its last meal**](#) [周二, 03 10月 21:39]

A new study on an exceptionally preserved salamander from the Eocene of France reveals that its soft organs are conserved under its skin and bones. Organs preserved in three dimensions include the lung, nerves, gut, and within it, the last meal of the animal, according to a new study.

- [**Monstrous crocodile fossil points to early rise of ancient reptiles**](#) [周二, 03 10月 08:22]

A newly identified prehistoric marine predator has shed light on the origins of the distant relatives of modern crocodiles.

- [**New source of radioactivity from Fukushima disaster**](#) [周二, 03 10月 04:12]

Scientists have found a previously unsuspected place where radioactive material from the Fukushima Dai-ichi nuclear power plant disaster has accumulated -- in sands and brackish groundwater beneath beaches up to 60 miles away. The sands took up and retained radioactive cesium originating from the disaster in 2011 and have been slowly releasing it back to the ocean.

- [**Did life on Earth start due to meteorites**](#)

[splashing into warm little ponds?](#) [周二, 03 10月 04:12]

Life on Earth began somewhere between 3.7 and 4.5 billion years ago, after meteorites splashed down and leached essential elements into warm little ponds, say scientists. Their calculations suggest that wet and dry cycles bonded basic molecular building blocks in the ponds' nutrient-rich broth into self-replicating RNA molecules that constituted the first genetic code for life on the planet.

• [Meteorite tells us that Mars had a dense atmosphere 4 billion years ago](#) [周一, 02 10月 23:42]

Exploration missions have suggested that Mars once had a warm climate, which sustained oceans on its surface. To keep Mars warm requires a dense atmosphere with a sufficient greenhouse effect, while the present-day Mars has a thin atmosphere whose surface pressure is only 0.006 bar, resulting in the cold climate it has today. It has been a big mystery as to when and how Mars lost its dense atmosphere.

• [ALMA and Rosetta detect Freon-40 in space dashing hopes that molecule may be marker of life](#) [周一, 02 10月 23:28]

Observations made with the Atacama Large Millimeter/submillimeter Array (ALMA) and ESA's Rosetta mission, have revealed the presence of the organohalogen Freon-40 in gas around both an infant star and a comet. Organohalogens are formed by organic processes on Earth, but this is the first ever detection of them in interstellar space. This discovery suggests that organohalogens may not be as good markers of life as had been hoped, but that they may be significant components of the material from whi...

• [First look at electrons escaping atoms](#) [周一, 02 10月 23:27]

Researchers have taken a first step toward controlling electrons' behavior inside matter -- and thus the first step down a long and complicated road that could eventually lead to the ability to create new states of matter at will.

• [Mini-kidneys grown in lab reveal renal disease](#)

secrets [周一, 02 10月 23:27]

By creating and manipulating mini-kidney organoids that contain a realistic micro-anatomy, researchers can now track the early stages of polycystic kidney disease. The organoids are grown from human stem cells.

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Health News

Top stories featured on ScienceDaily's Health & Medicine, Mind & Brain, and Living Well sections.

- [**US Olympians at 2016 Rio Games were infected with West Nile virus, not Zika**](#) [周日, 08 10月 05:29]

US Olympic and Paralympic athletes and staff who traveled to Rio de Janeiro, Brazil, for the 2016 Summer Games did not become infected with Zika virus but did test positive for other tropical, mosquito-borne viral infections, including West Nile Virus, Dengue Fever and Chikungunya.

- [**Cannabis consumption increases violent behavior in young people in psychiatric care**](#) [周六, 07 10月 04:48]

A new study on cannabis use that involved 1,136 patients (from 18 to 40 years of age) with mental illnesses who had been seen five times during the year after discharge from a psychiatric hospital demonstrates that sustained use of cannabis is associated with an increase in violent behavior in young people. Moreover, the association between persistent cannabis use and violence is stronger than that associated with alcohol or cocaine.

- [**Antibiotics for dental procedures linked to superbug infection**](#) [周六, 07 10月 04:48]

Dental procedures are an overlooked source of antibiotic prescribing, which is a concern as these medications increase the risk of developing *C. difficile*.

- [**Genetic body/brain connection identified in genomic region linked to autism**](#) [周六, 07 10月 04:48]

For the first time, scientists have documented a direct link between deletions in two genes--*fam57ba* and *doc2a*--in zebrafish and certain brain and body traits, such as seizures, hyperactivity, large head size, and increased fat content. Both genes reside in the 16p11.2 region of the genome, which has been linked to multiple brain and body disorders in humans, including autism spectrum disorder, developmental delays, seizures, and obesity.

[**Ebola vaccine tested in adults and children in Africa hailed a success**](#) [周六, 07 10月 02:23]

Experts have reported that an Ebola vaccine is safe for children as well as adults and produces an immune response.

[**DNA damage caused by cancer treatment reversed by ZATT protein**](#) [周六, 07 10月 02:22]

An international team has discovered a new way that cells fix an important and dangerous type of DNA damage known as a DNA-protein cross-link (DPC). The researchers found that a protein named ZATT can eliminate DPCs with the help of another protein, TDP2.

[**Preeclampsia triggered by an overdose of gene activity**](#) [周六, 07 10月 02:22]

Preeclampsia, the most dangerous form of hypertension during a pregnancy, is known to originate in the placenta. But the root causes remain largely a mystery. Findings reveal that it is not a single disease caused solely by genetic factors: Epigenetically regulated genes play an important role. The research team also developed an in vitro model of the disorder which demonstrates the dysregulation of an important transcription factor.

[**Asymmetric sound absorption lets in the light**](#) [周六, 07 10月 02:22]

Many asymmetric absorbers are currently based on a single-port system, where sound enters one side and is absorbed before a rigid wall. In this design, however, light and air are unable to pass through the system. But new research shows that asymmetric absorption can be realized within a straight transparent waveguide.

- [**Gluten intolerance appears largely undiagnosed in Canada**](#) [周六, 07 10月 00:40]

Research on a large sample of Canadians suggests that most people with celiac disease don't know they have it.

- [**Breast cancer linked to bacterial imbalances**](#) [周六, 07 10月 00:40]

Researchers have uncovered differences in the bacterial composition of breast tissue of healthy women vs. women with breast cancer. The research team has discovered for the first time that healthy breast tissue contains more of the bacterial species *Methylobacterium*, a finding which could offer a new perspective in the battle against breast cancer.

- [**Sensitivity to time improves performance at remotely controlling devices**](#) [周五, 06 10月 23:23]

A new study finds that people who are more sensitive to the passage of time are better at accounting for the latency -- or time lag -- inherent in remotely controlling robots or other tools.

- [**New antifungal drug**](#) [周五, 06 10月 22:18]

Medical researchers have developed a new antifungal drug to help in the treatment of life threatening invasive fungal infections such as invasive aspergillosis.

- [**Beyond bullying: Study shows damaging affects of multiple forms of victimization on school climate**](#) [周五, 06 10月 21:04]

School officials focused exclusively on bullying prevention efforts might want to consider the findings of a new study showing the highly damaging effects of multiple forms of victimization on school climate.

- [**Social acceptance more important than economic factors in fertility treatment availability**](#) [周五, 06 10月 20:59]

A new British study has shed light on some of the reasons why Assisted Reproductive Technologies (ART) usage varies across Europe --

pinpointing moral and social acceptance of the treatment and religion as key. Scientists have, for the first time, assessed the relative importance of the role that economic, demographic and cultural normative factors play in the process.

- [**Is your partner's hearing loss driving you mad?**](#)

[周五, 06 10月 20:59]

The impact of a person's hearing loss on their nearest and dearest should be considered when personalizing rehabilitation plans for patients with deafness, suggest researchers.

- [**How seemingly acute viral infections can persist**](#)

[周五, 06 10月 20:59]

Scientists have resolved a paradox of viral infection. They've identified how a viral product can both trigger an immune response aimed at eliminating the virus or, conversely, allow the virus to survive and persist.

- [**Discovery advances understanding of inflammatory bowel disease**](#)

[周五, 06 10月 07:06]

New findings could help guide doctors to determine how best to treat patients with Crohn's disease, outlines a new report.

- [**Pushy or laid back? Economic factors influence parenting style**](#)

[周五, 06 10月 07:03]

A new study argues that parenting styles are shaped by economic factors that incentivize one strategy over others.

- [**How to decrease the discard rate of donated organs**](#)

[周五, 06 10月 07:02]

From 2008-2015, the number of kidneys donated after circulatory death that were obtained by the country's 58 donor service areas varied substantially. The outcomes associated with these organs were generally excellent. The use of these organs could be increased if 'cold ischemia times' are limited.

- [**Women who get frequent UTIs may reduce risk by drinking plenty of water**](#)

[周五, 06 10月 07:02]

Women who suffer from recurrent urinary tract infections may reduce their risk by drinking more water, according to a new study.

- [**Screen children with reading difficulties for hearing problems**](#) [周五, 06 10月 07:02]

A new study found 25 percent of its young participants who had reading difficulties showed mild or moderate hearing impairment, of which their parents and teachers were unaware.

- [**Study challenges long-standing concept in cancer metabolism**](#) [周五, 06 10月 04:11]

Scientists have discovered that lactate provides a fuel for growing tumors, challenging a nearly century-old observation known as the Warburg effect.

- [**New research to combat pancreatic cancer**](#) [周五, 06 10月 04:11]

New research is underway that could help scientists combat the most lethal of cancers: pancreatic cancer. In a recent study, scientists demonstrated that bacteria in pancreatic tumors degrade a chemotherapy drug -- Gemcitabine -- most commonly used to treat patients who have pancreatic cancer.

- [**Bariatric surgery lowers cancer risk for severely obese patients**](#) [周五, 06 10月 04:11]

Bariatric surgery lowers the risk of cancer for severely obese patients. The risks drop most for postmenopausal breast cancer, endometrial cancer, pancreatic cancer and colon cancer.

- [**Smartphone-controlled smart bandage for better, faster healing**](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [**Multiple research approaches are key to**](#)

[**pandemic preparedness**](#) [周五, 06 10月 03:11]

Preparedness in the face of major disease outbreaks can save thousands of lives. A new article examines the multifaceted nature of effective preparedness and the role that biomedical research plays. Specifically, the article examines three approaches to pandemic preparedness: pathogen-specific work, platform-based technologies, and prototype-pathogen efforts.

- [**Good-guy bacteria may help cancer immunotherapies do their job**](#) [周五, 06 10月 02:42]

Individuals with certain types of bacteria in their gut may be more likely to respond well to cancer immunotherapy, researchers found in a study of patients with metastatic melanoma.

- [**Low serum calcium may increase risk of sudden cardiac arrest**](#) [周五, 06 10月 02:18]

In a new study, researchers found that individuals with lower levels of calcium in the blood, which is easily monitored, are more likely to experience SCA than those with higher calcium levels.

- [**Molecule created that could 'kick and kill' HIV**](#) [周五, 06 10月 02:18]

Researchers have been looking for ways to eliminate the 'reservoirs' where the virus hides, and researchers may have developed a solution. Their approach involves sending an agent to 'wake up' the dormant virus, which causes it to begin replicating so that either the immune system or the virus itself would kill the cell harboring HIV.

- [**Cost-effectiveness of guinea worm disease eradication**](#) [周五, 06 10月 02:18]

Eradication of guinea worm disease (dracunculiasis), targeted by the World Health Organization (WHO) for the year 2015, is finally within reach, with only 25 reported human transmissions in 2016. Now, researchers have re-asserted the cost-effectiveness of the global Guinea Worm Eradication Programme (GWEP), some 30 years after it started.

- [**Simulating a brain-cooling treatment that could**](#)

[one day ease epilepsy](#) [周五, 06 10月 02:18]

Using computer simulation techniques, scientists have gained new insights into the mechanism by which lowering the temperature of specific brain regions could potentially treat epileptic seizures.

• [First cell-type census of mouse brains: Surprises about structure, male-female differences](#) [周五, 06 10月 02:18]

Neuroscientists have mobilized advanced imaging and computational methods to comprehensively map -- 'count' -- the total populations of specific types of cells throughout the mouse brain. In a new study, they report two highly surprising findings regarding distribution of cell types across the brain as well as male-female brain differences.

• [Prehistoric humans are likely to have formed mating networks to avoid inbreeding](#) [周五, 06 10月 02:17]

Early humans seem to have recognized the dangers of inbreeding at least 34,000 years ago, and developed surprisingly sophisticated social and mating networks to avoid it, new research has found.

• [Scientists solve 3-D structure of key defense protein against Parkinson's disease](#) [周五, 06 10月 02:17]

Scientists have identified the structure of a key enzyme that protects the brain against Parkinson's disease. The result of a decade of work, the research team said that solving the 3-D structure and inner workings of the PINK1 enzyme represented a major breakthrough.

• [Better genetic decoding of neurodevelopmental disorders](#) [周五, 06 10月 02:17]

New research into improving the genetic decoding of neurodevelopmental disorders promises to help future diagnosis of children with such conditions, including intellectual disability, autism or schizophrenia.

• [Middle managers may turn to unethical behavior to face unrealistic expectations](#) [周五, 06 10月 02:17]

While unethical behavior in organizations is often portrayed as flowing down from top management, or creeping up from low-level positions, a team of researchers suggest that middle management also can play a key role in promoting wide-spread unethical behavior among their subordinates.

- [**Delivering bad news? Don't beat around the bush**](#) [周五, 06 10月 02:17]

New research shows that when it comes to receiving bad news, most people prefer directness, candor and very little -- if any -- buffer.

- [**Predicting when a sound will occur relies on the brain's motor system**](#) [周五, 06 10月 02:17]

Whether it is dancing or just tapping one foot to the beat, we all experience how auditory signals like music can induce movement. Now new research suggests that motor signals in the brain actually sharpen sound perception, and this effect is increased when we move in rhythm with the sound.

- [**New research on sperm stem cells has implications for male infertility and cancer**](#) [周五, 06 10月 02:17]

Scientists have shed light on the complex process that occurs in the development of human sperm stem cells.

- [**Identifying ways to minimize the harm of energy drinks**](#) [周五, 06 10月 02:17]

Because many countries allow the sale of energy drinks to young people, identifying ways to minimize potential harm from energy drinks is critical. A new study provided unique insights into intervention strategies suggested by young people themselves to reduce consumption. In addition to more research and education, these strategies included policy changes targeting energy drink sales, packaging, price, and visibility.

- [**Faster Salmonella test boosts food safety for humans and animals**](#) [周五, 06 10月 02:17]

A new test allows accurate, rapid testing for Salmonella, a bacteria that is one of the leading causes of food-borne illness across all regions of the world.

- [**Planning for the future**](#) [周五, 06 10月 02:17]

Over the past decade, increasing temperatures across much of Africa and decreasing rainfall across East Africa have come to represent an alarming climate trend. Chief among concerns is the impact such conditions have on human health.

- [**Something universal occurs in the brain when it processes stories, regardless of language**](#) [周五, 06 10月 02:17]

New brain research shows that reading stories generates activity in the same regions of the brain for speakers of three different languages.

- [**Heart: No evidence for piezoelectricity or ferroelectricity in the aorta**](#) [周五, 06 10月 02:17]

While some studies have supported the idea that the walls of the aorta are piezoelectric or ferroelectric, the most recent research finds no evidence of these properties. Researchers investigated by testing samples of pig aorta using a traditional setup, known as Sawyer-Tower, to detect ferroelectricity. Their experiments suggest the aorta has no special properties, and instead acts as a standard dielectric material that does not conduct current.

- [**Why can't mTOR inhibitors kill cancer? Study explains**](#) [周五, 06 10月 00:50]

Anti-cancer drugs called mTOR inhibitors slow the growth of cancer cells but show limited ability to cause cancer cell death. A new studies explain why.

- [**Air pollution exposure on home-to-school routes reduces the growth of working memory**](#) [周五, 06 10月 00:50]

A new study has demonstrated that exposure to air pollution on the way to school can have damaging effects on children's cognitive development. The study found an association between a reduction in

working memory and exposure to fine particulate matter (PM2.5) and black carbon during the walking commute to and from school.

• [Genetic drivers of most common form of lymphoma identified](#) [周五, 06 10月 00:50]

An international research effort has been working to better understand the genetic underpinnings of the most prevalent form of lymphoma -- diffuse large B cell lymphoma -- and how those genes might play a role in patients' responses to therapies.

• [New findings on mechanisms for body temperature regulation by fat tissue](#) [周五, 06 10月 00:11]

New discoveries about the mechanism responsible for heat generation in the body related to fat tissue oppose classical views in the field and could lead to new ways to fight metabolic disorders associated with obesity, according to a study.

• [A new CRISPR-engineered cancer model to test therapeutics](#) [周五, 06 10月 00:11]

Using multiplex CRISPR-Cas9 editing of human hematopoietic, or blood-forming, stem cells followed by transplantation in mice, researchers designed customized mouse models for the progression of leukemia. In a number of different experiments, the animal models successfully reflected human responses to a therapeutic agent commonly used to treat blood cancers.

• [Germs in the kitchen: Salmonella better known than Campylobacter](#) [周五, 06 10月 00:11]

What health risks are consumers aware of? What are they concerned about?

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [**New electro-organic synthesis allows sustainable and green production of fine chemicals**](#) [周六, 07 10月 04:49]

Scientists have succeeded in developing a state-of-the-art and innovative electro-organic synthesis.

- [**Mars study yields clues to possible cradle of life**](#) [周六, 07 10月 03:49]

The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth. The research offers evidence that these deposits were formed by heated water from a volcanically active part of the planet's crust entering the bottom of a large sea long ago.

- [**A dash of gold improves microlasers**](#) [周六, 07 10月 02:22]

By attaching gold nanoparticles to the surface of a microlaser, researchers demonstrated a frequency comb that takes up less space and requires 1000 times less power than current comb technology.

- [**New telescope attachment allows ground-based observations of new worlds**](#) [周六, 07 10月 02:22]

A new, low-cost attachment to telescopes allows previously unachievable precision in ground-based observations of planets beyond our solar system. With it, ground-based telescopes can produce measurements of light intensity that rival the highest quality photometric observations from space.

- [**Breakthrough in direct activation of CO₂ and CH₄ into liquid fuels and chemicals**](#) [周六, 07 10月 00:40]

Researchers have made a significant breakthrough in the direct conversion of carbon dioxide (CO₂) and methane (CH₄) into liquid fuels and chemicals which could help industry to reduce greenhouse gas emissions whilst producing valuable chemical feedstocks.

- [**Energy against the current on a quantum scale, without contradicting the laws of physics**](#) [周五, 06 10月 23:23]

In a classical thermodynamic system, the heat current flows from the hotter body to the colder one, or electricity from the higher voltage to the lower one. The same thing happens in quantum systems, but this state can be changed, and the flow of energy and particles can be reversed if a quantum observer is inserted into the system.

- [**Sensitivity to time improves performance at remotely controlling devices**](#) [周五, 06 10月 23:23]

A new study finds that people who are more sensitive to the passage of time are better at accounting for the latency -- or time lag -- inherent in remotely controlling robots or other tools.

- [**Predicting insect feeding preferences after deforestation**](#) [周五, 06 10月 22:18]

Understanding how parasitoids and hosts interact, and how their interactions change with human influence, is critically important to understanding ecosystems. New research finds mathematical models can predict complex insect behavioral changes using a simple description of insect preferences.

- [**Segregation-induced ordered superstructures at general grain boundaries in a Ni-Bi alloy**](#) [周五, 06 10月 22:18]

Randomly selected, high-angle, general grain boundaries in a nickel-bismuth (Ni-Bi) polycrystalline alloy can undergo interfacial reconstruction to form ordered superstructures, a discovery that enriches the theories and fundamental understandings of both grain boundary segregation and liquid metal embrittlement in physical metallurgy.

- [**Exotic quantum particle observed in bilayer**](#)

[**graphene**](#) [周五, 06 10月 21:22]

Physicists have definitively observed an intensely studied anomaly in condensed matter physics -- the even-denominator fractional quantum Hall state -- via transport measurement in bilayer graphene.

. [**Electron behavior under extreme conditions described for the first time**](#) [周五, 06 10月 21:02]

Researchers have modeled the actions of electrons under extreme temperatures and densities, such as those found within planets and stars.

. [**Engineers invent breakthrough millimeter-wave circulator IC**](#) [周五, 06 10月 20:59]

Researchers continue to break new ground in developing magnet-free non-reciprocal components in modern semiconductor processes. They have built the first magnet-free non-reciprocal circulator on a silicon chip that operates at millimeter-wave frequencies, enabling circulators to be built in conventional semiconductor chips and operate at millimeter-wave frequencies, enabling full-duplex or two-way wireless.

. [**Shrinking the proton again**](#) [周五, 06 10月 07:04]

Scientists, using high precision laser spectroscopy of atomic hydrogen, confirm the surprisingly small value of the proton radius determined from muonic hydrogen.

. [**'Transformative' research unrealistic to predict, scientists tell granting agencies**](#) [周五, 06 10月 07:03]

Research-funding agencies that require scientists to declare at the proposal stage how their projects will be 'transformative' may actually be hindering discovery.

. [**Smartphone-controlled smart bandage for better, faster healing**](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [**Simulating a brain-cooling treatment that could one day ease epilepsy**](#) [周五, 06 10月 02:18]

Using computer simulation techniques, scientists have gained new insights into the mechanism by which lowering the temperature of specific brain regions could potentially treat epileptic seizures.

- [**3-D quantum gas atomic clock offers new dimensions in measurement**](#) [周五, 06 10月 02:18]

Physicists have created an entirely new design for an atomic clock, in which strontium atoms are packed into a tiny three-dimensional cube at 1,000 times the density of previous one-dimensional clocks. In doing so, they are the first to harness the ultra-controlled behavior of a so-called 'quantum gas' to make a practical measurement device.

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [**Why lab researchers should talk with industry counterparts**](#) [周五, 06 10月 02:17]

A research team has found both obstacles and lessons from the process of getting a novel membrane for chemical processing out of the lab into the commercial world.

- [**Road pricing most effective in reducing vehicle emissions**](#) [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

• [**New test opens path for better 2-D catalysts**](#) [周五, 06 10月 02:17]

Scientists have developed technology for rapid screening of two-dimensional materials for electrocatalysis of hydrogen. The method could accelerate the development of 2-D materials for energy applications.

• [**Heart: No evidence for piezoelectricity or ferroelectricity in the aorta**](#) [周五, 06 10月 02:17]

While some studies have supported the idea that the walls of the aorta are piezoelectric or ferroelectric, the most recent research finds no evidence of these properties. Researchers investigated by testing samples of pig aorta using a traditional setup, known as Sawyer-Tower, to detect ferroelectricity. Their experiments suggest the aorta has no special properties, and instead acts as a standard dielectric material that does not conduct current.

• [**'Body-on-a-chip' system to accelerate testing of new drugs**](#) [周五, 06 10月 00:10]

Being able to test new drugs in a 3-D model of the body has the potential to speed up drug discovery, reduce the use of animal testing and advance personalized medicine.

• [**Paper-based supercapacitor uses metal nanoparticles to boost energy density**](#) [周五, 06 10月 00:10]

Using a simple layer-by-layer coating technique, researchers have developed a paper-based flexible supercapacitor that could be used to help power wearable devices. The device uses metallic nanoparticles to coat cellulose fibers in the paper, creating supercapacitor electrodes with high energy and power densities -- and the best performance so far in a textile-based supercapacitor.

• [**Violent helium reaction on white dwarf surface triggers supernova explosion**](#) [周四, 05 10月 23:11]

Astronomers have found solid evidence about what triggered a star to explode, which will contribute to a further understanding of supernova

history and behavior.

- [**Fingerprints lack scientific basis for legal certainty**](#) [周四, 05 10月 23:11]

A new report on the quality of latent fingerprint analysis says that courtroom testimony and reports stating or even implying that fingerprints collected from a crime scene belong to a single person are indefensible and lack scientific foundation.

- [**New 'molecular trap' cleans more radioactive waste from nuclear fuel rods**](#) [周四, 05 10月 23:10]

A new method for capturing radioactive waste from nuclear power plants is cheaper and more effective than current methods, a potential boon for the energy industry, according to new research.

- [**Machinery that repairs itself**](#) [周四, 05 10月 22:38]

Scientists are developing maintenance technology capable of forecasting machine downtimes in production before they occur. This allows plant managers to rectify faults before the machine breaks down. The system even corrects some defects automatically.

- [**Safety assistance system warns of dirty bombs**](#) [周四, 05 10月 22:38]

The threat of terrorism has been on the rise in recent years, with experts and politicians particularly worried that terrorists might make use of dirty bombs. Researchers have developed a new system that will be able to detect possible carriers of radioactive substances, even in large crowds of people.

- [**Spray drying: Perfect dosing thanks to drug capsules**](#) [周四, 05 10月 22:38]

Instant coffee and powdered milk are produced by spray drying. Researchers have adapted this technique to the tricky question of incorporating insoluble substances in core-shell particles. The new method helps reduce the concentration of active ingredients in therapeutic medications.

- [**Tracking debris in the Earth's orbit with**](#)

[centimeter precision using efficient laser technology](#) [周四, 05 10月 22:38]

Uncontrollable flying objects in orbit are a massive risk for modern space travel, and, due to our dependence on satellites today, it is also a risk to global economy. Scientists have now developed a fiber laser that reliably determines the position and direction of the space debris' movement to mitigate these risks.

• [Mitigating the unpleasant scent of adhesives](#) [周四, 05 10月 22:38]

It is a known fact that adhesives may smell unpleasant. However, as researchers have recently discovered, this doesn't need to be the case. Through extensive research on acrylic adhesives they were able to identify the substances responsible for the offensive odors. So far, very little research has been conducted on the subject, but now manufacturers finally have the opportunity to optimize their production process.

• [Using elastomer films to generate electricity](#) [周四, 05 10月 22:35]

Water is still the most important source of renewable energy in Bavaria, Germany, accounting for some 33 percent of all renewable energy produced in the region, as showed by the Bavarian Energy Map. But conventional hydroelectric plants, especially micro hydro generators, are a subject of controversy due to their low output volumes and their interference with the ecosystem. Researchers are working on an environmentally friendly alternative: in the future, innovative elastomer materials are set to...

• [New nanoplatelets improve the brightness of LEDs, lasers and LCD screens, researchers show](#) [周四, 05 10月 22:35]

New semiconductor nanoplatelets synthesized in laboratories can improve the brightness of LEDs, lasers and LCD screens of computers or televisions because they allow to minimize energy losses compared to current semiconductor materials.

• ['Squirtable' elastic surgical glue seals wounds in 60 seconds](#) [周四, 05 10月 22:27]

A highly elastic and adhesive surgical glue that quickly seals wounds without the need for common staples or sutures could transform how surgeries are performed.

- [Completing the drug design jigsaw](#) [周四, 05 10月 22:27]

A powerful new way of analysing how drugs interact with molecules in the body could aid the design of better treatments with fewer side-effects.

- [Computer model unravels knotty problems in DNA](#) [周四, 05 10月 22:27]

If you've ever tried to untangle a pair of earbuds, you'll understand how loops and cords can get twisted up. DNA can get tangled in the same way, and in some cases, has to be cut and reconnected to resolve the knots. Now a team of mathematicians, biologists and computer scientists has unraveled how E. coli bacteria can unlink tangled DNA by a local reconnection process. The math behind the research could have implications far beyond biology.

- [Mars' moon Phobos examined in a different light](#) [周四, 05 10月 22:27]

NASA's longest-lived mission to Mars has gained its first look at the Martian moon Phobos, pursuing a deeper understanding by examining it in infrared wavelengths.

- [How much can watching hockey stress your heart?](#) [周四, 05 10月 22:27]

A new study suggests that both the thrill of victory and the agony of defeat can have a substantial effect on the cardiovascular system. Investigators took the pulse of fans during a hockey game and found that on average, their heart rate increased by 75 percent when watching on TV, and by a whopping 110 percent (more than doubled, equivalent to the cardiac stress with vigorous exercise) when watching in person.

- [Caution ahead: The growing challenge for drivers' attention](#) [周四, 05 10月 22:27]

Many of the infotainment features in most 2017 vehicles are so distracting they should not be enabled while a vehicle is in motion, according to a new study. The study found In-Vehicle Information Systems take drivers' attention off the road for too long to be safe.

[A novel textile material that keeps itself germ-free](#) [周四, 05 10月 22:27]

Scientists have developed a novel weapon in the battle against deadly hospital-acquired infections -- a textile that disinfects itself. And independent tests show it can reduce bacteria levels by more than 90 per cent. By incorporating the specially-engineered textile in a device designed to be used on hospital doors instead of the traditional aluminum door plate, that part of the door that people push to open it -- they aim to bolster hand hygiene.

[Vertigo and understanding the body's balance system](#) [周四, 05 10月 22:26]

Finding out what's happening in the brains of people with balance disorders, such as vertigo, might be one step closer following new research on the vestibular system, which controls balance and movement. An interdisciplinary team of optical physicists and biologists has found a novel way, using optical tweezers, or focused beams of light, to understand the vestibular system while animals are still, not moving.

[Milky Way's 'most-mysterious star' continues to confound](#) [周四, 05 10月 07:05]

In 2015, a star called KIC 8462852 caused quite a stir in and beyond the astronomy community due to a series of rapid, unexplained dimming events. The latest findings from astronomers take a longer look at the star, going back to 2006 -- before its strange behavior was detected by Kepler.

[Impacts of ride-hailing on crashes differ from city to city](#) [周四, 05 10月 07:05]

Ride-hailing services reduce drunk-driving crashes in some cities,

reports a new study. The research is the first to look at the specific effects of ride-hailing, or 'ride-sharing,' within specific cities, rather than averaging data across multiple cities.

- [**New nanomaterial can extract hydrogen fuel from seawater**](#) [周四, 05 10月 04:20]

A new hybrid nanomaterial harvests solar energy and uses it to extract hydrogen from seawater, cheaply and efficiently. Future commercialization could mean a new source of environmentally friendly fuel and less dependence on fossil fuels.

- [**The super-Earth that came home for dinner**](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire solar system to one side. It is a possible "Planet Nine" -- a world perhaps 10 times the mass of Earth and 20 times farther from the sun than Neptune.

- [**Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

- [**Light-activated nanoparticles can supercharge current antibiotics**](#) [周四, 05 10月 02:26]

Light-activated nanoparticles, also known as quantum dots, can provide a crucial boost in effectiveness for antibiotic treatments used to combat drug-resistant superbugs such as E. coli and Salmonella, new research shows.

- [**A new way to produce clean hydrogen fuel from water using sunlight**](#) [周四, 05 10月 02:01]

Researchers combined graphitic carbon nitride and black phosphorous to make a new metal-free composite photocatalyst capable of producing hydrogen from water. The photocatalyst featured good photocatalytic production of hydrogen, even when powered by low-energy near infrared light.

[Surface helium detonation spells end for white dwarf](#) [周四, 05 10月 02:01]

Researchers have found evidence that the brightest stellar explosions in our Universe could be triggered by helium nuclear detonation near the surface of a white dwarf star.

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [**US Olympians at 2016 Rio Games were infected with West Nile virus, not Zika**](#) [周日, 08 10月 05:29]

US Olympic and Paralympic athletes and staff who traveled to Rio de Janeiro, Brazil, for the 2016 Summer Games did not become infected with Zika virus but did test positive for other tropical, mosquito-borne viral infections, including West Nile Virus, Dengue Fever and Chikungunya.

- [**DNA barcoding technology helping monitor health of all-important boreal forest**](#) [周六, 07 10月 04:48]

The Boreal forest is essential to Canada and the world, storing carbon, purifying water and air and regulating climate. But keeping tabs on the health of this vulnerable biome has proven to be a painstaking and time-consuming undertaking - until now. Cutting-edge DNA metabarcoding technology can help speed up and improve the monitoring process, according to a new study.

- [**Mars study yields clues to possible cradle of life**](#) [周六, 07 10月 03:49]

The discovery of evidence for ancient sea-floor hydrothermal deposits on Mars identifies an area on the planet that may offer clues about the origin of life on Earth. The research offers evidence that these deposits were formed by heated water from a volcanically active part of the planet's crust entering the bottom of a large sea long ago.

- [**Deer prefer native plants leaving lasting damage on forests**](#) [周六, 07 10月 02:21]

When rampant white-tailed deer graze in forests, they prefer to eat native plants over certain unpalatable invasive plants, such as garlic mustard and Japanese stiltgrass. These eating habits lower native plant diversity and abundance, while increasing the proportion of plant communities made up of non-native species, according to a new study.

- [**Breakthrough in direct activation of CO₂ and CH₄ into liquid fuels and chemicals**](#) [周六, 07 10月 00:40]

Researchers have made a significant breakthrough in the direct conversion of carbon dioxide (CO₂) and methane (CH₄) into liquid fuels and chemicals which could help industry to reduce greenhouse gas emissions whilst producing valuable chemical feedstocks.

- [**Breast cancer linked to bacterial imbalances**](#) [周六, 07 10月 00:40]

Researchers have uncovered differences in the bacterial composition of breast tissue of healthy women vs. women with breast cancer. The research team has discovered for the first time that healthy breast tissue contains more of the bacterial species *Methylobacterium*, a finding which could offer a new perspective in the battle against breast cancer.

- [**'Lost chapel' of Westminster Palace revealed in new 3-D model**](#) [周五, 06 10月 23:23]

The first dedicated House of Commons chamber, destroyed in the 1834 Palace of Westminster fire, has been reconstructed with the help of 3-D visualization technology.

- [**Predicting insect feeding preferences after deforestation**](#) [周五, 06 10月 22:18]

Understanding how parasitoids and hosts interact, and how their interactions change with human influence, is critically important to understanding ecosystems. New research finds mathematical models can predict complex insect behavioral changes using a simple description of insect preferences.

- [**Plant cells survive but stop dividing upon DNA damage**](#) [周五, 06 10月 22:18]

The cell cycle is how a cell passes its DNA but ceases if the DNA is damaged, as otherwise it risks passing this damage to daughter cells. Scientists report a new molecular mechanism that explains how this cessation occurs. The study shows that the transcription factor family MYB3R is normally degraded, but accumulates upon DNA damage to prevent cell cycle progression.

- [**New study analyzes volcanic fatalities in more detail than ever before**](#) [周五, 06 10月 22:18]

Building on existing information and databases relating to volcanic fatalities, scientists have, for the first time, been able to classify victims by activity or occupation and look at the distance of their death from the volcano.

- [**Microbes dictate regime shifts causing anoxia in lakes and seas**](#) [周五, 06 10月 21:03]

Gradual environmental changes due to eutrophication and global warming can cause a rapid depletion of oxygen levels in lakes and coastal waters. A new study shows that microorganisms play a key role in these disastrous regime shifts.

- [**Old Faithful's geological heart revealed**](#) [周五, 06 10月 07:02]

Scientists have mapped the near-surface geology around Old Faithful, revealing the reservoir of heated water that feeds the geyser's surface vent and how the ground shaking behaves in between eruptions.

- [**Interpreting hurricane forecast displays can be difficult for general public**](#) [周五, 06 10月 03:11]

The 2017 hurricane season has highlighted the critical need to communicate a storm's impact path and intensity accurately, but new research shows significant misunderstandings of the two most commonly used storm forecast visualization methods.

- [**Do earthquakes have a 'tell'?**](#) [周五, 06 10月 03:11]

Data scientists and seismologists could potentially forecast strong earthquakes through algorithms designed to detect and monitor 'deep tremor.'

- [**Cost-effectiveness of guinea worm disease eradication**](#) [周五, 06 10月 02:18]

Eradication of guinea worm disease (dracunculiasis), targeted by the World Health Organization (WHO) for the year 2015, is finally within reach, with only 25 reported human transmissions in 2016. Now, researchers have re-asserted the cost-effectiveness of the global Guinea Worm Eradication Programme (GWEP), some 30 years after it started.

- [**Carbon feedback from forest soils to accelerate global warming**](#) [周五, 06 10月 02:18]

After 26 years, the world's longest-running experiment to discover how warming temperatures affect forest soils has revealed a surprising, cyclical response: Soil warming stimulates periods of abundant carbon release from the soil to the atmosphere alternating with periods of no detectable loss in soil carbon stores. The study indicates that in a warming world, a self-reinforcing and perhaps uncontrollable carbon feedback will occur between forest soils and the climate system, accelerating global...

- [**Decision to rescind Waters of the United States rule \(WOTUS\) based on flawed analysis**](#) [周五, 06 10月 02:18]

New evidence suggests that the Trump Administration's proposal to rescind the 2015 Waters of the United States (WOTUS) rule that would limit the scope of the Clean Water Act inappropriately overlooks wetlands-related values.

- [**What Earth's climate system and topological insulators have in common**](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [**Prehistoric humans are likely to have formed mating networks to avoid inbreeding**](#) [周五, 06 10月 02:17]

Early humans seem to have recognized the dangers of inbreeding at least

34,000 years ago, and developed surprisingly sophisticated social and mating networks to avoid it, new research has found.

- [**Road pricing most effective in reducing vehicle emissions**](#) [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

- [**New 'movie' technique reveals bacterial signalling in sharper resolution**](#) [周五, 06 10月 02:17]

Researchers used a study of the plant-growth promoting bacterium *Pseudomonas fluorescens* to develop an advanced analysis method which, they hope, will increase our capacity to understand plant and human diseases.

- [**Faster Salmonella test boosts food safety for humans and animals**](#) [周五, 06 10月 02:17]

A new test allows accurate, rapid testing for Salmonella, a bacteria that is one of the leading causes of food-borne illness across all regions of the world.

- [**Planning for the future**](#) [周五, 06 10月 02:17]

Over the past decade, increasing temperatures across much of Africa and decreasing rainfall across East Africa have come to represent an alarming climate trend. Chief among concerns is the impact such conditions have on human health.

- [**Key plant species may be important for supporting wildflower pollinators**](#) [周五, 06 10月 02:17]

Increased agricultural production has likely led to loss, fragmentation, and degradation of flower-rich habitats for pollinators. To counteract

these negative effects of modern agricultural practices, efforts to maintain and restore diverse plants in agricultural landscapes -- called agri-environmental schemes -- have been implemented in numerous European countries.

- [**12,000 years ago, Florida hurricanes heated up despite chilly seas**](#) [周五, 06 10月 00:50]

Category 5 hurricanes may have slammed Florida repeatedly during the chilly Younger Dryas, 12,000 years ago. The cause? Hurricane-suppressing effects of cooler sea surface were out-weighed by side effects of slowed ocean circulation.

- [**Brain study reveals how insects make beeline for home**](#) [周五, 06 10月 00:50]

Scientists have discovered how the wiring of bees' brains helps them plot the most direct route back to their hive.

- [**Air pollution exposure on home-to-school routes reduces the growth of working memory**](#) [周五, 06 10月 00:50]

A new study has demonstrated that exposure to air pollution on the way to school can have damaging effects on children's cognitive development. The study found an association between a reduction in working memory and exposure to fine particulate matter (PM2.5) and black carbon during the walking commute to and from school.

- [**Liverwort genes and land plant evolution**](#) [周五, 06 10月 00:11]

The common liverwort is a living link to the transition from marine algae to land plants. Biologists have analyzed the genome sequence of the common liverwort (*Marchantia polymorpha*) to identify genes and gene families that were deemed crucial to plant evolution and have been conserved over millions of years and across plant lineages.

- [**Germs in the kitchen: Salmonella better known than Campylobacter**](#) [周五, 06 10月 00:11]

What health risks are consumers aware of? What are they concerned about?

• [**How yellow and blue make green in parrots**](#) [周五, 06 10月 00:11]

Many brightly colored birds get their pigments from the foods that they eat, but that's not true of parrots. Now, researchers reporting a study of familiar pet store parakeets -- also known as budgies -- have new evidence to explain how the birds produce their characteristic yellow, blue, and green feathers.

• [**Once declared extinct, Lord Howe Island stick insects really do live**](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead Lord Howe Island stick insects have some good news: those rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

• [**Novel PET tracer identifies most bacterial infections**](#) [周四, 05 10月 23:11]

Medical scientists have developed a novel imaging agent that could be used to identify most bacterial infections.

• [**New 'molecular trap' cleans more radioactive waste from nuclear fuel rods**](#) [周四, 05 10月 23:10]

A new method for capturing radioactive waste from nuclear power plants is cheaper and more effective than current methods, a potential boon for the energy industry, according to new research.

• [**Athletes and health aficionados: The lupine protein beverage**](#) [周四, 05 10月 22:39]

With its intensive colors and many blossoms, the lupine looks like an ornamental plant. Yet, the tall lupine is far too good to be used decoratively as the plant's seeds contain nutritious proteins. However, it is rather complicated to make lupines edible for humans.

• [**Tracking debris in the Earth's orbit with**](#)

[centimeter precision using efficient laser technology](#) [周四, 05 10月 22:38]

Uncontrollable flying objects in orbit are a massive risk for modern space travel, and, due to our dependence on satellites today, it is also a risk to global economy. Scientists have now developed a fiber laser that reliably determines the position and direction of the space debris' movement to mitigate these risks.

[Predatory bacteria that engineer 'portholes' and paint 'frescoes' in harmful bacteria](#) [周四, 05 10月 22:34]

A microbiological mystery of how one bacterium could invade another and grow inside it without breaking the other bacterium instantly has been illuminated by scientists.

[Lake water mixing: The might of the microorganism?](#) [周四, 05 10月 22:32]

Can microorganisms cause lake water to be mixed? The answer given by previous studies is no, since the movement of small, slow-swimming bacteria is not sufficient to disturb the stratification of lake water induced by differences in, for example, temperature or salinity.

[Computer model unravels knotty problems in DNA](#) [周四, 05 10月 22:27]

If you've ever tried to untangle a pair of earbuds, you'll understand how loops and cords can get twisted up. DNA can get tangled in the same way, and in some cases, has to be cut and reconnected to resolve the knots. Now a team of mathematicians, biologists and computer scientists has unraveled how E. coli bacteria can unlink tangled DNA by a local reconnection process. The math behind the research could have implications far beyond biology.

[Modified peptides could boost plant growth and development](#) [周四, 05 10月 22:27]

A new study of peptide hormones critical for plant development could result in wide-ranging benefits for agriculture, tissue culture, and related

industries, and even improve knowledge of peptides in humans. The study synthesized and examined the function of CLE peptides, a relatively new class of the peptide hormone family in plants.

• [**A need for bananas? Dietary potassium regulates calcification of arteries**](#) [周四, 05 10月 22:27]

Researchers have shown, for the first time, that reduced dietary potassium promotes elevated aortic stiffness in a mouse model. Such arterial stiffness in humans is predictive of heart disease and death from heart disease, and it represents an important health problem for the nation. The researchers also found that increased dietary potassium levels lessened vascular calcification and aortic stiffness. Furthermore, they unraveled the molecular mechanism underlying the effects of low or high dietary potassium...

• [**Climate solution in soil?**](#) [周四, 05 10月 22:26]

The land under our feet and the plant matter it contains could offset a significant amount of carbon emissions if managed properly. More research is needed to unlock soil's potential to mitigate global warming, improve crop yields and increase resilience, say researchers.

• [**Who fatally undermined Scott's Antarctic expedition?**](#) [周四, 05 10月 22:26]

What doomed Captain Robert Falcon Scott's British Antarctic Expedition in 1912? Scientists have uncovered documents and diary entries that suggest a team member stole food Scott needed, failed to pass on orders that would have sent out a dog team to meet the men and then changed his story over time to cover up his role in their deaths.

• [**Vertigo and understanding the body's balance system**](#) [周四, 05 10月 22:26]

Finding out what's happening in the brains of people with balance disorders, such as vertigo, might be one step closer following new research on the vestibular system, which controls balance and movement. An interdisciplinary team of optical physicists and biologists has found a novel way, using optical tweezers, or focused beams of

light, to understand the vestibular system while animals are still, not moving.

- [**How cells adapt to help repair damage**](#) [周四, 05 10月 22:26]

Genetic processes that allow cells to transform so they can mend damaged nerves have been identified by scientists.

- [**Supervolcanoes: Magma chambers have a sponge-like structure**](#) [周四, 05 10月 22:26]

Researchers show that magma chambers under supervolcanoes are more like soggy sponges than reservoirs of molten rock. Before a volcano of this kind erupts, such mush must slowly be reactivated by heat input following deep magma recharge ultimately derived from the Earth's mantle.

- [**Sunlight and 'right' microbes convert Arctic carbon into carbon dioxide**](#) [周四, 05 10月 04:38]

A new study outlines the mechanisms and points to the importance of both sunlight and the right microbial community as keys to converting permafrost carbon to CO₂.

- [**Climate change, population growth may lead to open ocean aquaculture**](#) [周四, 05 10月 04:37]

A new analysis suggests that open-ocean aquaculture for three species of finfish is a viable option for industry expansion under most climate change scenarios -- an option that may provide a new source of protein for the world's growing population.

- [**Are we at a tipping point with weed control?**](#) [周四, 05 10月 04:20]

Imagine walking the cereal aisle at your favorite grocery store. Are you reading labels? Scanning prices? Thinking about weeds? If you're like most American consumers, weeds probably aren't at the forefront of your mind when buying food. But if farmers could no longer control weeds with existing herbicides, Americans would take notice pretty quickly.

- [**New nanomaterial can extract hydrogen fuel**](#)

from seawater [周四, 05 10月 04:20]

A new hybrid nanomaterial harvests solar energy and uses it to extract hydrogen from seawater, cheaply and efficiently. Future commercialization could mean a new source of environmentally friendly fuel and less dependence on fossil fuels.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [**New study analyzes volcanic fatalities in more detail than ever before**](#) [周五, 06 10月 22:18]

Building on existing information and databases relating to volcanic fatalities, scientists have, for the first time, been able to classify victims by activity or occupation and look at the distance of their death from the volcano.

- [**Social acceptance more important than economic factors in fertility treatment availability**](#) [周五, 06 10月 20:59]

A new British study has shed light on some of the reasons why Assisted Reproductive Technologies (ART) usage varies across Europe -- pinpointing moral and social acceptance of the treatment and religion as key. Scientists have, for the first time, assessed the relative importance of the role that economic, demographic and cultural normative factors play in the process.

- [**Pushy or laid back? Economic factors influence parenting style**](#) [周五, 06 10月 07:03]

A new study argues that parenting styles are shaped by economic factors that incentivize one strategy over others.

- [**'Transformative' research unrealistic to predict, scientists tell granting agencies**](#) [周五, 06 10月 07:03]

Research-funding agencies that require scientists to declare at the proposal stage how their projects will be 'transformative' may actually

be hindering discovery.

- [**Screen children with reading difficulties for hearing problems**](#) [周五, 06 10月 07:02]

A new study found 25 percent of its young participants who had reading difficulties showed mild or moderate hearing impairment, of which their parents and teachers were unaware.

- [**Multiple research approaches are key to pandemic preparedness**](#) [周五, 06 10月 03:11]

Preparedness in the face of major disease outbreaks can save thousands of lives. A new article examines the multifaceted nature of effective preparedness and the role that biomedical research plays. Specifically, the article examines three approaches to pandemic preparedness: pathogen-specific work, platform-based technologies, and prototype-pathogen efforts.

- [**Interpreting hurricane forecast displays can be difficult for general public**](#) [周五, 06 10月 03:11]

The 2017 hurricane season has highlighted the critical need to communicate a storm's impact path and intensity accurately, but new research shows significant misunderstandings of the two most commonly used storm forecast visualization methods.

- [**Do earthquakes have a 'tell'?**](#) [周五, 06 10月 03:11]

Data scientists and seismologists could potentially forecast strong earthquakes through algorithms designed to detect and monitor 'deep tremor.'

- [**Decision to rescind Waters of the United States rule \(WOTUS\) based on flawed analysis**](#) [周五, 06 10月 02:18]

New evidence suggests that the Trump Administration's proposal to rescind the 2015 Waters of the United States (WOTUS) rule that would limit the scope of the Clean Water Act inappropriately overlooks wetlands-related values.

- [**Middle managers may turn to unethical**](#)

behavior to face unrealistic expectations [周五, 06 10月 02:17]

While unethical behavior in organizations is often portrayed as flowing down from top management, or creeping up from low-level positions, a team of researchers suggest that middle management also can play a key role in promoting wide-spread unethical behavior among their subordinates.

Why lab researchers should talk with industry counterparts [周五, 06 10月 02:17]

A research team has found both obstacles and lessons from the process of getting a novel membrane for chemical processing out of the lab into the commercial world.

Delivering bad news? Don't beat around the bush [周五, 06 10月 02:17]

New research shows that when it comes to receiving bad news, most people prefer directness, candor and very little -- if any -- buffer.

