

Search ScienceNOW

Enter Keyword

GO

Advanced Search >
Science Magazine >

About Access

ScienceNOW articles are free for four weeks after publication. Older articles from the archive may require AAAS membership or separate subscription.

Alerts & Feeds

Email Alerts
RSS Feeds

Science Signaling

New on Science Signaling

- How Hosts Respond to Pathogens
- Regulation of and Signaling by Interleukin 1
- Submit Your Research
- More from Science Signaling

Science Careers

Career Tools:

- Find a Job
- Find a Grant
- Find a Meeting/Event

New Articles on Careers

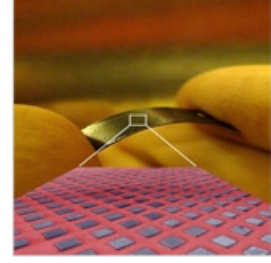
- Tenure-Track Jobs Remain Scarce
- Tooling Up: What's Your Mission?
- More Careers Articles

ScienceShots

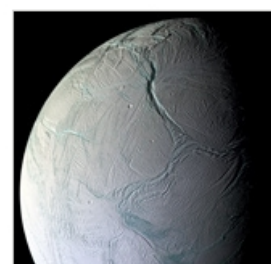
To Advertise Find Products



Tough guy. This gastropod's shell has even the best metal armor beat. It's the kind of protection the scaly-foot snail (*Crysmallon squamiferum*) needs as it fights enormous water pressure and the vice-like grip of crabs on the deep sea bottom. The shell's unique three-layered structure--an iron-sulfide outer shell, a thick organic middle, and an inner calcified layer--dissipates stress so well, researchers [report](#) online 19 January in the *Proceedings of the National Academy of Sciences*, that copying it should lead to tougher personal-protection vests and bomb-proof vehicles. (Photo: Anders Warén/Swedish Museum of Natural History)



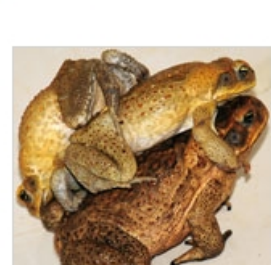
Shrinkage. Printable electronics are about to become a whole lot smaller. Scientists have developed a new way to write electrically conducting silicon ink onto a plastic backing with five times more accuracy than previously possible. Whereas past printable electronics have manually placed components using, for example, inkjet printers, the researchers have developed an elaborate way of making the components fall into place like scattered iron filings spontaneously tracing out a picture, they [report](#) online the week of 11 January in the *Proceedings of the National Academy of Sciences*. The team demonstrated its self-assembled technique by building a flexible solar cell out of silicon crystals the thickness of a human hair (shown left, with magnified section showing crystals). (Photo: Heiko O. Jacobs)



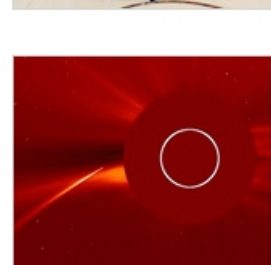
Turmoil. Researchers have figured out what causes Saturn's moon Enceladus to spew icy jets hundreds of kilometers into space. Like a frigid lava lamp, subsurface heat slowly builds up from tidal forces, causing blobs of partially melted ice to push toward the surface. That produces the massive geysers, researchers [report](#) online 10 January in *Nature Geoscience*, as well as the cracks and huge gouge seen in this image. All of this turmoil has melted and reconstituted up to 40% of the Enceladus's icy surface--but the moon is slowing down. Based on 5 years of observations by the Cassini spacecraft, plus new computer simulations, researchers have concluded that Enceladus's lava lamp will soon shut down, and the moon will remain quiet for up to 2 billion years. (Photo: NASA/JPL/Space Science Institute)



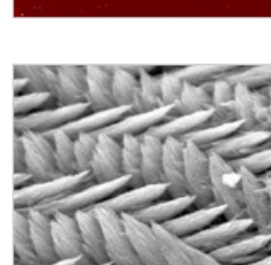
Long haul. Large birds don't necessarily fly farther than small ones. In fact, the new record for longest annual migration belongs to the 125-gram arctic tern, researchers report online 11 January in the *Proceedings of the National Academy of Sciences*. By attaching tags weighing just over a gram to the birds' legs and recovering them later, the team was able to show that the tern can cover 71,000 kilometers on average on the round trip from its arctic breeding grounds to the high latitudes of the Southern Ocean. That's over 7000 kilometers farther than the much larger sooty shearwater bird, the previous record holder. Tracking small birds like terns was previously impossible because the weight of earlier instruments would have interfered with their flight. (Photo: Carsten Evegang/ARC-PIC.com)