Road pricing most effective in reducing vehicle emissions [周五, 06 10月 02:17]

For decades municipal and regional governments have used various traffic management strategies to reduce vehicle emissions, alongside advancements like cleaner fuel and greener cars. But not all traffic management strategies are created equal, says transportation experts. After reviewing more than 60 studies on the subject, scientists have concluded that road pricing -- or pay per use -- is the most effective strategy to reduce emissions and traffic.

Identifying ways to minimize the harm of energy drinks [周五, 06 10月 02:17]

Because many countries allow the sale of energy drinks to young people, identifying ways to minimize potential harm from energy drinks is critical. A new study provided unique insights into intervention strategies suggested by young people themselves to reduce consumption. In addition to more research and education, these strategies included

policy changes targeting energy drink sales, packaging, price, and visibility.

- **[Planning for the future](#)** [周五, 06 10月 02:17]

Over the past decade, increasing temperatures across much of Africa and decreasing rainfall across East Africa have come to represent an alarming climate trend. Chief among concerns is the impact such conditions have on human health.

- **[Something universal occurs in the brain when it processes stories, regardless of language](#)** [周五, 06 10月 02:17]

New brain research shows that reading stories generates activity in the same regions of the brain for speakers of three different languages.

- **[Air pollution exposure on home-to-school routes reduces the growth of working memory](#)** [周五, 06 10月 00:50]

A new study has demonstrated that exposure to air pollution on the way to school can have damaging effects on children's cognitive development. The study found an association between a reduction in working memory and exposure to fine particulate matter (PM2.5) and black carbon during the walking commute to and from school.

- **[Beer brands popular among youth violate code with youth-appealing ads](#)** [周四, 05 10月 22:27]

Alcohol brands popular among underage drinkers are more likely to air television advertisements that violate the industry's voluntary code by including youth-appealing content, according to a new study.

- **[Low-cost, high-volume services make up big portion of spending on unneeded health care](#)** [周四, 05 10月 22:27]

Low-cost, high-volume health services account for a high percentage of unnecessary health spending, adding strain to the health care system.

- **[Caution ahead: The growing challenge for drivers' attention](#)** [周四, 05 10月 22:27]

Many of the infotainment features in most 2017 vehicles are so

distracting they should not be enabled while a vehicle is in motion, according to a new study. The study found In-Vehicle Information Systems take drivers' attention off the road for too long to be safe.

- [**DNA-based Zika vaccine is safe and effective at inducing immune response**](#) [周四, 05 10月 07:05]

A new generation DNA-based Zika vaccine demonstrated both safety and ability to elicit an immune response against Zika in humans in a phase 1 clinical trial.

- [**Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

- [**Parole violations, not new crimes, help drive prison's revolving door**](#) [周四, 05 10月 02:27]

Failing a drug test, associating with felons and other technical parole violations are among the key drivers of prison's 'revolving door,' according to new American research.

- [**Win-win for spotted owls and forest management**](#) [周四, 05 10月 02:01]

Remote sensing technology has detected what could be a win for both spotted owls and forestry management, according to a study.

- [**In warmer climates, Greenlandic deltas have grown**](#) [周四, 05 10月 01:35]

Unlike most other deltas worldwide, Greenland's are growing -- a trend with major consequences for both fishing and tourism.

- [**Assessing regional earthquake risk and hazards in the age of exascale**](#) [周四, 05 10月 00:05]

Researchers are building the first-ever end-to-end simulation code to precisely capture the geology and physics of regional earthquakes, and how the shaking impacts buildings.

• [**Albatross feces show diet of fishery discards**](#) [周四, 05 10月 00:04]

The first-ever analysis of fish DNA in albatross scat indicates a high level of interaction between seabirds and commercial fisheries. This non-invasive method could be used to assess whether fisheries are complying with discard policies. Extending the analysis to other marine predators could help monitor marine biodiversity and broader marine ecosystem changes.

• [**Safe motherhood campaign associated with more prenatal visits, birth planning, study finds**](#) [周四, 05 10月 00:04]

In Tanzania, pregnant women who were exposed to a national safe motherhood campaign designed to get them to visit health facilities for prenatal care and delivery were more likely to create birth plans and to attend more prenatal appointments.

• [**Rampant consumption of hippo teeth**](#) [周三, 04 10月 22:14]

Investigators have examined the case of hippo teeth and revealed discordance in trade volumes declared between importers and exporters -- a scenario that could threaten the survival of the species.

• [**Doing homework is associated with change in students' personality**](#) [周三, 04 10月 22:07]

Homework may have a positive influence on students' conscientiousness. Students who do more homework than their peers show positive changes in conscientiousness, according to new research. Thus, schools may be doing more than contributing to students' learning, but they may also be effecting changes of their students' personality.

• [**What is STEM education?**](#) [周三, 04 10月 21:51]

Everyone needs a good teacher -- including teachers. Two new studies show how digging deeper into what STEM education means and

strategically designing online classrooms can enhance teaching science, technology, engineering, and math.

- [**Too little is known about wildfire smoke**](#) [周三, 04 10月 21:29]

How do fire-suppression chemicals and pesticides affect wildfire smoke and the health of those who breathe it? New research has discovered that this question cannot be answered based on current scientific evidence, say investigators.

- [**Neighborhood affluence linked to positive birth outcomes**](#) [周三, 04 10月 02:48]

It's not uncommon for new parents to relocate in search of neighborhoods with better schools, safer streets and healthier, more kid-friendly activities. But a new study has found that living in such neighborhoods before a baby is born protects against the risks of poor birth outcomes.

- [**Women firefighters can improve safety, but department culture must change**](#) [周三, 04 10月 02:45]

A new study has discerned that gender may be a unique contributor to safety, but hypermasculine fire service culture creates barriers.

- [**Twitter a hotbed of anti-vaccine sentiment**](#) [周二, 03 10月 23:11]

Anti-vaccine sentiment is alive and growing on social media, with California, Connecticut, Massachusetts, New York and Pennsylvania showing the most negative tweets, according to a new 5-year study.

- [**Social action may give youth a career edge, education faculty research suggests**](#) [周二, 03 10月 23:11]

When disadvantaged youth engage in social activism, they tend to have high-status occupations in adulthood, according to researchers. The findings also suggest there's a place for more discussion of social issues in our educational systems.

- [**New method to quantify life cycle land use of natural gas**](#) [周二, 03 10月 23:10]

A case study of the Barnett Shale region in Texas, where hydraulic fracturing was first implemented, for the first time provides quantifiable information on the life cycle land use of generating electricity from natural gas based on physical measurements instead of using assumptions and averages that were previously used for evaluation.

- [**U.S. breast cancer death rates dropped 39 percent between 1989 and 2015**](#) [周二, 03 10月 23:10]

Breast cancer death rates dropped 39 percent between 1989 and 2015, averting 322,600 breast cancer deaths during those 26 years. Death rates in several states are now statistically equivalent, perhaps reflecting an elimination of disparities in those states.

- [**Incidence of measles in the United States**](#) [周二, 03 10月 23:10]

From 2001 to 2015, the overall annual incidence of measles in the United States remained extremely low (less than 1 case/million population) compared with incidence worldwide (40 cases/million population). Relative increases in measles rates were observed over the period, and the findings suggest that failure to vaccinate may be the main driver of measles transmission, according to a study.

- [**European sea bass show chronic impairment after exposure to crude oil**](#) [周二, 03 10月 21:46]

We may be underestimating the long-term impact of oil spills on fish, particularly their ability to tolerate low oxygen environments, according to research.

- [**New method could help disrupt opioid crisis**](#) [周二, 03 10月 21:40]

Researchers have zeroed in on a unique component of heroin that could help zero in on the locations of origin for individual batches.

- [**Cutting absenteeism in primary schools**](#) [周二, 03 10月 08:23]

A pilot program reduced absenteeism in elementary schools by an average of 10 percent, according to a new study.

- [**Breakthrough cancer treatment brings hope and**](#)

challenges [周二, 03 10月 08:23]

The first gene therapy for cancer will transform approaches to cancer treatments, but it poses ethical challenges for policy-makers.

New source of radioactivity from Fukushima disaster [周二, 03 10月 04:12]

Scientists have found a previously unsuspected place where radioactive material from the Fukushima Dai-ichi nuclear power plant disaster has accumulated -- in sands and brackish groundwater beneath beaches up to 60 miles away. The sands took up and retained radioactive cesium originating from the disaster in 2011 and have been slowly releasing it back to the ocean.

Firearm-related injuries account for \$2.8 billion on emergency room and inpatient charges each year [周二, 03 10月 04:12]

A new study of more than 704,000 people who arrived alive at a United States emergency room for treatment of a firearm-related injury between 2006 and 2014 finds decreasing incidence of such injury in some age groups, increasing trends in others, and affirmation of the persistently high cost of gunshot wounds in dollars and human suffering.

Most Americans want the government to combat climate change, some willing to pay a high amount [周二, 03 10月 02:49]

Sixty-one percent of Americans think climate change is a problem that the government needs to address, including 43 percent of Republicans and 80 percent of Democrats, according to a new survey.

Win-win strategies for climate and food security [周一, 02 10月 20:48]

Efforts to reduce greenhouse gas emissions from the agriculture and forestry sectors could lead to increased food prices -- but new research identifies strategies that could help mitigate climate change while avoiding steep hikes in food prices.

[Adulteration of proprietary Chinese medicines and health products poses severe health risks](#) [周一, 02

10月 20:48]

Traditional Chinese medicine is widely used as a form of complementary medicine all over the world for various indications and for improving general health. Various reports have documented the adulteration of pCMs and health products with undeclared agents, including prescription drugs, drug analogues, and banned drugs. Such adulteration can have serious and even fatal consequences.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- [Smartphone-controlled smart bandage for better, faster healing](#) [周五, 06 10月 04:11]

Wireless microcontrollers release precise amounts of antibiotics, painkillers, growth factors or other medications. The bandage, which remains several years from market, could improve treatment of chronic skin wounds related to diabetes.

- [What Earth's climate system and topological insulators have in common](#) [周五, 06 10月 02:18]

New research shows that equatorial waves -- pulses of warm ocean water that play a role in regulating Earth's climate -- are driven by the same dynamics as the exotic materials known as topological insulators.

- [How yellow and blue make green in parrots](#) [周五, 06 10月 00:11]

Many brightly colored birds get their pigments from the foods that they eat, but that's not true of parrots. Now, researchers reporting a study of familiar pet store parakeets -- also known as budgies -- have new evidence to explain how the birds produce their characteristic yellow, blue, and green feathers.

- [Once declared extinct, Lord Howe Island stick insects really do live](#) [周五, 06 10月 00:11]

Lord Howe Island stick insects were once numerous on the tiny crescent-shaped island off the coast of Australia for which they are named. Now, biologists who have analyzed the DNA of living and dead Lord Howe Island stick insects have some good news: those

rediscovered on Ball's Pyramid, which are now being bred at the Melbourne Zoo and elsewhere, really are Lord Howe Island stick insects.

[More traits associated with your Neanderthal DNA](#) [周五, 06 10月 00:11]

After humans and Neanderthals met many thousands of years ago, the two species began interbreeding. Recent studies have shown that some of those Neanderthal genes have contributed to human immunity and modern diseases. Now researchers have found that our Neanderthal inheritance has contributed to other characteristics, too, including skin tone, hair color, sleep patterns, mood, and even a person's smoking status.

[How much can watching hockey stress your heart?](#) [周四, 05 10月 22:27]

A new study suggests that both the thrill of victory and the agony of defeat can have a substantial effect on the cardiovascular system. Investigators took the pulse of fans during a hockey game and found that on average, their heart rate increased by 75 percent when watching on TV, and by a whopping 110 percent (more than doubled, equivalent to the cardiac stress with vigorous exercise) when watching in person.

[Milky Way's 'most-mysterious star' continues to confound](#) [周四, 05 10月 07:05]

In 2015, a star called KIC 8462852 caused quite a stir in and beyond the astronomy community due to a series of rapid, unexplained dimming events. The latest findings from astronomers take a longer look at the star, going back to 2006 -- before its strange behavior was detected by Kepler.

[The super-Earth that came home for dinner](#) [周四, 05 10月 02:45]

It might be lingering bashfully on the icy outer edges of our solar system, hiding in the dark, but subtly pulling strings behind the scenes: stretching out the orbits of distant bodies, perhaps even tilting the entire solar system to one side. It is a possible "Planet Nine" -- a world perhaps

10 times the mass of Earth and 20 times farther from the sun than Neptune.

- [**Teleoperating robots with virtual reality: Making it easier for factory workers to telecommute**](#) [周四, 05 10月 02:27]

Many manufacturing jobs require a physical presence to operate machinery. But what if such jobs could be done remotely? Researchers have now presented a virtual-reality (VR) system that lets you teleoperate a robot using an Oculus Rift headset.

- [**Female fish like males who sing**](#) [周四, 05 10月 00:05]

Noisier seas seem to hamper fish reproduction. New research shows that noise pollution impedes reproduction in sand and common gobies, both of which are important food sources for juvenile cod.

- [**Burmese python's hungry escapades may have consequences for human health**](#) [周三, 04 10月 22:12]

As the large, invasive Burmese python eats its way through south Florida's mammals, the mosquitoes in the area have fewer types of animals to bite. Now, more mosquitoes are drawing blood from a rat that carries a virus dangerous to humans.

- [**Prehistoric squid was last meal of newborn ichthyosaur 200 million years ago**](#) [周二, 03 10月 21:39]

Scientists have identified the smallest and youngest specimen of *Ichthyosaurus communis* on record and found an additional surprise preserved in its stomach.

- [**Ancient petrified salamander reveals its last meal**](#) [周二, 03 10月 21:39]

A new study on an exceptionally preserved salamander from the Eocene of France reveals that its soft organs are conserved under its skin and bones. Organs preserved in three dimensions include the lung, nerves, gut, and within it, the last meal of the animal, according to a new study.

- [**Monstrous crocodile fossil points to early rise of ancient reptiles**](#) [周二, 03 10月 08:22]

A newly identified prehistoric marine predator has shed light on the origins of the distant relatives of modern crocodiles.

- [**Immature flies in Central Park subsist on duck droppings**](#) [周二, 03 10月 04:12]

Introducing *Themira lohmanus*, a fly like no other, and the most recently discovered species in the popular Manhattan urban oasis of Central Park. The immature insects subsist on duck droppings.

- [**Meteorite tells us that Mars had a dense atmosphere 4 billion years ago**](#) [周一, 02 10月 23:42]

Exploration missions have suggested that Mars once had a warm climate, which sustained oceans on its surface. To keep Mars warm requires a dense atmosphere with a sufficient greenhouse effect, while the present-day Mars has a thin atmosphere whose surface pressure is only 0.006 bar, resulting in the cold climate it has today. It has been a big mystery as to when and how Mars lost its dense atmosphere.

- [**First look at electrons escaping atoms**](#) [周一, 02 10月 23:27]

Researchers have taken a first step toward controlling electrons' behavior inside matter -- and thus the first step down a long and complicated road that could eventually lead to the ability to create new states of matter at will.

- [**Asphalt helps lithium batteries charge faster**](#) [周一, 02 10月 22:52]

A touch of asphalt may be the secret to high-capacity lithium batteries that charge up to 20 times faster than commercial lithium-ion batteries, according to scientists.

- [**DNA: The next hot material in photonics?**](#) [周一, 02 10月 22:52]

Using DNA from salmon, researchers in South Korea hope to make better biomedical and other photonic devices based on organic thin films.

- [**Animals that play with objects learn how to use them as tools**](#) [周一, 02 10月 22:52]

New Caledonian crows and kea parrots can learn about the usefulness of objects by playing with them -- similar to human baby behavior.

- [**Electricity produced from tears**](#) [周一, 02 10月 22:51]

A team of scientists has discovered that applying pressure to a protein found in egg whites and tears can generate electricity. The researchers observed that crystals of lysozyme, a model protein that is abundant in egg whites of birds as well as in the tears, saliva and milk of mammals can generate electricity when pressed.

- [**Body energy as a power source**](#) [周一, 02 10月 20:56]

Smartphones, MP3 players, sports electronics devices such as pulse meters or trackers, medical equipment such as tonometers, pacemakers of the heart, or insulin pumps: An increasing number of electronic companions make daily life easier for us. But as useful these smart helpers may be: Their constant hunger for electricity is a problem. The solution: power supply by means of energy produced by body movements.

- [**A sea of spinning electrons**](#) [周一, 02 10月 20:48]

Picture two schools of fish swimming in clockwise and counterclockwise circles. It's enough to make your head spin, and now scientists have discovered the 'chiral spin mode' -- a sea of electrons spinning in opposing circles.

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- [**How scientists used NASA data to predict the corona of the Aug. 21 Total Solar Eclipse**](#) [周六, 14 10月 23:17]

When the total solar eclipse swept across the United States on Aug. 21, 2017, NASA satellites captured a diverse set of images from space. But days before the eclipse, some NASA satellites also enabled scientists to predict what the corona -- the Sun's outer atmosphere -- would look like during the eclipse, from the ground. In addition to offering a case study to test our predictive abilities, the predictions also enabled some eclipse scientists to choose their study targets in advance.

- [**MS risk in children spotted with MRI brain scans**](#) [周六, 14 10月 23:17]

By the time multiple sclerosis (MS) is diagnosed in children, it may be difficult to prevent the disabilities and relapses that come with the disease. In a new study, researchers examined MRI brain scans to identify children at high risk of developing MS before symptoms appear, which may lead to earlier diagnosis and treatment.

- [**Detailed look at 2-D structure of turbulence in tokamaks**](#) [周六, 14 10月 23:17]

A key hurdle for fusion researchers is understanding turbulence, the ripples and eddies that can cause the superhot plasma that fuels fusion

reactions to leak heat and particles and keep fusion from taking place. Comprehending and reducing turbulence will facilitate the development of fusion as a safe, clean and abundant source of energy for generating electricity from power plants around the world.

- [**A dietary supplement dampens the brain hyperexcitability seen in seizures or epilepsy**](#) [周六, 14 10月 23:17]

Researchers have found that inducing a biochemical alteration in brain proteins via the dietary supplement glucosamine was able to rapidly dampen that pathological hyperexcitability in rat and mouse models. These results represent a potentially novel therapeutic target for the treatment of seizure disorders, and they show the need to better understand the physiology underlying these neural and brain circuit changes.

- [**Giant sea bass worth more alive as undersea wonders than as commercial catch**](#) [周六, 14 10月 23:16]

An investigation of the different economic values of giant sea bass finds they are worth more alive as undersea wonders than as commercial catch.

- [**Solar research: NASA sounding rocket instrument spots signatures of long-sought small solar flares**](#) [周六, 14 10月 02:03]

Like most solar sounding rockets, the second flight of the FOXSI instrument -- short for Focusing Optics X-ray Solar Imager -- lasted 15 minutes, with just six minutes of data collection. But in that short time, the cutting-edge instrument found the best evidence to date of a phenomenon scientists have been seeking for years: signatures of tiny solar flares that could help explain the mysterious extreme heating of the Sun's outer atmosphere.

- [**Importance of studying sleep and eating in tandem**](#) [周六, 14 10月 01:22]

A new study offers important insights into possible links between sleep

and hunger.

- [**Gutters teem with inconspicuous life**](#) [周六, 14 10月 01:22]

Scientists have shown that Parisian street gutters are oases of microscopic life, home to microalgae, fungi, sponges, and mollusks. Grouped into communities, these microorganisms may help clean rainwater and urban waste by decomposing solid debris and pollutants. A deeper understanding of the role and composition of these communities could help elucidate the services rendered by gutter ecosystems. The researchers' findings are the first to reveal the unsuspected biodiversity of microscopic life i...

- [**'Roadmap' to aid osteoporosis treatment development**](#) [周六, 14 10月 01:22]

Scientists have developed a molecular model that may provide a new framework for improving the design of osteoporosis treatments.

- [**Genetic clues to spinal stenosis**](#) [周六, 14 10月 01:21]

A new study indicates that certain genetic changes are linked with an increased risk of developing lumbar spinal stenosis, a narrowing of the open spaces in the lower spine that can lead to pain in the legs when individuals walk.

- [**Worms reveal secrets of aging**](#) [周六, 14 10月 00:51]

Investigators have identified a new molecular pathway that controls lifespan and healthspan in worms and mammals. Researchers have shown that worms with excess levels of certain proteins lived longer and healthier than normal worms. In addition, mice with excess levels of these proteins demonstrated a delay in blood vessel dysfunction associated with aging. The study has major implications for our understanding of aging and age-associated disorders.

- [**Augmented tongue ultrasound for speech therapy**](#) [周六, 14 10月 00:32]

Researchers have developed a system that can display the movements of our own tongues in real time. These movements are processed by a machine learning algorithm that controls an 'articulatory talking head.'

This avatar shows the tongue, palate and teeth, which are usually hidden inside the vocal tract.

- [**Atrazine alters the sex ratio in Blanchard's cricket frogs**](#) [周六, 14 10月 00:32]

A study found that Blanchard's cricket frogs are highly sensitive to atrazine. When exposed, there were up to 55 percent fewer males than females compared with the control group, indicating that atrazine can affect the sex ratio. However, cricket frog populations do persist in areas with widespread atrazine application, despite reports of range contractions for enigmatic reasons.

- [**Astronomers find potential solution into how planets form**](#) [周六, 14 10月 00:32]

The quest to discover how planets found in the far reaches of the universe are born has taken a new, crucial twist.

- [**Surgeries performed later in the day have more complications**](#) [周六, 14 10月 00:32]

A new study finds that patients who undergo a neurosurgical procedure with surgical start times between 9 pm and 7 am are at an increased risk of developing complications compared to patients with a surgical start time earlier in the day.

- [**Spin current detection in quantum materials unlocks potential for alternative electronics**](#) [周六, 14 10月 00:31]

A new method that precisely measures the mysterious behavior and magnetic properties of electrons flowing across the surface of quantum materials could open a path to next-generation electronics. A team of scientists has developed an innovative microscopy technique to detect the spin of electrons in topological insulators, a new kind of quantum material that could be used in applications such as spintronics and quantum computing.

- [**Solar research: On the generation of solar spicules and Alfvénic waves**](#) [周六, 14 10月 00:31]

Combining computer observations and simulations, a new model shows that the presence of neutrals in the gas facilitates the magnetic fields to penetrate through the surface of the Sun producing the spicules.

• [**Melting ice makes the sea around Greenland less saline**](#) [周五, 13 10月 23:30]

For the first time, ocean data from Northeast Greenland reveals the long-term impact of the melting of the Greenland ice sheet. The observed increase in freshwater content will affect the conditions in all Greenland fjords and may ultimately affect the global ocean currents that keep Europe warm.

• [**Scientists reveal the relationship between sugar, cancer**](#) [周五, 13 10月 22:36]

A nine-year joint research project has led to a crucial breakthrough in cancer research. Scientists have clarified how the Warburg effect, a phenomenon in which cancer cells rapidly break down sugars, stimulates tumor growth. This discovery provides evidence for a positive correlation between sugar and cancer, which may have far-reaching impacts on tailor-made diets for cancer patients.

• [**First atomic structure from cryo-EM facility**](#) [周五, 13 10月 22:33]

Researchers have outlined a 3-D atomic structure of the ion channel found in mammals that is implicated in a rare, inherited neurodegenerative disease in humans.

• [**Usutu virus is back: Not only in blackbirds but also in humans**](#) [周五, 13 10月 22:33]

Usutu virus, a flavivirus of African origin, was first detected in Austria in 2001, when it caused a severe bird die-off, mainly of blackbirds. The virus was active in the eastern part of Austria until 2005, killing many blackbirds, but also other songbirds. During 10 subsequent years no Usutu virus associated bird mortality was observed in Austria -- contrary to neighboring Hungary. Last year Usutu virus was identified again in two blackbirds -- and in 2017 already in sixteen songbirds. In anoth...

- [**Making healthier decisions, step by step**](#) [周五, 13 10月 21:52]

For 10 days, scientists posted signs at the bottom of a set of airport stairs and escalators encouraging them to take the stairs. They found when the signs were present, people were about twice as likely to use the stairs.

- [**Space radiation won't stop NASA's human exploration**](#) [周五, 13 10月 21:52]

While it's true that space radiation is one of the biggest challenges for a human journey to Mars, it's also true that NASA is developing technologies and countermeasures to ensure a safe and successful journey to the red planet.

- [**Purple power: Synthetic 'purple membranes' transform sunlight to hydrogen fuel**](#) [周五, 13 10月 21:19]

A new way has been found to produce solar fuels by developing “synthetic purple membranes.” These membranes involve an assembly of lipid nanodiscs, man-made proteins, and semiconducting nanoparticles that, when taken together, can transform sunlight into hydrogen fuel.

- [**Cell biology: Proteins may prevent dysfunction, disease by relaxing, study shows**](#) [周五, 13 10月 21:19]

A team of researchers used simulations and X-rays to conclude that disordered proteins remain unfolded and expanded as they float loose in the cytoplasm of a cell. The answer affects how we envision the movement of a protein through its life--essential for understanding how proteins fold, what goes wrong during disorders and disease and how to model their behavior.

- [**Star Dust Helps Explain Mysterious Dimming Star**](#) [周五, 13 10月 21:19]

Astronomers are working to understand the mysterious dimming of Tabby's Star. The astronomers report that space dust orbiting the star -- not alien megastructures -- is the likely cause of the star's long-term dimming.

- **[Higher dose of vitamin D increases bone density in premature babies, study finds](#)** [周五, 13 10月 21:18]

If the standard supplementation of 400 IUs of vitamin D is increased to 800 IUs daily there are reductions in the number of premature and preterm babies with extremely low bone density, new research has found.

- **[Contests for female attention turns males into better performers in fruit flies](#)** [周五, 13 10月 21:17]

Giving females an opportunity to choose the male they mate with leads to the evolution of better performing males, according to new research into the behavior of fruit flies.

- **[Wildlife in the ditches need a detox cure](#)** [周五, 13 10月 21:17]

When it's raining on the roads, slops of road dust and contaminants drain into the road trenches. What does it do to wildlife living by the road?

- **[Does size matter? Bigger cod fish contain more mercury](#)** [周五, 13 10月 21:17]

The levels of mercury in the Oslofjord cod has increased over the last 30 years, despite reduced emissions of this toxic element. In the same period, the average size of sampled cod has increased. Are the elevated levels of mercury simply a result of larger cod?

- **[DISTRO: Researchers create digital objects from incomplete 3D data](#)** [周五, 13 10月 21:17]

Depth sensors, such as those of the Microsoft Kinect, are very powerful, but unfortunately they do not work equally well on all materials, which leads to noisy data or even missing measurements.

- **[Cold molecules on collision course](#)** [周五, 13 10月 21:15]

Using a new cooling technique scientists succeed at observing collisions in a dense beam of cold and slow dipolar molecules.

- **[New insight into the limits of possible life on Mars](#)** [周五, 13 10月 21:10]

Researchers investigating whether liquid water could exist on Mars have provided new insight into the limits of life on the red planet.

- [**New mechanism detected in Alzheimer's disease**](#)

[周五, 13 10月 21:10]

Researchers have discovered a cellular mechanism that may contribute to the breakdown of communication between neurons in Alzheimer's disease. In the brain tissue of Alzheimer's patients, the RNAs that encode synaptic proteins are degraded more rapidly than in healthy brain cells, the researchers found. Their findings indicate that inadequate levels of a protein known as RBFOX1 may be a factor in the faulty connections that are a hallmark of Alzheimer's disease.

- [**Single photon reveals quantum entanglement of 16 million atoms**](#)

[周五, 13 10月 21:10]

Quantum theory predicts that a vast number of atoms can be entangled and intertwined by a very strong quantum relationship even in a macroscopic structure. Until now, experimental evidence has been mostly lacking, despite recent advances have shown the entanglement of 2,900 atoms. Scientists recently reengineered their data processing, demonstrating that 16 million atoms were entangled in a one-centimeter crystal.

- [**Baltic clams, worms release as much greenhouse gas as 20,000 dairy cows**](#)

[周五, 13 10月 21:10]

Ocean clams and worms are releasing a significant amount of potentially harmful greenhouse gas into the atmosphere, scientists have shown.

- [**'Magic mushrooms' may 'reset' the brains of depressed patients, study suggests**](#)

[周五, 13 10月 21:10]

Patients taking psilocybin to treat depression show reduced symptoms weeks after treatment following a 'reset' of their brain activity.

- [**Restless legs syndrome study identifies 13 new genetic risk variants**](#)

[周五, 13 10月 21:10]

A new study into the genetics underlying restless legs syndrome has identified 13 previously-unknown genetic risk variants, while helping

inform potential new treatment options for the condition.

- [**Learning and staying in shape key to longer lifespan, study finds**](#) [周五, 13 10月 21:10]

People who are overweight cut their life expectancy by two months for every extra kilogram of weight they carry, research suggests. A major study has also found that education leads to a longer life, with almost a year added for each year spent studying beyond school.

- [**Scientists uncover a centuries-old case of mistaken identity in the Chesapeake Bay**](#) [周五, 13 10月 21:10]

Scientists recently discovered that some jellyfish in the Bay are quite different from their ocean cousins. This led scientists to declare them as two different species.

- [**How E. coli bacteria adapt under stress**](#) [周五, 13 10月 21:10]

Researchers have developed a genome-scale model that can accurately predict how E. coli bacteria respond to temperature changes and genetic mutations. The work sheds light on how cells adapt under environmental stress and has applications in precision medicine, where adaptive cell modeling could provide patient-specific treatments for bacterial infections.

- [**Tweets can help predict the outcome of soccer matches**](#) [周五, 13 10月 08:02]

Twitter activity can help predict the result of soccer matches when combined with betting market prices, new study shows. The tone of Twitter posts can predict when a team is more likely to win and soccer bets are mispriced, the study found.

- [**Possible new treatment pathway for severe allergic asthma**](#) [周五, 13 10月 08:02]

Research demonstrates that blocking the action of two pro-inflammatory molecules significantly reduces symptoms of allergic asthma in mice, which could lead to development of a new treatment for people with a severe form of the condition.

• [**Direct Numerical Simulations enhance combustion efficiency, reduces pollution**](#) [周五, 13 10月 08:02]

Researchers use Direct Numerical Simulations to enhance efficiency, reduce pollution in diesel engines.

• [**Mantis shrimp-inspired camera enables glimpse into hidden world**](#) [周五, 13 10月 08:02]

By mimicking the eye of the mantis shrimp, researchers have developed an ultra-sensitive camera capable of sensing both color and polarization. The bioinspired imager can potentially improve early cancer detection and help provide a new understanding of underwater phenomena, the researchers said. See a video of describing the study on YouTube.

• [**Is it gonna blow? Measuring volcanic emissions from space**](#) [周五, 13 10月 08:02]

Carbon dioxide measured by a NASA satellite pinpoints sources of the gas from human and volcanic activities, which may help monitor greenhouse gases responsible for climate change.

• [**Converting carbon dioxide to carbon monoxide using water, electricity**](#) [周五, 13 10月 08:02]

Researchers have determined how electrocatalysts can convert carbon dioxide to carbon monoxide using water and electricity. The discovery can lead to the development of efficient electrocatalysts for large scale production of synthesis gas -- a mixture of carbon monoxide and hydrogen.

• [**Understanding rare Earth emulsions**](#) [周五, 13 10月 08:02]

Through a series of theoretical simulations, researchers discovered that surface polarization in mixed media increases attraction among elements.

• [**Combination of El Niño and 2016 Ecuador earthquake likely worsened Zika outbreak**](#) [周五, 13 10月 08:02]

A Zika virus outbreak in coastal Ecuador in 2016 was likely worsened

by a strong El Niño and a magnitude 7.8 earthquake that struck the region in April, according to a new study.

• [Intense storms batter Saturn's largest moon, scientists report](#) [周五, 13 10月 05:25]

Titan, the largest of Saturn's more than 60 moons, has surprisingly intense rainstorms, according to research by a team of UCLA planetary scientists and geologists. Although the storms are relatively rare -- they occur less than once per Titan year, which is 29 and a half Earth years -- they occur much more frequently than the scientists expected.

How scientists used NASA data to predict the corona of the Aug. 21 Total Solar Eclipse -- ScienceDaily

When the total solar eclipse swept across the United States on Aug. 21, 2017, NASA satellites captured a diverse set of images from space. But days before the eclipse, some NASA satellites also enabled scientists to predict what the corona -- the Sun's outer atmosphere -- would look like during the eclipse, from the ground. In addition to offering a case study to test our predictive abilities, the predictions also enabled some eclipse scientists to choose their study targets in advance.

Predictive Science, Inc., San Diego, Calif. -- a private computational physics research company supported by NASA, the National Science Foundation and the Air Force Office of Scientific Research -- used data from NASA's Solar Dynamics Observatory, or SDO to develop an improved numerical model that simulated what the corona would look like during the total eclipse. Their model uses observations of magnetic fields on the Sun's surface and requires a wealth of

supercomputing resources to predict how the magnetic field shapes the corona over time.

As the corona and solar material spread outward from the Sun, they can manifest themselves as disturbances in near-Earth space, known as space weather. "Space weather models must be able to characterize the structure of the corona in order to improve forecasts of the path and possible impacts of these events," Predictive Science president and scientist Jon Linker said.

One key tool are computer models that simulate events on the Sun before they even happen. This comparing of models and observations is a core aspect of heliophysics -- the field of science dedicated to understanding the Sun and its dynamic influence throughout the solar system. Without the ability to measure the corona directly, heliophysicists test their theories by using complex computer simulations.

Eclipses offer a unique opportunity for scientists to test such models. During the total eclipse, the Moon completely obscured the Sun's bright face, revealing the innermost part of the corona -- the region where solar eruptions such as coronal mass ejections

originate, but is difficult to observe under ordinary circumstances. By comparing their predictions to the observations gathered during the eclipse itself, researchers can assess and improve the performance of their coronal models.

The model the Predictive Science researchers used for their final prediction of the August 2017 eclipse was their most complex yet. In addition to SDO's maps of the Sun's magnetic field, it also utilized SDO observations of filaments -- serpentine structures on the Sun's surface composed of cool, dense solar material.

Greater complexity demands more computing hours, and each simulation required thousands of processors and took about two days of real time to complete. The research group ran their model on several supercomputers including facilities at the Texas Advanced Computer Center in Austin, Texas; the San Diego Supercomputer Center in California; and the Pleiades supercomputer at the NASA Advanced Supercomputing facility at NASA's Ames Research Center in Silicon Valley, California.

"Based on a very preliminary comparison, it looks like the model did very well in capturing features of the

large-scale corona," Linker said. In its increased complexity, the model demonstrates that even the Sun's fine magnetic structures are intimately related to the vast structure of the corona.

While scientists were running their models, NASA's own Solar and Terrestrial Relations Observatory, or STEREO-A spacecraft, was also able to peer into the future and provide clues as to what the corona would look like the day of the eclipse. As the eclipse drew closer, due to STEREO-A's position behind the Sun and the particular rotation rates of the Sun and Earth, STEREO-A's view of the corona on Aug. 12, 2017, was virtually the same those within the path of totality would see nine days later on Aug. 21. That is, STEREO-A's vantage point is roughly nine days in advance of Earth's.

STEREO's key instruments include a pair of coronagraphs -- telescopes that use a metal disk called an occulting disk to study the corona. Just like a total eclipse, the occulting disk blocks the Sun's bright light, making it possible to discern the surrounding corona.

Coronagraph images from Aug. 12 and 21 show great similarity; both feature a dominant three-streamer

shape. Here, the STEREO image is compared to an image from the joint ESA/NASA Solar and Heliospheric Observatory, or SOHO, which was positioned to share Earth's view of the corona on Aug. 21. The slight difference in the location of the streamers is due to the fact that STEREO-A and SOHO view the Sun from slightly different angles.

"The small difference between the Aug. 12 and Aug. 21 images show the Sun's atmosphere evolves very slowly -- as we expect it to, in its declining phase toward solar minimum," said Angelos Vourlidas, a STEREO science team member and heliophysicist at the Johns Hopkins University Applied Physics Laboratory in Laurel, Maryland. "The Sun is slowly going to sleep -- but not quietly, as the recent spate of solar activity reminded us!"

Solar minimum is the period of lower solar activity in the Sun's natural approximately 11-year cycle. In times of greater solar activity, the dynamic corona could have evolved too quickly to make such a prediction useful. But in these times nearing solar minimum, both Predictive Science and STEREO's eclipse predictions offered an opportunity for researchers to improve models and our understanding of the Sun's current

activity.

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MS risk in children spotted with MRI brain scans -- ScienceDaily

By the time multiple sclerosis (MS) is diagnosed in children, it may be difficult to prevent the disabilities and relapses that come with the disease. In a new Yale School of Medicine study, researchers examined MRI brain scans to identify children at high risk of developing MS before symptoms appear, which may lead to earlier diagnosis and treatment.

Published in the November issue of the journal *Neurology: Neuroimmunology & Neuroinflammation*, the study of 38 children at 16 sites in six countries showed that the MRIs can reveal changes in the brain associated with MS before the clinical symptoms of the disease appear in children.

The children in the study all underwent MRI scans for other reasons, most commonly headache, but the MRIs unexpectedly revealed signs of MS. Having MRI findings of MS without any symptoms of the disease has been termed radiologically isolated syndrome (RIS) and previously had only been seen in adults.

"For the first time we have proposed a definition of RIS in children," said lead author Naila Makhani, M.D., assistant professor of pediatrics and neurology at Yale School of Medicine. "Children with RIS may represent a high-risk group of children that needs to be followed more closely for the later development of clinical multiple sclerosis."

Approximately 42% of children in the study with MRI findings of MS developed the first clinical symptoms of the disease about two years after the abnormal MRI, which shows a faster development of the disease than has been reported in adults. Children who had a specific marker in spinal fluid or who had MRI changes in the spinal cord, were at greatest risk of developing the clinical symptoms of MS.

Makhani said five of the children in the study received an approved treatment for multiple sclerosis to try to prevent the disease. This number is too small to accurately draw conclusions about the effect of treatment, she noted.

"We hope that our work will help inform expert guidelines for how to follow up children with RIS and help us accurately inform families of the risk of later

developing multiple sclerosis, something we were previously unable to do," said Makhani.

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Detailed look at 2-D structure of turbulence in tokamaks -- ScienceDaily

A key hurdle for fusion researchers is understanding turbulence, the ripples and eddies that can cause the superhot plasma that fuels fusion reactions to leak heat and particles and keep fusion from taking place. Comprehending and reducing turbulence will facilitate the development of fusion as a safe, clean and abundant source of energy for generating electricity from power plants around the world.

At the U.S. Department of Energy's (DOE) Princeton Plasma Physics Laboratory (PPPL), scientists have assembled a large database of detailed measurements of the two dimensional (2-D) structure of edge plasma turbulence made visible by a diagnostic technique known as gas puff imaging. The two dimensions, measured inside a fusion device called a tokamak, represent the radial and vertical structure of the turbulence.

Step toward fuller understanding

"This study is an incremental step toward a fuller understanding of turbulence," said physicist Stewart Zweben, lead author of the research published in the journal *Physics of Plasmas*. "It could help us understand how turbulence functions as the main cause of leakage of plasma confinement."

Fusion occurs naturally in space, merging the light elements in plasma to release the energy that powers the sun and stars. On Earth, researchers create fusion in facilities like tokamaks, which control the hot plasma with magnetic fields. But turbulence frequently causes heat to leak from its magnetic confinement.

PPPL scientists have now delved beyond previously published characterizations of turbulence and analyzed the data to focus on the 2-D spatial correlations within the turbulence. This correlation provides clues to the origin of the turbulent behavior that causes heat and particle leakage, and will serve as an additional basis for testing computer simulations of turbulence against empirical evidence.

Studying 20 discharges of plasma

The paper studied 20 discharges of plasma chosen as a

representative sample of those created in PPPL's National Spherical Torus Experiment (NSTX) prior to its recent upgrade. In each of these discharges, a gas puff illuminated the turbulence near the edge of the plasma, where turbulence is of special interest. The puffs, a source of neutral atoms that glow in response to density changes within a well-defined region, allowed researchers to see fluctuations in the density of the turbulence. A fast camera recorded the resulting light at the rate of 400,000 frames per second over an image frame size of 64 pixels wide by 80 pixels high.

Zweben and co-authors performed computational analysis of the data from the camera, determining the correlations between different regions of the frames as the turbulent eddies moved through them. "We're observing the patterns of the spatial structure," Zweben said. "You can compare it to the structure of clouds drifting by. Some large clouds can be massed together or there can be a break with just plain sky."

Detailed view of turbulence

The correlations provide a detailed view of the nature of plasma turbulence. "Simple things about turbulence like its size and time scale have long been known," said

PPPL physicist Daren Stotler, a coauthor of the paper. "These simulations take a deep dive into another level to look at how turbulence in one part of the plasma varies with respect to turbulence in another part."

In the resulting graphics, a blue cross indicates the point of focus for a calculation; the red and yellow areas around the cross are regions in which the turbulence is evolving similarly to the turbulence at the focal point. Farther away, researchers found regions in which the turbulence is changing opposite to the changes at the focal point. These farther-away regions are shown as shades of blue in the graphics, with the yellow cross indicating the point with the most negative correlation.

For example, if the red and yellow images were a region of high density turbulence, the blue images indicated low density. "The density increase must come from somewhere," said Zweben. "Maybe from the blue regions."

Going forward, knowledge of these correlations could be used to predict the behavior of turbulence in magnetically confined plasma. Success of the effort could deepen understanding of a fundamental cause of

the loss of heat from fusion reactions.

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A dietary supplement dampens the brain hyperexcitability seen in seizures or epilepsy: These results, seen in animal models, represent a potentially novel therapeutic target for the treatment of seizure disorders -- ScienceDaily

Seizure disorders -- including epilepsy -- are associated with pathological hyperexcitability in brain neurons. Unfortunately, there are limited available treatments that can prevent this hyperexcitability. However, University of Alabama at Birmingham researchers have found that inducing a biochemical alteration in brain proteins via the dietary supplement glucosamine was able to rapidly dampen that pathological hyperexcitability in rat and mouse models.

These results represent a potentially novel therapeutic target for the treatment of seizure disorders, and they show the need to better understand the physiology underlying these neural and brain circuit changes.

Proteins are the workhorses of living cells, and their activities are tightly and rapidly regulated in responses to changing conditions. Adding or removing a phosphoryl group to proteins is a well-known regulator for many proteins, and it is estimated that human proteins may have as many as 230,000 sites for phosphorylation.

A lesser-known regulation comes from the addition or removal of N-acetylglucosamine to proteins, which is usually controlled by glucose, the primary fuel for neurons. Several years ago, neuroscientist Lori McMahon, Ph.D., professor of cell, developmental and integrative biology at UAB, found out from her colleague John Chatham, D.Phil., a UAB professor of pathology and a cardiac physiologist, that brain cells had the second-highest amounts of proteins with N-acetylglucosamine, or O-GlcNAcylation, in the body.

At the time, very little was known about how O-GlcNAcylation might affect brain function, so McMahon and Chatham started working together. In 2014, McMahon and Chatham, in a study led by graduate student Erica Taylor and colleagues, reported that acute increases in protein O-GlcNAcylation caused long-term synaptic depression, a reduction in neuronal

synaptic strength, in the hippocampus of the brain. This was the first time acute changes in O-GlcNAcylation of neuronal proteins were shown to directly change synaptic function.

Since neural excitability in the hippocampus is a key feature of seizures and epilepsy, they hypothesized that acutely increasing protein O-GlcNAcylation might dampen the pathological hyperexcitability associated with these brain disorders.

That turned out to be the case, as reported in the *Journal of Neuroscience* study, "Acute increases in protein O-GlcNAcylation dampen epileptiform activity in hippocampus." The study was led by corresponding author McMahan and first author Luke Stewart, a doctoral student in the Neuroscience Theme of the Graduate Biomedical Sciences Program. Stewart is co-mentored by McMahan and Chatham.

"Our findings support the conclusion that protein O-GlcNAcylation is a regulator of neuronal excitability, and it represents a promising target for further research on seizure disorder therapeutics," they wrote in their research significance statement. The researchers caution that the mechanism underlying the dampening

is likely to be complex.

Research details

Glucose, the major fuel for neurons, also controls the levels of protein O-GlcNAcylation on proteins. However, high levels of the dietary supplement glucosamine, or an inhibitor of the enzyme that removes O-GlcNAcylation, leads to rapid increases in O-GlcNAc levels.

In experiments with hippocampal brain slices treated to induce a stable and ongoing hyperexcitability, UAB researchers found that an acute increase in protein O-GlcNAcylation significantly decreased the sudden bursts of electrical activity known as epileptiform activity in area CA1 of the hippocampus. An increased protein O-GlcNAcylation in normal cells also protected against a later induction of drug-induced hyperexcitability.

The effects were seen in slices treated with both glucosamine and an inhibitor of the enzyme that removes O-GlcNAc groups. They also found that treatment with glucosamine alone for as short a time as 10 minutes was able to dampen ongoing drug-induced

hyperexcitability.

In common with the long-term synaptic depression provoked by increased O-GlcNAcylation, the dampening of hyperexcitability required the GluA2 subunit of the AMPA receptor, which is a glutamate-gated ion channel responsible for fast synaptic transmission in the brain. This finding suggested a conserved mechanism for the two changes provoked by increased O-GlcNAcylation -- synaptic depression and dampening of hyperexcitability.

The researchers also found that the spontaneous firing of pyramidal neurons in another region of hippocampus, area CA3, was reduced by increased O-GlcNAcylation in normal brain slices and in slices with drug-induced hyperexcitability. This reduction in spontaneous firing of CA3 pyramidal neurons likely contributes to decreased hyperexcitability in area CA1 since the CA3 neurons directly excite those in CA1.

Similar to the findings for brain slices, mice that were treated to increase O-GlcNAcylation before getting drug-induced hyperexcitability had fewer of the brain activity spikes associated with epilepsy that are called interictal spikes. Several drug-induced hyperexcitable

mice had convulsive seizures during the experiments -- this occurred in both the increased O-GlcNAcylation mice and the control mice. Brain activity during the seizures differed between these two groups: The peak power of the brain activity for the mice with increased O-GlcNAcylation occurred at a lower frequency, as compared with the control mice.

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Giant sea bass worth more alive as undersea wonders than as commercial catch -- ScienceDaily

Almost as large as a Smart car, giant sea bass can weigh more than 500 pounds and grow longer than 6 feet. At this size, they are the largest bony fish found along the California coast.

Once commercially important, these gentle giants were overfished in the 1900s, leading to the collapse of the fishery in the 1970s. Now, they are classified as critically endangered by the International Union for Conservation of Nature, making them as imperiled as the black rhino.

In a new study, UCSB researchers investigated the different economic values of giant sea bass -- paradoxically both a flagship species to the recreational dive industry and regularly sold in California's commercial fisheries when incidentally caught -- to two key stakeholders: commercial fishers and recreational scuba divers. Their findings appear in the

journal *Aquatic Conservation: Marine and Freshwater Ecosystems*.

"Analyzing commercial catch data, we found that the average annual value of the giant sea bass fishery to fishers in California was \$12,600," said lead author Ana Sofia Guerra, a graduate student in UCSB's Department of Ecology, Evolution, and Marine Biology (EEMB). "This represents less than 1 percent of the value of the non-endangered fish commercial fishers are actually targeting: white sea bass and California halibut, which are healthy and sustainable seafood options."

While giant sea bass can no longer be targeted by commercial fishermen, if one is caught in a gill net during the capture of other species, it can be sold, which is why this endangered fish still appears regularly on restaurant menus and in fish markets.

Using self-reported fishery catch location data, the researchers identified seasonal bycatch hotspots, where commercial fishermen were not catching white sea bass or halibut but accidentally caught a lot of giant sea bass. According to co-author Douglas McCauley, an EEMB assistant professor, managing such ocean

pockets as seasonal giant sea bass sanctuaries would likely have minimal or no financial impact on California's important fisheries but might create a lot more worth for the dive industry.

Although the economic value of a species generally is equated with consumption, the growth of ecotourism has expanded the range of value to include animal interaction -- think photography or wildlife viewing.

"Approximately 1.38 million dives are done in California on an annual basis," Guerra said. "Annual direct expenditures from scuba diving in California range from \$161 to \$323 million."

Giant sea bass are to California divers what a bison sighting might be to a visitor in Yellowstone National Park. An iconic part of the state's underwater wilderness, giant sea bass have a curious gentle disposition, yet some divers go years without seeing one.

To ascertain the value of giant sea bass in the scuba community, the scientists surveyed recreational divers in Southern California online and in person. They rode along on recreational dive boats to determine the worth

divers place on a rare face-to-face encounter with these unique creatures.

The researchers estimated that average annual value at \$2.3 million. This amount does not represent a direct cash flow to the diving industry but rather is derived from how much value divers assign to a sighting of this gigantic fish. The high value to divers demonstrates the potential for an industry centered on giant sea bass viewing, which could be more lucrative than their consumption potential.

Similar values have been estimated for other charismatic ocean species. Reef sharks in Palau were found to be over 17 times more valuable alive as an ecotourism attraction in their lifetimes than dead in the market. Globally, the estimated annual economic value of manta ray tourism is \$140 million, which substantially exceeds the annual \$5 million value of the manta ray gill raker trade.

Viewing value in this way highlights the importance of giant sea bass beyond a fishery and stresses the importance of considering all stakeholders in policy and management plans, Guerra noted. "Fishing and ecotourism or wildlife viewing are not mutually

exclusive activities," she said. "The paper highlights ways to strategically maximize the value of giant sea bass to both stakeholders."

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All Top News

Top science stories featured on ScienceDaily's home page.

- [**Melting ice makes the sea around Greenland less saline**](#) [周五, 13 10月 23:30]

For the first time, ocean data from Northeast Greenland reveals the long-term impact of the melting of the Greenland ice sheet. The observed increase in freshwater content will affect the conditions in all Greenland fjords and may ultimately affect the global ocean currents that keep Europe warm.

- [**Star Dust Helps Explain Mysterious Dimming Star**](#) [周五, 13 10月 21:19]

Astronomers are working to understand the mysterious dimming of Tabby's Star. The astronomers report that space dust orbiting the star -- not alien megastructures -- is the likely cause of the star's long-term dimming.

- [**New insight into the limits of possible life on Mars**](#) [周五, 13 10月 21:10]

Researchers investigating whether liquid water could exist on Mars have provided new insight into the limits of life on the red planet.

- [**Learning and staying in shape key to longer lifespan, study finds**](#) [周五, 13 10月 21:10]

People who are overweight cut their life expectancy by two months for every extra kilogram of weight they carry, research suggests. A major study has also found that education leads to a longer life, with almost a year added for each year spent studying beyond school.

- [**Is it gonna blow? Measuring volcanic emissions**](#)

[from space](#) [周五, 13 10月 08:02]

Carbon dioxide measured by a NASA satellite pinpoints sources of the gas from human and volcanic activities, which may help monitor greenhouse gases responsible for climate change.

. [Intense storms batter Saturn's largest moon, scientists report](#) [周五, 13 10月 05:25]

Titan, the largest of Saturn's more than 60 moons, has surprisingly intense rainstorms, according to research by a team of UCLA planetary scientists and geologists. Although the storms are relatively rare -- they occur less than once per Titan year, which is 29 and a half Earth years -- they occur much more frequently than the scientists expected.

. [Spotting the spin of the Majorana fermion under the microscope](#) [周五, 13 10月 02:33]

Using a new twist on a technique for imaging atomic structures, researchers have detected a unique quantum property of the Majorana fermion, an elusive particle with the potential for use in quantum information systems.

. [Newfoundland populated multiple times by distinct groups, DNA evidence shows](#) [周五, 13 10月 02:33]

Researchers who've examined genetic evidence from mitochondrial DNA provide evidence that two groups of indigenous people in Canada, known as the Maritime Archaic and Beothuk, brought different matrilineal lineages to the island, adding further support to the notion that those groups had distinct population histories.

. [Baby talk in any language: Shifting the timbre of our voices](#) [周五, 13 10月 02:33]

When talking with their young infants, parents instinctively use 'baby talk,' a unique form of speech including exaggerated pitch contours and short, repetitive phrases. Now, researchers have found another unique feature of the way mothers talk to their babies: they shift the timbre of their voice in a rather specific way. The findings hold true regardless of

a mother's native language.

- [**Genes responsible for diversity of human skin colors identified**](#) [周五, 13 10月 02:33]

A study of diverse African groups by geneticists has identified new genetic variants associated with skin pigmentation. The findings help explain the vast range of skin color on the African continent, shed light on human evolution and inform an understanding of the genetic risk factors for conditions such as skin cancer.

- [**Engineers develop a programmable 'camouflaging' material inspired by octopus skin**](#) [周五, 13 10月 02:33]

Engineers have invented stretchable surfaces with programmable 3-D texture morphing, a synthetic 'camouflaging skin' inspired by studying and modeling the real thing in octopus and cuttlefish.

- [**Paleogenomic analysis sheds light on Easter Island mysteries**](#) [周五, 13 10月 00:30]

New paleogenomic research appears to rule out the likelihood that inhabitants of Easter Island intermixed with South Americans prior to the arrival of Europeans on the island in 1722.

- [**Devourer of planets? Astronomers dub star 'Kronos'**](#) [周五, 13 10月 00:28]

'Kronos' is enhanced in metals and other rock-forming elements but not in volatiles, prompting a team of researchers to conclude that it absorbed as much as 15 Earth masses worth of rocky planets. Its twin, 'Krios,' does not show this unusual pattern of enhancement.

- [**Brain waves reflect different types of learning**](#) [周五, 13 10月 00:28]

Researchers have, for the first time, identified neural signatures of explicit and implicit learning.

- [**Geologic evidence is the forerunner of ominous prospects for a warming Earth**](#) [周四, 12 10月 23:48]

While strong seasonal hurricanes have devastated many of the

Caribbean and Bahamian islands this year, geologic studies on several of these islands illustrate that more extreme conditions existed in the past. A new analysis shows that the limestone islands of the Bahamas and Bermuda experienced climate changes that were even more extreme than historical events.

- [**Scientists begin bold conservation effort to save the vaquita porpoise from extinction**](#) [周四, 12 10月 22:37]

An international team of experts has gathered in San Felipe, Mexico at the request of the Mexican government (SEMARNAT) and has begun a bold, compassionate plan known as VaquitaCPR to save the endangered vaquita porpoise from extinction.

- [**Pumas found to exhibit behaviors like social animals**](#) [周四, 12 10月 22:36]

Pumas, long known as solitary carnivores, are more social than previously thought, according to a new study. The findings provide the first evidence of complex social strategies in any solitary carnivore -- and may have implications for multiple species, including other wild cats around the world.

- [**Haumea, the most peculiar of Pluto companions, has a ring around it**](#) [周四, 12 10月 21:33]

The trans-neptunian belt contains four dwarf planets, among which Haumea stands out for its extremely elongated shape and rapid rotation. A stellar occultation makes it possible to establish the main physical characteristics of this previously little known body -- among which most surprising was the presence of a ring.

- [**New threat to the ozone layer**](#) [周四, 12 10月 21:10]

'Ozone depletion is a well-known phenomenon and, thanks to the success of the Montreal Protocol, is widely perceived as a problem solved,' say some. But an international team of researchers, has now found an unexpected, growing danger to the ozone layer from substances not regulated by the treaty.

- [**Last common ancestor of humans and apes**](#)

[weighed about five kilograms](#) [周四, 12 10月 21:09]

New research suggests that the last common ancestor of apes -- including great apes and humans -- was much smaller than previously thought, about the size of a gibbon. The findings, published today in the journal Nature Communications, are fundamental to understanding the evolution of the human family tree.

• [Experimental Ebola vaccines elicit year-long immune response](#) [周四, 12 10月 06:06]

Results from a large randomized, placebo-controlled clinical trial in Liberia show that two candidate Ebola vaccines pose no major safety concerns and can elicit immune responses by one month after initial vaccination that last for at least one year. The findings are based on a study of 1,500 adults that began during the West Africa Ebola outbreak.

• ['Killer' toothaches likely cause misery for captive orca: Whales chew concrete and steel tank surfaces](#) [周四, 12 10月 06:05]

An international research team has undertaken the first in-depth investigation of the teeth of captive orca (killer whales) and have found them a sorry state, which raises serious concerns for these majestic mammals' overall health and welfare.

• [Engineers identify key to albatross' marathon flight](#) [周四, 12 10月 06:02]

Engineers have developed a new model to simulate dynamic soaring, and have used it to identify the optimal flight pattern that an albatross should take in order to harvest the most wind and energy. They found that as an albatross banks or turns to dive down and soar up, it should do so in shallow arcs, keeping almost to a straight, forward trajectory.

• [Giant exoplanet hunters: Look for debris disks](#) [周四, 12 10月 01:52]

There's no map showing all the billions of exoplanets hiding in our galaxy -- they're so distant and faint compared to their stars, it's hard to find them. Now, astronomers hunting for new worlds have established a

possible signpost for giant exoplanets.

- [**New type of stem cell line produced offers expanded potential for research and treatments**](#)

[周四, 12 10月 01:17]

Researchers have created expanded potential stem cells (EPSCs) in mice, for the first time, that have a greater potential for development than current stem cell lines. These stem cells have the features of the very first cells in the developing embryo, and can develop into any type of cell.

- [**Bycatch responsible for decline of endangered New Zealand sea lion**](#)

[周四, 12 10月 01:17]

Getting caught in fishing nets is a major cause of death for the increasingly endangered New Zealand sea lion, according to new research.

- [**'Ridiculously healthy' elderly have the same gut microbiome as healthy 30-year-olds**](#)

[周四, 12 10月 00:37]

In one of the largest microbiota studies conducted in humans, researchers have shown a potential link between healthy aging and a healthy gut.

- [**Kune Kune piglets possess social learning skills and have an astonishingly good memory**](#)

[周四, 12 10月 00:03]

Pigs are socially competent and capable of learning. But the combination of these skills, learning by observing others, has been insufficiently studied so far. Exact copying and understanding of demonstrated actions -- highly developed learning abilities -- could not be proven. A new study with Kune Kune pigs, has now shown for the first time that pigs do learn from each other. The intelligent animals also possess remarkable long-term memory after internalizing a technique.

- [**Scientists discover one of the most luminous 'new stars' ever**](#)

[周四, 12 10月 00:03]

Astronomers have discovered possibly the most luminous 'new star' ever -- a nova discovered in the direction of one of our closest neighboring

galaxies: The Small Magellanic Cloud.

• [**One of planet's largest volcanic eruptions**](#) [周三, 11 10月 21:11]

Researchers have determined that the Pacific Northwest was home to one of the Earth's largest known volcanic eruptions, a millennia-long spewing of sulfuric gas that blocked out the sun and cooled the planet. Only two other eruptions -- the basalt floods of the Siberian Traps and the Deccan Traps -- were larger, and they led to two of the Earth's great extinctions.

• [**Anticipated social media buzz can drive tourism**](#) [周三, 11 10月 10:45]

How much positive feedback travelers think they'll get on social media can predict whether they intend to visit a tourism destination, a new study has found.

• [**World will have more obese children and adolescents than underweight by 2022**](#) [周三, 11 10月 10:44]

The number of obese children and adolescents (aged 5 to 19 years) worldwide has risen tenfold in the past four decades, according to a new study. If current trends continue, more children and adolescents will be obese than moderately or severely underweight by 2022.

• [**Better mini brains could help scientists identify treatments for Zika-related brain damage**](#) [周三, 11 10月 08:01]

Researchers have developed an improved technique for creating simplified human brain tissue from stem cells. Because these so-called 'mini brain organoids' mimic human brains in how they grow and develop, they're vital to studying complex neurological diseases.

• [**How fever in early pregnancy causes heart, facial birth defects**](#) [周三, 11 10月 02:44]

Researchers have known for decades that fevers in the first trimester of pregnancy increase risk for some heart defects and facial deformities such as cleft lip or palate. Exactly how this happens is unclear. Scientists have debated whether a virus or other infection source causes the defects, or if fever alone is the underlying problem.

• [**Humpback whale blow microbiome described**](#) [周三, 11 10月 01:39]

For the first time, scientists have identified an extensive conserved group of bacteria within healthy humpback whales' blow -- the moist breath that whales spray out of their blowholes when they exhale.

• [**Breath instead of a blood test**](#) [周三, 11 10月 00:41]

Blow into the tube, please. In the future, the procedure will not just be used by police checking for alcohol intoxication, but also for testing the condition of athletes and for people who want to lose that extra bit of weight. A new sensor makes it possible to measure when the body starts burning fat with a convenient breathalyser.

• [**Mass extinctions led to low species diversity, dinosaur rule**](#) [周三, 11 10月 00:40]

Two of Earth's five mass extinction events -- times when more than half of the world's species died -- resulted in the survival of a low number of so-called 'weedy' species that spread their sameness across the world as the Earth recovered from these dramatic upheavals. The findings could shed light on modern high extinction rates and how biological communities may change in the future.

• [**Diversity of large animals plays an important role in carbon cycle**](#) [周二, 10 10月 22:56]

With abundant data on plants, large animals and their activity, and carbon soil levels in the Amazon, research suggests that large animal diversity influences carbon stocks and contributes to climate change mitigation.

• [**Size doesn't matter, at least for hammerheads and swimming performance**](#) [周二, 10 10月 22:56]

Different head shapes and different body sizes of hammerhead sharks should result in differences in their swimming performance right? Researchers have conducted the first study to examine the whole body shape and swimming kinematics of two closely related yet very different hammerhead sharks, with some unexpected results.

- **[Best way to recognize emotions in others: Listen](#)**

[周二, 10 10月 22:56]

If you want to know how someone is feeling, it might be better to close your eyes and use your ears: People tend to read others' emotions more accurately when they listen and don't look, according to research.

- **['Fake fin' discovery reveals new ichthyosaur species](#)**

[周二, 10 10月 22:56]

An ichthyosaur first discovered in the 1970s but then dismissed and consigned to museum storerooms across the country has been re-examined and found to be a new species.

- **[Genetically boosting the nutritional value of corn could benefit millions](#)**

[周二, 10 10月 03:49]

Scientists have found an efficient way to enhance the nutritional value of corn -- the world's largest commodity crop -- by inserting a bacterial gene that causes it to produce a key nutrient called methionine, according to a new study.

- **[Huge energy potential in open ocean wind farms in the North Atlantic](#)**

[周二, 10 10月 03:49]

Because wind speeds are higher on average over ocean than over land, wind turbines in the open ocean could in theory intercept more than five times as much energy as wind turbines over land. This presents an enticing opportunity for generating renewable energy through wind turbines. But it was unknown whether the faster ocean winds could actually be converted to increased amounts of electricity.

- **[Human brain recalls visual features in reverse order than it detects them](#)**

[周二, 10 10月 03:49]

New research has contributed to solving a paradox of perception, literally upending models of how the brain constructs interpretations of the outside world. When observing a scene, the brain first processes details -- spots, lines and simple shapes -- and uses that information to build internal representations of more complex objects, like cars and people. But during recall, the brain remembers those larger concepts

first. This could shed light on concepts such as eyewitness testimony to autism.

• [**'Turbo charge' for your brain?**](#) [周二, 10 10月 03:49]

Two brain regions -- the medial frontal and lateral prefrontal cortices -- control most executive function. Researchers used high-definition transcranial alternating current stimulation (HD-tACS) to synchronize oscillations between them, improving brain processing. De-synchronizing did the opposite.

• [**Amazon farmers discovered the secret of domesticating wild rice 4,000 years ago**](#) [周二, 10 10月 03:47]

Amazonian farmers discovered how to manipulate wild rice so the plants could provide more food 4,000 years ago, long before Europeans colonized America, archaeologists have discovered.

• [**Farsighted children struggle with attention, study finds**](#) [周二, 10 10月 00:40]

Farsighted preschoolers and kindergartners have a harder time paying attention and that could put them at risk of slipping behind in school, a new study suggests.

• [**The female brain reacts more strongly to prosocial behavior than the male brain, study finds**](#) [周二, 10 10月 00:32]

Women are more generous than men, behavioral experiments show. Now, researchers have been able to demonstrate that female and male brains process prosocial and selfish behavior differently. For women, prosocial behavior triggers a stronger reward signal, while male reward systems respond more strongly to selfish behavior.

• [**Bacteria self-organize to build working sensors**](#) [周二, 10 10月 00:32]

By programming bacteria with a synthetic gene circuit that can recruit gold nanoparticles to the surface of their colony, researchers can build functional devices. A proof-of-concept study uses this technique to build dome-shaped pressure sensors with the help of living bacteria.

[Solar energy: Prototype shows how tiny photodetectors can double their efficiency](#) [周二, 10 10月]

00:32]

Physicists have developed a photodetector -- a device that converts light into electrons -- by combining two distinct inorganic materials and producing quantum mechanical processes that could revolutionize the way solar energy is collected. The researchers stacked two atomic layers of tungsten diselenide on a single atomic layer of molybdenum diselenide. Such stacking results in properties vastly different from those of the parent layers, allowing for customized electronic engineering at the tini...

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Health News

Top stories featured on ScienceDaily's Health & Medicine, Mind & Brain, and Living Well sections.

- [**MS risk in children spotted with MRI brain scans**](#) [周六, 14 10月 23:17]

By the time multiple sclerosis (MS) is diagnosed in children, it may be difficult to prevent the disabilities and relapses that come with the disease. In a new study, researchers examined MRI brain scans to identify children at high risk of developing MS before symptoms appear, which may lead to earlier diagnosis and treatment.

- [**A dietary supplement dampens the brain hyperexcitability seen in seizures or epilepsy**](#) [周六, 14 10月 23:17]

Researchers have found that inducing a biochemical alteration in brain proteins via the dietary supplement glucosamine was able to rapidly dampen that pathological hyperexcitability in rat and mouse models. These results represent a potentially novel therapeutic target for the treatment of seizure disorders, and they show the need to better understand the physiology underlying these neural and brain circuit changes.

- [**Importance of studying sleep and eating in tandem**](#) [周六, 14 10月 01:22]

A new study offers important insights into possible links between sleep and hunger.

- [**'Roadmap' to aid osteoporosis treatment development**](#) [周六, 14 10月 01:22]

Scientists have developed a molecular model that may provide a new

framework for improving the design of osteoporosis treatments.

- [**Genetic clues to spinal stenosis**](#) [周六, 14 10月 01:21]

A new study indicates that certain genetic changes are linked with an increased risk of developing lumbar spinal stenosis, a narrowing of the open spaces in the lower spine that can lead to pain in the legs when individuals walk.

- [**Worms reveal secrets of aging**](#) [周六, 14 10月 00:51]

Investigators have identified a new molecular pathway that controls lifespan and healthspan in worms and mammals. Researchers have shown that worms with excess levels of certain proteins lived longer and healthier than normal worms. In addition, mice with excess levels of these proteins demonstrated a delay in blood vessel dysfunction associated with aging. The study has major implications for our understanding of aging and age-associated disorders.

- [**Augmented tongue ultrasound for speech therapy**](#) [周六, 14 10月 00:32]

Researchers have developed a system that can display the movements of our own tongues in real time. These movements are processed by a machine learning algorithm that controls an 'articulatory talking head.' This avatar shows the tongue, palate and teeth, which are usually hidden inside the vocal tract.

- [**Surgeries performed later in the day have more complications**](#) [周六, 14 10月 00:32]

A new study finds that patients who undergo a neurosurgical procedure with surgical start times between 9 pm and 7 am are at an increased risk of developing complications compared to patients with a surgical start time earlier in the day.

- [**Scientists reveal the relationship between sugar, cancer**](#) [周五, 13 10月 22:36]

A nine-year joint research project has led to a crucial breakthrough in cancer research. Scientists have clarified how the Warburg effect, a phenomenon in which cancer cells rapidly break down sugars,

stimulates tumor growth. This discovery provides evidence for a positive correlation between sugar and cancer, which may have far-reaching impacts on tailor-made diets for cancer patients.

• [**First atomic structure from cryo-EM facility**](#) [周五, 13 10月 22:33]

Researchers have outlined a 3-D atomic structure of the ion channel found in mammals that is implicated in a rare, inherited neurodegenerative disease in humans.

• [**Usutu virus is back: Not only in blackbirds but also in humans**](#) [周五, 13 10月 22:33]

Usutu virus, a flavivirus of African origin, was first detected in Austria in 2001, when it caused a severe bird die-off, mainly of blackbirds. The virus was active in the eastern part of Austria until 2005, killing many blackbirds, but also other songbirds. During 10 subsequent years no Usutu virus associated bird mortality was observed in Austria -- contrary to neighboring Hungary. Last year Usutu virus was identified again in two blackbirds -- and in 2017 already in sixteen songbirds. In anoth...

• [**Making healthier decisions, step by step**](#) [周五, 13 10月 21:52]

For 10 days, scientists posted signs at the bottom of a set of airport stairs and escalators encouraging them to take the stairs. They found when the signs were present, people were about twice as likely to use the stairs.

• [**Cell biology: Proteins may prevent dysfunction, disease by relaxing, study shows**](#) [周五, 13 10月 21:19]

A team of researchers used simulations and X-rays to conclude that disordered proteins remain unfolded and expanded as they float loose in the cytoplasm of a cell. The answer affects how we envision the movement of a protein through its life--essential for understanding how proteins fold, what goes wrong during disorders and disease and how to model their behavior.

• [**Higher dose of vitamin D increases bone density in premature babies, study finds**](#) [周五, 13 10月 21:18]

If the standard supplementation of 400 IUs of vitamin D is increased to

800 IUs daily there are reductions in the number of premature and preterm babies with extremely low bone density, new research has found.

- [**New mechanism detected in Alzheimer's disease**](#)

[周五, 13 10月 21:10]

Researchers have discovered a cellular mechanism that may contribute to the breakdown of communication between neurons in Alzheimer's disease. In the brain tissue of Alzheimer's patients, the RNAs that encode synaptic proteins are degraded more rapidly than in healthy brain cells, the researchers found. Their findings indicate that inadequate levels of a protein known as RBFOX1 may be a factor in the faulty connections that are a hallmark of Alzheimer's disease.

- [**'Magic mushrooms' may 'reset' the brains of depressed patients, study suggests**](#)

[周五, 13 10月 21:10]

Patients taking psilocybin to treat depression show reduced symptoms weeks after treatment following a 'reset' of their brain activity.

- [**Restless legs syndrome study identifies 13 new genetic risk variants**](#)

[周五, 13 10月 21:10]

A new study into the genetics underlying restless legs syndrome has identified 13 previously-unknown genetic risk variants, while helping inform potential new treatment options for the condition.

- [**Learning and staying in shape key to longer lifespan, study finds**](#)

[周五, 13 10月 21:10]

People who are overweight cut their life expectancy by two months for every extra kilogram of weight they carry, research suggests. A major study has also found that education leads to a longer life, with almost a year added for each year spent studying beyond school.

- [**Possible new treatment pathway for severe allergic asthma**](#)

[周五, 13 10月 08:02]

Research demonstrates that blocking the action of two pro-inflammatory molecules significantly reduces symptoms of allergic asthma in mice, which could lead to development of a new treatment for people with a

severe form of the condition.

- [**Combination of El Niño and 2016 Ecuador earthquake likely worsened Zika outbreak**](#) [周五, 13 10月 08:02]

A Zika virus outbreak in coastal Ecuador in 2016 was likely worsened by a strong El Niño and a magnitude 7.8 earthquake that struck the region in April, according to a new study.

- [**New protein study broadens knowledge of molecular basis for disease**](#) [周五, 13 10月 04:40]

Scientists are one step closer to unraveling the mystery of how intrinsically disordered proteins work, according to new research.

- [**Fighting racism: Teaching kids to identify individual black people can reduce racial bias**](#) [周五, 13 10月 04:39]

Many times, those who hold racially biased views of other people see them as all the same. Instead of thinking of them as specific individuals, they lump them into a group -- seeing them as 'those people.' Now an international team of researchers suggests one way to reduce racial bias in kids is by teaching them to identify individual faces of those of other races.

- [**Liquid biopsy for retinoblastoma**](#) [周五, 13 10月 03:27]

A new study provides proof of concept for a safe and effective way to derive genetic information from a retinoblastoma tumor.

- [**International team reconstructs nanoscale virus features from correlations of scattered X-rays**](#) [周五, 13 10月 03:18]

Key algorithms have been developed which helped scientists achieve a goal first proposed more than 40 years ago -- using angular correlations of X-ray snapshots from non-crystalline molecules to determine the 3-D structure of important biological objects.

- [**3D packaging of DNA regulates cell identity**](#) [周五, 13 10月 03:18]

The ability of a stem cell to differentiate into cardiac muscle (and by

extension other cell types) depends on what portions of the genome are available for activation, which is controlled by the location of DNA in a cell's nucleus, new research suggests.

- [**Like it or not: Broccoli may be good for the gut**](#) [周五, 13 10月 03:17]

For the broccoli haters of the world, researchers may have more bad news: the vegetable may also help promote a healthy gut.

- [**Mechanism for precise targeting of the immune response uncovered**](#) [周五, 13 10月 02:34]

The immune system checks the health of cells of the body by examining a kind of molecular passport. Sometimes cells present the wrong passport, which can lead to autoimmune diseases, chronic inflammations or cancer. Scientists can now explain the process how this happens.

- [**Scientists pinpoint surprising origin of melanoma**](#) [周五, 13 10月 02:34]

A team of researchers has tracked down the cellular origin of cutaneous melanoma, the deadliest form of skin cancer. The team was surprised to observe that these very aggressive tumors arise from mature, pigment-producing cells called melanocytes. As melanoma develops, these cells are eventually reprogrammed, lose their differentiated features and become invasive, migratory cancer cells. This knowledge is vital to understand how these melanoma lesions are formed, facilitate their early detection ...

- [**Cell biology: Cell contacts in embryonic development determine cellular fate**](#) [周五, 13 10月 02:33]

The average human consists of about 37.2 trillion cells. But not all cells are created equal: while muscle cells contain the molecular machinery to contract and relax your muscles, some neurons send meter-long axons from the spinal cord to the tip of your toes, and red blood cells bind oxygen and transport it around the body. How does a cell 'know' which function to fulfill?

- [**In a first for wearable optics, researchers**](#)

[develop stretchy fiber to capture body motion](#) [周五, 13 10月 02:33]

New research offers the first demonstration of optical fibers sturdy enough to sense a wide range of human motion.

• [The sea cucumber genome points to genes for tissue regeneration](#) [周五, 13 10月 02:33]

A new high-definition genome sequence of the sea cucumber provides molecular insights into its ability to regenerate.

• [Chemistry provides a new supply of a promising cancer and HIV treatment](#) [周五, 13 10月 02:33]

Supplies of a promising drug for cancer, HIV and possibly other diseases is dwindling, and scientists have struggled to extract more from the marine creatures who produce it. Now, chemists have a synthetic solution.

• [Leishmania: Immune reaction to sandfly saliva varies between individuals living in endemic areas](#) [周五, 13 10月 02:33]

The Phlebotomus papatasi sandfly is responsible for spreading Leishmania throughout the tropics and subtropics. How individuals in areas endemic for Leishmania infection react to sandfly saliva depends on their long-term exposure to the flies.

• [Newfoundland populated multiple times by distinct groups, DNA evidence shows](#) [周五, 13 10月 02:33]

Researchers who've examined genetic evidence from mitochondrial DNA provide evidence that two groups of indigenous people in Canada, known as the Maritime Archaic and Beothuk, brought different matrilineal lineages to the island, adding further support to the notion that those groups had distinct population histories.

• [Baby talk in any language: Shifting the timbre of our voices](#) [周五, 13 10月 02:33]

When talking with their young infants, parents instinctively use 'baby

talk,' a unique form of speech including exaggerated pitch contours and short, repetitive phrases. Now, researchers have found another unique feature of the way mothers talk to their babies: they shift the timbre of their voice in a rather specific way. The findings hold true regardless of a mother's native language.

- [**Genes responsible for diversity of human skin colors identified**](#) [周五, 13 10月 02:33]

A study of diverse African groups by geneticists has identified new genetic variants associated with skin pigmentation. The findings help explain the vast range of skin color on the African continent, shed light on human evolution and inform an understanding of the genetic risk factors for conditions such as skin cancer.

- [**Reengineered immune system cells show early promise against HIV**](#) [周五, 13 10月 02:31]

Improving on a previous attempt, scientists have developed a new strategy that could potentially be used to reengineer a patient's own immune system cells to fight HIV. The approach shows benefit in human cell cultures and in mice.

- [**Cholesterol byproduct hijacks immune cells, lets breast cancer spread**](#) [周五, 13 10月 00:52]

High cholesterol levels have been associated with breast cancer spreading to other sites in the body, but doctors and researchers don't know the cause for the link. A new study found that the culprit is a byproduct of cholesterol metabolism that acts on specific immune cells so that they facilitate the cancer's spread instead of stopping it.

- [**Biology study suggests father's nutrition before sex could contribute to health of baby**](#) [周五, 13 10月 00:52]

Doctors long have stressed the importance of good nutrition for expectant mothers. Now biologists say the father's diet, too, could play a similar role in the health of a baby.

- [**Halting liver cancer with a sugar look-a-like**](#) [周五, 13 10月 00:30]

Researchers have discovered a way to prevent the spread of cancer in the liver. The study details how treatment with a modified fucose sugar can disrupt a biological pathway, which in turn blocks hepatoma -- cancer cells in the liver -- from invading healthy liver cells.

• [**Cause of cancer form in the liver identified**](#) [周五, 13 10月 00:30]

Researchers have identified the two genes whose mutation cause a serious cancer form found in the liver. The result sets concrete goals for future treatment of the otherwise incurable disease.

• [**Climate change may accelerate infectious disease outbreaks, say researchers**](#) [周五, 13 10月 00:28]

Aside from inflicting devastating natural disasters on often vulnerable communities, climate change can also spur outbreaks of infectious diseases like Zika , malaria and dengue fever, according to a new study.

• [**One if by editing, two if by roadblock: Human protein fights HIV as monomer and dimer**](#) [周五, 13 10月 00:28]

Fifteen years ago, a class of proteins was discovered, which give humans innate immunity to HIV-1. Unfortunately, HIV-1 is a smart virus and has evolved to battle these proteins. Researchers have been studying these proteins for several years to help further understand their function and mechanisms in the hopes to be better prepared against HIV-1.

• [**How switches work in bacteria**](#) [周五, 13 10月 00:28]

Many bacteria have molecular control elements, via which they can switch on and off genes. These riboswitches also open up new options in the development of antibiotics or for the detection and decomposition of environmental toxins. Researchers have now used light optical microscopy of single molecules to fundamentally study the way riboswitches work.

• [**Caution in use of courtroom evidence presentation methods urged**](#) [周五, 13 10月 00:28]

Two experts are calling into question a shorthand method of presenting

forensic evidence in courtrooms, arguing that it risks allowing personal preference to creep into expert testimony and potentially distorts evidence for a jury.

- **[Brain waves reflect different types of learning](#)** [周五, 13 10月 00:28]

Researchers have, for the first time, identified neural signatures of explicit and implicit learning.

- **[Whole genome sequencing identifies new genetic signature for autism](#)** [周五, 13 10月 00:28]

An analysis of the complete genomes of 2,064 people reveals that multiple genetic variations could contribute to autism. The work suggests that scanning whole genomes may one day be useful for clinical diagnostics.

- **[Brain stimulation can improve athletic performance](#)** [周五, 13 10月 00:27]

Research into the effects of brain stimulation on athletes' performance has demonstrated that it is an effective way to improve endurance. The findings are expected to advance understanding of the brain's role in endurance exercise, how it can alter the physical limits of performance in healthy people and add evidence to the debate on the use of legal methods to enhance performance in competition.

- **[Ischemic stroke patients not receiving life-saving treatment, study finds](#)** [周五, 13 10月 00:27]

Ischemic stroke patients who do not receive intravenous (IV) alteplase, a clot-dissolving medication, are significantly less likely to survive, according to researchers.

- **[Don't dispense of cannabis dispensaries, caution researchers](#)** [周四, 12 10月 23:14]

Researchers are cautioning policy makers not to alter a cannabis distribution system that -- while not legal yet -- works well. They say store-front dispensaries -- often under fire by law enforcement and city governments -- are a tried and true method of selling cannabis.

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [**How scientists used NASA data to predict the corona of the Aug. 21 Total Solar Eclipse**](#) [周六, 14 10月 23:17]

When the total solar eclipse swept across the United States on Aug. 21, 2017, NASA satellites captured a diverse set of images from space. But days before the eclipse, some NASA satellites also enabled scientists to predict what the corona -- the Sun's outer atmosphere -- would look like during the eclipse, from the ground. In addition to offering a case study to test our predictive abilities, the predictions also enabled some eclipse scientists to choose their study targets in advance.

- [**Detailed look at 2-D structure of turbulence in tokamaks**](#) [周六, 14 10月 23:17]

A key hurdle for fusion researchers is understanding turbulence, the ripples and eddies that can cause the superhot plasma that fuels fusion reactions to leak heat and particles and keep fusion from taking place. Comprehending and reducing turbulence will facilitate the development of fusion as a safe, clean and abundant source of energy for generating electricity from power plants around the world.

- [**Solar research: NASA sounding rocket instrument spots signatures of long-sought small solar flares**](#) [周六, 14 10月 02:03]

Like most solar sounding rockets, the second flight of the FOXSI instrument -- short for Focusing Optics X-ray Solar Imager -- lasted 15 minutes, with just six minutes of data collection. But in that short time, the cutting-edge instrument found the best evidence to date of a

phenomenon scientists have been seeking for years: signatures of tiny solar flares that could help explain the mysterious extreme heating of the Sun's outer atmosphere.

- [**Astronomers find potential solution into how planets form**](#) [周六, 14 10月 00:32]

The quest to discover how planets found in the far reaches of the universe are born has taken a new, crucial twist.

- [**Spin current detection in quantum materials unlocks potential for alternative electronics**](#) [周六, 14 10月 00:31]

A new method that precisely measures the mysterious behavior and magnetic properties of electrons flowing across the surface of quantum materials could open a path to next-generation electronics. A team of scientists has developed an innovative microscopy technique to detect the spin of electrons in topological insulators, a new kind of quantum material that could be used in applications such as spintronics and quantum computing.

- [**Solar research: On the generation of solar spicules and Alfvénic waves**](#) [周六, 14 10月 00:31]

Combining computer observations and simulations, a new model shows that the presence of neutrals in the gas facilitates the magnetic fields to penetrate through the surface of the Sun producing the spicules.

- [**First atomic structure from cryo-EM facility**](#) [周五, 13 10月 22:33]

Researchers have outlined a 3-D atomic structure of the ion channel found in mammals that is implicated in a rare, inherited neurodegenerative disease in humans.

- [**Space radiation won't stop NASA's human exploration**](#) [周五, 13 10月 21:52]

While it's true that space radiation is one of the biggest challenges for a human journey to Mars, it's also true that NASA is developing technologies and countermeasures to ensure a safe and successful journey to the red planet.

- [**Purple power: Synthetic 'purple membranes' transform sunlight to hydrogen fuel**](#) [周五, 13 10月 21:19]

A new way has been found to produce solar fuels by developing “synthetic purple membranes.” These membranes involve an assembly of lipid nanodiscs, man-made proteins, and semiconducting nanoparticles that, when taken together, can transform sunlight into hydrogen fuel.

- [**Star Dust Helps Explain Mysterious Dimming Star**](#) [周五, 13 10月 21:19]

Astronomers are working to understand the mysterious dimming of Tabby's Star. The astronomers report that space dust orbiting the star -- not alien megastructures -- is the likely cause of the star's long-term dimming.

- [**Wildlife in the ditches need a detox cure**](#) [周五, 13 10月 21:17]

When it's raining on the roads, slops of road dust and contaminants drain into the road trenches. What does it do to wildlife living by the road?

- [**DISTRO: Researchers create digital objects from incomplete 3D data**](#) [周五, 13 10月 21:17]

Depth sensors, such as those of the Microsoft Kinect, are very powerful, but unfortunately they do not work equally well on all materials, which leads to noisy data or even missing measurements.

- [**Cold molecules on collision course**](#) [周五, 13 10月 21:15]

Using a new cooling technique scientists succeed at observing collisions in a dense beam of cold and slow dipolar molecules.

- [**New insight into the limits of possible life on Mars**](#) [周五, 13 10月 21:10]

Researchers investigating whether liquid water could exist on Mars have provided new insight into the limits of life on the red planet.

- [**Single photon reveals quantum entanglement of 16 million atoms**](#) [周五, 13 10月 21:10]

Quantum theory predicts that a vast number of atoms can be entangled and intertwined by a very strong quantum relationship even in a macroscopic structure. Until now, experimental evidence has been mostly lacking, despite recent advances have shown the entanglement of 2,900 atoms. Scientists recently reengineered their data processing, demonstrating that 16 million atoms were entangled in a one-centimeter crystal.

- [**Tweets can help predict the outcome of soccer matches**](#) [周五, 13 10月 08:02]

Twitter activity can help predict the result of soccer matches when combined with betting market prices, new study shows. The tone of Twitter posts can predict when a team is more likely to win and soccer bets are mispriced, the study found.

- [**Direct Numerical Simulations enhance combustion efficiency, reduces pollution**](#) [周五, 13 10月 08:02]

Researchers use Direct Numerical Simulations to enhance efficiency, reduce pollution in diesel engines.

- [**Mantis shrimp-inspired camera enables glimpse into hidden world**](#) [周五, 13 10月 08:02]

By mimicking the eye of the mantis shrimp, researchers have developed an ultra-sensitive camera capable of sensing both color and polarization. The bioinspired imager can potentially improve early cancer detection and help provide a new understanding of underwater phenomena, the researchers said. See a video of describing the study on YouTube.

- [**Converting carbon dioxide to carbon monoxide using water, electricity**](#) [周五, 13 10月 08:02]

Researchers have determined how electrocatalysts can convert carbon dioxide to carbon monoxide using water and electricity. The discovery can lead to the development of efficient electrocatalysts for large scale production of synthesis gas -- a mixture of carbon monoxide and hydrogen.

• [**Understanding rare Earth emulsions**](#) [周五, 13 10月 08:02]

Through a series of theoretical simulations, researchers discovered that surface polarization in mixed media increases attraction among elements.

• [**Intense storms batter Saturn's largest moon, scientists report**](#) [周五, 13 10月 05:25]

Titan, the largest of Saturn's more than 60 moons, has surprisingly intense rainstorms, according to research by a team of UCLA planetary scientists and geologists. Although the storms are relatively rare -- they occur less than once per Titan year, which is 29 and a half Earth years -- they occur much more frequently than the scientists expected.

• [**Finally! A solution to office thermostat wars**](#) [周五, 13 10月 04:40]

A new method has been proposed that simultaneously optimizes individual office workers' productivity and energy consumption costs by automating the control of indoor environmental conditions including air quality, temperature and lighting.

• [**New headway in desalination technology**](#) [周五, 13 10月 04:40]

Engineers have taken a step forward in developing a saltwater desalination process that is potentially cheaper than reverse osmosis and borrows from battery technology. In their study, the researchers are focusing on new materials that could make desalination of brackish waters economically desirable and energy efficient.

• [**International team reconstructs nanoscale virus features from correlations of scattered X-rays**](#) [周五, 13 10月 03:18]

Key algorithms have been developed which helped scientists achieve a goal first proposed more than 40 years ago -- using angular correlations of X-ray snapshots from non-crystalline molecules to determine the 3-D structure of important biological objects.

• [**Satellites map photosynthesis at high resolution**](#) [周五, 13 10月 02:34]

Life on Earth is impossible without photosynthesis. It provides food and

oxygen to all higher life forms and plays an important role in the climate system, since this process regulates the uptake of carbon dioxide from the Earth's atmosphere and its fixation in biomass. However, quantification of photosynthesis at the ecosystem-to-global scale remains uncertain. Now an international team of scientists have made a major step forward.

- [Measurement promises complete picture of Milky Way](#) [周五, 13 10月 02:34]

Distance measured out to the far side of our Milky Way means that radio astronomers now can work on producing an accurate map of the full extent of our galaxy's structure for the first time.

- [In a first for wearable optics, researchers develop stretchy fiber to capture body motion](#) [周五, 13 10月 02:33]

New research offers the first demonstration of optical fibers sturdy enough to sense a wide range of human motion.

- [Spotting the spin of the Majorana fermion under the microscope](#) [周五, 13 10月 02:33]

Using a new twist on a technique for imaging atomic structures, researchers have detected a unique quantum property of the Majorana fermion, an elusive particle with the potential for use in quantum information systems.

- [Laser cavities take on new shapes and functionalities](#) [周五, 13 10月 02:33]

Researchers have demonstrated the first laser cavity that can confine and propagate light in any shape imaginable, even pathways with sharp bends and angles. The new cavity, called a topological cavity, could enable laser components to be packed more densely on a chip, leading to higher speed optical communication technologies that can be fabricated in an efficient and scalable manner using photonic integration techniques.

- [Engineers develop a programmable](#)

['camouflaging' material inspired by octopus skin](#)

[周五, 13 10月 02:33]

Engineers have invented stretchable surfaces with programmable 3-D texture morphing, a synthetic 'camouflaging skin' inspired by studying and modeling the real thing in octopus and cuttlefish.

• [Using Facebook data as a real-time census](#) [周五, 13 10月

00:30]

A new study is believed to be the first to demonstrate how present-day migration statistics can be obtained by compiling the same data that advertisers use to target their audience on Facebook, and by combining that source with information from the Census Bureau.

• [Devourer of planets? Astronomers dub star](#)

['Kronos'](#)

[周五, 13 10月 00:28]

'Kronos' is enhanced in metals and other rock-forming elements but not in volatiles, prompting a team of researchers to conclude that it absorbed as much as 15 Earth masses worth of rocky planets. Its twin, 'Krios,' does not show this unusual pattern of enhancement.

• [A better understanding of space, via helicopter](#) [周

五, 13 10月 00:26]

An algorithm that helps engineers design better helicopters may help astronomers more precisely envision the formation of planets and galaxies. Researchers have created a new model for understanding how black holes, planets, and galaxies emerge from the vortex-rich environments of space.

• [Reconstructing Cassini's plunge into Saturn](#) [周四, 12

10月 23:35]

As NASA's Cassini spacecraft made its fateful dive into the upper atmosphere of Saturn on Sept. 15, the spacecraft was live-streaming data from eight of its science instruments, along with readings from a variety of engineering systems. While analysis of science data from the final plunge will take some time, Cassini engineers already have a pretty clear understanding of how the spacecraft itself behaved as it went in.

• [Rough microparticles can cause big problems](#) [周四,

12 10月 23:13]

Research finds the surface texture of microparticles in a liquid

suspension can cause internal friction that significantly alters the suspension's viscosity -- effectively making the liquid thicker or thinner. The finding can help address problems for companies in fields from biopharmaceuticals to chemical manufacturing.

- [**A new miniature solution for storing renewable energy**](#) [周四, 12 10月 22:38]

In a first for metal-organic frameworks, scientists have demonstrated their metallic conductivity.

- [**Carbon dioxide levels lower than thought during super greenhouse period**](#) [周四, 12 10月 22:37]

Researchers adds to the understanding of Earth's historic hyperthermal events to help explain the planet's current warming trend.

- [**Experimental 'nano-chemo' particle to treat bladder cancer**](#) [周四, 12 10月 22:37]

Working with mice and rats, researchers have developed a way to successfully deliver nano-sized, platinum-based chemotherapy drugs to treat a form of bladder cancer called nonmuscle-invasive that is found in the lining of the organ and has not invaded deeper into bladder tissue. The tiny drug-infused particles, they say, potentially offer a less toxic clinical alternative to standard chemotherapy delivered intravenously or through a catheter inserted into the bladder.

- [**Enzymes at work: Breaking down stubborn cellulose for biofuels**](#) [周四, 12 10月 22:37]

Researchers have observed enzymes breaking down cellulose to aid the production of biofuels.

- [**Haumea, the most peculiar of Pluto companions, has a ring around it**](#) [周四, 12 10月 21:33]

The trans-neptunian belt contains four dwarf planets, among which Haumea stands out for its extremely elongated shape and rapid rotation. A stellar occultation makes it possible to establish the main physical characteristics of this previously little known body -- among which most

surprising was the presence of a ring.

- **[Study reveals need for better modeling of weather systems for climate prediction](#)** [周四, 12 10月 21:15]

A team of researchers discovered persistent dry and warm biases in the central U.S. that was caused by poor modeling of atmospheric convective systems. Their findings call for better calculations with global climate models.

- **[Virtual humans work better than current ways to identify post-traumatic stress in soldiers](#)** [周四, 12 10月 21:10]

Researchers find that soldiers are more likely to open up about post-traumatic stress when interviewed by a virtual interviewer, reports a new study. Virtual interviewers can combine the rapport-building skills of human interviewers with feelings safety provided by anonymous surveys to help soldiers to reveal more about their mental health symptoms.

- **[Electric cars can become more eco-friendly through life cycle assessment](#)** [周四, 12 10月 21:09]

It is time to stop discussing whether electric cars are good or bad. Instead industry, authorities and policy-makers need to work together to make them as eco-friendly as possible. One researcher now provides concrete advice and tools showing how life cycle assessment can assist in the development of electric cars.

- **[Chemists use modified DNA nucleotides to create new materials](#)** [周四, 12 10月 06:01]

Chemists have demonstrate that they can repurpose DNA to create new substances with possible medical applications.

- **[Ultraflat magnets: Atom-thick alloys with unanticipated magnetic properties](#)** [周四, 12 10月 02:48]

Adding rhenium to a two-dimensional alloy induced a structural phase transition in its crystalline order and, surprisingly, a magnetic signature.

- [**Rainstorm generator assesses watershed rainfall under climate change simulations**](#) [周四, 12 10月 01:58]

The Colorado River tumbles through varied landscapes, draining watersheds from seven western states. This 1,450-mile-long system is a critical water supply for agriculture, industry and municipalities from Denver to Tijuana.

- [**This is a test: Asteroid tracking network observes close approach**](#) [周四, 12 10月 01:55]

On Oct. 12 EDT (Oct. 11 PDT), a small asteroid designated 2012 TC4 will safely pass by Earth at a distance of approximately 26,000 miles (42,000 kilometers). This is a little over one tenth the distance to the Moon and just above the orbital altitude of communications satellites. This encounter with TC4 is being used by asteroid trackers around the world to test their ability to operate as a coordinated international asteroid warning network.

- [**Giant exoplanet hunters: Look for debris disks**](#) [周四, 12 10月 01:52]

There's no map showing all the billions of exoplanets hiding in our galaxy -- they're so distant and faint compared to their stars, it's hard to find them. Now, astronomers hunting for new worlds have established a possible signpost for giant exoplanets.

- [**Injecting electrons jolts 2-D structure into new atomic pattern**](#) [周四, 12 10月 01:17]

The same electrostatic charge that can make hair stand on end and attach balloons to clothing could be an efficient way to drive atomically thin electronic memory devices of the future, according to a new study. Scientists have found a way to reversibly change the atomic structure of a 2-D material by injecting it with electrons. The process uses far less energy than current methods for changing the configuration of a material's structure.

- [**Ceramic pump moves molten metal at a record 1,400 degrees Celsius**](#) [周四, 12 10月 01:17]

A ceramic-based mechanical pump able to operate at record temperatures of more than 1,400 degrees Celsius (1,673 Kelvin) can transfer high temperature liquids such as molten tin, enabling a new generation of energy conversion and storage systems.

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [**Giant sea bass worth more alive as undersea wonders than as commercial catch**](#) [周六, 14 10月 23:16]

An investigation of the different economic values of giant sea bass finds they are worth more alive as undersea wonders than as commercial catch.

- [**Gutters teem with inconspicuous life**](#) [周六, 14 10月 01:22]

Scientists have shown that Parisian street gutters are oases of microscopic life, home to microalgae, fungi, sponges, and mollusks. Grouped into communities, these microorganisms may help clean rainwater and urban waste by decomposing solid debris and pollutants. A deeper understanding of the role and composition of these communities could help elucidate the services rendered by gutter ecosystems. The researchers' findings are the first to reveal the unsuspected biodiversity of microscopic life i...

- [**Worms reveal secrets of aging**](#) [周六, 14 10月 00:51]

Investigators have identified a new molecular pathway that controls lifespan and healthspan in worms and mammals. Researchers have shown that worms with excess levels of certain proteins lived longer and healthier than normal worms. In addition, mice with excess levels of these proteins demonstrated a delay in blood vessel dysfunction associated with aging. The study has major implications for our understanding of aging and age-associated disorders.

- [**Atrazine alters the sex ratio in Blanchard's cricket frogs**](#) [周六, 14 10月 00:32]

A study found that Blanchard's cricket frogs are highly sensitive to atrazine. When exposed, there were up to 55 percent fewer males than females compared with the control group, indicating that atrazine can affect the sex ratio. However, cricket frog populations do persist in areas with widespread atrazine application, despite reports of range contractions for enigmatic reasons.

- [**Melting ice makes the sea around Greenland less saline**](#) [周五, 13 10月 23:30]

For the first time, ocean data from Northeast Greenland reveals the long-term impact of the melting of the Greenland ice sheet. The observed increase in freshwater content will affect the conditions in all Greenland fjords and may ultimately affect the global ocean currents that keep Europe warm.

- [**Usutu virus is back: Not only in blackbirds but also in humans**](#) [周五, 13 10月 22:33]

Usutu virus, a flavivirus of African origin, was first detected in Austria in 2001, when it caused a severe bird die-off, mainly of blackbirds. The virus was active in the eastern part of Austria until 2005, killing many blackbirds, but also other songbirds. During 10 subsequent years no Usutu virus associated bird mortality was observed in Austria -- contrary to neighboring Hungary. Last year Usutu virus was identified again in two blackbirds -- and in 2017 already in sixteen songbirds. In anothe...

- [**Cell biology: Proteins may prevent dysfunction, disease by relaxing, study shows**](#) [周五, 13 10月 21:19]

A team of researchers used simulations and X-rays to conclude that disordered proteins remain unfolded and expanded as they float loose in the cytoplasm of a cell. The answer affects how we envision the movement of a protein through its life--essential for understanding how proteins fold, what goes wrong during disorders and disease and how to model their behavior.

- [**Contests for female attention turns males into better performers in fruit flies**](#) [周五, 13 10月 21:17]

Giving females an opportunity to choose the male they mate with leads to the evolution of better performing males, according to new research into the behavior of fruit flies.

• [**Wildlife in the ditches need a detox cure**](#) [周五, 13 10月 21:17]

When it's raining on the roads, slops of road dust and contaminants drain into the road trenches. What does it do to wildlife living by the road?

• [**Does size matter? Bigger cod fish contain more mercury**](#) [周五, 13 10月 21:17]

The levels of mercury in the Oslofjord cod has increased over the last 30 years, despite reduced emissions of this toxic element. In the same period, the average size of sampled cod has increased. Are the elevated levels of mercury simply a result of larger cod?

• [**Baltic clams, worms release as much greenhouse gas as 20,000 dairy cows**](#) [周五, 13 10月 21:10]

Ocean clams and worms are releasing a significant amount of potentially harmful greenhouse gas into the atmosphere, scientists have shown.

• [**'Magic mushrooms' may 'reset' the brains of depressed patients, study suggests**](#) [周五, 13 10月 21:10]

Patients taking psilocybin to treat depression show reduced symptoms weeks after treatment following a 'reset' of their brain activity.

• [**Scientists uncover a centuries-old case of mistaken identity in the Chesapeake Bay**](#) [周五, 13 10月 21:10]

Scientists recently discovered that some jellyfish in the Bay are quite different from their ocean cousins. This led scientists to declare them as two different species.

• [**How E. coli bacteria adapt under stress**](#) [周五, 13 10月 21:10]

Researchers have developed a genome-scale model that can accurately predict how E. coli bacteria respond to temperature changes and genetic mutations. The work sheds light on how cells adapt under environmental stress and has applications in precision medicine, where adaptive cell

modeling could provide patient-specific treatments for bacterial infections.

- [**Mantis shrimp-inspired camera enables glimpse into hidden world**](#) [周五, 13 10月 08:02]

By mimicking the eye of the mantis shrimp, researchers have developed an ultra-sensitive camera capable of sensing both color and polarization. The bioinspired imager can potentially improve early cancer detection and help provide a new understanding of underwater phenomena, the researchers said. See a video of describing the study on YouTube.

- [**Is it gonna blow? Measuring volcanic emissions from space**](#) [周五, 13 10月 08:02]

Carbon dioxide measured by a NASA satellite pinpoints sources of the gas from human and volcanic activities, which may help monitor greenhouse gases responsible for climate change.

- [**Understanding rare Earth emulsions**](#) [周五, 13 10月 08:02]

Through a series of theoretical simulations, researchers discovered that surface polarization in mixed media increases attraction among elements.

- [**Combination of El Niño and 2016 Ecuador earthquake likely worsened Zika outbreak**](#) [周五, 13 10月 08:02]

A Zika virus outbreak in coastal Ecuador in 2016 was likely worsened by a strong El Niño and a magnitude 7.8 earthquake that struck the region in April, according to a new study.

- [**New headway in desalination technology**](#) [周五, 13 10月 04:40]

Engineers have taken a step forward in developing a saltwater desalination process that is potentially cheaper than reverse osmosis and borrows from battery technology. In their study, the researchers are focusing on new materials that could make desalination of brackish waters economically desirable and energy efficient.

- [**Livestock grazing management compatible with**](#)

[nesting greater sage-grouse](#) [周五, 13 10月 04:39]

A new study looks at whether management of livestock grazing may help protect sagebrush and birds that depend on it.

• [Lead fishing tackle may be threatening loon populations](#) [周五, 13 10月 04:39]

A new study reveals the devastating effects of lead fishing tackle on loon populations.

• [Even modest oil exposure can harm coastal and marine birds](#) [周五, 13 10月 03:18]

Many birds and other wildlife die following an oil spill, but there are also other potential long-term effects of oil exposure on animals.

• [International team reconstructs nanoscale virus features from correlations of scattered X-rays](#) [周五, 13 10月 03:18]

Key algorithms have been developed which helped scientists achieve a goal first proposed more than 40 years ago -- using angular correlations of X-ray snapshots from non-crystalline molecules to determine the 3-D structure of important biological objects.

• [Warming seas could lead to 70 percent increase in hurricane-related financial loss](#) [周五, 13 10月 03:18]

Hurricane-related financial loss could increase more than 70 percent by 2100 if oceans warm at the worst-case-scenario rate predicted by the Intergovernmental Panel on Climate Change, according to a new study. The study used a combination of hurricane modeling and information in FEMA's HAZUS database to reach its conclusions.

• [3D packaging of DNA regulates cell identity](#) [周五, 13 10月 03:18]

The ability of a stem cell to differentiate into cardiac muscle (and by extension other cell types) depends on what portions of the genome are available for activation, which is controlled by the location of DNA in a cell's nucleus, new research suggests.

• [Tropical tree roots represent an](#)

[underappreciated carbon pool](#) [周五, 13 10月 03:17]

Estimates of the carbon stored by tropical forests rarely take tree roots into consideration. Scientists report that almost 30 percent of the total biomass of tropical trees may be in the roots.

• [Like it or not: Broccoli may be good for the gut](#) [周五, 13 10月 03:17]

For the broccoli haters of the world, researchers may have more bad news: the vegetable may also help promote a healthy gut.

• [Luring hornets: Scientists unlock sex pheromone of notorious honey bee predator](#) [周五, 13 10月 02:34]

Biologists have developed a solution for controlling the invasive Asian hornet *Vespa velutina* based on the insect's natural chemical mating instincts. They deciphered the sex pheromone of the insect and devised a method of luring males into traps baited with synthesized versions of the pheromones. *Vespa velutina* has recently spread its presence with invasions in Europe and Korea, posing risks to honey bees, humans and related economics.

• [Satellites map photosynthesis at high resolution](#) [周五, 13 10月 02:34]

Life on Earth is impossible without photosynthesis. It provides food and oxygen to all higher life forms and plays an important role in the climate system, since this process regulates the uptake of carbon dioxide from the Earth's atmosphere and its fixation in biomass. However, quantification of photosynthesis at the ecosystem-to-global scale remains uncertain. Now an international team of scientists have made a major step forward.

• [Cell biology: Cell contacts in embryonic development determine cellular fate](#) [周五, 13 10月 02:33]

The average human consists of about 37.2 trillion cells. But not all cells are created equal: while muscle cells contain the molecular machinery to contract and relax your muscles, some neurons send meter-long axons from the spinal cord to the tip of your toes, and red blood cells bind oxygen and transport it around the body. How does a cell 'know' which

function to fulfill?

- [**The sea cucumber genome points to genes for tissue regeneration**](#) [周五, 13 10月 02:33]

A new high-definition genome sequence of the sea cucumber provides molecular insights into its ability to regenerate.

- [**Leishmania: Immune reaction to sandfly saliva varies between individuals living in endemic areas**](#) [周五, 13 10月 02:33]

The Phlebotomus papatasi sandfly is responsible for spreading Leishmania throughout the tropics and subtropics. How individuals in areas endemic for Leishmania infection react to sandfly saliva depends on their long-term exposure to the flies.

- [**Newfoundland populated multiple times by distinct groups, DNA evidence shows**](#) [周五, 13 10月 02:33]

Researchers who've examined genetic evidence from mitochondrial DNA provide evidence that two groups of indigenous people in Canada, known as the Maritime Archaic and Beothuk, brought different matrilineal groups to the island, adding further support to the notion that those groups had distinct population histories.

- [**Engineers develop a programmable 'camouflaging' material inspired by octopus skin**](#) [周五, 13 10月 02:33]

Engineers have invented stretchable surfaces with programmable 3-D texture morphing, a synthetic 'camouflaging skin' inspired by studying and modeling the real thing in octopus and cuttlefish.

- [**Thunderstorm activity is highest at foot of the Zugspitze**](#) [周五, 13 10月 00:39]

Those who are afraid of thunderstorms should move to Kiel, whereas those who do not feel threatened by thunder and lightning should settle in Garmisch-Partenkirchen, because average thunderstorm activity is lowest in the city in Northern Germany and highest in the city in

Bavaria, report scientists who evaluated data on thunderstorm occurrences.

- [**Rainfall trends in arid regions buck commonly held climate change theories**](#) [周五, 13 10月 00:30]

To explore the links between climatic warming and rainfall in drylands, scientists analysed more than 50 years of detailed rainfall data (measured every minute) from a semi-arid drainage basin in south east Arizona exhibiting an upward trend in temperatures during that period.

- [**Paleogenomic analysis sheds light on Easter Island mysteries**](#) [周五, 13 10月 00:30]

New paleogenomic research appears to rule out the likelihood that inhabitants of Easter Island intermixed with South Americans prior to the arrival of Europeans on the island in 1722.

- [**An evolving sticky situation**](#) [周五, 13 10月 00:30]

While many animals try to avoid sticky situations, lizards evolved to seek them out. An evolutionary biologist shows how different groups of lizards -- geckos and anoles -- took two completely different evolutionary paths to developing the beneficial trait of sticky toe pads.

- [**Climate change may accelerate infectious disease outbreaks, say researchers**](#) [周五, 13 10月 00:28]

Aside from inflicting devastating natural disasters on often vulnerable communities, climate change can also spur outbreaks of infectious diseases like Zika , malaria and dengue fever, according to a new study.

- [**How switches work in bacteria**](#) [周五, 13 10月 00:28]

Many bacteria have molecular control elements, via which they can switch on and off genes. These riboswitches also open up new options in the development of antibiotics or for the detection and decomposition of environmental toxins. Researchers have now used light optical microscopy of single molecules to fundamentally study the way riboswitches work.

- [**Geologic evidence is the forerunner of ominous**](#)

[prospects for a warming Earth](#) [周四, 12 10月 23:48]

While strong seasonal hurricanes have devastated many of the Caribbean and Bahamian islands this year, geologic studies on several of these islands illustrate that more extreme conditions existed in the past. A new analysis shows that the limestone islands of the Bahamas and Bermuda experienced climate changes that were even more extreme than historical events.

• [Don't dispense of cannabis dispensaries, caution researchers](#) [周四, 12 10月 23:14]

Researchers are cautioning policy makers not to alter a cannabis distribution system that -- while not legal yet -- works well. They say store-front dispensaries -- often under fire by law enforcement and city governments -- are a tried and true method of selling cannabis.

• [Universality and specificity in protein motions](#) [周四, 12 10月 23:14]

Although proteins have very different function functions, or specialties, in living cells, they share the general characteristics -- the same universality -- in their motions, say scientists. Their motion is much like mountain landslides or wildfires, they report.

• [Novel mechanism protects mitochondrial DNA](#) [周四, 12 10月 23:14]

Researchers have discovered a novel mechanism safeguarding mitochondrial DNA. A central part of the protective mechanism is an unusual enzyme, PrimPol, which can re-initiate mitochondrial DNA replication after damage.

• [Carbon dioxide levels lower than thought during super greenhouse period](#) [周四, 12 10月 22:37]

Researchers adds to the understanding of Earth's historic hyperthermal events to help explain the planet's current warming trend.

• [Enzymes at work: Breaking down stubborn cellulose for biofuels](#) [周四, 12 10月 22:37]

Researchers have observed enzymes breaking down cellulose to aid the production of biofuels.

- [**Scientists begin bold conservation effort to save the vaquita porpoise from extinction**](#) [周四, 12 10月 22:37]

An international team of experts has gathered in San Felipe, Mexico at the request of the Mexican government (SEMARNAT) and has begun a bold, compassionate plan known as VaquitaCPR to save the endangered vaquita porpoise from extinction.

- [**Pumas found to exhibit behaviors like social animals**](#) [周四, 12 10月 22:36]

Pumas, long known as solitary carnivores, are more social than previously thought, according to a new study. The findings provide the first evidence of complex social strategies in any solitary carnivore -- and may have implications for multiple species, including other wild cats around the world.

- [**Pioneering discovery of an odor-detecting receptor enhancer**](#) [周四, 12 10月 22:36]

Scientists have identified a regulatory sequence that turns gene expression on, or simply an enhancer, for odor-detecting receptors, which form one of the largest gene clusters in the mouse genome. This was done using a combination of research methods, including the CRISPR-Cas9 system, which is a genome editing technique, the Bacillus subtilis synthetic genome vector system, which is a cloning system for large DNA fragments, and bioinformatics.

- [**Study reveals need for better modeling of weather systems for climate prediction**](#) [周四, 12 10月 21:15]

A team of researchers discovered persistent dry and warm biases in the central U.S. that was caused by poor modeling of atmospheric convective systems. Their findings call for better calculations with global climate models.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [Making healthier decisions, step by step](#) [周五, 13 10月 21:52]
For 10 days, scientists posted signs at the bottom of a set of airport stairs and escalators encouraging them to take the stairs. They found when the signs were present, people were about twice as likely to use the stairs.
- [Wildlife in the ditches need a detox cure](#) [周五, 13 10月 21:17]
When it's raining on the roads, slops of road dust and contaminants drain into the road trenches. What does it do to wildlife living by the road?
- [Tweets can help predict the outcome of soccer matches](#) [周五, 13 10月 08:02]
Twitter activity can help predict the result of soccer matches when combined with betting market prices, new study shows. The tone of Twitter posts can predict when a team is more likely to win and soccer bets are mispriced, the study found.
- [Fighting racism: Teaching kids to identify individual black people can reduce racial bias](#) [周五, 13 10月 04:39]
Many times, those who hold racially biased views of other people see them as all the same. Instead of thinking of them as specific individuals, they lump them into a group -- seeing them as 'those people.' Now an international team of researchers suggests one way to reduce racial bias in kids is by teaching them to identify individual faces of those of other races.
- [Warming seas could lead to 70 percent increase in hurricane-related financial loss](#) [周五, 13 10月 03:18]

Hurricane-related financial loss could increase more than 70 percent by 2100 if oceans warm at the worst-case-scenario rate predicted by the Intergovernmental Panel on Climate Change, according to a new study. The study used a combination of hurricane modeling and information in FEMA's HAZUS database to reach its conclusions.

- [**Using Facebook data as a real-time census**](#) [周五, 13 10月 00:30]

A new study is believed to be the first to demonstrate how present-day migration statistics can be obtained by compiling the same data that advertisers use to target their audience on Facebook, and by combining that source with information from the Census Bureau.

- [**Climate change may accelerate infectious disease outbreaks, say researchers**](#) [周五, 13 10月 00:28]

Aside from inflicting devastating natural disasters on often vulnerable communities, climate change can also spur outbreaks of infectious diseases like Zika , malaria and dengue fever, according to a new study.

- [**Scientists begin bold conservation effort to save the vaquita porpoise from extinction**](#) [周四, 12 10月 22:37]

An international team of experts has gathered in San Felipe, Mexico at the request of the Mexican government (SEMARNAT) and has begun a bold, compassionate plan known as VaquitaCPR to save the endangered vaquita porpoise from extinction.

- [**New threat to the ozone layer**](#) [周四, 12 10月 21:10]

'Ozone depletion is a well-known phenomenon and, thanks to the success of the Montreal Protocol, is widely perceived as a problem solved,' say some. But an international team of researchers, has now found an unexpected, growing danger to the ozone layer from substances not regulated by the treaty.

- [**Reducing racial bias in children**](#) [周四, 12 10月 21:10]

An international team of researchers suggests that one way to reduce implicit racial bias in young children is by teaching them to distinguish among faces of a different race and identify them as individuals.

- **[Electric cars can become more eco-friendly through life cycle assessment](#)** [周四, 12 10月 21:09]

It is time to stop discussing whether electric cars are good or bad. Instead industry, authorities and policy-makers need to work together to make them as eco-friendly as possible. One researcher now provides concrete advice and tools showing how life cycle assessment can assist in the development of electric cars.

- **[Lost in translation: When humor kills the message](#)** [周四, 12 10月 21:09]

Getting a laugh may not help get the road safety message across, with a new study showing humorous driver sleepiness advertisements via social media and other means can get lost in translation.

- **[Autism prevalence and socioeconomic status: What's the connection?](#)** [周四, 12 10月 06:05]

Children living in neighborhoods where incomes are low and fewer adults have bachelor's degrees are less likely to be diagnosed with autism spectrum disorder compared to kids from more affluent neighborhoods.

- **['Killer' toothaches likely cause misery for captive orca: Whales chew concrete and steel tank surfaces](#)** [周四, 12 10月 06:05]

An international research team has undertaken the first in-depth investigation of the teeth of captive orca (killer whales) and have found them a sorry state, which raises serious concerns for these majestic mammals' overall health and welfare.

- **[New conservation method empowers indigenous peoples](#)** [周四, 12 10月 03:14]

Environmental social scientists worked with indigenous people in the rural Peruvian Amazon and determined that local people meet their basic needs through diverse subsistence activities, such as hunting, fishing, and farming, and over centuries they have developed sophisticated

natural resource management systems that protect the robust rainforest ecosystem. Through the study, the scientists hope to overturn traditional notions about development and industrialization.

- [**Risk of tsunamis in Mediterranean Sea has been overstated, say experts**](#) [周四, 12 10月 02:48]

A review of geological evidence for tsunamis during the past 4500 years in the Mediterranean Sea has revealed that as many as 90 per cent of these inundation events may have been misinterpreted by scientists and were due to storm activity instead.

- [**Boost in collateral, not 'feeling richer,' drives consumers to borrow as home prices rise**](#) [周四, 12 10月 02:48]

Boost in collateral rather than feeling richer drives borrowing as home prices rise, an economist finds.

- [**Beyond EPA's Clean Power decision: Climate action window could close as early as 2023**](#) [周四, 12 10月 00:38]

As the Trump administration repeals the US Clean Power Plan, a new study underscores the urgency of reducing greenhouse gas emissions -- from both environmental and economic perspectives.

- [**Study shows untapped creativity in workforce**](#) [周四, 12 10月 00:04]

With the U.S. economy less reliant on manufacturing, creativity and innovation are of increasing value. Arts graduates, and others who have developed and honed their creative skills, can be critical assets.

- [**Experts express concerns over infant mental health assessment**](#) [周四, 12 10月 00:03]

Forty world experts on child development and mental health have released a joint statement calling for caution when applying an influential classification for assessing infant mental health and potential cases of abuse.

- [**Criminal offenders with genetic mental**](#)

[disorders judged more negatively](#) [周四, 12 10月 00:03]

Popular literature and crime dramas imply that defense attorneys who portray their clients as victims may have better outcomes. The belief is that jurors assign less blame to defendants they feel have been wronged. New research has shown that offenders with genetic mental disorders that predispose them to criminal behavior are judged more negatively than mentally disordered offenders whose criminal behavior may have been caused by environmental factors.

• [Major cities concentrate less scientific production](#) [周四, 12 10月 00:00]

The world's major cities, such as New York, London, and Tokyo, are losing their dominant position in the production and circulation of scientific articles, according to a new study.

• [Drivers are less cautious at railway crossings](#) [周三, 11 10月 22:07]

Drivers aren't as cautious approaching a railway level crossing compared to a road intersection despite the greater risk of fatality if a collision occurs, a new study has found.

• [World's 'better' countries have higher rates of cancer](#) [周三, 11 10月 22:07]

The world's 'better' countries, with greater access to healthcare, experience much higher rates of cancer incidence than the world's 'worse off' countries, according to new research.

• [What is a safe following distance?](#) [周三, 11 10月 22:07]

Confusion over what is a 'safe following distance' has road safety researchers calling for a standardized definition to prevent tailgating.

• [Average wages for all workers, men and women, have increased as a result of women joining the workforce](#) [周三, 11 10月 21:17]

Economists are continually examining the effect of the economy on women, but this male-dominated field seems to be failing to ask what impact women in turn have on the economy? Researchers have

examined how women's participation in the workforce has affected economic growth and productivity in cities across the US. They estimate that every 10% increase in female labor force participation rates increases average real wage growth in cities by approximately 5%.

- [**Homicide is the largest contributor to years of lost life among black Americans**](#) [周三, 11 10月 08:01]

Homicide is the largest contributor to potential years of life lost among black Americans, according to a new study published in PLOS ONE and conducted by researchers at the Indiana University School of Public Health-Bloomington.

- [**Doctors need a nudge to reduce antibiotic prescriptions, study finds**](#) [周三, 11 10月 03:29]

An update to a behavioral economics study on clinicians' prescriptions of antibiotics showed that the clinicians may, without long-term interventions, return to bad prescription habits.

- [**The costs of transporting petroleum products by pipelines and rail**](#) [周三, 11 10月 03:29]

While the policy debate surrounding crude oil transportation costs has emphasized accidents and spills, a new study indicates the debate is overlooking a far more serious external cost -- air pollution and greenhouse gas emissions.

- [**Raging Bull: First study to find link between testosterone and stock market instability**](#) [周三, 11 10月 03:27]

In the U.S. today, the majority of professional stock market traders are young males and new evidence suggests biology strongly influences their trading behavior. According to a new study this could be a significant contributor to fluctuations in the market, as high testosterone levels can cause these traders to overestimate future stock values and change their trading behavior, leading to dangerous price bubbles and subsequent crashes.

- [**Noncompliance thwarts comprehensive**](#)

[background check policy for private-party sales, study finds](#) [周三, 11 10月 02:14]

Only one state with expanded background check policies for all gun transfers is compliant, outlines a new report.

[More than half of police killings not officially documented on US death certificates, study finds](#)

[周三, 11 10月 02:14]

Official death certificates in the US failed to count more than half of the people killed by police in 2015 -- and the problem of undercounting is especially pronounced in lower-income counties and for deaths that are due to Tasers, according to a new study.

[Sharing of science is most likely among male scientists](#) [周三, 11 10月 00:54]

Even though science is becoming increasingly competitive, scientists are still very willing to share their work with colleagues. This is especially true for male scientists among each other and less so for females among each other or between the sexes.

[Indian government needs to do more to tackle rising sale of unapproved antibiotics, experts say](#)

[周三, 11 10月 00:41]

In India, the sale of antibiotics requiring the tightest control and regulation is rising the fastest, according to a new analysis. The correspondence highlights serious hurdles for controlling antimicrobial resistance in the country.

[Stepped care beneficial after hurricanes](#) [周三, 11 10月 00:38]

Stepped care is more effective than usual care in reducing the prevalence of posttraumatic stress disorder in the aftermath of hurricanes, according to a new study.

[Conservationists' eco-footprints suggest education alone won't change behavior](#) [周二, 10 10月 23:46]

A new study shows that even those presumably best informed on the environment find it hard to consistently 'walk the walk,' prompting

scientists to question whether relying solely on information campaigns will ever be enough.

- [**Green gentrification can limit the favorable effects of green areas on health**](#) [周二, 10 10月 22:58]

A new study suggests that more socially disadvantaged neighbors do not benefit equally from the effects newly created green areas have on health. Scientists consider that greener cities are not healthier and more equal for everyone.

- [**No 'narcissism epidemic' among college students, study finds**](#) [周二, 10 10月 22:57]

Today's college students are slightly less narcissistic than their counterparts were in the 1990s, researchers report in a new study - not significantly more, as some have proposed. The study analyzed data from 1,166 students at the University of California, Berkeley in the 1990s, and from tens of thousands of students at the University of Illinois at Urbana-Champaign and the University of California, Davis in the 2000s and 2010s.

- [**A lesson for Canada: Quebec pharmacare system creates winners and losers**](#) [周二, 10 10月 22:56]

Quebec spends \$200 more per person than the rest of Canada to provide prescription drug coverage to everyone in the province, finds new research that could inform plans for a nationwide universal drug plan.

- [**Illegal use of natural resources in the protected Brazilian Amazon mapped**](#) [周二, 10 10月 20:55]

New research uses law enforcement data collected from 2010 to 2015 to understand the geographical distribution of the illegal use of natural resources across the region's protected area network. In the study, a total of 4,243 reports of illegal use of natural resources were evaluated and mapped. These reports generated US \$224.6 million in fines.

- [**Heads-up, ceos: Corporate social responsibility may get you fired, study finds**](#) [周二, 10 10月 07:20]

Investing in product safety, employee diversity and carbon footprint reduction are all examples of corporate social responsibility (CSR) that can result in high praise for a chief executive — or get them fired — according to new research.

- [**School year 'relative age' causing bias in ADHD diagnosis, says research**](#) [周二, 10 10月 07:15]

Younger primary school children are more likely to be diagnosed with attention deficit hyperactivity disorder (ADHD) than their older peers within the same school year, new research has shown.

- [**Huge energy potential in open ocean wind farms in the North Atlantic**](#) [周二, 10 10月 03:49]

Because wind speeds are higher on average over ocean than over land, wind turbines in the open ocean could in theory intercept more than five times as much energy as wind turbines over land. This presents an enticing opportunity for generating renewable energy through wind turbines. But it was unknown whether the faster ocean winds could actually be converted to increased amounts of electricity.

- [**'Turbo charge' for your brain?**](#) [周二, 10 10月 03:49]

Two brain regions -- the medial frontal and lateral prefrontal cortices -- control most executive function. Researchers used high-definition transcranial alternating current stimulation (HD-tACS) to synchronize oscillations between them, improving brain processing. De-synchronizing did the opposite.

- [**The female brain reacts more strongly to prosocial behavior than the male brain, study finds**](#) [周二, 10 10月 00:32]

Women are more generous than men, behavioral experiments show. Now, researchers have been able to demonstrate that female and male brains process prosocial and selfish behavior differently. For women, prosocial behavior triggers a stronger reward signal, while male reward systems respond more strongly to selfish behavior.

- [**Scientists complete conservation puzzle, shaping understanding of life on Earth**](#) [周二, 10 10月 00:31]

An international team of scientists has completed the 'atlas of life' -- the first global review and map of every vertebrate on Earth. The 39 scientists have produced a catalogue and atlas of the world's reptiles. By linking this atlas with existing maps for birds, mammals and amphibians, the team have found many new areas where conservation action is vital.

- [**A new kind of influenza vaccine: One shot might do the trick**](#) [周一, 09 10月 21:33]

Certain proteins in the influenza virus remain constant year after year. Researchers are taking one of those conserved proteins, Matrix-2 (M2), and packaging it in a nanoscale, controlled-release "capsule" in an attempt to create a quick-acting, long-lasting, multi-strain vaccine against pandemic influenza A.

- [**Official fish trade 'hugely underestimates' global catches**](#) [周一, 09 10月 21:29]

Conservation of dwindling fish stocks is being severely hampered by poor controls on global trade, according to new research.

- [**Sustainable irrigation may harm other development goals**](#) [周一, 09 10月 20:43]

Pursuing sustainable irrigation without significant irrigation efficiency gains could negatively impact environmental and development goals in many areas of the world, a new study has found.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- [Gutters teem with inconspicuous life](#) [周六, 14 10月 01:22]

Scientists have shown that Parisian street gutters are oases of microscopic life, home to microalgae, fungi, sponges, and mollusks. Grouped into communities, these microorganisms may help clean rainwater and urban waste by decomposing solid debris and pollutants. A deeper understanding of the role and composition of these communities could help elucidate the services rendered by gutter ecosystems. The researchers' findings are the first to reveal the unsuspected biodiversity of microscopic life i...

- [New insight into the limits of possible life on Mars](#) [周五, 13 10月 21:10]

Researchers investigating whether liquid water could exist on Mars have provided new insight into the limits of life on the red planet.

- [In a first for wearable optics, researchers develop stretchy fiber to capture body motion](#) [周五, 13 10月 02:33]

New research offers the first demonstration of optical fibers sturdy enough to sense a wide range of human motion.

- [Engineers develop a programmable 'camouflaging' material inspired by octopus skin](#) [周五, 13 10月 02:33]

Engineers have invented stretchable surfaces with programmable 3-D texture morphing, a synthetic 'camouflaging skin' inspired by studying and modeling the real thing in octopus and cuttlefish.

- [**Paleogenomic analysis sheds light on Easter Island mysteries**](#) [周五, 13 10月 00:30]

New paleogenomic research appears to rule out the likelihood that inhabitants of Easter Island intermixed with South Americans prior to the arrival of Europeans on the island in 1722.

- [**Devourer of planets? Astronomers dub star 'Kronos'**](#) [周五, 13 10月 00:28]

'Kronos' is enhanced in metals and other rock-forming elements but not in volatiles, prompting a team of researchers to conclude that it absorbed as much as 15 Earth masses worth of rocky planets. Its twin, 'Krios,' does not show this unusual pattern of enhancement.

- [**Dangerous trend: The placenta is not suitable as a 'superfood'**](#) [周四, 12 10月 21:13]

More and more women want to take their own placenta with them after childbirth in order to eat it for "health reasons". This phenomenon is growing, especially in the USA, but also in Europe, although physicians are increasingly expressing concerns about it.

- [**Scorpions target their venom**](#) [周四, 12 10月 21:10]

In the first study of its kind, scientists have shown scorpions can fine-tune their venom to suit different predators and prey.

- [**Last common ancestor of humans and apes weighed about five kilograms**](#) [周四, 12 10月 21:09]

New research suggests that the last common ancestor of apes -- including great apes and humans -- was much smaller than previously thought, about the size of a gibbon. The findings, published today in the journal Nature Communications, are fundamental to understanding the evolution of the human family tree.

- [**Chemists use modified DNA nucleotides to create new materials**](#) [周四, 12 10月 06:01]

Chemists have demonstrate that they can repurpose DNA to create new substances with possible medical applications.

- **['Obscure' stalked filter feeder lived in Utah some 500 million years ago](#)** [周四, 12 10月 00:04]

The only fossilized specimen of a species previously unknown to science -- an 'obscure' stalked filter feeder -- has just been detailed for the first time.

- **[Our brain omits grammatical elements when it has limited resources](#)** [周四, 12 10月 00:03]

A study of the use of pronouns by French speakers with agrammatic aphasia shows that grammatical pronouns are significantly more impaired in speech than lexical ones. The findings support a new theory of grammar which suggests that grammatical elements contain secondary information that speakers with limited cognitive resources can omit from their speech and still make sense.

- **[Kune Kune piglets possess social learning skills and have an astonishingly good memory](#)** [周四, 12 10月 00:03]

Pigs are socially competent and capable of learning. But the combination of these skills, learning by observing others, has been insufficiently studied so far. Exact copying and understanding of demonstrated actions -- highly developed learning abilities -- could not be proven. A new study with Kune Kune pigs, has now shown for the first time that pigs do learn from each other. The intelligent animals also possess remarkable long-term memory after internalizing a technique.

- **[The making of medieval bling](#)** [周四, 12 10月 00:03]

Gold has long been valued for its luxurious glitter and hue, and threads of the gleaming metal have graced clothing and tapestries for centuries. Determining how artisans accomplished these adornments in the distant past can help scientists restore, preserve and date artifacts, but solutions to these puzzles have been elusive. Now scientists have revealed that medieval artisans used a gilding technology that has endured for centuries.

- **[Some plants grow bigger -- and 'meaner' -- when](#)**

[clipped, study finds](#) [周四, 12 10月 00:03]

Some plants behave like the mythical monster Hydra: Cut off their heads and they grow back, bigger and better than before. A new study finds that these 'overcompensators,' as they are called, also augment their defensive chemistry -- think plant venom -- when they are clipped. The discovery could lead to the development of new methods for boosting plant growth while reducing the need for insecticides, the researchers said.

• [Step toward creating planes that travel at hypersonic speed](#) [周三, 11 10月 03:29]

A recent study could lead to a drastic decrease in flight times. The study is one of the first steps toward the creation of planes able to move at hypersonic speeds, five to 10 times the speed of sound.

• [Do male fish prefer them big and colorful?](#) [周三, 11 10月 00:41]

Male black-finned goodeid or mexcalpique fish know what they want when they pick a female to mate with; they prefer them big-bellied and as orange as possible. Interestingly, females displaying these traits are the ones most able to produce more offspring that survive, two researchers from the National Autonomous University of Mexico have found.

• [A self-propelled catheter with earthworm-like peristaltic motion](#) [周二, 10 10月 23:46]

A research team has developed a mechanism of a self-propelled catheter capable of generating peristaltic motion just like an earthworm by applying pneumatic pressure inside only one tube. The goal is to develop an AutoGuide robot that propels itself inside bronchi, automatically reaching the target lesion within the lungs, and can take a lesion sample and provide treatment.

• [This soft robotic gripper can screw in your light bulbs for you](#) [周二, 10 10月 23:46]

How many robots does it take to screw in a light bulb? The answer: just

one, assuming you're talking about a newly created robotic gripper. The engineering team has designed and built a gripper that can pick up and manipulate objects without needing to see them and needing to be trained.

- [**Salt marsh research warns of pumpkin-colored 'zombies'**](#) [周二, 10 10月 22:57]

Salt marsh research shows that growing abundance of tiny shrimp infected by a microscopic parasite may portend future threats to humankind through disease.

- [**'Fake fin' discovery reveals new ichthyosaur species**](#) [周二, 10 10月 22:56]

An ichthyosaur first discovered in the 1970s but then dismissed and consigned to museum storerooms across the country has been re-examined and found to be a new species.

- [**Invisibility is within sight**](#) [周二, 10 10月 04:11]

The theoretical discovery of transparent particles that break the previously accepted limit of visibility opens a new door in the search for perfect transparency, report scientists.

- [**What soot-covered, hundred-year-old birds can tell us about saving the environment**](#) [周二, 10 10月 03:50]

Birds in museum collections from Rust Belt cities around the turn of the century are covered with black soot from air pollution at the time. Scientists have compared the amount of soot on birds through the years to track environmental pollution over the last 135 years.

- [**'Turbo charge' for your brain?**](#) [周二, 10 10月 03:49]

Two brain regions -- the medial frontal and lateral prefrontal cortices -- control most executive function. Researchers used high-definition transcranial alternating current stimulation (HD-tACS) to synchronize oscillations between them, improving brain processing. De-synchronizing did the opposite.

- [**Human minibrains reveal effects of psychedelic**](#)

substance [周一, 09 10月 20:44]

Scientists have identified changes in signaling pathways associated with neural plasticity, inflammation and neurodegeneration triggered by a compound from the family of dimethyltryptamine known as 5-MeO-DMT.

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- [**Brain-controlled drones are here: What's coming in the next five years?**](#) [周六, 30 9月 11:04]

Single unmanned autonomous vehicles (UAVs) directed by joysticks, radio controllers, and mobile phones are already accomplishing a variety of useful tasks, such as aerial photography and security patrols. But using multiple drones requires multiple human operators, and this presents a coordination problem.

- [**Genes that separate humans from fruit flies found**](#) [周六, 30 9月 10:59]

Genes which determine animal complexity -- or what makes humans so much more complex than a fruit fly or a sea urchin -- have been identified for the first time.

- [**A new approach to cancer drug discovery**](#) [周六, 30 9月 03:22]

Scientists have developed and demonstrated a promising new strategy for the discovery of novel anti-cancer therapies.

- [**Physical abuse and punishment impact children's academic performance**](#) [周六, 30 9月 03:22]

Scientists have found that physical abuse was associated with decreases in children's cognitive performance, while non-abusive forms of

physical punishment were independently associated with reduced school engagement and increased peer isolation.

- [**Open-access collider data confirm subatomic particle patterns**](#) [周六, 30 9月 03:22]

Scientists used the Compact Muon Solenoid (CMS) data to reveal, for the first time, a universal feature within jets of subatomic particles, which are produced when high-energy protons collide. Their effort represents the first independent, published analysis of the CMS open data.

- [**UV-irradiated amorphous ice behaves like liquid at low temperatures**](#) [周六, 30 9月 03:21]

Ice analogs mimicking interstellar ice behave like liquids at temperatures between -210°C and -120°C according to researchers. This liquid-like ice may enhance the formation of organic compounds including prebiotic molecules and the accretion of dust to form planets.

- [**Compound from oilseeds may be high-value product**](#) [周六, 30 9月 01:35]

Extracting a substance called glucosinolate from camelina and carinata seeds may help bring these promising sources of biofuel one stop closer to reality.

- [**Snapchat users motivation, level of interest**](#) [周六, 30 9月 01:35]

The simplicity of the platform and brevity of posts are key factors in determining how students can become very regular users.

- [**Confronted with bacteria, infected cells die so others can live, study finds**](#) [周六, 30 9月 01:26]

In a new study, a team of researchers identified a 'back-up alarm' system in host cells that responds to a pathogen's attempt to subvert the immune system.

- [**Video gamers have an advantage in learning**](#) [周六, 30 9月 00:51]

Neuropsychologists let video gamers compete against non-gamers in a

learning competition. During the test, the video gamers performed significantly better and showed an increased brain activity in the brain areas that are relevant for learning.

- [**Raccoons solve an ancient puzzle, but do they really understand it?**](#) [周六, 30 9月 00:51]

Scientists have been using an ancient Greek fable written by Aesop as inspiration to test whether birds and small children understand cause and effect relationships. A group of scientists have now extended this body of work to study raccoon intelligence. Their research uses the Aesop's Fable paradigm to assess if mammalian carnivores understand the principles of water displacement.

- [**Helium found in coal seams could aid safe shale gas extraction**](#) [周六, 30 9月 00:50]

Natural deposits of helium gas found in UK coal seams could help scientists monitor the secure recovery of coal or shale gas from underground sites, according to research.

- [**New mouse model replicates an underlying cause of intellectual disability**](#) [周六, 30 9月 00:50]

Researchers have developed the first mice that lack the Upf3b gene, providing a new model for studying its underlying role in intellectual disabilities and neurodevelopmental disorders.

- [**New technique could detect explosives, dangerous gases rapidly, remotely**](#) [周六, 30 9月 00:50]

A laser-based method that could be used to detect chemicals such as explosives and dangerous gases quickly and accurately has now been developed by researchers.

- [**There are only 15 possible pentagonal tiles**](#) [周五, 29 9月 23:50]

Tiling the plane with a single pattern is a mathematical problem that has interested humans since Antiquity, notably for the aesthetic quality of tiles in mosaics or tiling. One of the unresolved problems in this field that has been puzzling the scientific community since 1918 has now

been definitively resolved.

- [**New study changes our view on flying insects**](#) [周五, 29 9月 23:49]

For the first time, researchers are able to prove that there is an optimal speed for certain insects when they fly. At this speed, they are the most efficient and consume the least amount of energy. Corresponding phenomena have previously been demonstrated in birds, but never among insects.

- [**Erosion from ancient tsunami in Northern California**](#) [周五, 29 9月 23:30]

Geologists use ground-penetrating radar to determine the breadth and depth of erosion from an ancient tsunami in Northern California.

- [**Scandinavia's earliest farmers exchanged terminology with Indo-Europeans**](#) [周五, 29 9月 23:29]

5,000 years ago, the Yamnaya culture migrated into Europe from the Caspian steppe. In addition to innovations such as the wagon and dairy production, they brought a new language -- Indo-European -- that replaced most local languages the following millennia. But local cultures also influenced the new language, particularly in southern Scandinavia, where Neolithic farmers made lasting contributions to Indo-European vocabulary before their own language went extinct, new research shows.

- [**Algae with light switch**](#) [周五, 29 9月 23:29]

The adhesion of *Chlamydomonas*, a unicellular alga, to surfaces is light-dependent.

- [**Bioreactors on a chip renew promises for algal biofuels**](#) [周五, 29 9月 23:29]

Researchers report exciting new technology that may revolutionize the search for the perfect algal strain: algal droplet bioreactors on a chip the size of a quarter.

- [**Small collisions make big impact on Mercury's**](#)

[thin atmosphere](#) [周五, 29 9月 23:29]

Mercury, our smallest planetary neighbor, has very little to call an atmosphere, but it does have a strange weather pattern: morning micro-meteor showers.

• [Protein that could improve symptoms and reduce mortality in flu](#) [周五, 29 9月 23:29]

Flu season is on its way, and a new report has identified an innovative strategy for battling this deadly illness.

• [Arbuscular mycorrhizal fungal communities exposed with new DNA sequencing approach](#) [周五, 29 9月 23:29]

Arbuscular mycorrhizal fungal systems play crucial roles in their environment, affecting the plants that can grow there and the nutrients in the soils. Researchers have developed a new DNA sequencing technique using barcoded primers that is capable of detecting rare fungal species in a community, paving the way for future insights into how they might vary in response to environmental changes.

• [Why do we fall asleep when bored?](#) [周五, 29 9月 21:34]

Why do we have the tendency to fall asleep in the absence of motivating stimuli, i.e., when bored.

• [A stinging report: Climate change a major threat to bumble bees](#) [周五, 29 9月 21:33]

New research is helping to explain the link between a changing global climate and a dramatic decline in bumble bee populations worldwide.

• [Safety, effectiveness of cognitive enhancers for Alzheimer's ranked](#) [周五, 29 9月 21:33]

A new study ranking the safety and effectiveness of four drugs taken to enhance concentration, memory, alertness and moods, found that donepezil was most likely to effectively improve cognition in patients with Alzheimer's disease.

• [MRIs are safe for patients with wide variety of](#)

[pacemakers, defibrillators, study shows](#) [周五, 29 9月 21:33]

Magnetic resonance imaging appears to be safe for patients with cardiac implantable electronic devices, even for chest imaging, according to a new study.

• [Frequent sauna bathing keeps blood pressure in check](#) [周五, 29 9月 21:33]

Frequent sauna bathing reduces the risk of elevated blood pressure, according to an extensive follow-up population-based study. The risk of developing elevated blood pressure was nearly 50 percent lower among men who had a sauna 4-7 times a week compared to men who had a sauna only once a week.

• [New regulator of liver metabolism discovered](#) [周五, 29 9月 21:33]

Researchers have identified an enzyme that has a major effect on glucose utilization in liver cells. The enzyme, retinol saturase, helps these cells adapt to variations in glucose levels. However, when glucose levels are consistently too high, retinol saturase appears to exert a damaging effect on cells.

• [How the lungs of premature babies can undergo damage](#) [周五, 29 9月 21:33]

Premature babies that need ventilation to support their breathing often suffer from a condition known as bronchopulmonary dysplasia. Researchers have now discovered a molecular mechanism that plays a key role in the development of the disease.

• [Antarctica: Return of the Weddell polynya supports Kiel climate model](#) [周五, 29 9月 21:33]

Currently, winter has still a firm grip on Antarctica. At this time of the year, the Weddell Sea usually is covered with a thick layer of sea ice. In spite of the icy temperatures in the region, satellite images depict a large ice-free area in the middle of the ice cover.

• [Ultracold atoms point toward an intriguing magnetic behavior](#) [周五, 29 9月 21:33]

Researchers have studied the quantum behavior of ultracold atoms and discovered an intriguing magnetic behavior that could help explain how high-temperature superconductivity works.

• [**Breakdown of brain cells' metabolic collaboration linked to Alzheimer's disease**](#) [周五, 29 9月 21:33]

Researchers have discovered that impairing a critical partnership between brain cells can lead to neurodegeneration.

• [**New role for fragile X protein could offer clues for treatment**](#) [周五, 29 9月 21:33]

The protein behind fragile X syndrome, a leading cause of autism and intellectual disability, controls a suite of genetic regulators.

• [**Electrically heated textiles now possible via UMass Amherst research**](#) [周五, 29 9月 21:33]

Skiers, crossing guards and others who endure frozen fingers in cold weather may look forward to future relief as manufacturers are poised to take advantage of a new technique for creating electrically heated cloth. Researchers have made gloves that keep fingers as warm as the palm of the hand.

• [**New clues from brain structures of mantis shrimp**](#) [周五, 29 9月 21:33]

New research sheds new light on the evolution of some of the earliest brain structures, and stirs up new, intriguing questions about the origins of centers that support learning and memory.

• [**Immune system cells protect against CMV-induced hearing loss in mice**](#) [周五, 29 9月 21:33]

Immune system cells known as natural killer cells play an important protective role against hearing loss in mice infected with cytomegalovirus (CMV), according to a new study.

• [**Sharks and rays live a lot longer than we thought**](#) [周五, 29 9月 21:32]

Sharks and rays live a lot longer than we thought -- some twice as long as previously estimated.

• [**Uncovering a winning basketball formula**](#) [周五, 29 9月 21:32]

Scientists have come up with a winning formula for basketball teams looking to take home Olympic gold.

• [**An epidemic of dream deprivation: Unrecognized health hazard of sleep loss**](#) [周五, 29 9月 21:32]

A sleep and dream specialist has completed a comprehensive review of data about the causes, extent and consequences of dream loss includes recommendations for restoring healthy dreaming.

• [**Elderly who have trouble identifying odors face risk of dementia**](#) [周五, 29 9月 21:32]

A long-term study of nearly 3,000 older adults found that those who could not identify at least four out of five common odors were more than twice as likely as those with a normal sense of smell to develop dementia within five years. About 14 percent could name just three, 5 percent could identify only two, and 2 percent could name just one. One percent of the study subjects were not able to identify a single scent.

• [**Global methane emissions from agriculture larger than reported, according to new estimates**](#) [周五, 29 9月 21:32]

Global methane emissions from agriculture are larger than estimated due to the previous use of out-of-date data on carbon emissions generated by livestock, according to a new study.

• [**New functions of hippocampus unveiled**](#) [周五, 29 9月 21:32]

A research team has made major breakthrough in unveiling the mysteries of the brain to reveal functions of an important region, hippocampus, not known to scientists before.

• [**Transcranial electrical stimulation shows promise for treating mild traumatic brain injury**](#) [周五, 29 9月 21:30]

Using a form of low-impulse electrical stimulation to the brain,

documented by neuroimaging, researchers report significantly improved neural function in participants with mild traumatic brain injury (TBI).

- [**Ultra-fast and ultra-sensitive hydrogen sensor**](#) [周五, 29 9月 21:29]

Scientists have made an ultra-fast hydrogen sensor that can detect hydrogen gas levels under 1 percent in less than seven seconds. The sensor also can detect hundreds of parts per million levels of hydrogen gas within 60 seconds at room temperature.

- [**m6A enzymes found to be central to the development of AML**](#) [周五, 29 9月 04:05]

A new molecular pathway that is required for acute myeloid leukemia (AML) development has been identified by a team of researchers for the first time. This work could provide a rationale for targeting the RNA methylation program in myeloid leukemia.

- [**Broad-spectrum inhibitors of influenza virus developed**](#) [周五, 29 9月 03:28]

Artificial peptide molecules that neutralize a broad range of influenza virus strains have been developed by a team of researchers.

- [**Hunt is over for one of the 'top 50 most-wanted fungi'**](#) [周五, 29 9月 03:27]

In a step toward bridging the gap between fungal taxonomy and molecular ecology, scientists have characterized a sample of "mystery" fungus collected in North Carolina and found its home in the fungal tree of life.

- [**Sensible driving saves more gas than drivers think**](#) [周五, 29 9月 03:27]

A new study has quantified the impact speeding and slamming on the brakes has on fuel economy and consumption. Aggressive behavior behind the wheel can lower gas mileage in light-duty vehicles, which can equate to losing about \$0.25 to \$1 per gallon.

- [**Solving the mystery of Pluto's giant blades of ice**](#) [周五, 29 9月 03:24]

NASA's New Horizons mission revolutionized our knowledge of Pluto when it flew past that distant world in July 2015. Among its many discoveries were images of strange formations resembling giant knife blades of ice, whose origin had remained a mystery. Now, scientists have turned up a fascinating explanation for this "bladed terrain": the structures are made almost entirely of methane ice, and likely formed as a specific kind of erosion wore away their surfaces.

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Brain-controlled drones are here: What's coming in the next five years? - - ScienceDaily

Single unmanned autonomous vehicles (UAVs) directed by joysticks, radio controllers, and mobile phones are already accomplishing a variety of useful tasks, such as aerial photography and security patrols. But using multiple drones requires multiple human operators, and this presents a coordination problem.

Now a single operator using emerging human-brain interfaces can control a swarm of drones, making possible new classes of applications, according to Panos Artemiadis, director of the Human-Oriented Robotics and Control (HORC) Lab at Arizona State University.

Artemiadis thinks it is likely that drone swarms using human-brain interface mechanisms will, in the next three to five years, make inroads where individually controlled UAVs cannot. Here are a few of the drone applications that are now within reach:

Search and Rescue Missions

Humans will collaborate with swarms of robots in search and rescue scenarios. The brain-robot interface enables control of many robots at the same time, and it scales the ability of a robotic team to cover larger areas in less time. If the controller detects something in the video stream that warrants closer surveillance, the swarm can be directed to close in on that area.

Fire Fighting

Armed with infrared imaging equipment, a drone swarm can be used to track the spread of a forest fire over large areas in real time, allowing firefighters to adjust their plans accordingly. The human controller can follow a reported change in weather conditions, such as a shift in wind direction, with a swarm of drones to determine if the fire has jumped to a new area.

Agriculture Analysis

Teams of drones will oversee and analyze large agricultural fields -- creating topographic maps for soil analysis and irrigation planning. In addition to being

outfitted with cameras, aerial drones will use sensors to identify necessary irrigation adjustments and scanners that can identify crop infections or infestations. Some drone systems are already being used for crop spraying -- swarms will be able to accomplish the task more quickly and efficiently.

Entertainment

As drones enter the entertainment arena, we will begin to see mind-controlled drone swarms for events. For example, a single person could operate a fleet of drones shooting photos and videos at an outdoor concert or sports venue, narrowing in on spectator activities for display on the Jumbotron. And while Lady Gaga's Super Bowl drones were controlled by a central computer (and filmed in advance of the show), smaller swarms can be managed by a single human for smaller light displays or to drop gifts (t-shirts or CDs, for example) into a crowd.

Cyber-physical surveillance systems

Understanding brain-drone interfaces allows building cyber-physical surveillance systems that combine human intuition and experience with the sensing

capabilities of multiple drones. This would allow more efficient and accurate surveillance systems than what is now available -- especially for large, security sensitive events like bowl games, marathons and political rallies.

Story Source:

[Materials](#) provided by [Arizona State University \(ASU\)](#). *Note: Content may be edited for style and length.*

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Genes that separate humans from fruit flies found: Genes which determine animal complexity, or what makes humans so much more complex than a fruit fly or a sea urchin, have been identified for the first time -- ScienceDaily

Genes which determine animal complexity -- or what makes humans so much more complex than a fruit fly or a sea urchin -- have been identified for the first time.

The secret mechanism for how a cell in one animal can be significantly more complex than a similar cell in another animal appears to be due to proteins and their ability to control 'events' in a cell's nucleus.

The research, by biochemist Dr Colin Sharpe and colleagues in the University of Portsmouth, is published in *PLoS One*.

Dr Sharpe said: "Most people agree that mammals, and

humans in particular, are more complex than a worm or a fruit fly, without really knowing why. The question has been nagging at me and others for a long time.

"One common measure of complexity is the number of different cell types in an animal, but little is known about how complexity is achieved at the genetic level. The total number of genes in a genome is not a driver, this value varies only slightly in multicellular animals, so we looked for other factors."

Dr Sharpe and MRes student, Daniela Lopes Cardoso interrogated large amounts of data from the genomes of nine animals -- from humans and macaque monkeys to nematode worms and the fruit fly, and calculated how diverse each was at the genetic level.

They found a small number of proteins which were better at interacting with other proteins and with chromatin, the packaged form of DNA in the cell nucleus.

"These proteins appear to be excellent candidates for what lies behind enormously varied degrees of complexity in animals," Dr Sharpe said.

"We expected to identify genes that interacted directly with DNA to regulate other genes, but this was not the case. Instead we identified genes that interacted with 'chromatin'.

"Our results suggest that the increased ability of certain proteins to interact with each other to regulate the dynamic organisation of chromatin in the nucleus as a component of animal complexity."

The results matter, he said, because biomedical scientists depend on better understanding human disease by studying it in animals. While this has value, there is an underlying concern that an animal model may be too simple to be useful, that results seen in a simpler animal may not correlate with what happens in a more complex animal.

Understanding the inherent differences in how animals are organised at genetic level and the limitations to interpretations that this imposes, will provide a more rational selection of appropriate animal models in biomedicine.

Dr Sharpe and team's previous research found that three factors lay behind the proteins made by one gene

-- NCoR -- being more diverse in complex animals such as humans compared to, for example, sea urchins:

- Gene duplication, although the total number of genes in the genome doesn't vary significantly, some specific genes duplicate one or more times, for example there is one NCoR gene in sea urchin and two in humans.

- Single genes often make more than one protein. The messenger RNA (mRNA) that links gene to protein can be processed by 'splicing' to generate a range of different mRNAs, each of which encodes a related, but different protein. For example, the sea urchin gene produces just one type of RNA while in humans the NCoR2 gene produces well over 30 and each is likely to have a different function.

- Most proteins consist of domains that have a specific function. Dr Sharpe and team found that the number of domains increases, again with NCoR, from one in sea urchins to three in humans.

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Physical abuse and punishment impact children's academic performance -- ScienceDaily

A Penn State researcher and her collaborator found that physical abuse was associated with decreases in children's cognitive performance, while non-abusive forms of physical punishment were independently associated with reduced school engagement and increased peer isolation.

Sarah Font, assistant professor of sociology and co-funded faculty member of the Child Maltreatment Solutions Network, and Jamie Cage, assistant professor in Virginia Commonwealth University's School of Social Work, found that children's performances and engagement in the classroom are significantly influenced by their exposure to mild, harsh and abusive physical punishment in the home. Their study was recently published in *Child Abuse and Neglect*.

While corporal punishment and physical abuse have been linked with reduced cognitive development and

academic achievement in children previously, Font's study is one of the few that simultaneously examines abusive and non-abusive physical punishment as reported by both children and caregivers.

Even if physical punishment does not result in serious physical injury, children may experience fear and distress, and this stress has been found to negatively impact brain structure, development and overall well-being.

"This punishment style is meant to inflict minor pain so the child will change their behavior to avoid future punishment, but it does not give children the opportunity to learn how to behave appropriately through explanation and reasoning," stated Font.

In this study, over 650 children and their caregivers were examined in three areas of physical punishment: mild corporal punishment, harsh corporal punishment, and physical abuse. The groups reported their use or experience with physical punishment and researchers then measured cognitive outcomes, school engagement, and peer isolation in the children. The data was analyzed to determine trajectories between cognitive and academic performance and how initial

and varying exposure to physical punishment and abuse influences them.

"We found that while all forms of physical punishment and abuse are associated with declines in school engagement, only initial exposure to physical abuse has a significant negative influence on cognitive performance, and only harsh corporal punishment notably increases peer isolation in children and was observed in both child and caregiver reports. This suggests that preventing physical abuse could promote children's cognitive performance, but it may not be enough to get children to be involved and well-adjusted in school," said Font.

Considering that mild physical punishment can develop into physical abuse and that even these mild punishments have consequences on children's cognitive and social school functioning, parent education on alternative forms of punishment may be one solution to prevent physical abuse.

Programs that reach parents during services that they regularly use may be one way to give them alternative punishment technique education. This could be a medical professional informing parents during a child's

health visit or staff members of an Early Head Start program providing parent education during the child's enrollment. "Further research and efforts in these types of interventions needs to continue so we can learn more," Font said.

This research was made possible support from the Population Research Institute, part of the Social Science Research Institute.

Story Source:

[Materials](#) provided by [Penn State](#). Original written by Brooke McCord. *Note: Content may be edited for style and length.*

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Open-access collider data confirm subatomic particle patterns: CERN Open Data Portal results reveal predictable patterns from colliding high-energy protons -- ScienceDaily

In November of 2014, in a first, unexpected move for the field of particle physics, the Compact Muon Solenoid (CMS) experiment -- one of the main detectors in the world's largest particle accelerator, the Large Hadron Collider -- released to the public an immense amount of data, through a website called the CERN Open Data Portal.

The data, recorded and processed throughout the year 2010, amounted to about 29 terabytes of information, yielded from 300 million individual collisions of high-energy protons within the CMS detector. The sharing of these data marked the first time any major particle collider experiment had released such an information cache to the general public.

A new study by Jesse Thaler, an associate professor of

physics at MIT and a long-time advocate for open access in particle physics, and his colleagues now demonstrates the scientific value of this move. In a paper published in *Physical Review Letters*, the researchers used the CMS data to reveal, for the first time, a universal feature within jets of subatomic particles, which are produced when high-energy protons collide. Their effort represents the first independent, published analysis of the CMS open data.

"In our field of particle physics, there isn't the tradition of making data public," says Thaler. "To actually get data publicly with no other restrictions -- that's unprecedented."

Part of the reason groups at the Large Hadron Collider and other particle accelerators have kept proprietary hold over their data is the concern that such data could be misinterpreted by people who may not have a complete understanding of the physical detectors and how their various complex properties may influence the data produced.

"The worry was, if you made the data public, then you would have people claiming evidence for new physics when actually it was just a glitch in how the detector

was operating," Thaler says. "I think it was believed that no one could come from the outside and do those corrections properly, and that some rogue analyst could claim existence of something that wasn't really there."

"This is a resource that we now have, which is new in our field," Thaler adds. "I think there was a reluctance to try to dig into it, because it was hard. But our work here shows that we can understand in general how to use this open data, that it has scientific value, and that this can be a stepping stone to future analysis of more exotic possibilities."

Thaler's co-authors are Andrew Larkoski of Reed College, Simone Marzani of the State University of New York at Buffalo, and Aashish Tripathy and Wei Xue of MIT's Center for Theoretical Physics and Laboratory for Nuclear Science.

Seeing fractals in jets

When the CMS collaboration publicly released its data in 2014, Thaler sought to apply new theoretical ideas to analyze the information. His goal was to use novel methods to study jets produced from the high-energy collision of protons.

Protons are essentially accumulations of even smaller subatomic particles called quarks and gluons, which are bound together by interactions known in physics parlance as the strong force. One feature of the strong force that has been known to physicists since the 1970s describes the way in which quarks and gluons repeatedly split and divide in the aftermath of a high-energy collision.

This feature can be used to predict the energy imparted to each particle as it cleaves from a mother quark or gluon. In particular, physicists can use an equation, known as an evolution equation or splitting function, to predict the pattern of particles that spray out from an initial collision, and therefore the overall structure of the jet produced.

"It's this fractal-like process that describes how jets are formed," Thaler says. "But when you look at a jet in reality, it's really messy. How do you go from this messy, chaotic jet you're seeing to the fundamental governing rule or equation that generated that jet? It's a universal feature, and yet it has never directly been seen in the jet that's measured."

Collider legacy

In 2014, the CMS released a preprocessed form of the detector's 2010 raw data that contained an exhaustive listing of "particle flow candidates," or the types of subatomic particles that are most likely to have been released, given the energies measured in the detector after a collision.

The following year, Thaler published a theoretical paper with Larkoski and Marzani, proposing a strategy to more fully understand a complicated jet in a way that revealed the fundamental evolution equation governing its structure.

"This idea had not existed before," Thaler says. "That you could distill the messiness of the jet into a pattern, and that pattern would match beautifully onto that equation -- this is what we found when we applied this method to the CMS data."

To apply his theoretical idea, Thaler examined 750,000 individual jets that were produced from proton collisions within the CMS open data. He looked to see whether the pattern of particles in those jets matched with what the evolution equation predicted, given the energies released from their respective collisions.

Taking each collision one by one, his team looked at the most prominent jet produced and used previously developed algorithms to trace back and disentangle the energies emitted as particles cleaved again and again. The primary analysis work was carried out by Tripathee, as part of his MIT bachelor's thesis, and by Xue.

"We wanted to see how this jet came from smaller pieces," Thaler says. "The equation is telling you how energy is shared when things split, and we found when you look at a jet and measure how much energy is shared when they split, they're the same thing."

The team was able to reveal the splitting function, or evolution equation, by combining information from all 750,000 jets they studied, showing that the equation -- a fundamental feature of the strong force -- can indeed predict the overall structure of a jet and the energies of particles produced from the collision of two protons.

While this may not generally be a surprise to most physicists, the study represents the first time this equation has been seen so clearly in experimental data.

"No one doubts this equation, but we were able to

expose it in a new way," Thaler says. "This is a clean verification that things behave the way you'd expect. And it gives us confidence that we can use this kind of open data for future analyses."

Thaler hopes his and others' analysis of the CMS open data will spur other large particle physics experiments to release similar information, in part to preserve their legacies.

"Colliders are big endeavors," Thaler says. "These are unique datasets, and we need to make sure there's a mechanism to archive that information in order to potentially make discoveries down the line using old data, because our theoretical understanding changes over time. Public access is a stepping stone to making sure this data is available for future use."

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All Top News

Top science stories featured on ScienceDaily's home page.

- [**Genes that separate humans from fruit flies found**](#) [周六, 30 9月 10:59]

Genes which determine animal complexity -- or what makes humans so much more complex than a fruit fly or a sea urchin -- have been identified for the first time.

- [**Physical abuse and punishment impact children's academic performance**](#) [周六, 30 9月 03:22]

Scientists have found that physical abuse was associated with decreases in children's cognitive performance, while non-abusive forms of physical punishment were independently associated with reduced school engagement and increased peer isolation.

- [**Video gamers have an advantage in learning**](#) [周六, 30 9月 00:51]

Neuropsychologists let video gamers compete against non-gamers in a learning competition. During the test, the video gamers performed significantly better and showed an increased brain activity in the brain areas that are relevant for learning.

- [**Raccoons solve an ancient puzzle, but do they really understand it?**](#) [周六, 30 9月 00:51]

Scientists have been using an ancient Greek fable written by Aesop as inspiration to test whether birds and small children understand cause and effect relationships. A group of scientists have now extended this body of work to study raccoon intelligence. Their research uses the Aesop's Fable paradigm to assess if mammalian carnivores understand the principles of water displacement.

- [**New study changes our view on flying insects**](#) [周五, 29 9月 23:49]

For the first time, researchers are able to prove that there is an optimal speed for certain insects when they fly. At this speed, they are the most efficient and consume the least amount of energy. Corresponding phenomena have previously been demonstrated in birds, but never among insects.

- [**Small collisions make big impact on Mercury's thin atmosphere**](#) [周五, 29 9月 23:29]

Mercury, our smallest planetary neighbor, has very little to call an atmosphere, but it does have a strange weather pattern: morning micro-meteor showers.

- [**A stinging report: Climate change a major threat to bumble bees**](#) [周五, 29 9月 21:33]

New research is helping to explain the link between a changing global climate and a dramatic decline in bumble bee populations worldwide.

- [**Antarctica: Return of the Weddell polynya supports Kiel climate model**](#) [周五, 29 9月 21:33]

Currently, winter has still a firm grip on Antarctica. At this time of the year, the Weddell Sea usually is covered with a thick layer of sea ice. In spite of the icy temperatures in the region, satellite images depict a large ice-free area in the middle of the ice cover.

- [**Electrically heated textiles now possible via UMass Amherst research**](#) [周五, 29 9月 21:33]

Skiers, crossing guards and others who endure frozen fingers in cold weather may look forward to future relief as manufacturers are poised to take advantage of a new technique for creating electrically heated cloth. Researchers have made gloves that keep fingers as warm as the palm of the hand.

- [**Sharks and rays live a lot longer than we thought**](#) [周五, 29 9月 21:32]

Sharks and rays live a lot longer than we thought -- some twice as long as previously estimated.

- [**Solving the mystery of Pluto's giant blades of ice**](#)

[周五, 29 9月 03:24]

NASA's New Horizons mission revolutionized our knowledge of Pluto when it flew past that distant world in July 2015. Among its many discoveries were images of strange formations resembling giant knife blades of ice, whose origin had remained a mystery. Now, scientists have turned up a fascinating explanation for this "bladed terrain": the structures are made almost entirely of methane ice, and likely formed as a specific kind of erosion wore away their surfaces.

- [**Farthest active inbound comet yet seen**](#) [周五, 29 9月 03:23]

NASA's Hubble Space Telescope has photographed the farthest active inbound comet ever seen, at a whopping distance of 1.5 billion miles from the Sun (beyond Saturn's orbit). Slightly warmed by the remote Sun, it has already begun to develop an 80,000-mile-wide fuzzy cloud of dust, called a coma, enveloping a tiny, solid nucleus of frozen gas and dust. These observations represent the earliest signs of activity ever seen from a comet entering the solar system's planetary zone for the first time.

- [**A fresh look at older data yields a surprise near the Martian equator**](#) [周五, 29 9月 03:22]

Scientists taking a new look at older data from NASA's longest-operating Mars orbiter have discovered evidence of significant hydration near the Martian equator -- a mysterious signature in a region of the Red Planet where planetary scientists figure ice shouldn't exist.

- [**Disease resistance successfully spread from modified to wild mosquitoes**](#) [周五, 29 9月 02:54]

Using genetically modified mosquitoes to reduce or prevent the spread of disease is a rapidly expanding field of investigation. One challenge is ensuring that GM mosquitoes can mate with their wild counterparts so the desired modification is spread in the wild population. Investigators have engineered mosquitoes with an altered microbiota that suppresses

human malaria-causing parasites. These GM mosquitoes preferred to mate with wild mosquitoes and passed the desired protection to offspring.

- [**Tsunami enabled hundreds of aquatic species to raft across Pacific**](#) [周五, 29 9月 02:21]

The 2011 Japanese tsunami set the stage for something unprecedented. For the first time in recorded history, scientists have detected entire communities of coastal species crossing the ocean by floating on makeshift rafts. Nearly 300 species have appeared on the shores of Hawaii and the US West Coast attached to tsunami debris, marine biologists discovered.

- [**New measurements show widespread forest loss has reversed the role of tropics as a carbon sink**](#) [周五, 29 9月 02:20]

A new report provides the most comprehensive picture of deforestation's toll on critical climate change safeguard; reveals hard-to-measure forest degradation is responsible for nearly 70 percent of emissions from tropical forests. Researchers discovered that tropical regions are now a net source of carbon to the atmosphere.

- [**Modern humans emerged more than 300,000 years ago new study suggests**](#) [周五, 29 9月 02:20]

A genomic analysis of ancient human remains from KwaZulu-Natal revealed that southern Africa has an important role to play in writing the history of humankind.

- [**Supersonic gas streams left over from the Big Bang drive massive black hole formation**](#) [周五, 29 9月 02:20]

A super-computer simulation by an international team of researchers has shown the formation of a rapidly growing star from supersonic gas streams in the early universe left over from the Big Bang. The star ends its life with catastrophic collapse to leave a black hole with a mass of 34,000 times that of the Sun.

- [**Summer could be one long heatwave if planet**](#)

[hits 2 degrees Celsius](#) [周五, 29 9月 00:18]

New paper highlighting how heatwaves will change with every degree of global warming up to 5 degrees C. It finds tropical summers may be one continuous heatwave at 2 degrees C.

[Saber-toothed kittens may have been born with thicker bones than other contemporary cats](#) [周五, 29 9月 00:17]

Saber-toothed kittens may have been born with thicker bones compared to other contemporary cats, but they have a similar pattern of bone development, according to a new study.

[Chimpanzees can learn how to use tools without observing others](#) [周四, 28 9月 21:42]

New observations have led researchers to believe that chimpanzees can use tools spontaneously to solve a task, without needing to watch others first.

[The hormone that could be making your dog aggressive discovered](#) [周四, 28 9月 04:20]

Thousands of people are hospitalized every year for dog bites, and aggressive behavior is a major reason dogs end up in shelters. Biologists have studied the biology behind canine aggression, specifically the role of the hormones vasopressin and oxytocin.

[Black holes with ravenous appetites define Type I active galaxies](#) [周四, 28 9月 01:36]

Type I and Type II active galaxies do not just appear different -- they are, in fact, very different from each other, both structurally and energetically, new research shows. According to the results of a new study, the key factor that distinguishes Type I and Type II galaxies is the rate at which their central black holes -- or active galactic nuclei -- consume matter and spit out energy.

[New light shed on how Earth and Mars were created](#) [周四, 28 9月 01:36]

Analysing a mixture of earth samples and meteorites, scientists have shed new light on the sequence of events that led to the creation of the planets Earth and Mars.

- [**The volatile processes that shaped Earth**](#) [周四, 28 9月 01:36]

Although it is widely understood that Earth was formed gradually, from much smaller bodies, many of the processes involved in shaping our growing planet are less clear. Astronomers have now untangled some of these processes, revealing that the mini-planets added to Earth had previously undergone melting and evaporation. They also address another scientific conundrum: Earth's depletion in many economically important chemical elements.

- [**LIGO and Virgo observatories jointly detect black hole collision**](#) [周四, 28 9月 00:36]

The first observation of gravitational waves has been discovered by by three different detectors, marking a new era of greater insights and improved localization of cosmic events now available through globally networked gravitational-wave observatories.

- [**Soft, flexible origami-inspired robot**](#) [周三, 27 9月 22:23]

A Case Western Reserve University researcher has turned the origami she enjoyed as a child into a patent-pending soft robot that may one day be used on an assembly line, in surgery or even outer space.

- [**Emerging infectious disease threatens Darwin's frog with extinction**](#) [周三, 27 9月 22:09]

Iconic species likely to be wiped-out by amphibian fungus, despite lack of obvious short-term evidence.

- [**Geographic variation in Gentoo penguin calls**](#) [周三, 27 9月 21:33]

Vocal communication is central to the lives of many birds, which use sound to attract mates and defend territories. Penguins are no exception, but we know little about how or why penguin vocalizations vary between isolated populations. A new study takes a broad look at vocalizations across the range of Gentoo penguins and concludes that while their calls do vary from place to place, we still have lots to learn

about the processes at work.

- [**Songbird populations may indicate trouble in northwestern forests**](#) [周三, 27 9月 21:33]

Populations of many North American songbirds are declining, and in many cases we don't understand why. Conservation efforts need this information to be effective, and bird banding stations can help fill in the gaps, providing insights into how demographics vary across space and time. A new study presents ten years of data from banding stations across northern California and southern Oregon and offers new hints on what's driving changes in the region's songbird populations.

- [**Tree-dwelling, coconut-cracking giant rat discovered in Solomon Islands**](#) [周三, 27 9月 21:33]

Scientists have discovered a new species of giant rat. It's more than four times the size of the black rats that live in the US, it lives in trees, and it's rumored to crack open coconuts with its teeth. And it's actually pretty cute.

- [**Lost continent of Zealandia: Scientists return from expedition to sunken land**](#) [周三, 27 9月 11:59]

After a nine-week voyage to study the lost, submerged continent of in the South Pacific, a team of 32 scientists from 12 countries has arrived in Hobart, Tasmania, aboard the research vessel JOIDES Resolution.

- [**Caribbean praying mantises have ancient African origin**](#) [周三, 27 9月 11:59]

Three seemingly unrelated praying mantis groups inhabiting Cuba and the rest of the Greater Antilles actually share an ancient African ancestor and possibly form the oldest endemic animal lineage on the Caribbean islands, researchers have determined.

- [**Umbilical cord stem cells show promise as heart failure treatment**](#) [周三, 27 9月 04:23]

Intravenous stem cell infusion derived from umbilical cords appears to boost heart muscle function in patients with heart failure, according to a

small study. In this first-of-its-kind study, patients had 'significant' improvement in their hearts' ability to pump blood and experienced no adverse side effects related to the therapy. The results suggest IV-infused umbilical cord-derived stem cells are a promising avenue to treat heart failure.

- [**Energy harvested from evaporation could power much of US**](#) [周三, 27 9月 00:51]

In the first evaluation of evaporation as a renewable energy source, researchers find that US lakes and reservoirs could generate 325 gigawatts of power, nearly 70 percent of what the United States currently produces.

- [**Amount of water in stem cells can determine its fate as fat or bone**](#) [周三, 27 9月 00:51]

Adding or removing water from a stem cell can change the destiny of the cell to either pre-fat cells or pre-bone cells, researchers have discovered in a new study.

- [**Wearable solar thermoelectric generator created**](#) [周二, 26 9月 22:55]

Engineers have introduced a new advanced energy harvesting system, capable of generating electricity by simply being attached to clothes, windows, and outer walls of a building.

- [**Cartography of the Cosmos**](#) [周二, 26 9月 21:16]

There are hundreds of billions of stars in our own Milky Way galaxy, interspersed with all manner of matter, from the dark to the sublime. This is the universe that one group of researchers is trying to reconstruct, structure by structure, combining telescope surveys with next-generation data analysis and simulation techniques currently being primed for exascale computing.

- [**Pigeons better at multitasking than humans**](#) [周二, 26 9月 21:05]

Pigeons are capable of switching between two tasks as quickly as humans -- and even more quickly in certain situations. These are the findings of biopsychologists who had performed the same behavioral

experiments to test birds and humans. The authors hypothesize that the cause of the slight multitasking advantage in birds is their higher neuronal density.

- [**After 15 years in a vegetative state, nerve stimulation restores consciousness**](#) [周二, 26 9月 01:29]

A 35-year-old man who had been in a vegetative state for 15 years after a car accident has shown signs of consciousness after neurosurgeons implanted a vagus nerve stimulator into his chest. The findings show that vagus nerve stimulation (VNS) -- a treatment already in use for epilepsy and depression--can help to restore consciousness even after many years in a vegetative state.

- [**Antibody protects against Zika and dengue, mouse study shows**](#) [周二, 26 9月 01:29]

The same countries hard hit by Zika virus -- which can cause brain damage in babies infected before birth -- are also home to dengue virus. Researchers now report that they have found an antibody that protects against both viruses. These findings, in mice, could be a step towards an antibody-based preventative drug to protect fetuses from brain damage, while also protecting their mothers from both Zika and dengue disease.

- [**Lava tubes: Hidden sites for future human habitats on the Moon and Mars**](#) [周一, 25 9月 23:28]

Lava tubes, underground caves created by volcanic activity, could provide protected habitats large enough to house streets on Mars or even towns on the Moon, according to new research. A further study shows how the next generation of lunar orbiters will be able to use radar to locate these structures under the Moon's surface.

- [**Visual attention drawn to meaning, not what stands out**](#) [周一, 25 9月 23:13]

Our visual attention is drawn to parts of a scene that have meaning, rather than to those that are salient or 'stick out,' according to new research. The findings overturn the widely held model of visual attention.

- **[Panda habitat shrinking, becoming more fragmented](#)** [周一, 25 9月 23:13]

Using remote sensing data, Chinese and US scientists have re-assessed the conservation status of the giant panda. Their analysis shows that while panda numbers are increasing, their habitat still covers less area and is more fragmented than it was in 1988, when the species was listed as endangered on the IUCN Red List.

- **[Child abuse affects brain wiring](#)** [周一, 25 9月 23:13]

For the first time, researchers have been able to see changes in the neural structures in specific areas of the brains of people who suffered severe abuse as children. The researchers believe that these changes may contribute to the emergence of depressive disorders and suicidal behavior.

- **[Genes are controlled by 'Nano footballs,' scientists discover](#)** [周一, 25 9月 23:12]

Genes are controlled by 'nano footballs' -- structures that look like footballs but 10 million times smaller than the average ball -- new research has revealed.

- **[Brain damage in fish from plastic nanoparticles in water](#)** [周一, 25 9月 22:47]

A new study shows that plastic particles in water may end up inside fish brains. The plastic can cause brain damage, which is the likely cause of behavioral disorders observed in the fish.

- **[Brain guides body much sooner than previously believed](#)** [周一, 25 9月 21:54]

The brain plays an active role much earlier than previously thought. Long before movement or other behaviors occur, the nascent brain of an embryonic frog instructs normal muscle and nerve patterning and protects the embryo from agents that cause developmental defects. In addition to identifying these essential functions for the first time, researchers successfully rescued defects caused by lack of a brain by

using widely available, human-approved drugs.

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Health News

Top stories featured on ScienceDaily's Health & Medicine, Mind & Brain, and Living Well sections.

- [**Genes that separate humans from fruit flies found**](#) [周六, 30 9月 10:59]

Genes which determine animal complexity -- or what makes humans so much more complex than a fruit fly or a sea urchin -- have been identified for the first time.

- [**A new approach to cancer drug discovery**](#) [周六, 30 9月 03:22]

Scientists have developed and demonstrated a promising new strategy for the discovery of novel anti-cancer therapies.

- [**Physical abuse and punishment impact children's academic performance**](#) [周六, 30 9月 03:22]

Scientists have found that physical abuse was associated with decreases in children's cognitive performance, while non-abusive forms of physical punishment were independently associated with reduced school engagement and increased peer isolation.

- [**Snapchat users motivation, level of interest**](#) [周六, 30 9月 01:35]

The simplicity of the platform and brevity of posts are key factors in determining how students can become very regular users.

- [**Confronted with bacteria, infected cells die so others can live, study finds**](#) [周六, 30 9月 01:26]

In a new study, a team of researchers identified a 'back-up alarm' system in host cells that responds to a pathogen's attempt to subvert the immune system.

• [**Video gamers have an advantage in learning**](#) [周六, 30 9月 00:51]

Neuropsychologists let video gamers compete against non-gamers in a learning competition. During the test, the video gamers performed significantly better and showed an increased brain activity in the brain areas that are relevant for learning.

• [**New mouse model replicates an underlying cause of intellectual disability**](#) [周六, 30 9月 00:50]

Researchers have developed the first mice that lack the Upf3b gene, providing a new model for studying its underlying role in intellectual disabilities and neurodevelopmental disorders.

• [**Protein that could improve symptoms and reduce mortality in flu**](#) [周五, 29 9月 23:29]

Flu season is on its way, and a new report has identified an innovative strategy for battling this deadly illness.

• [**Why do we fall asleep when bored?**](#) [周五, 29 9月 21:34]

Why do we have the tendency to fall asleep in the absence of motivating stimuli, i.e., when bored.

• [**Safety, effectiveness of cognitive enhancers for Alzheimer's ranked**](#) [周五, 29 9月 21:33]

A new study ranking the safety and effectiveness of four drugs taken to enhance concentration, memory, alertness and moods, found that donepezil was most likely to effectively improve cognition in patients with Alzheimer's disease.

• [**MRIs are safe for patients with wide variety of pacemakers, defibrillators, study shows**](#) [周五, 29 9月 21:33]

Magnetic resonance imaging appears to be safe for patients with cardiac implantable electronic devices, even for chest imaging, according to a new study.

• [**Frequent sauna bathing keeps blood pressure in check**](#) [周五, 29 9月 21:33]

Frequent sauna bathing reduces the risk of elevated blood pressure, according to an extensive follow-up population-based study. The risk of developing elevated blood pressure was nearly 50 percent lower among men who had a sauna 4-7 times a week compared to men who had a sauna only once a week.

• [**New regulator of liver metabolism discovered**](#) [周五, 29 9月 21:33]

Researchers have identified an enzyme that has a major effect on glucose utilization in liver cells. The enzyme, retinol saturase, helps these cells adapt to variations in glucose levels. However, when glucose levels are consistently too high, retinol saturase appears to exert a damaging effect on cells.

• [**How the lungs of premature babies can undergo damage**](#) [周五, 29 9月 21:33]

Premature babies that need ventilation to support their breathing often suffer from a condition known as bronchopulmonary dysplasia. Researchers have now discovered a molecular mechanism that plays a key role in the development of the disease.

• [**Breakdown of brain cells' metabolic collaboration linked to Alzheimer's disease**](#) [周五, 29 9月 21:33]

Researchers have discovered that impairing a critical partnership between brain cells can lead to neurodegeneration.

• [**New role for fragile X protein could offer clues for treatment**](#) [周五, 29 9月 21:33]

The protein behind fragile X syndrome, a leading cause of autism and intellectual disability, controls a suite of genetic regulators.

• [**Immune system cells protect against CMV-induced hearing loss in mice**](#) [周五, 29 9月 21:33]

Immune system cells known as natural killer cells play an important protective role against hearing loss in mice infected with cytomegalovirus (CMV), according to a new study.

- [**An epidemic of dream deprivation: Unrecognized health hazard of sleep loss**](#) [周五, 29 9月 21:32]

A sleep and dream specialist has completed a comprehensive review of data about the causes, extent and consequences of dream loss includes recommendations for restoring healthy dreaming.

- [**Elderly who have trouble identifying odors face risk of dementia**](#) [周五, 29 9月 21:32]

A long-term study of nearly 3,000 older adults found that those who could not identify at least four out of five common odors were more than twice as likely as those with a normal sense of smell to develop dementia within five years. About 14 percent could name just three, 5 percent could identify only two, and 2 percent could name just one. One percent of the study subjects were not able to identify a single scent.

- [**New functions of hippocampus unveiled**](#) [周五, 29 9月 21:32]

A research team has made major breakthrough in unveiling the mysteries of the brain to reveal functions of an important region, hippocampus, not known to scientists before.

- [**Transcranial electrical stimulation shows promise for treating mild traumatic brain injury**](#) [周五, 29 9月 21:30]

Using a form of low-impulse electrical stimulation to the brain, documented by neuroimaging, researchers report significantly improved neural function in participants with mild traumatic brain injury (TBI).

- [**m6A enzymes found to be central to the development of AML**](#) [周五, 29 9月 04:05]

A new molecular pathway that is required for acute myeloid leukemia (AML) development has been identified by a team of researchers for the first time. This work could provide a rationale for targeting the RNA methylation program in myeloid leukemia.

- [**Broad-spectrum inhibitors of influenza virus developed**](#) [周五, 29 9月 03:28]

Artificial peptide molecules that neutralize a broad range of influenza virus strains have been developed by a team of researchers.

- [**Understanding connection between HIV transmission, racial/ethnic/geographical differences**](#) [周五, 29 9月 02:54]

The health effects of where people live, work, and interact are well documented, as are the value of neighborhood-level structural interventions designed to improve health. But place-based characteristics that contribute to disparities in HIV transmission and disease burden are poorly understood, possibly resulting in less-effective HIV risk reduction interventions and programming.

- [**Disease resistance successfully spread from modified to wild mosquitoes**](#) [周五, 29 9月 02:54]

Using genetically modified mosquitoes to reduce or prevent the spread of disease is a rapidly expanding field of investigation. One challenge is ensuring that GM mosquitoes can mate with their wild counterparts so the desired modification is spread in the wild population. Investigators have engineered mosquitoes with an altered microbiota that suppresses human malaria-causing parasites. These GM mosquitoes preferred to mate with wild mosquitoes and passed the desired protection to offspring.

- [**Massive projected increase in use of antimicrobials in animals by 2030**](#) [周五, 29 9月 02:21]

The amount of antimicrobials given to animals destined for human consumption is expected to rise by a staggering 52 percent and reach 200,000 tons by 2030 unless policies are implemented to limit their use, according to new research.

- [**Smart molecules trigger white blood cells to become better cancer-eating machines**](#) [周五, 29 9月 02:21]

A team of researchers has engineered smart protein molecules that can reprogram white blood cells to ignore a self-defense signaling

mechanism that cancer cells use to survive and spread in the body. Researchers say the advance could lead to a new method of re-engineering immune cells to fight cancer and infectious diseases. The team successfully tested this method in a live cell culture system.

• [**How molecular scissors cut in the right place**](#) [周五, 29 9月 02:21]

A research group has found out how CRISPR-Cas9 -- also known as 'molecular scissors' -- can search the genome for a specific DNA sequence. Cas9 already has many applications in biotechnology and is also expected to revolutionize medicine. The new research findings show how Cas9 can be improved to make the molecular scissors faster and more reliable.

• [**Neuro-immune crosstalk in allergic asthma**](#) [周五, 29 9月 02:21]

A research team has uncovered a fundamental molecular cue that the nervous system uses to communicate with the immune system, and may potentially trigger allergic lung inflammation leading to asthma.

• [**Protecting 'self-reactive' immune cells so they can fight melanoma**](#) [周五, 29 9月 02:21]

Researchers report on a potential new way to fight melanoma by blocking one of the immune system's checks and balances.

• [**Why public appeals may fall flat with some would-be donors**](#) [周五, 29 9月 02:21]

To give or not to give: sometimes the answer is in the question, researchers into human behavior and charitable giving have found. The study suggests that sometimes the 'ask' needs to suit the potential donors' sense of independence or interdependence.

• [**Students know about learning strategies -- but don't use them**](#) [周五, 29 9月 02:21]

Researchers find that university students have high levels of knowledge about self-regulated learning strategies, but many students don't use them. Specific training on how and when to use these techniques could help more students to maximize their academic potential.

- [**Bed bugs attracted to dirty laundry**](#) [周五, 29 9月 02:20]

Bed bugs are attracted to dirty laundry, according to new research.

- [**Molecular fingerprint of breast tumors linked to immune response in bloodstream**](#) [周五, 29 9月 02:20]

Using newly developed software, researchers have shown that genes and molecular processes in breast cancer tumor cells are tightly linked to genes and processes in blood cells, including immune system cells.

- [**Central America 'kissing bug' carries two main subtypes of Chagas disease parasite**](#) [周五, 29 9月 02:20]

Trypanosoma cruzi, the parasite that causes Chagas disease, is divided into six strains, each of which differs in where they are found and in how important they are in human infections. Now, researchers have found that most T. cruzi parasites in Central America belong to just two of those strains.

- [**Male hormones may promote infection by virus that causes Kaposi's sarcoma**](#) [周五, 29 9月 02:20]

Male hormones may facilitate infection with a virus that can cause a type of cancer known as Kaposi's sarcoma. This finding could help explain why men have an increased risk of developing Kaposi's sarcoma.

- [**How 'love hormone' spurs sociability**](#) [周五, 29 9月 02:20]

Oxytocin, a substance involved in nurturing, sexual and pair-bonding behaviors, has also been implicated in overall sociability. A new study describes the brain circuitry that's involved.

- [**Speedy urine test for amphetamines sends results via app**](#) [周五, 29 9月 00:17]

Researchers have developed a wireless sensor and a smartphone app that can detect the presence of speed in a drop of human urine in seconds. The prototype device is also portable enough to be worn as a bracelet, has unprecedented sensitivity for amphetamines with low risk for false-positive results, and costs about \$50 to produce.

- **[For boys at risk of psychopathy, laughter isn't so contagious](#)** [周五, 29 9月 00:17]

For most people, laughter is highly contagious. It's nearly impossible to hear or see someone laughing and not feel the urge to join in. But researchers have new evidence to show that boys at risk of developing psychopathy when they become adults don't have that same urge.

- **[Incurable childhood brain tumors split into 10 new diseases](#)** [周五, 29 9月 00:17]

Scientists have found that deadly childhood brain tumors are actually 10 different diseases that should each be diagnosed and treated based on their specific genetic faults. The major new study has important implications for treatment, since personalizing care for each type of brain tumor is likely to be much more effective than grouping them all together as one.

- **[How brain develops before birth is tightly controlled by RNA modification](#)** [周五, 29 9月 00:17]

A chemical tag added to RNA during embryonic development regulates how the early brain grows. When this development goes awry, problems happen and may cause psychiatric disorders in people.

- **[How do we sense moonlight? Daylight? There's a cell for that](#)** [周五, 29 9月 00:17]

Neuroscientists describe an unexpected way that we sense the overall degree of illumination in our environment. They found that neurons in the retina of the eye divvy up the job, with particular neurons tuned to different ranges of light intensity.

- **[Uncovering why psoriasis recurs](#)** [周五, 29 9月 00:17]

New research helps address a longstanding question about the inflammatory skin condition psoriasis: Why do skin lesions that have resolved with therapy recur in the same locations after a patient stops using topical steroids?

- **[Necessity is indeed mother of invention,](#)**

regardless of resources, study shows [周五, 29 9月 00:16]

People who live in extremely resource poor environments can also be highly innovative in a different way and provide benefits to a range of people through creative problem solving, research shows.

Zinc can halt the growth of cancer cells, study says [周五, 29 9月 00:16]

Zinc supplements can significantly inhibit the proliferation of esophageal cancer cells, according to a new study.

Nearly one in six new HIV diagnoses in Europe are among people over 50 [周五, 29 9月 00:16]

A new study showed that while the rate of newly reported HIV cases in Europe remained steady in younger people between 2004 and 2015, it increased by 2 percent each year overall in older people. With around 30,000 newly diagnosed HIV infections reported each year over the last decade, the HIV epidemic remains a significant public health problem in the 31 countries of the European Union and European Economic Area.

Highly virulent bacterium causes rampant caries in some children [周五, 29 9月 00:16]

Researchers have made a novel discovery connecting highly variant types of the caries bacterium *Streptococcus mutans* and their adhesive function to children with rampant caries and increased risk of dental caries.

Study provides first estimate of total US population with felony convictions [周五, 29 9月 00:16]

New research on the growth in the scope and scale of felony convictions finds that, as of 2010, 3 percent of the total US population and 15 percent of the African-American male population have served time in prison. People with felony convictions more broadly account for 8 percent of the overall population and 33 percent of the African-American male population.

In people with OCD, actions are at odds with

[beliefs](#) [周五, 29 9月 00:16]

The repeated behaviors that characterize obsessive-compulsive disorder are a manifestation of an underlying brain dysfunction that is not yet well understood. Now, scientists report the use of a mathematical model that they say will help them get at the root of what causes OCD. They find that people with OCD develop an internal, accurate sense of how things work but do not use it to guide behavior.

. [Tracking the body's mini-shuttles](#) [周四, 28 9月 23:30]

The development of a new technique for labelling the body's own transporters -- exosomes -- could have long term benefits in the treatment of life-threatening medical conditions, including cancer.

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [**Brain-controlled drones are here: What's coming in the next five years?**](#) [周六, 30 9月 11:04]

Single unmanned autonomous vehicles (UAVs) directed by joysticks, radio controllers, and mobile phones are already accomplishing a variety of useful tasks, such as aerial photography and security patrols. But using multiple drones requires multiple human operators, and this presents a coordination problem.

- [**UV-irradiated amorphous ice behaves like liquid at low temperatures**](#) [周六, 30 9月 03:21]

Ice analogs mimicking interstellar ice behave like liquids at temperatures between -210°C and -120°C according to researchers. This liquid-like ice may enhance the formation of organic compounds including prebiotic molecules and the accretion of dust to form planets.

- [**Compound from oilseeds may be high-value product**](#) [周六, 30 9月 01:35]

Extracting a substance called glucosinolate from camelina and carinata seeds may help bring these promising sources of biofuel one stop closer to reality.

- [**Video gamers have an advantage in learning**](#) [周六, 30 9月 00:51]

Neuropsychologists let video gamers compete against non-gamers in a learning competition. During the test, the video gamers performed significantly better and showed an increased brain activity in the brain areas that are relevant for learning.

- [**Helium found in coal seams could aid safe shale gas extraction**](#) [周六, 30 9月 00:50]

Natural deposits of helium gas found in UK coal seams could help scientists monitor the secure recovery of coal or shale gas from underground sites, according to research.

- [**New technique could detect explosives, dangerous gases rapidly, remotely**](#) [周六, 30 9月 00:50]

A laser-based method that could be used to detect chemicals such as explosives and dangerous gases quickly and accurately has now been developed by researchers.

- [**There are only 15 possible pentagonal tiles**](#) [周五, 29 9月 23:50]

Tiling the plane with a single pattern is a mathematical problem that has interested humans since Antiquity, notably for the aesthetic quality of tiles in mosaics or tiling. One of the unresolved problems in this field that has been puzzling the scientific community since 1918 has now been definitively resolved.

- [**Bioreactors on a chip renew promises for algal biofuels**](#) [周五, 29 9月 23:29]

Researchers report exciting new technology that may revolutionize the search for the perfect algal strain: algal droplet bioreactors on a chip the size of a quarter.

- [**Small collisions make big impact on Mercury's thin atmosphere**](#) [周五, 29 9月 23:29]

Mercury, our smallest planetary neighbor, has very little to call an atmosphere, but it does have a strange weather pattern: morning micro-meteor showers.

- [**MRIs are safe for patients with wide variety of pacemakers, defibrillators, study shows**](#) [周五, 29 9月 21:33]

Magnetic resonance imaging appears to be safe for patients with cardiac implantable electronic devices, even for chest imaging, according to a

new study.

- [**Ultracold atoms point toward an intriguing magnetic behavior**](#) [周五, 29 9月 21:33]

Researchers have studied the quantum behavior of ultracold atoms and discovered an intriguing magnetic behavior that could help explain how high-temperature superconductivity works.

- [**Electrically heated textiles now possible via UMass Amherst research**](#) [周五, 29 9月 21:33]

Skiers, crossing guards and others who endure frozen fingers in cold weather may look forward to future relief as manufacturers are poised to take advantage of a new technique for creating electrically heated cloth. Researchers have made gloves that keep fingers as warm as the palm of the hand.

- [**Uncovering a winning basketball formula**](#) [周五, 29 9月 21:32]

Scientists have come up with a winning formula for basketball teams looking to take home Olympic gold.

- [**Ultra-fast and ultra-sensitive hydrogen sensor**](#) [周五, 29 9月 21:29]

Scientists have made an ultra-fast hydrogen sensor that can detect hydrogen gas levels under 1 percent in less than seven seconds. The sensor also can detect hundreds of parts per million levels of hydrogen gas within 60 seconds at room temperature.

- [**Sensible driving saves more gas than drivers think**](#) [周五, 29 9月 03:27]

A new study has quantified the impact speeding and slamming on the brakes has on fuel economy and consumption. Aggressive behavior behind the wheel can lower gas mileage in light-duty vehicles, which can equate to losing about \$0.25 to \$1 per gallon.

- [**Solving the mystery of Pluto's giant blades of ice**](#) [周五, 29 9月 03:24]

NASA's New Horizons mission revolutionized our knowledge of Pluto when it flew past that distant world in July 2015. Among its many

discoveries were images of strange formations resembling giant knife blades of ice, whose origin had remained a mystery. Now, scientists have turned up a fascinating explanation for this "bladed terrain": the structures are made almost entirely of methane ice, and likely formed as a specific kind of erosion wore away their surfaces.

• [**Farthest active inbound comet yet seen**](#) [周五, 29 9月 03:23]

NASA's Hubble Space Telescope has photographed the farthest active inbound comet ever seen, at a whopping distance of 1.5 billion miles from the Sun (beyond Saturn's orbit). Slightly warmed by the remote Sun, it has already begun to develop an 80,000-mile-wide fuzzy cloud of dust, called a coma, enveloping a tiny, solid nucleus of frozen gas and dust. These observations represent the earliest signs of activity ever seen from a comet entering the solar system's planetary zone for the first time.

• [**A fresh look at older data yields a surprise near the Martian equator**](#) [周五, 29 9月 03:22]

Scientists taking a new look at older data from NASA's longest-operating Mars orbiter have discovered evidence of significant hydration near the Martian equator -- a mysterious signature in a region of the Red Planet where planetary scientists figure ice shouldn't exist.

• [**It takes the right amount of carbon**](#) [周五, 29 9月 03:22]

Researchers have created a model that sheds new light on the formation of terrestrial planets and Earth.

• [**Flexible new platform for high-performance electronics**](#) [周五, 29 9月 02:21]

A team of engineers has created the most functional flexible transistor in the world -- and with it, a fast, simple and inexpensive fabrication process that's easily scalable to the commercial level. It's an advance that could open the door to an increasingly interconnected world, enabling manufacturers to add 'smart,' wireless capabilities to any number of large or small products or objects -- like wearable sensors and computers for people and animals -- that curve, bend, stretch and move.

- [**Generating terahertz radiation from water makes 'the impossible, possible'**](#) [周五, 29 9月 02:21]

For nearly a decade, researchers have worked to solve a scientific puzzle that many in the research community believed to be impossible: producing terahertz waves -- a form of electromagnetic radiation in the far infrared frequency range -- from liquid water.

- [**Supersonic gas streams left over from the Big Bang drive massive black hole formation**](#) [周五, 29 9月 02:20]

A super-computer simulation by an international team of researchers has shown the formation of a rapidly growing star from supersonic gas streams in the early universe left over from the Big Bang. The star ends its life with catastrophic collapse to leave a black hole with a mass of 34,000 times that of the Sun.

- [**Perovskite solar cells reach record long-term stability, efficiency over 20 percent**](#) [周五, 29 9月 02:20]

Scientists have greatly improved the operational stability of perovskite solar cells by introducing cuprous thiocyanate protected by a thin layer of reduced graphene oxide. Devices lost less than 5 percent performance when subjected to a crucial accelerated aging test during which they were exposed for more than 1,000 hours to full sunlight at 60°C.

- [**Speedy urine test for amphetamines sends results via app**](#) [周五, 29 9月 00:17]

Researchers have developed a wireless sensor and a smartphone app that can detect the presence of speed in a drop of human urine in seconds. The prototype device is also portable enough to be worn as a bracelet, has unprecedented sensitivity for amphetamines with low risk for false-positive results, and costs about \$50 to produce.

- [**Fluorine-containing molecules from cell cultures**](#) [周五, 29 9月 00:16]

Natural organic compounds that contain fluorine are rare because living organisms -- with a few exceptions -- do not produce them. Scientists have now genetically engineered a microbial host for organofluorine

metabolism, allowing it to produce a fluoridated intermediate known as a diketide. As reported, the diketide could then be used as a monomer for the in vivo production of fluorinated bioplastics.

- [**Popping bubbles: Surfactants have surprising effect on nanobubble stability**](#) [周五, 29 9月 00:16]

The stability of nanobubbles is well understood, but the mechanisms causing their eventual destabilization are still in question. Using molecular dynamics simulations, researchers explored the effect of surfactants -- components that lower surface tension -- on the stabilization of nanobubbles.

- [**How do zebrafish develop their stripes?**](#) [周四, 28 9月 22:31]

A mathematician has thrown new light on the longstanding mystery of how zebrafish develop the distinctive striped patterns on their skin.

- [**Bursting with starbirth**](#) [周四, 28 9月 22:12]

This oddly shaped galactic spectacle is bursting with brand new stars. The pink fireworks in this image taken with the NASA/ESA Hubble Space Telescope are regions of intense star formation, triggered by a cosmic-scale collision. The huge galaxy in this image, NGC 4490, has a smaller galaxy in its gravitational grip and is feeling the strain.

- [**Small scale energy harvesters show large scale impact**](#) [周四, 28 9月 22:12]

The production of nano-scale devices has drastically increased with the rise in technological applications, yet a major drawback to the functionality of nano-sized systems is the need for an equally small energy resource. To address this, researchers have been modeling new piezoelectric energy harvester technology at the nano-scale level.

- [**Biodegradable microsensors for food monitoring**](#) [周四, 28 9月 21:42]

A new generation of microsensors could provide the vital link between food products and the Internet of Things. Researchers have developed an ultra-thin temperature sensor that is both biocompatible and biodegradable.

- [**Making surgical screws from bones**](#) [周四, 28 9月 20:51]

Biomechanics are developing surgical screws from donated human bone material for foot and jaw surgery together with an Austrian start-up.

- [**Non-toxic flame retardant enters market, study suggests**](#) [周四, 28 9月 20:51]

Chemists have developed and patented an environmentally friendly way to produce flame retardants for foams that can be used in mattresses and upholstery. Unlike previous flame retardants made of chemicals containing chlorine, the new material is non-toxic and effective, researchers say.

- [**Move towards 'holy grail' of computing by creation of brain-like photonic microchips**](#) [周四, 28 9月 04:20]

Scientists have made a crucial step towards unlocking the 'holy grail' of computing -- microchips that mimic the way the human brain works to store and process information.

- [**High cost of truckers not having enough places to park and rest**](#) [周四, 28 9月 04:20]

A pilot study illustrates the high economic cost of having too few safe places for commercial truck drivers to park and rest.

- [**Band gaps, made to order**](#) [周四, 28 9月 04:20]

Engineers have created atomically thin superlattice materials with precision.

- [**Atomistic simulations go the distance on metal strength**](#) [周四, 28 9月 04:20]

Researchers have dived down to the atomic scale to resolve every 'jiggle and wiggle' of atomic motion that underlies metal strength.

- [**Minimally invasive valve replacements hold up well after five years, study shows**](#) [周四, 28 9月 01:36]

A minimally invasive procedure used to replace heart valves without open heart surgery appears to provide a durable remedy for people with

a life-threatening form of heart disease in which the aortic valve opening narrows, diminishing blood flow.

- [**Black holes with ravenous appetites define Type I active galaxies**](#) [周四, 28 9月 01:36]

Type I and Type II active galaxies do not just appear different -- they are, in fact, very different from each other, both structurally and energetically, new research shows. According to the results of a new study, the key factor that distinguishes Type I and Type II galaxies is the rate at which their central black holes -- or active galactic nuclei -- consume matter and spit out energy.

- [**New light shed on how Earth and Mars were created**](#) [周四, 28 9月 01:36]

Analysing a mixture of earth samples and meteorites, scientists have shed new light on the sequence of events that led to the creation of the planets Earth and Mars.

- [**The volatile processes that shaped Earth**](#) [周四, 28 9月 01:36]

Although it is widely understood that Earth was formed gradually, from much smaller bodies, many of the processes involved in shaping our growing planet are less clear. Astronomers have now untangled some of these processes, revealing that the mini-planets added to Earth had previously undergone melting and evaporation. They also address another scientific conundrum: Earth's depletion in many economically important chemical elements.

- [**Recipe for quantum-enhanced technologies refined**](#) [周四, 28 9月 00:57]

A breakthrough has been made in understanding the structure of entanglement in quantum systems with long-range interactions.

- [**Turbocharging engine design**](#) [周四, 28 9月 00:51]

Researchers have moved the development process into the passing lane. For the first time, scientists and engineers have pinpointed engine designs for a given fuel using the Mira supercomputer at the heart of the Argonne Leadership Computing Facility (ALCF), a DOE Office of

Science User Facility.

- [**Prototype UT equipment can detect rheumatoid arthritis**](#) [周四, 28 9月 00:50]

Researchers have designed a device that shows the difference between healthy fingers and arthritic fingers, according to a first clinical study published. The researchers responsible for the development of the compact device believe that it may in time help doctors to objectively diagnose the degree of inflammation in joints.

- [**LIGO and Virgo observatories jointly detect black hole collision**](#) [周四, 28 9月 00:36]

The first observation of gravitational waves has been discovered by by three different detectors, marking a new era of greater insights and improved localization of cosmic events now available through globally networked gravitational-wave observatories.

- [**Unlocking the mysteries of memory -- and potentially enhancing it**](#) [周四, 28 9月 00:36]

Memory acts like an anchor, reminding us of past experiences that have made us who we are today. Attempts to boost it, particularly as we age, have sprouted cottage industries of supplements and brain games. In parallel, researchers have been pursuing pharmaceutical interventions. In some of the latest work on this front, one team reports that they have identified a novel compound that enhances long-term memory in animal studies.

- [**Ancient ink for cancer treatment**](#) [周四, 28 9月 00:35]

For hundreds of years, Chinese calligraphers have used a plant-based ink to create beautiful messages and art. Now, one group reports that this ink could noninvasively and effectively treat cancer cells that spread, or metastasize, to lymph nodes.

- [**Total solar eclipse viewed from space**](#) [周四, 28 9月 00:35]

While people across the nation gazed at August's total solar eclipse from Earth, a bread loaf-sized NASA satellite had a front row seat for the astronomical event.

• [**On a collision course with game theory**](#) [周三, 27 9月 22:23]

How do pedestrians behave in a large crowd? How do they avoid collisions? How can their paths be modeled? A new approach developed by mathematicians provides answers to these questions.

• [**Soft, flexible origami-inspired robot**](#) [周三, 27 9月 22:23]

A Case Western Reserve University researcher has turned the origami she enjoyed as a child into a patent-pending soft robot that may one day be used on an assembly line, in surgery or even outer space.

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [**Genes that separate humans from fruit flies found**](#) [周六, 30 9月 10:59]

Genes which determine animal complexity -- or what makes humans so much more complex than a fruit fly or a sea urchin -- have been identified for the first time.

- [**Compound from oilseeds may be high-value product**](#) [周六, 30 9月 01:35]

Extracting a substance called glucosinolate from camelina and carinata seeds may help bring these promising sources of biofuel one stop closer to reality.

- [**Confronted with bacteria, infected cells die so others can live, study finds**](#) [周六, 30 9月 01:26]

In a new study, a team of researchers identified a 'back-up alarm' system in host cells that responds to a pathogen's attempt to subvert the immune system.

- [**Raccoons solve an ancient puzzle, but do they really understand it?**](#) [周六, 30 9月 00:51]

Scientists have been using an ancient Greek fable written by Aesop as inspiration to test whether birds and small children understand cause and effect relationships. A group of scientists have now extended this body of work to study raccoon intelligence. Their research uses the Aesop's Fable paradigm to assess if mammalian carnivores understand the principles of water displacement.

- [**Helium found in coal seams could aid safe shale gas extraction**](#) [周六, 30 9月 00:50]

Natural deposits of helium gas found in UK coal seams could help scientists monitor the secure recovery of coal or shale gas from underground sites, according to research.

- [**New study changes our view on flying insects**](#) [周五, 29 9月 23:49]

For the first time, researchers are able to prove that there is an optimal speed for certain insects when they fly. At this speed, they are the most efficient and consume the least amount of energy. Corresponding phenomena have previously been demonstrated in birds, but never among insects.

- [**Erosion from ancient tsunami in Northern California**](#) [周五, 29 9月 23:30]

Geologists use ground-penetrating radar to determine the breadth and depth of erosion from an ancient tsunami in Northern California.

- [**Scandinavia's earliest farmers exchanged terminology with Indo-Europeans**](#) [周五, 29 9月 23:29]

5,000 years ago, the Yamnaya culture migrated into Europe from the Caspian steppe. In addition to innovations such as the wagon and dairy production, they brought a new language -- Indo-European -- that replaced most local languages the following millennia. But local cultures also influenced the new language, particularly in southern Scandinavia, where Neolithic farmers made lasting contributions to Indo-European vocabulary before their own language went extinct, new research shows.

- [**Algae with light switch**](#) [周五, 29 9月 23:29]

The adhesion of *Chlamydomonas*, a unicellular alga, to surfaces is light-dependent.

- [**Arbuscular mycorrhizal fungal communities exposed with new DNA sequencing approach**](#) [周五, 29 9月 23:29]

Arbuscular mycorrhizal fungal systems play crucial roles in their environment, affecting the plants that can grow there and the nutrients in the soils. Researchers have developed a new DNA sequencing technique using barcoded primers that is capable of detecting rare fungal species in a community, paving the way for future insights into how they might vary in response to environmental changes.

- [**A stinging report: Climate change a major threat to bumble bees**](#) [周五, 29 9月 21:33]

New research is helping to explain the link between a changing global climate and a dramatic decline in bumble bee populations worldwide.

- [**Antarctica: Return of the Weddell polynya supports Kiel climate model**](#) [周五, 29 9月 21:33]

Currently, winter has still a firm grip on Antarctica. At this time of the year, the Weddell Sea usually is covered with a thick layer of sea ice. In spite of the icy temperatures in the region, satellite images depict a large ice-free area in the middle of the ice cover.

- [**New clues from brain structures of mantis shrimp**](#) [周五, 29 9月 21:33]

New research sheds new light on the evolution of some of the earliest brain structures, and stirs up new, intriguing questions about the origins of centers that support learning and memory.

- [**Sharks and rays live a lot longer than we thought**](#) [周五, 29 9月 21:32]

Sharks and rays live a lot longer than we thought -- some twice as long as previously estimated.

- [**Global methane emissions from agriculture larger than reported, according to new estimates**](#) [周五, 29 9月 21:32]

Global methane emissions from agriculture are larger than estimated due to the previous use of out-of-date data on carbon emissions generated by livestock, according to a new study.

- [**Broad-spectrum inhibitors of influenza virus developed**](#) [周五, 29 9月 03:28]

Artificial peptide molecules that neutralize a broad range of influenza virus strains have been developed by a team of researchers.

- [**Hunt is over for one of the 'top 50 most-wanted fungi'**](#) [周五, 29 9月 03:27]

In a step toward bridging the gap between fungal taxonomy and molecular ecology, scientists have characterized a sample of "mystery" fungus collected in North Carolina and found its home in the fungal tree of life.

- [**Sensible driving saves more gas than drivers think**](#) [周五, 29 9月 03:27]

A new study has quantified the impact speeding and slamming on the brakes has on fuel economy and consumption. Aggressive behavior behind the wheel can lower gas mileage in light-duty vehicles, which can equate to losing about \$0.25 to \$1 per gallon.

- [**How different ant species coexist in the same territory**](#) [周五, 29 9月 03:22]

In every animal community, several species in the same group share habitats. An international team has chosen ants to create the largest public-access database on the cohabitation of these insects. The goal is to understand their tricks for coexistence and how they respond to invasive species and climate change.

- [**Disease resistance successfully spread from modified to wild mosquitoes**](#) [周五, 29 9月 02:54]

Using genetically modified mosquitoes to reduce or prevent the spread of disease is a rapidly expanding field of investigation. One challenge is ensuring that GM mosquitoes can mate with their wild counterparts so the desired modification is spread in the wild population. Investigators have engineered mosquitoes with an altered microbiota that suppresses human malaria-causing parasites. These GM mosquitoes preferred to

mate with wild mosquitoes and passed the desired protection to offspring.

- **[Massive projected increase in use of antimicrobials in animals by 2030](#)** [周五, 29 9月 02:21]

The amount of antimicrobials given to animals destined for human consumption is expected to rise by a staggering 52 percent and reach 200,000 tons by 2030 unless policies are implemented to limit their use, according to new research.

- **[Continental controls needed to maintain fightback against tree diseases](#)** [周五, 29 9月 02:21]

Tighter controls on timber and plant movements into Europe are necessary to prevent further disastrous effects of plant diseases, a new study of the ash-dieback pathogen advises.

- **[Smart molecules trigger white blood cells to become better cancer-eating machines](#)** [周五, 29 9月 02:21]

A team of researchers has engineered smart protein molecules that can reprogram white blood cells to ignore a self-defense signaling mechanism that cancer cells use to survive and spread in the body. Researchers say the advance could lead to a new method of re-engineering immune cells to fight cancer and infectious diseases. The team successfully tested this method in a live cell culture system.

- **[Tsunami enabled hundreds of aquatic species to raft across Pacific](#)** [周五, 29 9月 02:21]

The 2011 Japanese tsunami set the stage for something unprecedented. For the first time in recorded history, scientists have detected entire communities of coastal species crossing the ocean by floating on makeshift rafts. Nearly 300 species have appeared on the shores of Hawaii and the US West Coast attached to tsunami debris, marine biologists discovered.

- **[Bed bugs attracted to dirty laundry](#)** [周五, 29 9月 02:20]

Bed bugs are attracted to dirty laundry, according to new research.

- [**Central America 'kissing bug' carries two main subtypes of Chagas disease parasite**](#) [周五, 29 9月 02:20]

Trypanosoma cruzi, the parasite that causes Chagas disease, is divided into six strains, each of which differs in where they are found and in how important they are in human infections. Now, researchers have found that most T. cruzi parasites in Central America belong to just two of those strains.

- [**New measurements show widespread forest loss has reversed the role of tropics as a carbon sink**](#) [周五, 29 9月 02:20]

A new report provides the most comprehensive picture of deforestation's toll on critical climate change safeguard; reveals hard-to-measure forest degradation is responsible for nearly 70 percent of emissions from tropical forests. Researchers discovered that tropical regions are now a net source of carbon to the atmosphere.

- [**Modern humans emerged more than 300,000 years ago new study suggests**](#) [周五, 29 9月 02:20]

A genomic analysis of ancient human remains from KwaZulu-Natal revealed that southern Africa has an important role to play in writing the history of humankind.

- [**Database of earthquakes triggered by human activity is growing, with some surprises**](#) [周五, 29 9月 02:20]

The Human-Induced Earthquake Database (HiQuake), the world's most complete database of earthquake sequences proposed to have been triggered by human activity, now includes approximately 730 entries, according to a report.

- [**Perovskite solar cells reach record long-term stability, efficiency over 20 percent**](#) [周五, 29 9月 02:20]

Scientists have greatly improved the operational stability of perovskite solar cells by introducing cuprous thiocyanate protected by a thin layer of reduced graphene oxide. Devices lost less than 5 percent performance when subjected to a crucial accelerated aging test during which they

were exposed for more than 1,000 hours to full sunlight at 60°C.

- [**Summer could be one long heatwave if planet hits 2 degrees Celsius**](#) [周五, 29 9月 00:18]

New paper highlighting how heatwaves will change with every degree of global warming up to 5 degrees C. It finds tropical summers may be one continuous heatwave at 2 degrees C.

- [**Saber-toothed kittens may have been born with thicker bones than other contemporary cats**](#) [周五, 29 9月 00:17]

Saber-toothed kittens may have been born with thicker bones compared to other contemporary cats, but they have a similar pattern of bone development, according to a new study.

- [**Fluorine-containing molecules from cell cultures**](#) [周五, 29 9月 00:16]

Natural organic compounds that contain fluorine are rare because living organisms -- with a few exceptions -- do not produce them. Scientists have now genetically engineered a microbial host for organofluorine metabolism, allowing it to produce a fluoridated intermediate known as a diketide. As reported, the diketide could then be used as a monomer for the in vivo production of fluorinated bioplastics.

- [**Highly virulent bacterium causes rampant caries in some children**](#) [周五, 29 9月 00:16]

Researchers have made a novel discovery connecting highly variant types of the caries bacterium *Streptococcus mutans* and their adhesive function to children with rampant caries and increased risk of dental caries.

- [**How do zebrafish develop their stripes?**](#) [周四, 28 9月 22:31]

A mathematician has thrown new light on the longstanding mystery of how zebrafish develop the distinctive striped patterns on their skin.

- [**Mapping the Tasmanian tiger's mysterious loss from mainland**](#) [周四, 28 9月 21:42]

Ancient DNA extracted from fossil bones and museum specimens has

shed new light on the mysterious loss of the Tasmanian tiger (thylacine) from Australia's mainland.

• [**Did rapid sea-level rise drown fossil coral reefs around Hawaii?**](#) [周四, 28 9月 21:42]

Investigations to predict changes in sea levels and their impacts on coastal systems are a step closer, as a result of a new international collaboration.

• [**Chimpanzees can learn how to use tools without observing others**](#) [周四, 28 9月 21:42]

New observations have led researchers to believe that chimpanzees can use tools spontaneously to solve a task, without needing to watch others first.

• [**Large earthquakes along Olympic Mountain faults, Washington State, USA**](#) [周四, 28 9月 21:42]

A comprehensive study of faults along the north side of the Olympic Mountains of Washington State emphasizes the substantial seismic hazard to the northern Puget Lowland region. The study examined the Lake Creek-Boundary Creek and Sadie Creek faults along the north flank the Olympic Mountains, and concludes that there were three to five large, surface-rupturing earthquakes along the faults within the last 13,000 years.

• [**Breakthrough in rapid, mass screening for the Ebola virus**](#) [周四, 28 9月 20:49]

A new, faster and safer way of diagnosing the Ebola virus has been developed.

• [**Exploring an ancient event in pumpkin, gourd and melon evolution**](#) [周四, 28 9月 20:47]

Recently, scientists have making great strides in better understanding with the genomes sequenced of cucumber, watermelon, and melons. With these projects completed, a research team has performed the first large comparative genomics exploration of their genome structures and

evolution. After reconstructing evolutionary trees and extensive comparisons of common genes between Cucurbitaceae plants, unexpectedly, the research team has found the first evidence of an ancient whole genome duplication ev...

- [**New mechanism points the way to breaking ribosome antibiotic resistance**](#) [周四, 28 9月 20:47]

Research groups reveal a novel mechanism of ribosome dimerization in the bacterium *Lactococcus lactis* using cryo-electron microscopy. As this dimerization renders ribosomes more resistant to antibiotics, this study provides the necessary structural basis to design new generations of antibiotics.

- [**Examining the lifestyles of microbes**](#) [周四, 28 9月 06:43]

Scientists are studying microbes called Parcubacteria that were found by James Cameron (director of 'Terminator') during a recent deep sea expedition. They want to study the microbes' lifestyle and see how similar they are to those found on land.

- [**That cup of coffee may not relieve Parkinson's symptoms**](#) [周四, 28 9月 04:20]

Contrary to previous research, caffeine may not relieve movement symptoms for people with Parkinson's disease, according to a study.

- [**The hormone that could be making your dog aggressive discovered**](#) [周四, 28 9月 04:20]

Thousands of people are hospitalized every year for dog bites, and aggressive behavior is a major reason dogs end up in shelters. Biologists have studied the biology behind canine aggression, specifically the role of the hormones vasopressin and oxytocin.

- [**How cells recover from the verge of programmed death**](#) [周四, 28 9月 04:20]

Biologists explore the molecular underpinnings of cells that recover from the verge of programmed death.

- [**Earliest evidence for a native African cultigen**](#)

[discovered in Eastern Sudan](#) [周四, 28 9月 04:20]

Archaeologists examining plant impressions within broken pottery have discovered the earliest evidence for domesticated sorghum in Africa.

• [Beer can lift your spirits due to malted barley ingredient](#) [周四, 28 9月 03:28]

Visitors to the Oktoberfest have always known it and now it has been scientifically -- beer can lift your spirits. Scientists examined 13,000 food components to find out whether they stimulate the reward center in the brain and make people feel good. Hordenine which is found in malted barley and beer seems to do the job quite well.

• [Haplobank: A biobank of reversible mutant embryonic stem cells](#) [周四, 28 9月 01:38]

Scientists have developed a biobank of revertible, mutant embryonic stem cells – called Haplobank - which contains over 100,000 mutated, conditional mouse embryonic stem cell lines, targeting about 70% of the protein-coding genome.

• [The volatile processes that shaped Earth](#) [周四, 28 9月 01:36]

Although it is widely understood that Earth was formed gradually, from much smaller bodies, many of the processes involved in shaping our growing planet are less clear. Astronomers have now untangled some of these processes, revealing that the mini-planets added to Earth had previously undergone melting and evaporation. They also address another scientific conundrum: Earth's depletion in many economically important chemical elements.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [**Physical abuse and punishment impact children's academic performance**](#) [周六, 30 9月 03:22]

Scientists have found that physical abuse was associated with decreases in children's cognitive performance, while non-abusive forms of physical punishment were independently associated with reduced school engagement and increased peer isolation.

- [**Compound from oilseeds may be high-value product**](#) [周六, 30 9月 01:35]

Extracting a substance called glucosinolate from camelina and carinata seeds may help bring these promising sources of biofuel one stop closer to reality.

- [**Video gamers have an advantage in learning**](#) [周六, 30 9月 00:51]

Neuropsychologists let video gamers compete against non-gamers in a learning competition. During the test, the video gamers performed significantly better and showed an increased brain activity in the brain areas that are relevant for learning.

- [**Helium found in coal seams could aid safe shale gas extraction**](#) [周六, 30 9月 00:50]

Natural deposits of helium gas found in UK coal seams could help scientists monitor the secure recovery of coal or shale gas from underground sites, according to research.

- [**New technique could detect explosives,**](#)

[dangerous gases rapidly, remotely](#) [周六, 30 9月 00:50]

A laser-based method that could be used to detect chemicals such as explosives and dangerous gases quickly and accurately has now been developed by researchers.

• [Uncovering a winning basketball formula](#) [周五, 29 9月 21:32]

Scientists have come up with a winning formula for basketball teams looking to take home Olympic gold.

• [Sensible driving saves more gas than drivers think](#) [周五, 29 9月 03:27]

A new study has quantified the impact speeding and slamming on the brakes has on fuel economy and consumption. Aggressive behavior behind the wheel can lower gas mileage in light-duty vehicles, which can equate to losing about \$0.25 to \$1 per gallon.

• [Understanding connection between HIV transmission, racial/ethnic/geographical differences](#) [周五, 29 9月 02:54]

The health effects of where people live, work, and interact are well documented, as are the value of neighborhood-level structural interventions designed to improve health. But place-based characteristics that contribute to disparities in HIV transmission and disease burden are poorly understood, possibly resulting in less-effective HIV risk reduction interventions and programming.

• [Massive projected increase in use of antimicrobials in animals by 2030](#) [周五, 29 9月 02:21]

The amount of antimicrobials given to animals destined for human consumption is expected to rise by a staggering 52 percent and reach 200,000 tons by 2030 unless policies are implemented to limit their use, according to new research.

• [Why public appeals may fall flat with some would-be donors](#) [周五, 29 9月 02:21]

To give or not to give: sometimes the answer is in the question, researchers into human behavior and charitable giving have found. The study suggests that sometimes the 'ask' needs to suit the potential donors' sense of independence or interdependence.

- [**Students know about learning strategies -- but don't use them**](#) [周五, 29 9月 02:21]

Researchers find that university students have high levels of knowledge about self-regulated learning strategies, but many students don't use them. Specific training on how and when to use these techniques could help more students to maximize their academic potential.

- [**Database of earthquakes triggered by human activity is growing, with some surprises**](#) [周五, 29 9月 02:20]

The Human-Induced Earthquake Database (HiQuake), the world's most complete database of earthquake sequences proposed to have been triggered by human activity, now includes approximately 730 entries, according to a report.

- [**Nearly one in six new HIV diagnoses in Europe are among people over 50**](#) [周五, 29 9月 00:16]

A new study showed that while the rate of newly reported HIV cases in Europe remained steady in younger people between 2004 and 2015, it increased by 2 percent each year overall in older people. With around 30,000 newly diagnosed HIV infections reported each year over the last decade, the HIV epidemic remains a significant public health problem in the 31 countries of the European Union and European Economic Area.

- [**Study provides first estimate of total US population with felony convictions**](#) [周五, 29 9月 00:16]

New research on the growth in the scope and scale of felony convictions finds that, as of 2010, 3 percent of the total US population and 15 percent of the African-American male population have served time in prison. People with felony convictions more broadly account for 8 percent of the overall population and 33 percent of the African-American male population.

- [**In people with OCD, actions are at odds with beliefs**](#) [周五, 29 9月 00:16]

The repeated behaviors that characterize obsessive-compulsive disorder are a manifestation of an underlying brain dysfunction that is not yet well understood. Now, scientists report the use of a mathematical model that they say will help them get at the root of what causes OCD. They find that people with OCD develop an internal, accurate sense of how things work but do not use it to guide behavior.

- [**Don't rely on mixed messages to change health behaviors**](#) [周四, 28 9月 23:30]

Self-improvement messages to lose weight, quit smoking or eat more fruits and vegetables can fall on deaf ears if the intervention message is mixed, says new research.

- [**Abusive bosses experience short-lived benefits**](#) [周四, 28 9月 22:12]

Being a jerk to your employees may actually improve your well-being, but only for a short while, suggests new research on abusive bosses.

- [**Self-esteem in kids: Lavish praise is not the answer, warmth is**](#) [周四, 28 9月 20:51]

How do children construct views of themselves and their place in the world? Children's social relationships turn out to be critical. For example, children develop higher self-esteem when their parents treat them warmly. But they develop lower self-esteem when their parents lavish them with inflated praise.

- [**Achieving U.S. National HIV/AIDS Strategy targets would save lives, be cost effective**](#) [周四, 28 9月 20:47]

An analysis shows that achieving the treatment targets of the National HIV/AIDS Strategy by 2020 not only would prevent hundreds of thousands of new infections and deaths but also would demonstrate excellent value.

- [**No evidence to support claims that telephone**](#)

consultations reduce GP workload or hospital referrals [周四, 28 9月 06:44]

Telephone consultations to determine whether a patient needs to see their GP face-to-face can deal with many problems, but a new study found no evidence to support claims by companies offering to manage these services or by NHS England that the approach saves money or reduces the number of hospital referrals.

Health and social care changes 'paving way for fewer services' warn experts [周四, 28 9月 06:44]

Current reforms to health and social care services, and radical redesign of the local government finance system, may signal the end of the NHS and local government in England as we know them, warn experts.

Should we welcome plans to sell off wasted NHS land? [周四, 28 9月 06:44]

With the NHS under severe financial pressure, should we welcome plans to raise capital by selling off inefficiently used land and buildings owned by the health service? Experts debate the issue in a new article.

High cost of truckers not having enough places to park and rest [周四, 28 9月 04:20]

A pilot study illustrates the high economic cost of having too few safe places for commercial truck drivers to park and rest.

New test rapidly diagnoses Zika [周四, 28 9月 04:20]

Researchers have developed a paper-based test that can diagnose Zika infection within 20 minutes. Unlike existing tests, the new diagnostic does not cross-react with Dengue virus, a close relative of the Zika virus that can produce false positives on many Zika tests.

Citizen science can predict butterfly population trends [周四, 28 9月 00:36]

New research shows that citizen scientists can play a role in gathering meaningful information to inform long-term monitoring of biodiversity trends such as butterfly population change.

- **[Iron supplements have long-term benefits for low birth-weight babies](#)** [周四, 28 9月 00:36]

Babies classified as low birth weight (under 2,500 grams) are at risk of iron deficiency, which is linked to impaired neurological development. A long-term randomized study now shows that providing such babies with iron supplements can prevent behavioral problems at school age.

- **[Teens' online friendships just as meaningful as face-to-face ones](#)** [周三, 27 9月 22:54]

Many parents worry about how much time teenagers spend texting, sharing selfies and engaging in other online activities with their friends. However, according to a recent research synthesis, many of these digital behaviors serve the same purpose and encompass the same core qualities as face-to-face relationships.

- **[Coping with stressful organizational change](#)** [周三, 27 9月 21:51]

Stress is not a recent phenomenon, but the modern work environment seems to highlight its detrimental effects on employees. This is no more obvious than during times of organizational change. New research considers the impact of such changes on workers in a healthcare authority in New Zealand, highlighting the problems that any organization might face under such circumstances and pointing to possible methods to cope and remediate employee stress.

- **[Monetizing time savings makes toll roads financially stack up](#)** [周三, 27 9月 21:34]

Putting a dollar value on the savings from traffic congestion, noise and air pollution as a result of toll roads and tunnels will make large infrastructure projects more cost effective, according to a new study.

- **[A record number of Americans viewed the 2017 solar eclipse](#)** [周三, 27 9月 02:36]

Eighty-eight percent of American adults viewed the August total solar eclipse directly or electronically. This audience of 215 million adults is nearly twice the size of the viewership of recent Super Bowl football

games.

- [**Do deep promotional discounts work? New study sheds light on strategy**](#) [周三, 27 9月 01:53]

Promotional discounts increase store traffic and lead to higher overall profits, especially if the advertised products are staples – items such as meat and produce that are purchased frequently and by many customers.

- [**Potential Zika vaccine protects against pregnancy transmission and testicular damage**](#) [周三, 27 9月 00:51]

For the first time, a research team led has shown that a potential Zika vaccine quickly can protect fetuses against infection as well as protect males against testicular infection and injury. It also prevents a lowered sperm count after one vaccination.

- [**Discovery: Bernie Sanders spider**](#) [周二, 26 9月 22:55]

Students and a scientist have discovered 15 new species of 'smiley-faced' spiders -- and named them after, among others, David Attenborough, Barack Obama, Michelle Obama, Leonardo DiCaprio, and Vermont Senator Bernie Sanders.

- [**Household chores: Women still do more**](#) [周二, 26 9月 22:54]

Women of all ages still tend to do more household chores than their male partners, no matter how much they work or earn in a job outside the home. New findings demonstrate the persistent gendered nature of how housework is divided.

- [**Preschool teachers need better training in science**](#) [周二, 26 9月 22:54]

Preschool instructors appear to lack the knowledge, skills and confidence to effectively teach their young students science -- a problem that is likely contributing to America's poor global performance in this crucially important subject.

- [**Teachers report weaker relationships with students of color, children of immigrants**](#) [周二, 26 9月 22:54]

The relationship between teachers and students is a critical factor for academic success. However, a new study finds that teachers report weaker relationships with children of immigrants and adolescents of color.

- [**Escaping wildfires**](#) [周二, 26 9月 21:15]

A new study is the first attempt to map escape routes for wildland fire fighters from an aerial perspective. The researchers used LiDAR technology to analyze the terrain slope, ground surface roughness and vegetation density of a fire-prone region in central Utah, and assessed how each landscape condition impeded a person's ability to travel.

- [**Drought: A cause of riots**](#) [周二, 26 9月 21:05]

The scientific community has been working on the possibility of a relationship between periods of drought and rioting for several years. Now a team has formally verified this hypothesis by studying almost 1,800 riots that occurred over a 20-year period in sub-Saharan Africa. The researchers observed a systematic link between the sudden depletion of water resources and the outbreak of unrest. They also succeeded in quantifying the impact of geographic and social factors on the same link.

- [**People are reluctant to use public defibrillators to treat cardiac arrests**](#) [周二, 26 9月 20:59]

A new study suggests that people are reluctant to use public-access defibrillators to treat cardiac arrests.

- [**Psychological impacts of natural disasters on youth**](#) [周二, 26 9月 04:32]

A researcher is fully aware of children's reaction to trauma. Her research focuses on the impact of disasters on youth since Hurricane Andrew in 1992. La Greca has been evaluating how best to define post-traumatic stress disorder (PTSD) in children. This line of research will help to quickly identify the children who need support services post-disaster and identify key aspects of the post-disaster environment that facilitate their recovery.

- **[Are children who see movie characters use guns more likely to use them?](#)** [周二, 26 9月 01:29]

Children who watched a PG-rated movie clip containing guns played with a disabled real gun longer and pulled the trigger more often than children who saw the same movie not containing guns.

- **[Climate insurance is rarely well thought out in agriculture](#)** [周一, 25 9月 23:33]

Internationally subsidised agricultural insurance is intended to protect farmers in developing countries from the effects of climate change. However, it can also lead to undesirable ecological and social side effects, as researchers have now explained. Their article also contains recommendations for improved insurance schemes which in future should also take account of ecological and social aspects in addition to economic issues.

- **[Group project? Taking turns, working with friends may improve grades](#)** [周一, 25 9月 23:33]

A new study with college students has found that the social dynamics of a group, such as whether one person dominates the conversation or whether students work with a friend, affect academic performance. Put simply, the more comfortable students are, the better they do, which yields benefits beyond the classroom.

- **[Fully renewable India in 2050 can take a shortcut to emission-free future](#)** [周一, 25 9月 23:16]

India can function on a fully renewable electricity system in 2050, research indicates. The study shows that developing countries that have an abundance of renewable resources do not need to take the path of the western countries where increasing living standards have been coupled with heavy emissions from electricity generation and other industry. They can move straight to renewable systems and do it cheaply.

- **[Clarifying perspectives to promote action on loss and damage from climate change](#)** [周一, 25 9月 23:13]

The hurricanes Harvey, Irma and Maria highlight the potential for the climate system to cause loss and damage. 'Loss and damage' is a phrase used in different ways by people who work on climate policy, negotiation and adaptation/resilience. A new study clarifies these different perspectives which is a key issue now that the United Nations Framework Convention on Climate Change, UNFCCC, is encouraging creation and implementation of actions to address loss and damage from climate change.

- **[Visual attention drawn to meaning, not what stands out](#)** [周一, 25 9月 23:13]

Our visual attention is drawn to parts of a scene that have meaning, rather than to those that are salient or 'stick out,' according to new research. The findings overturn the widely held model of visual attention.

- **[World's botanic gardens contain a third of all known plant species, and help protect the most threatened](#)** [周一, 25 9月 23:13]

The most in-depth species survey to date finds an 'astonishing array' of plant diversity in the global botanic garden network, including 41 percent of all endangered species. However, researchers find a significant imbalance between tropical and temperate plants, and say even more capacity should be given to conservation, as there is 'no technical reason for plant species to become extinct.'

- **[Minority public managers prefer integrating social equity, traditional public values](#)** [周一, 25 9月 22:57]

Minority public managers place more emphasis on both traditional values, like efficiency and effectiveness, and social equity when compared with their white counterparts, according to a new study.

- **[Scientists call for more research on how human activities affect the seabed](#)** [周一, 25 9月 22:47]

Extensive research has been released into how industry and

environmental change are affecting our seafloors. Researchers say more work is needed to help safeguard these complex ecosystems and the benefits they provide to people for the future.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- [**Small collisions make big impact on Mercury's thin atmosphere**](#) [周五, 29 9月 23:29]

Mercury, our smallest planetary neighbor, has very little to call an atmosphere, but it does have a strange weather pattern: morning micro-meteor showers.

- [**New clues from brain structures of mantis shrimp**](#) [周五, 29 9月 21:33]

New research sheds new light on the evolution of some of the earliest brain structures, and stirs up new, intriguing questions about the origins of centers that support learning and memory.

- [**Solving the mystery of Pluto's giant blades of ice**](#) [周五, 29 9月 03:24]

NASA's New Horizons mission revolutionized our knowledge of Pluto when it flew past that distant world in July 2015. Among its many discoveries were images of strange formations resembling giant knife blades of ice, whose origin had remained a mystery. Now, scientists have turned up a fascinating explanation for this "bladed terrain": the structures are made almost entirely of methane ice, and likely formed as a specific kind of erosion wore away their surfaces.

- [**Farthest active inbound comet yet seen**](#) [周五, 29 9月 03:23]

NASA's Hubble Space Telescope has photographed the farthest active inbound comet ever seen, at a whopping distance of 1.5 billion miles from the Sun (beyond Saturn's orbit). Slightly warmed by the remote Sun, it has already begun to develop an 80,000-mile-wide fuzzy cloud of dust, called a coma, enveloping a tiny, solid nucleus of frozen gas and

dust. These observations represent the earliest signs of activity ever seen from a comet entering the solar system's planetary zone for the first time.

- [**A fresh look at older data yields a surprise near the Martian equator**](#) [周五, 29 9月 03:22]

Scientists taking a new look at older data from NASA's longest-operating Mars orbiter have discovered evidence of significant hydration near the Martian equator -- a mysterious signature in a region of the Red Planet where planetary scientists figure ice shouldn't exist.

- [**Chimpanzees can learn how to use tools without observing others**](#) [周四, 28 9月 21:42]

New observations have led researchers to believe that chimpanzees can use tools spontaneously to solve a task, without needing to watch others first.

- [**Soft, flexible origami-inspired robot**](#) [周三, 27 9月 22:23]

A Case Western Reserve University researcher has turned the origami she enjoyed as a child into a patent-pending soft robot that may one day be used on an assembly line, in surgery or even outer space.

- [**Lost continent of Zealandia: Scientists return from expedition to sunken land**](#) [周三, 27 9月 11:59]

After a nine-week voyage to study the lost, submerged continent of in the South Pacific, a team of 32 scientists from 12 countries has arrived in Hobart, Tasmania, aboard the research vessel JOIDES Resolution.

- [**Innovative control system paves the way for large scale universal quantum computing**](#) [周三, 27 9月 01:30]

Future quantum computers promise exponential scaling in computing power with linearly increasing number of qubits. However, harnessing this power is challenging due to the complexity of controlling a large number of qubits simultaneously. A solution to this problem has now been engineered.

- **[Discovery: Bernie Sanders spider](#)** [周二, 26 9月 22:55]

Students and a scientist have discovered 15 new species of 'smiley-faced' spiders -- and named them after, among others, David Attenborough, Barack Obama, Michelle Obama, Leonardo DiCaprio, and Vermont Senator Bernie Sanders.

- **[Pigeons better at multitasking than humans](#)** [周二, 26 9月 21:05]

Pigeons are capable of switching between two tasks as quickly as humans -- and even more quickly in certain situations. These are the findings of biopsychologists who had performed the same behavioral experiments to test birds and humans. The authors hypothesize that the cause of the slight multitasking advantage in birds is their higher neuronal density.

- **[After 15 years in a vegetative state, nerve stimulation restores consciousness](#)** [周二, 26 9月 01:29]

A 35-year-old man who had been in a vegetative state for 15 years after a car accident has shown signs of consciousness after neurosurgeons implanted a vagus nerve stimulator into his chest. The findings show that vagus nerve stimulation (VNS) -- a treatment already in use for epilepsy and depression--can help to restore consciousness even after many years in a vegetative state.

- **[Bacterial nanosized speargun works like a power drill](#)** [周二, 26 9月 01:28]

In order to get rid of unpleasant competitors, some bacteria use a sophisticated weapon -- a nanosized speargun. Researchers have now gained new insights into the construction, mode of action and recycling of this weapon. The speargun drills a hole into the neighboring cells in only a few thousandths of a second and injects a cocktail of toxins.

- **[Lava tubes: Hidden sites for future human habitats on the Moon and Mars](#)** [周一, 25 9月 23:28]

Lava tubes, underground caves created by volcanic activity, could provide protected habitats large enough to house streets on Mars or even

towns on the Moon, according to new research. A further study shows how the next generation of lunar orbiters will be able to use radar to locate these structures under the Moon's surface.

• [**Genes are controlled by 'Nano footballs,' scientists discover**](#) [周一, 25 9月 23:12]

Genes are controlled by 'nano footballs' -- structures that look like footballs but 10 million times smaller than the average ball -- new research has revealed.

• [**Fish have surprisingly complex personalities**](#) [周一, 25 9月 21:54]

Tiny fish called Trinidadian guppies have individual 'personalities', new research shows.

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- [**Did life on Earth start due to meteorites splashing into warm little ponds?**](#) [周二, 03 10月 04:12]

Life on Earth began somewhere between 3.7 and 4.5 billion years ago, after meteorites splashed down and leached essential elements into warm little ponds, say scientists. Their calculations suggest that wet and dry cycles bonded basic molecular building blocks in the ponds' nutrient-rich broth into self-replicating RNA molecules that constituted the first genetic code for life on the planet.

- [**Skipping breakfast associated with hardening of the arteries**](#) [周二, 03 10月 02:56]

Skipping breakfast is associated with an increased risk of atherosclerosis, or the hardening and narrowing of arteries due to a build-up of plaque, according to research.

- [**New insights into leading cause of miscarriage, birth defects discovered**](#) [周二, 03 10月 02:50]

Ten to 25 percent of human embryos contain the wrong number of chromosomes, resulting in miscarriage or birth defects such as Down syndrome. The incidence of these errors rises dramatically as women age. Two recent studies shed new light on the mystery of the leading cause of birth defects and miscarriage, laying the foundation for further

research in an understudied but crucially important field of genetic study.

- [**Meteorite tells us that Mars had a dense atmosphere 4 billion years ago**](#) [周一, 02 10月 23:42]

Exploration missions have suggested that Mars once had a warm climate, which sustained oceans on its surface. To keep Mars warm requires a dense atmosphere with a sufficient greenhouse effect, while the present-day Mars has a thin atmosphere whose surface pressure is only 0.006 bar, resulting in the cold climate it has today. It has been a big mystery as to when and how Mars lost its dense atmosphere.

- [**ALMA and Rosetta detect Freon-40 in space**](#) [周一, 02 10月 23:28]

Observations made with the Atacama Large Millimeter/submillimeter Array (ALMA) and ESA's Rosetta mission, have revealed the presence of the organohalogen Freon-40 in gas around both an infant star and a comet. Organohalogens are formed by organic processes on Earth, but this is the first ever detection of them in interstellar space. This discovery suggests that organohalogens may not be as good markers of life as had been hoped, but that they may be significant components of the material from whi...

- [**Glowing news for organic materials**](#) [周一, 02 10月 23:28]

Researchers have developed the world's first glow-in-the-dark materials based on organic molecules. The materials eliminate the expensive metals and high-temperature processing needed by current inorganic glow-in-the-dark materials. In addition to reducing cost, organic materials are likely to enable improved flexibility, transparency, and bio-compatibility, opening the door for a variety of new applications.

- [**First look at electrons escaping atoms**](#) [周一, 02 10月 23:27]

Researchers have taken a first step toward controlling electrons' behavior inside matter -- and thus the first step down a long and complicated road that could eventually lead to the ability to create new states of matter at will.

- [**New 'building material' points toward quantum**](#)

computers [周一, 02 10月 23:27]

It is possible to produce 'Majorana particles' in a new 'building material,' new research indicates. The study paves the road for new types of experiments -- and at the same time represents an important contribution to the construction of the information circuits of tomorrow.

• **Basis of development of vertebrate limb muscles has been established in cartilaginous fishes** [周一, 02 10月 23:27]

Scientists have discovered that both bony and cartilaginous fish develop their appendages via a shared mechanism -- the mechanism is also observed in land-dwelling vertebrates such as mice. They found the fin muscles of cartilaginous are formed by muscle precursors expressing Lbx1 expression, a gene that coordinates limb-muscle formation. This work revisits some related evolutionary hypotheses using a molecular biology approach and provides new insights.

• **Superconductivity found in thin films of titanium oxide** [周一, 02 10月 23:27]

Many of us are familiar with titanium dioxide, a whitener commonly used in sunscreens and paints such as the white lines seen on tennis courts. Less well known are other higher titanium oxides -- those with a higher number of titanium and oxygen atoms than TiO -- that are now the subject of intensifying research due to their potential use in next-generation electronic devices.

• **Did game design elements increase physical activity among adults?** [周一, 02 10月 23:27]

Physical activity increased among families in a randomized clinical trial as part of a game-based intervention where they could earn points and progress through levels based on step goal achievements, according to a new article.

• **Mini-kidneys grown in lab reveal renal disease secrets** [周一, 02 10月 23:27]

By creating and manipulating mini-kidney organoids that contain a

realistic micro-anatomy, researchers can now track the early stages of polycystic kidney disease. The organoids are grown from human stem cells.

- [**Study reveals molecular pathway of weight-controlling hormone**](#) [周一, 02 10月 23:27]

Scientists have revealed deep insights into the role that a little-understood human hormone plays in regulating body weight. Named Growth and Differentiation Factor 15 (GDF15), this hormone is typically active only when the body experiences acute or prolonged stress, including following exposure to tissue-damaging toxins, such as chemotherapy, or during chronic disease, such as obesity or cancer. As a result, the GDF15 pathway holds promise for the development of potential therapeutics for diseases...

- [**Unexpected findings uncover new understanding of gene expression**](#) [周一, 02 10月 23:27]

Scientists have discovered surprising findings about an enzyme central to gene expression and mutated in many cancers.

- [**Sticker shock**](#) [周一, 02 10月 23:27]

Preventing a preterm birth could cost as little as \$200 or as much as \$20,000, depending on which one of two medications a doctor orders, according to a new analysis.

- [**International competition benchmarks metagenomics software**](#) [周一, 02 10月 23:23]

Communities of bacteria live everywhere: inside our bodies, on our bodies and all around us. The human gut alone contains hundreds of species of bacteria that help digest food and provide nutrients, but can also make us sick. Scientists use metagenomics -- the study of DNA from an environmental sample -- to study these bacterial communities.

- [**Tiny aquariums put nanoparticle self-assembly on display**](#) [周一, 02 10月 23:23]

Seeing is believing when it comes to nanoparticle self-assembly. A team

of engineers is observing the interactions of colloidal gold nanoparticles inside tiny aquariumlike sample containers to gain more control over the self-assembly process of engineered materials.

- [**Genetic test successfully detects some asymptomatic pancreatic cancers**](#) [周一, 02 10月 23:23]

PancreaSeq® analyzed mutations known to be associated with precursors to pancreatic cancers, report investigators at the conclusion of a study.

- [**How much is that call worth?**](#) [周一, 02 10月 23:23]

Call centres can be expensive as well as the source of lots of consumer angst. But companies can get more bang for their buck by doing a better job of coordinating marketing decisions that drive customers to call centers with operational ones about handling them once they get there.

- [**Childhood asthma: Not linked to BCG vaccination**](#) [周一, 02 10月 23:23]

Childhood asthma is a serious public health challenge in Québec and throughout the world. Although the immune mechanisms implicated in the development of childhood asthma are not fully understood, some studies seem to suggest that the BCG vaccine, used in tuberculosis prevention, may have a protective effect on childhood asthma. However there is no consensus and contradictory findings have been reported in other studies.

- [**Siberian volcanic eruptions caused extinction 250 million years ago, new evidence shows**](#) [周一, 02 10月 22:52]

The Great Permian Extinction, which occurred approximately 250 million years ago, was caused by massive volcanic eruptions that led to significant environmental changes, new evidence shows.

- [**Low consumption of vitamin K by adolescents associated with unhealthy enlargement of the heart's major pumping chamber**](#) [周一, 02 10月 22:52]

A study of 766 otherwise healthy adolescents showed that those who

consumed the least vitamin K1-- found in spinach, cabbage, iceberg lettuce and olive oil -- were at 3.3 times greater risk for an unhealthy enlargement of the major pumping chamber of their heart, according to the study. Vitamin K1, or phylloquinone, is the predominant form of vitamin K in the U.S. diet.

- [**Tracking live brain activity with the new NeuBtracker open-source microscope**](#) [周一, 02 10月 22:52]

A team of scientists has successfully developed a new type of microscope. The so-called NeuBtracker is an open source microscope that allows to observe neuronal activities of zebrafish without altering their behavior. This is opening up completely new perspectives for science, because now it will be possible to track natural behavior while simultaneously imaging neuronal activity in the brain.

- [**Scale of human impact on planet has changed course of Earth's history, scientists suggest**](#) [周一, 02 10月 22:52]

The significant scale of human impact on our planet has changed the course of Earth history, an international team of scientists.

- [**A new model of treatment for youth with anxiety**](#) [周一, 02 10月 22:52]

A stepped care model of treatment for youth with anxiety can be effectively delivered using at least 14% less therapist time than traditional treatment service, reports a new study.

- [**Asphalt helps lithium batteries charge faster**](#) [周一, 02 10月 22:52]

A touch of asphalt may be the secret to high-capacity lithium batteries that charge up to 20 times faster than commercial lithium-ion batteries, according to scientists.

- [**DNA: The next hot material in photonics?**](#) [周一, 02 10月 22:52]

Using DNA from salmon, researchers in South Korea hope to make better biomedical and other photonic devices based on organic thin films.

- [**Animals that play with objects learn how to use**](#)

[them as tools](#) [周一, 02 10月 22:52]

New Caledonian crows and kea parrots can learn about the usefulness of objects by playing with them -- similar to human baby behavior.

• [Electricity produced from tears](#) [周一, 02 10月 22:51]

A team of scientists has discovered that applying pressure to a protein found in egg whites and tears can generate electricity. The researchers observed that crystals of lysozyme, a model protein that is abundant in egg whites of birds as well as in the tears, saliva and milk of mammals can generate electricity when pressed.

• [A deeper understanding of a surface phenomenon](#) [周一, 02 10月 21:34]

Phenomena involving surface tension are extremely complex and have applications in our everyday lives, and researchers are tackling the complicated mathematics behind the physics.

• [New approach for AIDS: Lock HIV in reservoir cells, to die through apoptosis](#) [周一, 02 10月 21:34]

With the successful suppression of the AIDS virus (HIV) through medication, the focus turns toward its eradication. Researchers have developed a new compound that is key to the destruction of HIV. When the compound is introduced into infected cells, viral budding is suppressed thereby confining it within the host cells. The cell then dies naturally through apoptosis. This treatment is hoped to lead to the complete recovery from AIDS in the near future.

• [2017 Nobel Prize in Physiology or Medicine: Molecular mechanisms controlling the circadian rhythm](#) [周一, 02 10月 21:26]

The 2017 Nobel Prize in Physiology or Medicine is being awarded jointly to Jeffrey C. Hall, Michael Rosbash and Michael W. Young for their discoveries of molecular mechanisms controlling the circadian rhythm.

• [Can we end damaging dementia psychosis cycle?](#)

[周一, 02 10月 21:22]

A new research report calls for a change in approach in the treatment of psychosis in dementia, to find alternatives to highly damaging antipsychotics.

- [**Radical research raises hopes for eye disease treatment for premature babies**](#) [周一, 02 10月 21:22]

Ground-breaking research has demonstrated the previously unknown existence of a disease-fighting immune cell in the eye and points to potential novel ways of treating eye disorders in premature babies and diabetic adults.

- [**New drug protects heart from cardiac rupture after myocardial infarction**](#) [周一, 02 10月 21:22]

There are currently many kinds of drugs for heart failure. Among them, the new drug LCZ696 is recommended by US guidelines as a first-line treatment for chronic heart failure. LCZ696 is better than conventional drugs at reducing cardiac death and hospitalization due to heart failure. Now, researchers have revealed that LCZ696 can prevent cardiac rupture and heart failure following acute myocardial infarction which is one of the causes of chronic heart failure.

- [**Children without allergies can still be afflicted with asthma-like coughing and wheezing**](#) [周一, 02 10月 21:05]

Doctors have long wondered why children without allergies can still be afflicted with asthma-like coughing and wheezing. In a new study, researchers have identified a protein that may be responsible.

- [**Risks and recommendations for weight gain management in midlife women**](#) [周一, 02 10月 21:05]

A review of the weight gain risks and challenges faced by women in midlife has led researchers to a series of recommendations for this patient population.

- [**Menopause and estrogen affect muscle function**](#) [周一, 02 10月 20:56]

Estrogen acts as a regulator of muscle energy metabolism and muscle cell viability, research shows. Menopause leads to the cessation of

ovarian estrogen production concurrent to the deterioration of muscle function. After menopause, the risk of metabolic diseases also increases. Although a healthy lifestyle does not increase the amount of estrogen in circulation, it reduces risks.

- [**New insights into how sleep helps the brain to reorganize itself**](#) [周一, 02 10月 20:56]

A study has given new insights into how sleep contributes to brain plasticity -- the ability for our brain to change and reorganise itself -- and could pave the way for new ways to help people with learning and memory disorders.

- [**Body energy as a power source**](#) [周一, 02 10月 20:56]

Smartphones, MP3 players, sports electronics devices such as pulse meters or trackers, medical equipment such as tonometers, pacemakers of the heart, or insulin pumps: An increasing number of electronic companions make daily life easier for us. But as useful these smart helpers may be: Their constant hunger for electricity is a problem. The solution: power supply by means of energy produced by body movements.

- [**Doctors define 'safe and effective' margins for 'one and done' skin removal around suspicious moles**](#) [周一, 02 10月 20:48]

By carefully tracing a line of at least 2 millimeters outside of and around the edges of a mole that is suspected of being a cancer, doctors can remove all of its cells and avert the need for a second surgery, says a new report.

- [**Win-win strategies for climate and food security**](#) [周一, 02 10月 20:48]

Efforts to reduce greenhouse gas emissions from the agriculture and forestry sectors could lead to increased food prices -- but new research identifies strategies that could help mitigate climate change while avoiding steep hikes in food prices.

- [**Our muscles measure the time of day**](#) [周一, 02 10月 20:48]

Biological clocks are ticking everywhere throughout our body, and a 'master clock' in the brain synchronizes all the subsidiary ones in various organs. Medical researchers have now found that such a circadian clock is at work in our muscles. Their research shows that perturbations of this machinery might be important for type 2 diabetes development.

- [**If your child is bilingual, learning additional languages later might be easier**](#) [周一, 02 10月 20:48]

It is often claimed that people who are bilingual are better than monolinguals at learning languages. Now, the first study to examine bilingual and monolingual brains as they learn an additional language offers new evidence that supports this hypothesis, researchers say.

- [**DNA mutations shed in blood predicts response to immunotherapy in patients with cancer**](#) [周一, 02 10月 20:48]

A blood sample, or liquid biopsy, can reveal which patients will respond to checkpoint inhibitor-based immunotherapies, a first-of-its-kind study reports.

- [**Adulteration of proprietary Chinese medicines and health products poses severe health risks**](#) [周一, 02 10月 20:48]

Traditional Chinese medicine is widely used as a form of complementary medicine all over the world for various indications and for improving general health. Various reports have documented the adulteration of pCMs and health products with undeclared agents, including prescription drugs, drug analogues, and banned drugs. Such adulteration can have serious and even fatal consequences.

- [**Physician licensing laws keep doctors from seeking care**](#) [周一, 02 10月 20:48]

Licensing requirements in many states include questions about past mental health treatments or diagnoses, with the implication that they may limit a doctor's right to practice medicine, research shows.

- [**A sea of spinning electrons**](#) [周一, 02 10月 20:48]

Picture two schools of fish swimming in clockwise and

counterclockwise circles. It's enough to make your head spin, and now scientists have discovered the 'chiral spin mode' -- a sea of electrons spinning in opposing circles.

[GM soybean oil causes less obesity and insulin resistance but is harmful to liver function](#) [周一, 02 10月]

20:48]

Researchers have tested a genetically-modified soybean oil used in restaurants and found that while it induces less obesity and insulin resistance than conventional soybean oil, its effects on diabetes and fatty liver are similar to those of conventional soybean oil, the major vegetable cooking oil used in the United States, with popularity on the increase worldwide. The study also compares the GM soybean oil to coconut and olive oils.

Did life on Earth start due to meteorites splashing into warm little ponds? -- ScienceDaily

Life on Earth began somewhere between 3.7 and 4.5 billion years ago, after meteorites splashed down and leached essential elements into warm little ponds, say scientists at McMaster University and the Max Planck Institute in Germany. Their calculations suggest that wet and dry cycles bonded basic molecular building blocks in the ponds' nutrient-rich broth into self-replicating RNA molecules that constituted the first genetic code for life on the planet.

The researchers base their conclusion on exhaustive research and calculations drawing in aspects of astrophysics, geology, chemistry, biology and other disciplines. Though the "warm little ponds" concept has been around since Darwin, the researchers have now proven its plausibility through numerous evidence-based calculations.

Lead authors Ben K.D. Pearce and Ralph Pudritz, both

of the McMaster's Origins Institute and its Department of Physics and Astronomy, say available evidence suggests that life began when the Earth was still taking shape, with continents emerging from the oceans, meteorites pelting the planet -- including those bearing the building blocks of life -- and no protective ozone to filter the Sun's ultraviolet rays.

"No one's actually run the calculation before," says Pearce. "This is a pretty big beginning. It's pretty exciting."

"Because there are so many inputs from so many different fields, it's kind of amazing that it all hangs together," Pudritz says. "Each step led very naturally to the next. To have them all lead to a clear picture in the end is saying there's something right about this."

Their work, with collaborators Dmitry Semenov and Thomas Henning of the Max Planck Institute for Astronomy, has been published today in the *Proceedings of the National Academy of Science*.

"In order to understand the origin of life, we need to understand Earth as it was billions of years ago. As our study shows, astronomy provide a vital part of the

answer. The details of how our solar system formed have direct consequences for the origin of life on Earth," says Thomas Henning, from the Max Planck Institute for Astronomy and another co-author.

The spark of life, the authors say, was the creation of RNA polymers: the essential components of nucleotides, delivered by meteorites, reaching sufficient concentrations in pond water and bonding together as water levels fell and rose through cycles of precipitation, evaporation and drainage. The combination of wet and dry conditions was necessary for bonding, the paper says.

In some cases, the researchers believe, favorable conditions saw some of those chains fold over and spontaneously replicate themselves by drawing other nucleotides from their environment, fulfilling one condition for the definition of life. Those polymers were imperfect, capable of improving through Darwinian evolution, fulfilling the other condition.

"That's the Holy Grail of experimental origins-of-life chemistry," says Pearce.

That rudimentary form of life would give rise to the

eventual development of DNA, the genetic blueprint of higher forms of life, which would evolve much later. The world would have been inhabited only by RNA-based life until DNA evolved.

"DNA is too complex to have been the first aspect of life to emerge," Pudritz says. "It had to start with something else, and that is RNA."

The researchers' calculations show that the necessary conditions were present in thousands of ponds, and that the key combinations for the formation of life were far more likely to have come together in such ponds than in hydrothermal vents, where the leading rival theory holds that life began in roiling fissures in ocean floors, where the elements of life came together in blasts of heated water. The authors of the new paper say such conditions were unlikely to generate life, since the bonding required to form RNA needs both wet and dry cycles.

The calculations also appear to eliminate space dust as the source of life-generating nucleotides. Though such dust did indeed carry the right materials, it did not deposit them in sufficient concentration to generate life, the researchers have determined. At the time, early

in the life of the solar system, meteorites were far more common, and could have landed in thousands of ponds, carrying the building blocks of life. Pearce and Pudritz plan to put the theory to the test next year, when McMaster opens its Origins of Life laboratory that will re-create the pre-life conditions in a sealed environment.

"We're thrilled that we can put together a theoretical paper that combines all these threads, makes clear predictions and offers clear ideas that we can take to the laboratory," Pudritz says.

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New insights into leading cause of miscarriage, birth defects discovered: Studies begin to uncover why embryos sometimes lack correct amount of genetic material -- ScienceDaily

Two recent Northwestern University studies shed new light on the mystery of the leading cause of birth defects and miscarriage, laying the foundation for further research in an understudied but crucially important field of genetic study.

The studies look at what happens during the process that produces egg cells (oocytes), which later become embryos when they are fertilized. Ten to 25 percent of human embryos contain the wrong number of chromosomes because the egg cell has not divided properly, which is a problem unique to egg cells.

These mistakes are the leading cause of miscarriages and birth defects such as Down syndrome, and the incidence of these errors rises dramatically as women age. Understanding why egg cells are more prone to

this division error is critical, given that women are increasingly choosing to start families at later ages.

The first study, published in the *Journal of Cell Biology* in March, revealed that oocytes use an innovative strategy to detect and prevent errors during cell division, while the second study, published Sept. 26 in *PLOS Genetics*, identified new proteins essential for the cell-division process and discovered that a back-up protein kicks in when the division is failing to help ensure the embryo is receiving the correct number of chromosomes.

"Taken together, these two studies have revealed to us how vastly different egg cells are from every other type of cell, which could shed important new light on why the reproductive process can be so error prone," said senior author Sadie Wignall, assistant professor of molecular biosciences at Northwestern's Weinberg College of Arts and Sciences. "Solving this mystery would be a first step to prolonging a woman's fertile years."

Wignall researches a structure called the spindle, an elaborate football-shaped structure that physically separates the chromosomes during cell division. In

most cells, structures called centrosomes help to organize the spindle, ensuring that it can precisely separate chromosomes to send the correct number of chromosomes to each newly divided cell. Spindles in egg cells, however, lack centrosomes. This "acentrosomal" process is highly understudied compared to other types of cell division, leading to important unanswered questions about why it is much more prone to error when dividing.

In the study published in September, Wignall and her team discovered that in the absence of centrosomes, two proteins -- KLP-15 and KLP-16 -- were essential for dividing the cells. The researchers knocked out these two proteins to find that instead of forming the normal football-shaped spindle, the spindle structure collapsed into a messy round ball. Much to their surprise, despite this early defect, a back-up protein then jumped in and helped separate the chromosomes to the two ends of the cell.

"We were surprised to find that this protein came to the rescue and worked as a backup to properly organize the spindle," Wignall said.

The question remains why 10 to 25 percent of embryos

still end up not being viable if there is this backup process in place in oocytes. One theory, Wignall said, is that this backup protein changes or depletes as women age.

"While these basic cell mechanisms might be difficult to grasp, they directly impact female reproduction and infertility," Wignall said. "My lab focuses on this with the hope that one day, our research can help people experiencing fertility issues at in vitro fertilization clinics."

Wignall performs her research on oocytes using small worms called *C. elegans* since they are a powerful research organism for genetic studies. However, her lab is also building on these findings to perform parallel studies in mice in collaboration with Teresa Woodruff, a reproductive scientist and director of the Women's Health Research Institute at Northwestern University Feinberg School of Medicine. The next step will be to study these mechanisms in human oocytes.

Amanda C. Davis-Roca, a graduate student in Wignall's lab, was the first author on the study published in March, "*Caenorhabditis elegans* oocytes detect meiotic errors in the absence of canonical end-

on kinetochore attachments." Timothy J. Mullen, another graduate student in Wignall's lab, was first author on the study published in September, "Interplay between microtubule bundling and sorting factors ensures acentriolar spindle stability during *C. elegans* oocyte meiosis."

Funding for this research was provided by the Damon Runyon Cancer Research Foundation and the March of Dimes Birth Defects Foundation (grant number is #5-FY13-197).

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Meteorite tells us that Mars had a dense atmosphere 4 billion years ago -- ScienceDaily

Exploration missions have suggested that Mars once had a warm climate, which sustained oceans on its surface. To keep Mars warm requires a dense atmosphere with a sufficient greenhouse effect, while the present-day Mars has a thin atmosphere whose surface pressure is only 0.006 bar, resulting in the cold climate it has today. It has been a big mystery as to when and how Mars lost its dense atmosphere.

An old meteorite has been known to contain the ancient Martian atmosphere. The researchers simulated how the composition of the Martian atmosphere changed throughout history under various conditions. By comparing the results to the isotopic composition of the trapped gas, the researchers revealed how dense the Martian atmosphere was at the time when the gas became trapped in the meteorite.

The research team concluded that Mars had a dense

atmosphere 4 billion years ago. The surface air pressure at the time was at least 0.5 bar and could have been much higher. Because Mars had its magnetic field about 4 billion years ago and lost it, the result suggests that stripping by the solar wind is responsible for transforming Mars from a warm wet world into a cold desert world.

NASA's MAVEN spacecraft is orbiting Mars to explore the processes that removed the Martian atmosphere. The Japan Aerospace Exploration Agency (JAXA) is planning to further observe the removal processes by the Martian Moons eXploration (MMX) spacecraft. These missions will reveal how the dense atmosphere on ancient Mars predicted in this study was removed over time.

Story Source:

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ALMA and Rosetta detect Freon-40 in space: Dashing hopes that molecule may be marker of life -- ScienceDaily

Using data captured by ALMA in Chile and from the ROSINA instrument on ESA's Rosetta mission, a team of astronomers has found faint traces of the chemical compound [Freon-40] -- (CH₃Cl), also known as methyl chloride and chloromethane, around both the infant star system IRAS 16293-2422, about 400 light-years away, and the famous comet 67P/Churyumov-Gerasimenko (67P/C-G) in our own Solar System. The new ALMA observation is the first detection ever of a stable organohalogen in interstellar space.

Organohalogens consist of halogens, such as chlorine and fluorine, bonded with carbon and sometimes other elements. On Earth, these compounds are created by some biological processes -- in organisms ranging from humans to fungi -- as well as by industrial processes such as the production of dyes and medical drugs.

This new discovery of one of these compounds, Freon-

40, in places that must predate the origin of life, can be seen as a disappointment, as earlier research had suggested that these molecules could indicate the presence of life.

"Finding the organohalogen Freon-40 near these young, Sun-like stars was surprising," said Edith Fayolle, a researcher with the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts in the USA, and lead author of the new paper. "We simply didn't predict its formation and were surprised to find it in such significant concentrations. It's clear now that these molecules form readily in stellar nurseries, providing insights into the chemical evolution of planetary systems, including our own."

Exoplanet research has gone beyond the point of finding planets -- more than 3000 exoplanets are now known -- to looking for chemical markers that might indicate the potential presence of life. A vital step is determining which molecules could indicate life, but establishing reliable markers remains a tricky process.

"ALMA's discovery of organohalogens in the interstellar medium also tells us something about the starting conditions for organic chemistry on planets.

Such chemistry is an important step toward the origins of life," adds Karin Öberg, a co-author on the study. "Based on our discovery, organohalogens are likely to be a constituent of the so-called 'primordial soup', both on the young Earth and on nascent rocky exoplanets."

This suggests that astronomers may have had things around the wrong way; rather than indicating the presence of existing life, organohalogens may be an important element in the little-understood chemistry involved in the origin of life.

Co-author Jes Jørgensen from the Niels Bohr Institute at University of Copenhagen adds: "This result shows the power of ALMA to detect molecules of astrobiological interest toward young stars on scales where planets may be forming. Using ALMA we have previously found precursors to sugars and amino acids around different stars. The additional discovery of Freon-40 around Comet 67P/C-G strengthens the links between the pre-biological chemistry of distant protostars and our own Solar System."

The astronomers also compared the relative amounts of Freon-40 that contain different isotopes of chlorine in the infant star system and the comet -- and found

similar abundances. This supports the idea that a young planetary system can inherit the chemical composition of its parent star-forming cloud and opens up the possibility that organohalogens could arrive on planets in young systems during planet formation or via comet impacts.

"Our results shows that we still have more to learn about the formation of organohalogens," concludes Fayolle. "Additional searches for organohalogens around other protostars and comets need to be undertaken to help find the answer."

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· [**Did life on Earth start due to meteorites splashing into warm little ponds?**](#) [周二, 03 10月 04:12]

Life on Earth began somewhere between 3.7 and 4.5 billion years ago, after meteorites splashed down and leached essential elements into warm little ponds, say scientists. Their calculations suggest that wet and dry cycles bonded basic molecular building blocks in the ponds' nutrient-rich broth into self-replicating RNA molecules that constituted the first genetic code for life on the planet.

· [**Meteorite tells us that Mars had a dense atmosphere 4 billion years ago**](#) [周一, 02 10月 23:42]

Exploration missions have suggested that Mars once had a warm climate, which sustained oceans on its surface. To keep Mars warm requires a dense atmosphere with a sufficient greenhouse effect, while the present-day Mars has a thin atmosphere whose surface pressure is only 0.006 bar, resulting in the cold climate it has today. It has been a big mystery as to when and how Mars lost its dense atmosphere.

· [**ALMA and Rosetta detect Freon-40 in space**](#) [周一, 02 10月 23:28]

Observations made with the Atacama Large Millimeter/submillimeter Array (ALMA) and ESA's Rosetta mission, have revealed the presence of the organohalogen Freon-40 in gas around both an infant star and a comet. Organohalogens are formed by organic processes on Earth, but this is the first ever detection of them in interstellar space. This discovery suggests that organohalogens may not be as good markers of life as had been hoped, but that they may be significant components of the material from whi...

• [**First look at electrons escaping atoms**](#) [周一, 02 10月 23:27]

Researchers have taken a first step toward controlling electrons' behavior inside matter -- and thus the first step down a long and complicated road that could eventually lead to the ability to create new states of matter at will.

• [**Mini-kidneys grown in lab reveal renal disease secrets**](#) [周一, 02 10月 23:27]

By creating and manipulating mini-kidney organoids that contain a realistic micro-anatomy, researchers can now track the early stages of polycystic kidney disease. The organoids are grown from human stem cells.

• [**DNA: The next hot material in photonics?**](#) [周一, 02 10月 22:52]

Using DNA from salmon, researchers in South Korea hope to make better biomedical and other photonic devices based on organic thin films.

• [**Animals that play with objects learn how to use them as tools**](#) [周一, 02 10月 22:52]

New Caledonian crows and kea parrots can learn about the usefulness of objects by playing with them -- similar to human baby behavior.

• [**New approach for AIDS: Lock HIV in reservoir cells, to die through apoptosis**](#) [周一, 02 10月 21:34]

With the successful suppression of the AIDS virus (HIV) through medication, the focus turns toward its eradication. Researchers have developed a new compound that is key to the destruction of HIV. When the compound is introduced into infected cells, viral budding is suppressed thereby confining it within the host cells. The cell then dies naturally through apoptosis. This treatment is hoped to lead to the complete recovery from AIDS in the near future.

• [**2017 Nobel Prize in Physiology or Medicine: Molecular mechanisms controlling the circadian**](#)

[rhythm](#) [周一, 02 10月 21:26]

The 2017 Nobel Prize in Physiology or Medicine is being awarded jointly to Jeffrey C. Hall, Michael Rosbash and Michael W. Young for their discoveries of molecular mechanisms controlling the circadian rhythm.

• [Body energy as a power source](#) [周一, 02 10月 20:56]

Smartphones, MP3 players, sports electronics devices such as pulse meters or trackers, medical equipment such as tonometers, pacemakers of the heart, or insulin pumps: An increasing number of electronic companions make daily life easier for us. But as useful these smart helpers may be: Their constant hunger for electricity is a problem. The solution: power supply by means of energy produced by body movements.

• ['Revolutionary' new gesture control tech turns any object into a TV remote](#) [周一, 02 10月 10:53]

Imagine changing the channel of your TV simply by moving your cup of tea, adjusting the volume on a music player by rolling a toy car, or rotating a spatula to pause a cookery video on your tablet. New gesture control technology that can turn everyday objects into remote controls could revolutionize how we interact with televisions, and other screens - ending frustrating searches for remotes that have slipped down the side of sofa cushions.

• [Meet the hominin species that gave us genital herpes](#) [周一, 02 10月 10:53]

New research uses innovative data modeling to predict which species acted as an intermediary between our ancestors and those of chimpanzees to carry HSV2 -- the genital herpes virus -- across the species barrier.

• [Genes that separate humans from fruit flies found](#) [周六, 30 9月 10:59]

Genes which determine animal complexity -- or what makes humans so much more complex than a fruit fly or a sea urchin -- have been

identified for the first time.

- [**Physical abuse and punishment impact children's academic performance**](#) [周六, 30 9月 03:22]

Scientists have found that physical abuse was associated with decreases in children's cognitive performance, while non-abusive forms of physical punishment were independently associated with reduced school engagement and increased peer isolation.

- [**Video gamers have an advantage in learning**](#) [周六, 30 9月 00:51]

Neuropsychologists let video gamers compete against non-gamers in a learning competition. During the test, the video gamers performed significantly better and showed an increased brain activity in the brain areas that are relevant for learning.

- [**Raccoons solve an ancient puzzle, but do they really understand it?**](#) [周六, 30 9月 00:51]

Scientists have been using an ancient Greek fable written by Aesop as inspiration to test whether birds and small children understand cause and effect relationships. A group of scientists have now extended this body of work to study raccoon intelligence. Their research uses the Aesop's Fable paradigm to assess if mammalian carnivores understand the principles of water displacement.

- [**New study changes our view on flying insects**](#) [周五, 29 9月 23:49]

For the first time, researchers are able to prove that there is an optimal speed for certain insects when they fly. At this speed, they are the most efficient and consume the least amount of energy. Corresponding phenomena have previously been demonstrated in birds, but never among insects.

- [**Small collisions make big impact on Mercury's thin atmosphere**](#) [周五, 29 9月 23:29]

Mercury, our smallest planetary neighbor, has very little to call an atmosphere, but it does have a strange weather pattern: morning micro-meteor showers.

- [**A stinging report: Climate change a major threat to bumble bees**](#) [周五, 29 9月 21:33]

New research is helping to explain the link between a changing global climate and a dramatic decline in bumble bee populations worldwide.

- [**Antarctica: Return of the Weddell polynya supports Kiel climate model**](#) [周五, 29 9月 21:33]

Currently, winter has still a firm grip on Antarctica. At this time of the year, the Weddell Sea usually is covered with a thick layer of sea ice. In spite of the icy temperatures in the region, satellite images depict a large ice-free area in the middle of the ice cover.

- [**Electrically heated textiles now possible via UMass Amherst research**](#) [周五, 29 9月 21:33]

Skiers, crossing guards and others who endure frozen fingers in cold weather may look forward to future relief as manufacturers are poised to take advantage of a new technique for creating electrically heated cloth. Researchers have made gloves that keep fingers as warm as the palm of the hand.

- [**Sharks and rays live a lot longer than we thought**](#) [周五, 29 9月 21:32]

Sharks and rays live a lot longer than we thought -- some twice as long as previously estimated.

- [**Solving the mystery of Pluto's giant blades of ice**](#)

[周五, 29 9月 03:24]

NASA's New Horizons mission revolutionized our knowledge of Pluto when it flew past that distant world in July 2015. Among its many discoveries were images of strange formations resembling giant knife blades of ice, whose origin had remained a mystery. Now, scientists have turned up a fascinating explanation for this "bladed terrain": the structures are made almost entirely of methane ice, and likely formed as a specific kind of erosion wore away their surfaces.

- [**Farthest active inbound comet yet seen**](#) [周五, 29 9月 03:23]

NASA's Hubble Space Telescope has photographed the farthest active

inbound comet ever seen, at a whopping distance of 1.5 billion miles from the Sun (beyond Saturn's orbit). Slightly warmed by the remote Sun, it has already begun to develop an 80,000-mile-wide fuzzy cloud of dust, called a coma, enveloping a tiny, solid nucleus of frozen gas and dust. These observations represent the earliest signs of activity ever seen from a comet entering the solar system's planetary zone for the first time.

- [**A fresh look at older data yields a surprise near the Martian equator**](#) [周五, 29 9月 03:22]

Scientists taking a new look at older data from NASA's longest-operating Mars orbiter have discovered evidence of significant hydration near the Martian equator -- a mysterious signature in a region of the Red Planet where planetary scientists figure ice shouldn't exist.

- [**Disease resistance successfully spread from modified to wild mosquitoes**](#) [周五, 29 9月 02:54]

Using genetically modified mosquitoes to reduce or prevent the spread of disease is a rapidly expanding field of investigation. One challenge is ensuring that GM mosquitoes can mate with their wild counterparts so the desired modification is spread in the wild population. Investigators have engineered mosquitoes with an altered microbiota that suppresses human malaria-causing parasites. These GM mosquitoes preferred to mate with wild mosquitoes and passed the desired protection to offspring.

- [**Tsunami enabled hundreds of aquatic species to raft across Pacific**](#) [周五, 29 9月 02:21]

The 2011 Japanese tsunami set the stage for something unprecedented. For the first time in recorded history, scientists have detected entire communities of coastal species crossing the ocean by floating on makeshift rafts. Nearly 300 species have appeared on the shores of Hawaii and the US West Coast attached to tsunami debris, marine biologists discovered.

- [**New measurements show widespread forest loss**](#)

[has reversed the role of tropics as a carbon sink](#)

[周五, 29 9月 02:20]

A new report provides the most comprehensive picture of deforestation's toll on critical climate change safeguard; reveals hard-to-measure forest degradation is responsible for nearly 70 percent of emissions from tropical forests. Researchers discovered that tropical regions are now a net source of carbon to the atmosphere.

• [Modern humans emerged more than 300,000 years ago new study suggests](#)

[周五, 29 9月 02:20]

A genomic analysis of ancient human remains from KwaZulu-Natal revealed that southern Africa has an important role to play in writing the history of humankind.

• [Supersonic gas streams left over from the Big Bang drive massive black hole formation](#)

[周五, 29 9月 02:20]

A super-computer simulation by an international team of researchers has shown the formation of a rapidly growing star from supersonic gas streams in the early universe left over from the Big Bang. The star ends its life with catastrophic collapse to leave a black hole with a mass of 34,000 times that of the Sun.

• [Perovskite solar cells reach record long-term stability, efficiency over 20 percent](#)

[周五, 29 9月 02:20]

Scientists have greatly improved the operational stability of perovskite solar cells by introducing cuprous thiocyanate protected by a thin layer of reduced graphene oxide. Devices lost less than 5 percent performance when subjected to a crucial accelerated aging test during which they were exposed for more than 1,000 hours to full sunlight at 60°C.

• [Summer could be one long heatwave if planet hits 2 degrees Celsius](#)

[周五, 29 9月 00:18]

New paper highlighting how heatwaves will change with every degree of global warming up to 5 degrees C. It finds tropical summers may be one continuous heatwave at 2 degrees C.

• [Saber-toothed kittens may have been born with](#)

[thicker bones than other contemporary cats](#) [周五, 29 9月 00:17]

Saber-toothed kittens may have been born with thicker bones compared to other contemporary cats, but they have a similar pattern of bone development, according to a new study.

• [Chimpanzees can learn how to use tools without observing others](#) [周四, 28 9月 21:42]

New observations have led researchers to believe that chimpanzees can use tools spontaneously to solve a task, without needing to watch others first.

• [The hormone that could be making your dog aggressive discovered](#) [周四, 28 9月 04:20]

Thousands of people are hospitalized every year for dog bites, and aggressive behavior is a major reason dogs end up in shelters. Biologists have studied the biology behind canine aggression, specifically the role of the hormones vasopressin and oxytocin.

• [Black holes with ravenous appetites define Type I active galaxies](#) [周四, 28 9月 01:36]

Type I and Type II active galaxies do not just appear different -- they are, in fact, very different from each other, both structurally and energetically, new research shows. According to the results of a new study, the key factor that distinguishes Type I and Type II galaxies is the rate at which their central black holes -- or active galactic nuclei -- consume matter and spit out energy.

• [New light shed on how Earth and Mars were created](#) [周四, 28 9月 01:36]

Analysing a mixture of earth samples and meteorites, scientists have shed new light on the sequence of events that led to the creation of the planets Earth and Mars.

• [The volatile processes that shaped Earth](#) [周四, 28 9月 01:36]

Although it is widely understood that Earth was formed gradually, from much smaller bodies, many of the processes involved in shaping our

growing planet are less clear. Astronomers have now untangled some of these processes, revealing that the mini-planets added to Earth had previously undergone melting and evaporation. They also address another scientific conundrum: Earth's depletion in many economically important chemical elements.

- [**LIGO and Virgo observatories jointly detect black hole collision**](#) [周四, 28 9月 00:36]

The first observation of gravitational waves has been discovered by by three different detectors, marking a new era of greater insights and improved localization of cosmic events now available through globally networked gravitational-wave observatories.

- [**Soft, flexible origami-inspired robot**](#) [周三, 27 9月 22:23]

A Case Western Reserve University researcher has turned the origami she enjoyed as a child into a patent-pending soft robot that may one day be used on an assembly line, in surgery or even outer space.

- [**Emerging infectious disease threatens Darwin's frog with extinction**](#) [周三, 27 9月 22:09]

Iconic species likely to be wiped-out by amphibian fungus, despite lack of obvious short-term evidence.

- [**Geographic variation in Gentoo penguin calls**](#) [周三, 27 9月 21:33]

Vocal communication is central to the lives of many birds, which use sound to attract mates and defend territories. Penguins are no exception, but we know little about how or why penguin vocalizations vary between isolated populations. A new study takes a broad look at vocalizations across the range of Gentoo penguins and concludes that while their calls do vary from place to place, we still have lots to learn about the processes at work.

- [**Songbird populations may indicate trouble in northwestern forests**](#) [周三, 27 9月 21:33]

Populations of many North American songbirds are declining, and in many cases we don't understand why. Conservation efforts need this

information to be effective, and bird banding stations can help fill in the gaps, providing insights into how demographics vary across space and time. A new study presents ten years of data from banding stations across northern California and southern Oregon and offers new hints on what's driving changes in the region's songbird populations.

- [**Tree-dwelling, coconut-cracking giant rat discovered in Solomon Islands**](#) [周三, 27 9月 21:33]

Scientists have discovered a new species of giant rat. It's more than four times the size of the black rats that live in the US, it lives in trees, and it's rumored to crack open coconuts with its teeth. And it's actually pretty cute.

- [**Lost continent of Zealandia: Scientists return from expedition to sunken land**](#) [周三, 27 9月 11:59]

After a nine-week voyage to study the lost, submerged continent of in the South Pacific, a team of 32 scientists from 12 countries has arrived in Hobart, Tasmania, aboard the research vessel JOIDES Resolution.

- [**Caribbean praying mantises have ancient African origin**](#) [周三, 27 9月 11:59]

Three seemingly unrelated praying mantis groups inhabiting Cuba and the rest of the Greater Antilles actually share an ancient African ancestor and possibly form the oldest endemic animal lineage on the Caribbean islands, researchers have determined.

- [**Umbilical cord stem cells show promise as heart failure treatment**](#) [周三, 27 9月 04:23]

Intravenous stem cell infusion derived from umbilical cords appears to boost heart muscle function in patients with heart failure, according to a small study. In this first-of-its-kind study, patients had 'significant' improvement in their hearts' ability to pump blood and experienced no adverse side effects related to the therapy. The results suggest IV-infused umbilical cord-derived stem cells are a promising avenue to treat heart failure.

[Energy harvested from evaporation could power much of US](#) [周三, 27 9月 00:51]

In the first evaluation of evaporation as a renewable energy source, researchers find that US lakes and reservoirs could generate 325 gigawatts of power, nearly 70 percent of what the United States currently produces.

[Amount of water in stem cells can determine its fate as fat or bone](#) [周三, 27 9月 00:51]

Adding or removing water from a stem cell can change the destiny of the cell to either pre-fat cells or pre-bone cells, researchers have discovered in a new study.

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Health News

Top stories featured on ScienceDaily's Health & Medicine, Mind & Brain, and Living Well sections.

- [**Skipping breakfast associated with hardening of the arteries**](#) [周二, 03 10月 02:56]

Skipping breakfast is associated with an increased risk of atherosclerosis, or the hardening and narrowing of arteries due to a build-up of plaque, according to research.

- [**New insights into leading cause of miscarriage, birth defects discovered**](#) [周二, 03 10月 02:50]

Ten to 25 percent of human embryos contain the wrong number of chromosomes, resulting in miscarriage or birth defects such as Down syndrome. The incidence of these errors rises dramatically as women age. Two recent studies shed new light on the mystery of the leading cause of birth defects and miscarriage, laying the foundation for further research in an understudied but crucially important field of genetic study.

- [**Did game design elements increase physical activity among adults?**](#) [周一, 02 10月 23:27]

Physical activity increased among families in a randomized clinical trial as part of a game-based intervention where they could earn points and progress through levels based on step goal achievements, according to a new article.

- [**Mini-kidneys grown in lab reveal renal disease secrets**](#) [周一, 02 10月 23:27]

By creating and manipulating mini-kidney organoids that contain a

realistic micro-anatomy, researchers can now track the early stages of polycystic kidney disease. The organoids are grown from human stem cells.

- [**Study reveals molecular pathway of weight-controlling hormone**](#) [周一, 02 10月 23:27]

Scientists have revealed deep insights into the role that a little-understood human hormone plays in regulating body weight. Named Growth and Differentiation Factor 15 (GDF15), this hormone is typically active only when the body experiences acute or prolonged stress, including following exposure to tissue-damaging toxins, such as chemotherapy, or during chronic disease, such as obesity or cancer. As a result, the GDF15 pathway holds promise for the development of potential therapeutics for diseases...

- [**Unexpected findings uncover new understanding of gene expression**](#) [周一, 02 10月 23:27]

Scientists have discovered surprising findings about an enzyme central to gene expression and mutated in many cancers.

- [**Sticker shock**](#) [周一, 02 10月 23:27]

Preventing a preterm birth could cost as little as \$200 or as much as \$20,000, depending on which one of two medications a doctor orders, according to a new analysis.

- [**International competition benchmarks metagenomics software**](#) [周一, 02 10月 23:23]

Communities of bacteria live everywhere: inside our bodies, on our bodies and all around us. The human gut alone contains hundreds of species of bacteria that help digest food and provide nutrients, but can also make us sick. Scientists use metagenomics -- the study of DNA from an environmental sample -- to study these bacterial communities.

- [**Genetic test successfully detects some asymptomatic pancreatic cancers**](#) [周一, 02 10月 23:23]

PancreaSeq® analyzed mutations known to be associated with

precursors to pancreatic cancers, report investigators at the conclusion of a study.

• [How much is that call worth?](#) [周一, 02 10月 23:23]

Call centres can be expensive as well as the source of lots of consumer angst. But companies can get more bang for their buck by doing a better job of coordinating marketing decisions that drive customers to call centers with operational ones about handling them once they get there.

• [Childhood asthma: Not linked to BCG vaccination](#) [周一, 02 10月 23:23]

Childhood asthma is a serious public health challenge in Québec and throughout the world. Although the immune mechanisms implicated in the development of childhood asthma are not fully understood, some studies seem to suggest that the BCG vaccine, used in tuberculosis prevention, may have a protective effect on childhood asthma. However there is no consensus and contradictory findings have been reported in other studies.

• [Low consumption of vitamin K by adolescents associated with unhealthy enlargement of the heart's major pumping chamber](#) [周一, 02 10月 22:52]

A study of 766 otherwise healthy adolescents showed that those who consumed the least vitamin K1-- found in spinach, cabbage, iceberg lettuce and olive oil -- were at 3.3 times greater risk for an unhealthy enlargement of the major pumping chamber of their heart, according to the study. Vitamin K1, or phylloquinone, is the predominant form of vitamin K in the U.S. diet.

• [Tracking live brain activity with the new NeuBtracker open-source microscope](#) [周一, 02 10月 22:52]

A team of scientists has successfully developed a new type of microscope. The so-called NeuBtracker is an open source microscope that allows to observe neuronal activities of zebrafish without altering their behavior. This is opening up completely new perspectives for science, because now it will be possible to track natural behavior while

simultaneously imaging neuronal activity in the brain.

- [**A new model of treatment for youth with anxiety**](#)

[周一, 02 10月 22:52]

A stepped care model of treatment for youth with anxiety can be effectively delivered using at least 14% less therapist time than traditional treatment service, reports a new study.

- [**DNA: The next hot material in photonics?**](#) [周一, 02 10月

22:52]

Using DNA from salmon, researchers in South Korea hope to make better biomedical and other photonic devices based on organic thin films.

- [**New approach for AIDS: Lock HIV in reservoir cells, to die through apoptosis**](#) [周一, 02 10月 21:34]

With the successful suppression of the AIDS virus (HIV) through medication, the focus turns toward its eradication. Researchers have developed a new compound that is key to the destruction of HIV. When the compound is introduced into infected cells, viral budding is suppressed thereby confining it within the host cells. The cell then dies naturally through apoptosis. This treatment is hoped to lead to the complete recovery from AIDS in the near future.

- [**2017 Nobel Prize in Physiology or Medicine: Molecular mechanisms controlling the circadian rhythm**](#) [周一, 02 10月 21:26]

The 2017 Nobel Prize in Physiology or Medicine is being awarded jointly to Jeffrey C. Hall, Michael Rosbash and Michael W. Young for their discoveries of molecular mechanisms controlling the circadian rhythm.

- [**Can we end damaging dementia psychosis cycle?**](#)

[周一, 02 10月 21:22]

A new research report calls for a change in approach in the treatment of psychosis in dementia, to find alternatives to highly damaging antipsychotics.

- [**Radical research raises hopes for eye disease**](#)

[treatment for premature babies](#) [周一, 02 10月 21:22]

Ground-breaking research has demonstrated the previously unknown existence of a disease-fighting immune cell in the eye and points to potential novel ways of treating eye disorders in premature babies and diabetic adults.

• [New drug protects heart from cardiac rupture after myocardial infarction](#) [周一, 02 10月 21:22]

There are currently many kinds of drugs for heart failure. Among them, the new drug LCZ696 is recommended by US guidelines as a first-line treatment for chronic heart failure. LCZ696 is better than conventional drugs at reducing cardiac death and hospitalization due to heart failure. Now, researchers have revealed that LCZ696 can prevent cardiac rupture and heart failure following acute myocardial infarction which is one of the causes of chronic heart failure.

• [Children without allergies can still be afflicted with asthma-like coughing and wheezing](#) [周一, 02 10月 21:05]

Doctors have long wondered why children without allergies can still be afflicted with asthma-like coughing and wheezing. In a new study, researchers have identified a protein that may be responsible.

• [Risks and recommendations for weight gain management in midlife women](#) [周一, 02 10月 21:05]

A review of the weight gain risks and challenges faced by women in midlife has led researchers to a series of recommendations for this patient population.

• [Menopause and estrogen affect muscle function](#) [周一, 02 10月 20:56]

Estrogen acts as a regulator of muscle energy metabolism and muscle cell viability, research shows. Menopause leads to the cessation of ovarian estrogen production concurrent to the deterioration of muscle function. After menopause, the risk of metabolic diseases also increases. Although a healthy lifestyle does not increase the amount of estrogen in circulation, it reduces risks.

- [**New insights into how sleep helps the brain to reorganize itself**](#) [周一, 02 10月 20:56]

A study has given new insights into how sleep contributes to brain plasticity -- the ability for our brain to change and reorganise itself -- and could pave the way for new ways to help people with learning and memory disorders.

- [**Doctors define 'safe and effective' margins for 'one and done' skin removal around suspicious moles**](#) [周一, 02 10月 20:48]

By carefully tracing a line of at least 2 millimeters outside of and around the edges of a mole that is suspected of being a cancer, doctors can remove all of its cells and avert the need for a second surgery, says a new report.

- [**Our muscles measure the time of day**](#) [周一, 02 10月 20:48]

Biological clocks are ticking everywhere throughout our body, and a 'master clock' in the brain synchronizes all the subsidiary ones in various organs. Medical researchers have now found that such a circadian clock is at work in our muscles. Their research shows that perturbations of this machinery might be important for type 2 diabetes development.

- [**If your child is bilingual, learning additional languages later might be easier**](#) [周一, 02 10月 20:48]

It is often claimed that people who are bilingual are better than monolinguals at learning languages. Now, the first study to examine bilingual and monolingual brains as they learn an additional language offers new evidence that supports this hypothesis, researchers say.

- [**DNA mutations shed in blood predicts response to immunotherapy in patients with cancer**](#) [周一, 02 10月 20:48]

A blood sample, or liquid biopsy, can reveal which patients will respond to checkpoint inhibitor-based immunotherapies, a first-of-its-kind study reports.

- [**Adulteration of proprietary Chinese medicines and health products poses severe health risks**](#) [周一, 02 10月 20:48]

Traditional Chinese medicine is widely used as a form of complementary medicine all over the world for various indications and for improving general health. Various reports have documented the adulteration of pCMs and health products with undeclared agents, including prescription drugs, drug analogues, and banned drugs. Such adulation can have serious and even fatal consequences.

- [**Physician licensing laws keep doctors from seeking care**](#) [周一, 02 10月 20:48]

Licensing requirements in many states include questions about past mental health treatments or diagnoses, with the implication that they may limit a doctor's right to practice medicine, research shows.

- [**GM soybean oil causes less obesity and insulin resistance but is harmful to liver function**](#) [周一, 02 10月 20:48]

Researchers have tested a genetically-modified soybean oil used in restaurants and found that while it induces less obesity and insulin resistance than conventional soybean oil, its effects on diabetes and fatty liver are similar to those of conventional soybean oil, the major vegetable cooking oil used in the United States, with popularity on the increase worldwide. The study also compares the GM soybean oil to coconut and olive oils.

- [**Feeling sated can become a cue to eat more**](#) [周一, 02 10月 20:48]

When hunger pangs strike, we usually interpret them as a cue to reach for a snack; when we start to feel full, we take it as a sign that we should stop eating. But new research shows that these associations can be learned the other way around, such that satiety becomes a cue to eat more, not less. The findings suggest that internal, physical states themselves can serve as contexts that cue specific learned behaviors.

- [**Genes that separate humans from fruit flies**](#)

found [周六, 30 9月 10:59]

Genes which determine animal complexity -- or what makes humans so much more complex than a fruit fly or a sea urchin -- have been identified for the first time.

• **Exploring ways that a drug like Avandia can be made safer** [周六, 30 9月 04:38]

With the heightened concerns over the dangerous side effects of the once-popular antidiabetic drug Avandia, researchers are working to understand how small molecules, like those in Avandia, can have such varied effects throughout the body. The insights could help researchers design new drugs with better efficacy and fewer side effects.

• **Who's judging you based on brand choices?** [周六, 30 9月 03:22]

People with a flexible mindset do not tend to judge others based on the brands they use, while people with a fixed mindset use brands to judge another person's character, a new study shows.

• **A new approach to cancer drug discovery** [周六, 30 9月 03:22]

Scientists have developed and demonstrated a promising new strategy for the discovery of novel anti-cancer therapies.

• **Physical abuse and punishment impact children's academic performance** [周六, 30 9月 03:22]

Scientists have found that physical abuse was associated with decreases in children's cognitive performance, while non-abusive forms of physical punishment were independently associated with reduced school engagement and increased peer isolation.

• **Snapchat users motivation, level of interest** [周六, 30 9月 01:35]

The simplicity of the platform and brevity of posts are key factors in determining how students can become very regular users.

• **'Love hormone' leads worms to show their caring side** [周六, 30 9月 01:35]

Modern neuroscience has long been smitten by the idea of identifying

how the brain and its complex array of nerve cells bring about social behavior.

- [**Confronted with bacteria, infected cells die so others can live, study finds**](#) [周六, 30 9月 01:26]

In a new study, a team of researchers identified a 'back-up alarm' system in host cells that responds to a pathogen's attempt to subvert the immune system.

- [**Video gamers have an advantage in learning**](#) [周六, 30 9月 00:51]

Neuropsychologists let video gamers compete against non-gamers in a learning competition. During the test, the video gamers performed significantly better and showed an increased brain activity in the brain areas that are relevant for learning.

- [**New mouse model replicates an underlying cause of intellectual disability**](#) [周六, 30 9月 00:50]

Researchers have developed the first mice that lack the Upf3b gene, providing a new model for studying its underlying role in intellectual disabilities and neurodevelopmental disorders.

- [**Protein that could improve symptoms and reduce mortality in flu**](#) [周五, 29 9月 23:29]

Flu season is on its way, and a new report has identified an innovative strategy for battling this deadly illness.

- [**Why do we fall asleep when bored?**](#) [周五, 29 9月 21:34]

Why do we have the tendency to fall asleep in the absence of motivating stimuli, i.e., when bored.

- [**Safety, effectiveness of cognitive enhancers for Alzheimer's ranked**](#) [周五, 29 9月 21:33]

A new study ranking the safety and effectiveness of four drugs taken to enhance concentration, memory, alertness and moods, found that donepezil was most likely to effectively improve cognition in patients with Alzheimer's disease.

- [**MRIs are safe for patients with wide variety of pacemakers, defibrillators, study shows**](#) [周五, 29 9月 21:33]

Magnetic resonance imaging appears to be safe for patients with cardiac implantable electronic devices, even for chest imaging, according to a new study.

- [**Frequent sauna bathing keeps blood pressure in check**](#) [周五, 29 9月 21:33]

Frequent sauna bathing reduces the risk of elevated blood pressure, according to an extensive follow-up population-based study. The risk of developing elevated blood pressure was nearly 50 percent lower among men who had a sauna 4-7 times a week compared to men who had a sauna only once a week.

- [**New regulator of liver metabolism discovered**](#) [周五, 29 9月 21:33]

Researchers have identified an enzyme that has a major effect on glucose utilization in liver cells. The enzyme, retinol saturase, helps these cells adapt to variations in glucose levels. However, when glucose levels are consistently too high, retinol saturase appears to exert a damaging effect on cells.

- [**How the lungs of premature babies can undergo damage**](#) [周五, 29 9月 21:33]

Premature babies that need ventilation to support their breathing often suffer from a condition known as bronchopulmonary dysplasia. Researchers have now discovered a molecular mechanism that plays a key role in the development of the disease.

- [**Breakdown of brain cells' metabolic collaboration linked to Alzheimer's disease**](#) [周五, 29 9月 21:33]

Researchers have discovered that impairing a critical partnership between brain cells can lead to neurodegeneration.

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Technology News

Top stories featured on ScienceDaily's Space & Time, Matter & Energy, and Computers & Math sections.

- [**Meteorite tells us that Mars had a dense atmosphere 4 billion years ago**](#) [周一, 02 10月 23:42]

Exploration missions have suggested that Mars once had a warm climate, which sustained oceans on its surface. To keep Mars warm requires a dense atmosphere with a sufficient greenhouse effect, while the present-day Mars has a thin atmosphere whose surface pressure is only 0.006 bar, resulting in the cold climate it has today. It has been a big mystery as to when and how Mars lost its dense atmosphere.

- [**ALMA and Rosetta detect Freon-40 in space**](#) [周一, 02 10月 23:28]

Observations made with the Atacama Large Millimeter/submillimeter Array (ALMA) and ESA's Rosetta mission, have revealed the presence of the organohalogen Freon-40 in gas around both an infant star and a comet. Organohalogens are formed by organic processes on Earth, but this is the first ever detection of them in interstellar space. This discovery suggests that organohalogens may not be as good markers of life as had been hoped, but that they may be significant components of the material from whi...

- [**Glowing news for organic materials**](#) [周一, 02 10月 23:28]

Researchers have developed the world's first glow-in-the-dark materials based on organic molecules. The materials eliminate the expensive metals and high-temperature processing needed by current inorganic glow-in-the-dark materials. In addition to reducing cost, organic materials are likely to enable improved flexibility, transparency, and bio-compatibility, opening the door for a variety of new applications.

- [**First look at electrons escaping atoms**](#) [周一, 02 10月 23:27]

Researchers have taken a first step toward controlling electrons' behavior inside matter -- and thus the first step down a long and complicated road that could eventually lead to the ability to create new states of matter at will.

- [**New 'building material' points toward quantum computers**](#) [周一, 02 10月 23:27]

It is possible to produce 'Majorana particles' in a new 'building material,' new research indicates. The study paves the road for new types of experiments -- and at the same time represents an important contribution to the construction of the information circuits of tomorrow.

- [**Superconductivity found in thin films of titanium oxide**](#) [周一, 02 10月 23:27]

Many of us are familiar with titanium dioxide, a whitener commonly used in sunscreens and paints such as the white lines seen on tennis courts. Less well known are other higher titanium oxides -- those with a higher number of titanium and oxygen atoms than TiO -- that are now the subject of intensifying research due to their potential use in next-generation electronic devices.

- [**International competition benchmarks metagenomics software**](#) [周一, 02 10月 23:23]

Communities of bacteria live everywhere: inside our bodies, on our bodies and all around us. The human gut alone contains hundreds of species of bacteria that help digest food and provide nutrients, but can also make us sick. Scientists use metagenomics -- the study of DNA from an environmental sample -- to study these bacterial communities.

- [**Tiny aquariums put nanoparticle self-assembly on display**](#) [周一, 02 10月 23:23]

Seeing is believing when it comes to nanoparticle self-assembly. A team of engineers is observing the interactions of colloidal gold nanoparticles inside tiny aquariumlike sample containers to gain more control over the

self-assembly process of engineered materials.

- [**Tracking live brain activity with the new NeuBtracker open-source microscope**](#) [周一, 02 10月 22:52]

A team of scientists has successfully developed a new type of microscope. The so-called NeuBtracker is an open source microscope that allows to observe neuronal activities of zebrafish without altering their behavior. This is opening up completely new perspectives for science, because now it will be possible to track natural behavior while simultaneously imaging neuronal activity in the brain.

- [**Asphalt helps lithium batteries charge faster**](#) [周一, 02 10月 22:52]

A touch of asphalt may be the secret to high-capacity lithium batteries that charge up to 20 times faster than commercial lithium-ion batteries, according to scientists.

- [**DNA: The next hot material in photonics?**](#) [周一, 02 10月 22:52]

Using DNA from salmon, researchers in South Korea hope to make better biomedical and other photonic devices based on organic thin films.

- [**Electricity produced from tears**](#) [周一, 02 10月 22:51]

A team of scientists has discovered that applying pressure to a protein found in egg whites and tears can generate electricity. The researchers observed that crystals of lysozyme, a model protein that is abundant in egg whites of birds as well as in the tears, saliva and milk of mammals can generate electricity when pressed.

- [**A deeper understanding of a surface phenomenon**](#) [周一, 02 10月 21:34]

Phenomena involving surface tension are extremely complex and have applications in our everyday lives, and researchers are tackling the complicated mathematics behind the physics.

- [**Llama-derived nanobodies as a new tool in solving crystal structure**](#) [周一, 02 10月 21:34]

Scientists have developed miniature antibodies (nanobodies) that can be labelled on certain amino acids. This provides a direct route for solving new X-ray crystal structures of protein complexes important for gaining mechanistic understanding of cellular processes, which is important in the development of drugs.

- **[Body energy as a power source](#)** [周一, 02 10月 20:56]

Smartphones, MP3 players, sports electronics devices such as pulse meters or trackers, medical equipment such as tonometers, pacemakers of the heart, or insulin pumps: An increasing number of electronic companions make daily life easier for us. But as useful these smart helpers may be: Their constant hunger for electricity is a problem. The solution: power supply by means of energy produced by body movements.

- **[A sea of spinning electrons](#)** [周一, 02 10月 20:48]

Picture two schools of fish swimming in clockwise and counterclockwise circles. It's enough to make your head spin, and now scientists have discovered the 'chiral spin mode' -- a sea of electrons spinning in opposing circles.

- **['Revolutionary' new gesture control tech turns any object into a TV remote](#)** [周一, 02 10月 10:53]

Imagine changing the channel of your TV simply by moving your cup of tea, adjusting the volume on a music player by rolling a toy car, or rotating a spatula to pause a cookery video on your tablet. New gesture control technology that can turn everyday objects into remote controls could revolutionize how we interact with televisions, and other screens - - ending frustrating searches for remotes that have slipped down the side of sofa cushions.

- **[Brain-controlled drones are here: What's coming in the next five years?](#)** [周六, 30 9月 11:04]

Single unmanned autonomous vehicles (UAVs) directed by joysticks, radio controllers, and mobile phones are already accomplishing a variety of useful tasks, such as aerial photography and security patrols. But using multiple drones requires multiple human operators, and this

presents a coordination problem.

- [**Open-access collider data confirm subatomic particle patterns**](#) [周六, 30 9月 03:22]

Scientists used the Compact Muon Solenoid (CMS) data to reveal, for the first time, a universal feature within jets of subatomic particles, which are produced when high-energy protons collide. Their effort represents the first independent, published analysis of the CMS open data.

- [**UV-irradiated amorphous ice behaves like liquid at low temperatures**](#) [周六, 30 9月 03:21]

Ice analogs mimicking interstellar ice behave like liquids at temperatures between -210°C and -120°C according to researchers. This liquid-like ice may enhance the formation of organic compounds including prebiotic molecules and the accretion of dust to form planets.

- [**Compound from oilseeds may be high-value product**](#) [周六, 30 9月 01:35]

Extracting a substance called glucosinolate from camelina and carinata seeds may help bring these promising sources of biofuel one stop closer to reality.

- [**Video gamers have an advantage in learning**](#) [周六, 30 9月 00:51]

Neuropsychologists let video gamers compete against non-gamers in a learning competition. During the test, the video gamers performed significantly better and showed an increased brain activity in the brain areas that are relevant for learning.

- [**Helium found in coal seams could aid safe shale gas extraction**](#) [周六, 30 9月 00:50]

Natural deposits of helium gas found in UK coal seams could help scientists monitor the secure recovery of coal or shale gas from underground sites, according to research.

- [**New technique could detect explosives,**](#)

[dangerous gases rapidly, remotely](#) [周六, 30 9月 00:50]

A laser-based method that could be used to detect chemicals such as explosives and dangerous gases quickly and accurately has now been developed by researchers.

• [There are only 15 possible pentagonal tiles](#) [周五, 29 9月 23:50]

Tiling the plane with a single pattern is a mathematical problem that has interested humans since Antiquity, notably for the aesthetic quality of tiles in mosaics or tiling. One of the unresolved problems in this field that has been puzzling the scientific community since 1918 has now been definitively resolved.

• [Bioreactors on a chip renew promises for algal biofuels](#) [周五, 29 9月 23:29]

Researchers report exciting new technology that may revolutionize the search for the perfect algal strain: algal droplet bioreactors on a chip the size of a quarter.

• [Small collisions make big impact on Mercury's thin atmosphere](#) [周五, 29 9月 23:29]

Mercury, our smallest planetary neighbor, has very little to call an atmosphere, but it does have a strange weather pattern: morning micro-meteor showers.

• [MRIs are safe for patients with wide variety of pacemakers, defibrillators, study shows](#) [周五, 29 9月 21:33]

Magnetic resonance imaging appears to be safe for patients with cardiac implantable electronic devices, even for chest imaging, according to a new study.

• [Ultracold atoms point toward an intriguing magnetic behavior](#) [周五, 29 9月 21:33]

Researchers have studied the quantum behavior of ultracold atoms and discovered an intriguing magnetic behavior that could help explain how high-temperature superconductivity works.

- [**Electrically heated textiles now possible via UMass Amherst research**](#) [周五, 29 9月 21:33]

Skiers, crossing guards and others who endure frozen fingers in cold weather may look forward to future relief as manufacturers are poised to take advantage of a new technique for creating electrically heated cloth. Researchers have made gloves that keep fingers as warm as the palm of the hand.

- [**Uncovering a winning basketball formula**](#) [周五, 29 9月 21:32]

Scientists have come up with a winning formula for basketball teams looking to take home Olympic gold.

- [**Ultra-fast and ultra-sensitive hydrogen sensor**](#) [周五, 29 9月 21:29]

Scientists have made an ultra-fast hydrogen sensor that can detect hydrogen gas levels under 1 percent in less than seven seconds. The sensor also can detect hundreds of parts per million levels of hydrogen gas within 60 seconds at room temperature.

- [**Sensible driving saves more gas than drivers think**](#) [周五, 29 9月 03:27]

A new study has quantified the impact speeding and slamming on the brakes has on fuel economy and consumption. Aggressive behavior behind the wheel can lower gas mileage in light-duty vehicles, which can equate to losing about \$0.25 to \$1 per gallon.

- [**Solving the mystery of Pluto's giant blades of ice**](#) [周五, 29 9月 03:24]

NASA's New Horizons mission revolutionized our knowledge of Pluto when it flew past that distant world in July 2015. Among its many discoveries were images of strange formations resembling giant knife blades of ice, whose origin had remained a mystery. Now, scientists have turned up a fascinating explanation for this "bladed terrain": the structures are made almost entirely of methane ice, and likely formed as a specific kind of erosion wore away their surfaces.

- [**Farthest active inbound comet yet seen**](#) [周五, 29 9月 03:23]

NASA's Hubble Space Telescope has photographed the farthest active

inbound comet ever seen, at a whopping distance of 1.5 billion miles from the Sun (beyond Saturn's orbit). Slightly warmed by the remote Sun, it has already begun to develop an 80,000-mile-wide fuzzy cloud of dust, called a coma, enveloping a tiny, solid nucleus of frozen gas and dust. These observations represent the earliest signs of activity ever seen from a comet entering the solar system's planetary zone for the first time.

- [**A fresh look at older data yields a surprise near the Martian equator**](#) [周五, 29 9月 03:22]

Scientists taking a new look at older data from NASA's longest-operating Mars orbiter have discovered evidence of significant hydration near the Martian equator -- a mysterious signature in a region of the Red Planet where planetary scientists figure ice shouldn't exist.

- [**It takes the right amount of carbon**](#) [周五, 29 9月 03:22]

Researchers have created a model that sheds new light on the formation of terrestrial planets and Earth.

- [**Flexible new platform for high-performance electronics**](#) [周五, 29 9月 02:21]

A team of engineers has created the most functional flexible transistor in the world -- and with it, a fast, simple and inexpensive fabrication process that's easily scalable to the commercial level. It's an advance that could open the door to an increasingly interconnected world, enabling manufacturers to add 'smart,' wireless capabilities to any number of large or small products or objects -- like wearable sensors and computers for people and animals -- that curve, bend, stretch and move.

- [**Generating terahertz radiation from water makes 'the impossible, possible'**](#) [周五, 29 9月 02:21]

For nearly a decade, researchers have worked to solve a scientific puzzle that many in the research community believed to be impossible: producing terahertz waves -- a form of electromagnetic radiation in the far infrared frequency range -- from liquid water.

- [**Supersonic gas streams left over from the Big**](#)

[Bang drive massive black hole formation](#) [周五, 29 9月 02:20]

A super-computer simulation by an international team of researchers has shown the formation of a rapidly growing star from supersonic gas streams in the early universe left over from the Big Bang. The star ends its life with catastrophic collapse to leave a black hole with a mass of 34,000 times that of the Sun.

[Perovskite solar cells reach record long-term stability, efficiency over 20 percent](#) [周五, 29 9月 02:20]

Scientists have greatly improved the operational stability of perovskite solar cells by introducing cuprous thiocyanate protected by a thin layer of reduced graphene oxide. Devices lost less than 5 percent performance when subjected to a crucial accelerated aging test during which they were exposed for more than 1,000 hours to full sunlight at 60°C.

[Speedy urine test for amphetamines sends results via app](#) [周五, 29 9月 00:17]

Researchers have developed a wireless sensor and a smartphone app that can detect the presence of speed in a drop of human urine in seconds. The prototype device is also portable enough to be worn as a bracelet, has unprecedented sensitivity for amphetamines with low risk for false-positive results, and costs about \$50 to produce.

[Fluorine-containing molecules from cell cultures](#) [周五, 29 9月 00:16]

Natural organic compounds that contain fluorine are rare because living organisms -- with a few exceptions -- do not produce them. Scientists have now genetically engineered a microbial host for organofluorine metabolism, allowing it to produce a fluorinated intermediate known as a diketide. As reported, the diketide could then be used as a monomer for the in vivo production of fluorinated bioplastics.

[Popping bubbles: Surfactants have surprising effect on nanobubble stability](#) [周五, 29 9月 00:16]

The stability of nanobubbles is well understood, but the mechanisms causing their eventual destabilization are still in question. Using

molecular dynamics simulations, researchers explored the effect of surfactants -- components that lower surface tension -- on the stabilization of nanobubbles.

- [**How do zebrafish develop their stripes?**](#) [周四, 28 9月 22:31]

A mathematician has thrown new light on the longstanding mystery of how zebrafish develop the distinctive striped patterns on their skin.

- [**Bursting with starbirth**](#) [周四, 28 9月 22:12]

This oddly shaped galactic spectacle is bursting with brand new stars. The pink fireworks in this image taken with the NASA/ESA Hubble Space Telescope are regions of intense star formation, triggered by a cosmic-scale collision. The huge galaxy in this image, NGC 4490, has a smaller galaxy in its gravitational grip and is feeling the strain.

- [**Small scale energy harvesters show large scale impact**](#) [周四, 28 9月 22:12]

The production of nano-scale devices has drastically increased with the rise in technological applications, yet a major drawback to the functionality of nano-sized systems is the need for an equally small energy resource. To address this, researchers have been modeling new piezoelectric energy harvester technology at the nano-scale level.

- [**Biodegradable microsensors for food monitoring**](#) [周四, 28 9月 21:42]

A new generation of microsensors could provide the vital link between food products and the Internet of Things. Researchers have developed an ultra-thin temperature sensor that is both biocompatible and biodegradable.

- [**Making surgical screws from bones**](#) [周四, 28 9月 20:51]

Biomechanics are developing surgical screws from donated human bone material for foot and jaw surgery together with an Austrian start-up.

- [**Non-toxic flame retardant enters market, study suggests**](#) [周四, 28 9月 20:51]

Chemists have developed and patented an environmentally friendly way to produce flame retardants for foams that can be used in mattresses and

upholstery. Unlike previous flame retardants made of chemicals containing chlorine, the new material is non-toxic and effective, researchers say.

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Environment News

Top stories featured on ScienceDaily's Plants & Animals, Earth & Climate, and Fossils & Ruins sections.

- [**Did life on Earth start due to meteorites splashing into warm little ponds?**](#) [周二, 03 10月 04:12]

Life on Earth began somewhere between 3.7 and 4.5 billion years ago, after meteorites splashed down and leached essential elements into warm little ponds, say scientists. Their calculations suggest that wet and dry cycles bonded basic molecular building blocks in the ponds' nutrient-rich broth into self-replicating RNA molecules that constituted the first genetic code for life on the planet.

- [**Basis of development of vertebrate limb muscles has been established in cartilaginous fishes**](#) [周一, 02 10月 23:27]

Scientists have discovered that both bony and cartilaginous fish develop their appendages via a shared mechanism -- the mechanism is also observed in land-dwelling vertebrates such as mice. They found the fin muscles of cartilaginous are formed by muscle precursors expressing Lbx1 expression, a gene that coordinates limb-muscle formation. This work revisits some related evolutionary hypotheses using a molecular biology approach and provides new insights.

- [**International competition benchmarks metagenomics software**](#) [周一, 02 10月 23:23]

Communities of bacteria live everywhere: inside our bodies, on our bodies and all around us. The human gut alone contains hundreds of species of bacteria that help digest food and provide nutrients, but can also make us sick. Scientists use metagenomics -- the study of DNA from an environmental sample -- to study these bacterial communities.

• [**Siberian volcanic eruptions caused extinction 250 million years ago, new evidence shows**](#) [周一, 02 10月 22:52]

The Great Permian Extinction, which occurred approximately 250 million years ago, was caused by massive volcanic eruptions that led to significant environmental changes, new evidence shows.

• [**Tracking live brain activity with the new NeuBtracker open-source microscope**](#) [周一, 02 10月 22:52]

A team of scientists has successfully developed a new type of microscope. The so-called NeuBtracker is an open source microscope that allows to observe neuronal activities of zebrafish without altering their behavior. This is opening up completely new perspectives for science, because now it will be possible to track natural behavior while simultaneously imaging neuronal activity in the brain.

• [**Scale of human impact on planet has changed course of Earth's history, scientists suggest**](#) [周一, 02 10月 22:52]

The significant scale of human impact on our planet has changed the course of Earth history, an international team of scientists.

• [**DNA: The next hot material in photonics?**](#) [周一, 02 10月 22:52]

Using DNA from salmon, researchers in South Korea hope to make better biomedical and other photonic devices based on organic thin films.

• [**Animals that play with objects learn how to use them as tools**](#) [周一, 02 10月 22:52]

New Caledonian crows and kea parrots can learn about the usefulness of objects by playing with them -- similar to human baby behavior.

• [**New approach for AIDS: Lock HIV in reservoir cells, to die through apoptosis**](#) [周一, 02 10月 21:34]

With the successful suppression of the AIDS virus (HIV) through medication, the focus turns toward its eradication. Researchers have

developed a new compound that is key to the destruction of HIV. When the compound is introduced into infected cells, viral budding is suppressed thereby confining it within the host cells. The cell then dies naturally through apoptosis. This treatment is hoped to lead to the complete recovery from AIDS in the near future.

- [**2017 Nobel Prize in Physiology or Medicine: Molecular mechanisms controlling the circadian rhythm**](#) [周一, 02 10月 21:26]

The 2017 Nobel Prize in Physiology or Medicine is being awarded jointly to Jeffrey C. Hall, Michael Rosbash and Michael W. Young for their discoveries of molecular mechanisms controlling the circadian rhythm.

- [**Win-win strategies for climate and food security**](#) [周一, 02 10月 20:48]

Efforts to reduce greenhouse gas emissions from the agriculture and forestry sectors could lead to increased food prices -- but new research identifies strategies that could help mitigate climate change while avoiding steep hikes in food prices.

- [**GM soybean oil causes less obesity and insulin resistance but is harmful to liver function**](#) [周一, 02 10月 20:48]

Researchers have tested a genetically-modified soybean oil used in restaurants and found that while it induces less obesity and insulin resistance than conventional soybean oil, its effects on diabetes and fatty liver are similar to those of conventional soybean oil, the major vegetable cooking oil used in the United States, with popularity on the increase worldwide. The study also compares the GM soybean oil to coconut and olive oils.

- [**Meet the hominin species that gave us genital herpes**](#) [周一, 02 10月 10:53]

New research uses innovative data modeling to predict which species acted as an intermediary between our ancestors and those of chimpanzees to carry HSV2 -- the genital herpes virus -- across the

species barrier.

- [**Genes that separate humans from fruit flies found**](#) [周六, 30 9月 10:59]

Genes which determine animal complexity -- or what makes humans so much more complex than a fruit fly or a sea urchin -- have been identified for the first time.

- [**Compound from oilseeds may be high-value product**](#) [周六, 30 9月 01:35]

Extracting a substance called glucosinolate from camelina and carinata seeds may help bring these promising sources of biofuel one stop closer to reality.

- [**'Love hormone' leads worms to show their caring side**](#) [周六, 30 9月 01:35]

Modern neuroscience has long been smitten by the idea of identifying how the brain and its complex array of nerve cells bring about social behavior.

- [**Confronted with bacteria, infected cells die so others can live, study finds**](#) [周六, 30 9月 01:26]

In a new study, a team of researchers identified a 'back-up alarm' system in host cells that responds to a pathogen's attempt to subvert the immune system.

- [**Raccoons solve an ancient puzzle, but do they really understand it?**](#) [周六, 30 9月 00:51]

Scientists have been using an ancient Greek fable written by Aesop as inspiration to test whether birds and small children understand cause and effect relationships. A group of scientists have now extended this body of work to study raccoon intelligence. Their research uses the Aesop's Fable paradigm to assess if mammalian carnivores understand the principles of water displacement.

- [**Helium found in coal seams could aid safe shale**](#)

[gas extraction](#) [周六, 30 9月 00:50]

Natural deposits of helium gas found in UK coal seams could help scientists monitor the secure recovery of coal or shale gas from underground sites, according to research.

• [New study changes our view on flying insects](#) [周五, 29 9月 23:49]

For the first time, researchers are able to prove that there is an optimal speed for certain insects when they fly. At this speed, they are the most efficient and consume the least amount of energy. Corresponding phenomena have previously been demonstrated in birds, but never among insects.

• [Erosion from ancient tsunami in Northern California](#) [周五, 29 9月 23:30]

Geologists use ground-penetrating radar to determine the breadth and depth of erosion from an ancient tsunami in Northern California.

• [Scandinavia's earliest farmers exchanged terminology with Indo-Europeans](#) [周五, 29 9月 23:29]

5,000 years ago, the Yamnaya culture migrated into Europe from the Caspian steppe. In addition to innovations such as the wagon and dairy production, they brought a new language -- Indo-European -- that replaced most local languages the following millennia. But local cultures also influenced the new language, particularly in southern Scandinavia, where Neolithic farmers made lasting contributions to Indo-European vocabulary before their own language went extinct, new research shows.

• [Algae with light switch](#) [周五, 29 9月 23:29]

The adhesion of *Chlamydomonas*, a unicellular alga, to surfaces is light-dependent.

• [Arbuscular mycorrhizal fungal communities exposed with new DNA sequencing approach](#) [周五, 29 9月 23:29]

Arbuscular mycorrhizal fungal systems play crucial roles in their environment, affecting the plants that can grow there and the nutrients in

the soils. Researchers have developed a new DNA sequencing technique using barcoded primers that is capable of detecting rare fungal species in a community, paving the way for future insights into how they might vary in response to environmental changes.

- [**A stinging report: Climate change a major threat to bumble bees**](#) [周五, 29 9月 21:33]

New research is helping to explain the link between a changing global climate and a dramatic decline in bumble bee populations worldwide.

- [**Antarctica: Return of the Weddell polynya supports Kiel climate model**](#) [周五, 29 9月 21:33]

Currently, winter has still a firm grip on Antarctica. At this time of the year, the Weddell Sea usually is covered with a thick layer of sea ice. In spite of the icy temperatures in the region, satellite images depict a large ice-free area in the middle of the ice cover.

- [**New clues from brain structures of mantis shrimp**](#) [周五, 29 9月 21:33]

New research sheds new light on the evolution of some of the earliest brain structures, and stirs up new, intriguing questions about the origins of centers that support learning and memory.

- [**Sharks and rays live a lot longer than we thought**](#) [周五, 29 9月 21:32]

Sharks and rays live a lot longer than we thought -- some twice as long as previously estimated.

- [**Global methane emissions from agriculture larger than reported, according to new estimates**](#) [周五, 29 9月 21:32]

Global methane emissions from agriculture are larger than estimated due to the previous use of out-of-date data on carbon emissions generated by livestock, according to a new study.

- [**Broad-spectrum inhibitors of influenza virus developed**](#) [周五, 29 9月 03:28]

Artificial peptide molecules that neutralize a broad range of influenza virus strains have been developed by a team of researchers.

- [**Hunt is over for one of the 'top 50 most-wanted fungi'**](#) [周五, 29 9月 03:27]

In a step toward bridging the gap between fungal taxonomy and molecular ecology, scientists have characterized a sample of "mystery" fungus collected in North Carolina and found its home in the fungal tree of life.

- [**Sensible driving saves more gas than drivers think**](#) [周五, 29 9月 03:27]

A new study has quantified the impact speeding and slamming on the brakes has on fuel economy and consumption. Aggressive behavior behind the wheel can lower gas mileage in light-duty vehicles, which can equate to losing about \$0.25 to \$1 per gallon.

- [**How different ant species coexist in the same territory**](#) [周五, 29 9月 03:22]

In every animal community, several species in the same group share habitats. An international team has chosen ants to create the largest public-access database on the cohabitation of these insects. The goal is to understand their tricks for coexistence and how they respond to invasive species and climate change.

- [**Disease resistance successfully spread from modified to wild mosquitoes**](#) [周五, 29 9月 02:54]

Using genetically modified mosquitoes to reduce or prevent the spread of disease is a rapidly expanding field of investigation. One challenge is ensuring that GM mosquitoes can mate with their wild counterparts so the desired modification is spread in the wild population. Investigators have engineered mosquitoes with an altered microbiota that suppresses human malaria-causing parasites. These GM mosquitoes preferred to mate with wild mosquitoes and passed the desired protection to offspring.

- [**Massive projected increase in use of antimicrobials in animals by 2030**](#) [周五, 29 9月 02:21]

The amount of antimicrobials given to animals destined for human consumption is expected to rise by a staggering 52 percent and reach 200,000 tons by 2030 unless policies are implemented to limit their use, according to new research.

- [**Continental controls needed to maintain fightback against tree diseases**](#) [周五, 29 9月 02:21]

Tighter controls on timber and plant movements into Europe are necessary to prevent further disastrous effects of plant diseases, a new study of the ash-dieback pathogen advises.

- [**Smart molecules trigger white blood cells to become better cancer-eating machines**](#) [周五, 29 9月 02:21]

A team of researchers has engineered smart protein molecules that can reprogram white blood cells to ignore a self-defense signaling mechanism that cancer cells use to survive and spread in the body. Researchers say the advance could lead to a new method of re-engineering immune cells to fight cancer and infectious diseases. The team successfully tested this method in a live cell culture system.

- [**Tsunami enabled hundreds of aquatic species to raft across Pacific**](#) [周五, 29 9月 02:21]

The 2011 Japanese tsunami set the stage for something unprecedented. For the first time in recorded history, scientists have detected entire communities of coastal species crossing the ocean by floating on makeshift rafts. Nearly 300 species have appeared on the shores of Hawaii and the US West Coast attached to tsunami debris, marine biologists discovered.

- [**Bed bugs attracted to dirty laundry**](#) [周五, 29 9月 02:20]

Bed bugs are attracted to dirty laundry, according to new research.

- [**Central America 'kissing bug' carries two main subtypes of Chagas disease parasite**](#) [周五, 29 9月 02:20]

Trypanosoma cruzi, the parasite that causes Chagas disease, is divided into six strains, each of which differs in where they are found and in how important they are in human infections. Now, researchers have found that most T. cruzi parasites in Central America belong to just two of those strains.

- [**New measurements show widespread forest loss has reversed the role of tropics as a carbon sink**](#)

[周五, 29 9月 02:20]

A new report provides the most comprehensive picture of deforestation's toll on critical climate change safeguard; reveals hard-to-measure forest degradation is responsible for nearly 70 percent of emissions from tropical forests. Researchers discovered that tropical regions are now a net source of carbon to the atmosphere.

- [**Modern humans emerged more than 300,000 years ago new study suggests**](#)

[周五, 29 9月 02:20]

A genomic analysis of ancient human remains from KwaZulu-Natal revealed that southern Africa has an important role to play in writing the history of humankind.

- [**Database of earthquakes triggered by human activity is growing, with some surprises**](#)

[周五, 29 9月 02:20]

The Human-Induced Earthquake Database (HiQuake), the world's most complete database of earthquake sequences proposed to have been triggered by human activity, now includes approximately 730 entries, according to a report.

- [**Perovskite solar cells reach record long-term stability, efficiency over 20 percent**](#)

[周五, 29 9月 02:20]

Scientists have greatly improved the operational stability of perovskite solar cells by introducing cuprous thiocyanate protected by a thin layer of reduced graphene oxide. Devices lost less than 5 percent performance when subjected to a crucial accelerated aging test during which they were exposed for more than 1,000 hours to full sunlight at 60°C.

- [**Summer could be one long heatwave if planet**](#)

[hits 2 degrees Celsius](#) [周五, 29 9月 00:18]

New paper highlighting how heatwaves will change with every degree of global warming up to 5 degrees C. It finds tropical summers may be one continuous heatwave at 2 degrees C.

[Saber-toothed kittens may have been born with thicker bones than other contemporary cats](#) [周五, 29 9月 00:17]

Saber-toothed kittens may have been born with thicker bones compared to other contemporary cats, but they have a similar pattern of bone development, according to a new study.

[Fluorine-containing molecules from cell cultures](#) [周五, 29 9月 00:16]

Natural organic compounds that contain fluorine are rare because living organisms -- with a few exceptions -- do not produce them. Scientists have now genetically engineered a microbial host for organofluorine metabolism, allowing it to produce a fluoridated intermediate known as a diketide. As reported, the diketide could then be used as a monomer for the in vivo production of fluorinated bioplastics.

[Highly virulent bacterium causes rampant caries in some children](#) [周五, 29 9月 00:16]

Researchers have made a novel discovery connecting highly variant types of the caries bacterium *Streptococcus mutans* and their adhesive function to children with rampant caries and increased risk of dental caries.

[How do zebrafish develop their stripes?](#) [周四, 28 9月 22:31]

A mathematician has thrown new light on the longstanding mystery of how zebrafish develop the distinctive striped patterns on their skin.

[Mapping the Tasmanian tiger's mysterious loss from mainland](#) [周四, 28 9月 21:42]

Ancient DNA extracted from fossil bones and museum specimens has shed new light on the mysterious loss of the Tasmanian tiger (thylacine) from Australia's mainland.

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Society News

Top stories featured on ScienceDaily's Science & Society, Business & Industry, and Education & Learning sections.

- [Win-win strategies for climate and food security](#)

[周一, 02 10月 20:48]

Efforts to reduce greenhouse gas emissions from the agriculture and forestry sectors could lead to increased food prices -- but new research identifies strategies that could help mitigate climate change while avoiding steep hikes in food prices.

- [Adulteration of proprietary Chinese medicines and health products poses severe health risks](#)

[周一, 02 10月 20:48]

Traditional Chinese medicine is widely used as a form of complementary medicine all over the world for various indications and for improving general health. Various reports have documented the adulteration of pCMs and health products with undeclared agents, including prescription drugs, drug analogues, and banned drugs. Such adulation can have serious and even fatal consequences.

- [Who's judging you based on brand choices?](#)

[周六, 30 9月 03:22]

People with a flexible mindset do not tend to judge others based on the brands they use, while people with a fixed mindset use brands to judge another person's character, a new study shows.

- [Physical abuse and punishment impact children's academic performance](#)

[周六, 30 9月 03:22]

Scientists have found that physical abuse was associated with decreases in children's cognitive performance, while non-abusive forms of physical punishment were independently associated with reduced school engagement and increased peer isolation.

• [**Compound from oilseeds may be high-value product**](#) [周六, 30 9月 01:35]

Extracting a substance called glucosinolate from camelina and carinata seeds may help bring these promising sources of biofuel one stop closer to reality.

• [**Video gamers have an advantage in learning**](#) [周六, 30 9月 00:51]

Neuropsychologists let video gamers compete against non-gamers in a learning competition. During the test, the video gamers performed significantly better and showed an increased brain activity in the brain areas that are relevant for learning.

• [**Helium found in coal seams could aid safe shale gas extraction**](#) [周六, 30 9月 00:50]

Natural deposits of helium gas found in UK coal seams could help scientists monitor the secure recovery of coal or shale gas from underground sites, according to research.

• [**New technique could detect explosives, dangerous gases rapidly, remotely**](#) [周六, 30 9月 00:50]

A laser-based method that could be used to detect chemicals such as explosives and dangerous gases quickly and accurately has now been developed by researchers.

• [**Uncovering a winning basketball formula**](#) [周五, 29 9月 21:32]

Scientists have come up with a winning formula for basketball teams looking to take home Olympic gold.

• [**Sensible driving saves more gas than drivers think**](#) [周五, 29 9月 03:27]

A new study has quantified the impact speeding and slamming on the brakes has on fuel economy and consumption. Aggressive behavior behind the wheel can lower gas mileage in light-duty vehicles, which can equate to losing about \$0.25 to \$1 per gallon.

• [**Understanding connection between HIV**](#)

transmission, racial/ethnic/geographical differences [周五, 29 9月 02:54]

The health effects of where people live, work, and interact are well documented, as are the value of neighborhood-level structural interventions designed to improve health. But place-based characteristics that contribute to disparities in HIV transmission and disease burden are poorly understood, possibly resulting in less-effective HIV risk reduction interventions and programming.

• **Why public appeals may fall flat with some would-be donors** [周五, 29 9月 02:21]

To give or not to give: sometimes the answer is in the question, researchers into human behavior and charitable giving have found. The study suggests that sometimes the 'ask' needs to suit the potential donors' sense of independence or interdependence.

• **Students know about learning strategies -- but don't use them** [周五, 29 9月 02:21]

Researchers find that university students have high levels of knowledge about self-regulated learning strategies, but many students don't use them. Specific training on how and when to use these techniques could help more students to maximize their academic potential.

• **Database of earthquakes triggered by human activity is growing, with some surprises** [周五, 29 9月 02:20]

The Human-Induced Earthquake Database (HiQuake), the world's most complete database of earthquake sequences proposed to have been triggered by human activity, now includes approximately 730 entries, according to a report.

• **Nearly one in six new HIV diagnoses in Europe are among people over 50** [周五, 29 9月 00:16]

A new study showed that while the rate of newly reported HIV cases in Europe remained steady in younger people between 2004 and 2015, it increased by 2 percent each year overall in older people. With around

30,000 newly diagnosed HIV infections reported each year over the last decade, the HIV epidemic remains a significant public health problem in the 31 countries of the European Union and European Economic Area.

- [**Study provides first estimate of total US population with felony convictions**](#) [周五, 29 9月 00:16]

New research on the growth in the scope and scale of felony convictions finds that, as of 2010, 3 percent of the total US population and 15 percent of the African-American male population have served time in prison. People with felony convictions more broadly account for 8 percent of the overall population and 33 percent of the African-American male population.

- [**In people with OCD, actions are at odds with beliefs**](#) [周五, 29 9月 00:16]

The repeated behaviors that characterize obsessive-compulsive disorder are a manifestation of an underlying brain dysfunction that is not yet well understood. Now, scientists report the use of a mathematical model that they say will help them get at the root of what causes OCD. They find that people with OCD develop an internal, accurate sense of how things work but do not use it to guide behavior.

- [**Don't rely on mixed messages to change health behaviors**](#) [周四, 28 9月 23:30]

Self-improvement messages to lose weight, quit smoking or eat more fruits and vegetables can fall on deaf ears if the intervention message is mixed, says new research.

- [**Abusive bosses experience short-lived benefits**](#) [周四, 28 9月 22:12]

Being a jerk to your employees may actually improve your well-being, but only for a short while, suggests new research on abusive bosses.

- [**Self-esteem in kids: Lavish praise is not the answer, warmth is**](#) [周四, 28 9月 20:51]

How do children construct views of themselves and their place in the world? Children's social relationships turn out to be critical. For

example, children develop higher self-esteem when their parents treat them warmly. But they develop lower self-esteem when their parents lavish them with inflated praise.

- [**Achieving U.S. National HIV/AIDS Strategy targets would save lives, be cost effective**](#) [周四, 28 9月 20:47]

An analysis shows that achieving the treatment targets of the National HIV/AIDS Strategy by 2020 not only would prevent hundreds of thousands of new infections and deaths but also would demonstrate excellent value.

- [**No evidence to support claims that telephone consultations reduce GP workload or hospital referrals**](#) [周四, 28 9月 06:44]

Telephone consultations to determine whether a patient needs to see their GP face-to-face can deal with many problems, but a new study found no evidence to support claims by companies offering to manage these services or by NHS England that the approach saves money or reduces the number of hospital referrals.

- [**Health and social care changes 'paving way for fewer services' warn experts**](#) [周四, 28 9月 06:44]

Current reforms to health and social care services, and radical redesign of the local government finance system, may signal the end of the NHS and local government in England as we know them, warn experts.

- [**Should we welcome plans to sell off wasted NHS land?**](#) [周四, 28 9月 06:44]

With the NHS under severe financial pressure, should we welcome plans to raise capital by selling off inefficiently used land and buildings owned by the health service? Experts debate the issue in a new article.

- [**High cost of truckers not having enough places to park and rest**](#) [周四, 28 9月 04:20]

A pilot study illustrates the high economic cost of having too few safe places for commercial truck drivers to park and rest.

- [**New test rapidly diagnoses Zika**](#) [周四, 28 9月 04:20]

Researchers have developed a paper-based test that can diagnose Zika infection within 20 minutes. Unlike existing tests, the new diagnostic does not cross-react with Dengue virus, a close relative of the Zika virus that can produce false positives on many Zika tests.

- [**Citizen science can predict butterfly population trends**](#) [周四, 28 9月 00:36]

New research shows that citizen scientists can play a role in gathering meaningful information to inform long-term monitoring of biodiversity trends such as butterfly population change.

- [**Iron supplements have long-term benefits for low birth-weight babies**](#) [周四, 28 9月 00:36]

Babies classified as low birth weight (under 2,500 grams) are at risk of iron deficiency, which is linked to impaired neurological development. A long-term randomized study now shows that providing such babies with iron supplements can prevent behavioral problems at school age.

- [**Teens' online friendships just as meaningful as face-to-face ones**](#) [周三, 27 9月 22:54]

Many parents worry about how much time teenagers spend texting, sharing selfies and engaging in other online activities with their friends. However, according to a recent research synthesis, many of these digital behaviors serve the same purpose and encompass the same core qualities as face-to-face relationships.

- [**Coping with stressful organizational change**](#) [周三, 27 9月 21:51]

Stress is not a recent phenomenon, but the modern work environment seems to highlight its detrimental effects on employees. This is no more obvious than during times of organizational change. New research considers the impact of such changes on workers in a healthcare authority in New Zealand, highlighting the problems that any organization might face under such circumstances and pointing to possible methods to cope and remediate employee stress.

- [**Monetizing time savings makes toll roads financially stack up**](#) [周三, 27 9月 21:34]

Putting a dollar value on the savings from traffic congestion, noise and air pollution as a result of toll roads and tunnels will make large infrastructure projects more cost effective, according to a new study.

- [**A record number of Americans viewed the 2017 solar eclipse**](#) [周三, 27 9月 02:36]

Eighty-eight percent of American adults viewed the August total solar eclipse directly or electronically. This audience of 215 million adults is nearly twice the size of the viewership of recent Super Bowl football games.

- [**Do deep promotional discounts work? New study sheds light on strategy**](#) [周三, 27 9月 01:53]

Promotional discounts increase store traffic and lead to higher overall profits, especially if the advertised products are staples – items such as meat and produce that are purchased frequently and by many customers.

- [**Potential Zika vaccine protects against pregnancy transmission and testicular damage**](#) [周三, 27 9月 00:51]

For the first time, a research team led has shown that a potential Zika vaccine quickly can protect fetuses against infection as well as protect males against testicular infection and injury. It also prevents a lowered sperm count after one vaccination.

- [**Discovery: Bernie Sanders spider**](#) [周二, 26 9月 22:55]

Students and a scientist have discovered 15 new species of 'smiley-faced' spiders -- and named them after, among others, David Attenborough, Barack Obama, Michelle Obama, Leonardo DiCaprio, and Vermont Senator Bernie Sanders.

- [**Interventions for reducing hepatitis C infection in people who inject drugs**](#) [周二, 26 9月 22:54]

The first global review to quantify the impact of needle syringe

programs (NSP) and opioid substitution treatment (OST) in reducing the risk of becoming infected with the hepatitis C virus has now been published. The study has implications for millions of people who are 'at risk' from infection.

• [**Household chores: Women still do more**](#) [周二, 26 9月 22:54]

Women of all ages still tend to do more household chores than their male partners, no matter how much they work or earn in a job outside the home. New findings demonstrate the persistent gendered nature of how housework is divided.

• [**Preschool teachers need better training in science**](#) [周二, 26 9月 22:54]

Preschool instructors appear to lack the knowledge, skills and confidence to effectively teach their young students science -- a problem that is likely contributing to America's poor global performance in this crucially important subject.

• [**Teachers report weaker relationships with students of color, children of immigrants**](#) [周二, 26 9月 22:54]

The relationship between teachers and students is a critical factor for academic success. However, a new study finds that teachers report weaker relationships with children of immigrants and adolescents of color.

• [**Escaping wildfires**](#) [周二, 26 9月 21:15]

A new study is the first attempt to map escape routes for wildland fire fighters from an aerial perspective. The researchers used LiDAR technology to analyze the terrain slope, ground surface roughness and vegetation density of a fire-prone region in central Utah, and assessed how each landscape condition impeded a person's ability to travel.

• [**Drought: A cause of riots**](#) [周二, 26 9月 21:05]

The scientific community has been working on the possibility of a relationship between periods of drought and rioting for several years. Now a team has formally verified this hypothesis by studying almost 1,800 riots that occurred over a 20-year period in sub-Saharan Africa.

The researchers observed a systematic link between the sudden depletion of water resources and the outbreak of unrest. They also succeeded in quantifying the impact of geographic and social factors on the same link.

[People are reluctant to use public defibrillators to treat cardiac arrests](#) [周二, 26 9月 20:59]

A new study suggests that people are reluctant to use public-access defibrillators to treat cardiac arrests.

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Strange & Offbeat News

Quirky stories from all of ScienceDaily's health, technology, environment, and society sections.

- [Meteorite tells us that Mars had a dense atmosphere 4 billion years ago](#) [周一, 02 10月 23:42]

Exploration missions have suggested that Mars once had a warm climate, which sustained oceans on its surface. To keep Mars warm requires a dense atmosphere with a sufficient greenhouse effect, while the present-day Mars has a thin atmosphere whose surface pressure is only 0.006 bar, resulting in the cold climate it has today. It has been a big mystery as to when and how Mars lost its dense atmosphere.

- [First look at electrons escaping atoms](#) [周一, 02 10月 23:27]

Researchers have taken a first step toward controlling electrons' behavior inside matter -- and thus the first step down a long and complicated road that could eventually lead to the ability to create new states of matter at will.

- [Asphalt helps lithium batteries charge faster](#) [周一, 02 10月 22:52]

A touch of asphalt may be the secret to high-capacity lithium batteries that charge up to 20 times faster than commercial lithium-ion batteries, according to scientists.

- [DNA: The next hot material in photonics?](#) [周一, 02 10月 22:52]

Using DNA from salmon, researchers in South Korea hope to make better biomedical and other photonic devices based on organic thin films.

- [Animals that play with objects learn how to use them as tools](#) [周一, 02 10月 22:52]

New Caledonian crows and kea parrots can learn about the usefulness of objects by playing with them -- similar to human baby behavior.

- **[Electricity produced from tears](#)** [周一, 02 10月 22:51]

A team of scientists has discovered that applying pressure to a protein found in egg whites and tears can generate electricity. The researchers observed that crystals of lysozyme, a model protein that is abundant in egg whites of birds as well as in the tears, saliva and milk of mammals can generate electricity when pressed.

- **[Body energy as a power source](#)** [周一, 02 10月 20:56]

Smartphones, MP3 players, sports electronics devices such as pulse meters or trackers, medical equipment such as tonometers, pacemakers of the heart, or insulin pumps: An increasing number of electronic companions make daily life easier for us. But as useful these smart helpers may be: Their constant hunger for electricity is a problem. The solution: power supply by means of energy produced by body movements.

- **[A sea of spinning electrons](#)** [周一, 02 10月 20:48]

Picture two schools of fish swimming in clockwise and counterclockwise circles. It's enough to make your head spin, and now scientists have discovered the 'chiral spin mode' -- a sea of electrons spinning in opposing circles.

- **['Revolutionary' new gesture control tech turns any object into a TV remote](#)** [周一, 02 10月 10:53]

Imagine changing the channel of your TV simply by moving your cup of tea, adjusting the volume on a music player by rolling a toy car, or rotating a spatula to pause a cookery video on your tablet. New gesture control technology that can turn everyday objects into remote controls could revolutionize how we interact with televisions, and other screens - ending frustrating searches for remotes that have slipped down the side of sofa cushions.

- **[Small collisions make big impact on Mercury's thin atmosphere](#)** [周五, 29 9月 23:29]

Mercury, our smallest planetary neighbor, has very little to call an atmosphere, but it does have a strange weather pattern: morning micro-meteor showers.

- [**New clues from brain structures of mantis shrimp**](#) [周五, 29 9月 21:33]

New research sheds new light on the evolution of some of the earliest brain structures, and stirs up new, intriguing questions about the origins of centers that support learning and memory.

- [**Solving the mystery of Pluto's giant blades of ice**](#) [周五, 29 9月 03:24]

NASA's New Horizons mission revolutionized our knowledge of Pluto when it flew past that distant world in July 2015. Among its many discoveries were images of strange formations resembling giant knife blades of ice, whose origin had remained a mystery. Now, scientists have turned up a fascinating explanation for this "bladed terrain": the structures are made almost entirely of methane ice, and likely formed as a specific kind of erosion wore away their surfaces.

- [**Farthest active inbound comet yet seen**](#) [周五, 29 9月 03:23]

NASA's Hubble Space Telescope has photographed the farthest active inbound comet ever seen, at a whopping distance of 1.5 billion miles from the Sun (beyond Saturn's orbit). Slightly warmed by the remote Sun, it has already begun to develop an 80,000-mile-wide fuzzy cloud of dust, called a coma, enveloping a tiny, solid nucleus of frozen gas and dust. These observations represent the earliest signs of activity ever seen from a comet entering the solar system's planetary zone for the first time.

- [**A fresh look at older data yields a surprise near the Martian equator**](#) [周五, 29 9月 03:22]

Scientists taking a new look at older data from NASA's longest-operating Mars orbiter have discovered evidence of significant hydration near the Martian equator -- a mysterious signature in a region of the Red Planet where planetary scientists figure ice shouldn't exist.

- [**Chimpanzees can learn how to use tools without**](#)

[observing others](#) [周四, 28 9月 21:42]

New observations have led researchers to believe that chimpanzees can use tools spontaneously to solve a task, without needing to watch others first.

• [Soft, flexible origami-inspired robot](#) [周三, 27 9月 22:23]

A Case Western Reserve University researcher has turned the origami she enjoyed as a child into a patent-pending soft robot that may one day be used on an assembly line, in surgery or even outer space.

• [Lost continent of Zealandia: Scientists return from expedition to sunken land](#) [周三, 27 9月 11:59]

After a nine-week voyage to study the lost, submerged continent of in the South Pacific, a team of 32 scientists from 12 countries has arrived in Hobart, Tasmania, aboard the research vessel JOIDES Resolution.

• [Innovative control system paves the way for large scale universal quantum computing](#) [周三, 27 9月 01:30]

Future quantum computers promise exponential scaling in computing power with linearly increasing number of qubits. However, harnessing this power is challenging due to the complexity of controlling a large number of qubits simultaneously. A solution to this problem has now been engineered.

• [Discovery: Bernie Sanders spider](#) [周二, 26 9月 22:55]

Students and a scientist have discovered 15 new species of 'smiley-faced' spiders -- and named them after, among others, David Attenborough, Barack Obama, Michelle Obama, Leonardo DiCaprio, and Vermont Senator Bernie Sanders.

• [Pigeons better at multitasking than humans](#) [周二, 26 9月 21:05]

Pigeons are capable of switching between two tasks as quickly as humans -- and even more quickly in certain situations. These are the findings of biopsychologists who had performed the same behavioral experiments to test birds and humans. The authors hypothesize that the cause of the slight multitasking advantage in birds is their higher

neuronal density.

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