Step off! Male toads wrestle each other over a female, but sometimes the weaker male still gets to her. To keep him from scoring, the female inflates her body, the same trick she uses to repel predators, researchers [report](#) online 6 January in *Biology Letters*. That makes it more difficult for a weak male to get a firm grip--and it makes him vulnerable to a larger, stronger male, which can wrestle him off. When the researchers surgically prevented female cane toads from inflating, she was more often stuck with the first suitor to latch on. (Photo: Crystal Kelehear)



Going, going. Maybe they should have named this comet Icarus. On 3 January, the comet--actually a fragment of a larger comet that broke up about 2000 years ago--[passed](#) so close to the sun that it evaporated. Astronomers call such objects Kreutz sungrazers, after the 19th-century German astronomer who discovered them, because their orbits take them very close to our star's surface. Such encounters almost always result in the grazer's demise, but most such objects are too small to be tracked easily. This time, however, the camera aboard NASA's SOHO spacecraft, which usually observes solar phenomena, treated scientists to a ring-side seat. (Photo: NASA/Alan Watson)



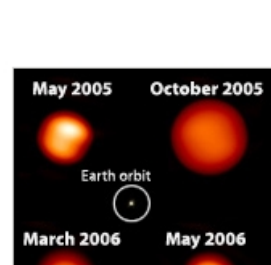
Bite strength. Zoom in on your tooth enamel, and you'll see this crisscrossing pattern of micron-sized crystals. But examine the thinner enamel of a frog's tooth, and you'll find smaller crystals with less intricate patterns. Researchers think the difference has to do with how many times an amino acid called proline repeats in amelogenin, a protein that acts like a scaffold for enamel's calcium minerals. The scientists synthesized versions of the protein with proline sequences of various lengths and found an almost 5-fold increase in crystal size between the shortest and the longest. In addition, mice that had their more proline-rich amelogenin gene replaced by a proline-poor frog version lacked the tell-tale crisscross crystal pattern--and they had 50% thinner enamel, the researchers [report](#) online 22 December in *PLoS Biology*. The find may help scientists engineer new ways to grow tooth enamel to replace broken teeth. (Photo: Tianquan Jin et al., PLoS Biology, 7 (December 2009))



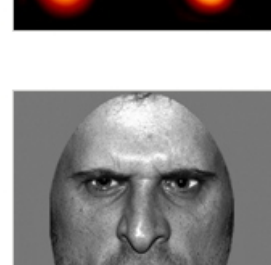
Shadows. Astronomers studying 17 supernova remnants, both in and near the Milky Way, have made a surprising discovery. By analyzing the shape of the remnants--created when massive stars exploded--they could tell what type of supernova caused the debris cloud. As they [reported](#) recently in *The Astrophysical Journal Letters*, a supernova known as a type Ia--caused when a sunlike star in a binary system draws in too much gas from its partner--generates a remnant cloud that's nearly spherical. But when stars that are much more massive explode, their remnant clouds are asymmetrical, as in this image of G292.0+1.8, located about 20,000 light-years away in the constellation Centaurus. (Photo: NASA/CXC/UCSC/L. Lopez et al.)



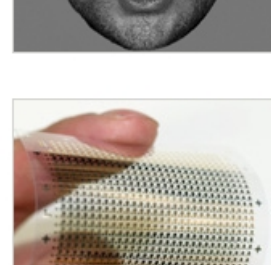
That's me. Chimps know their names. That's how keepers get their attention. But what exactly is going on in a chimp brain when it hears those familiar syllables? Researchers glued electrodes to the scalp of Mizuki, a research chimpanzee, and recorded her brain activity while she heard four sounds: her own name, the name of another group member (Tsubaki), an unfamiliar name (Asuka), and white noise that sounded similar. Mizuki's brain waves showed that she noticed all the sounds, the researchers reported online 16 December in the journal *Biology Letters*. But only her own name produced a peak that, in human babies, is related to how they pay attention to important stimuli. This shows that, like humans, chimps process their own names differently from other sounds, the team says. (Photo: Hayashibara Great Ape Research Institute)



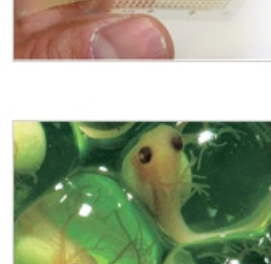
Throes. Chi Cygni is dying, and astronomers are watching closely. The red supergiant star, about 550 light-years away in the constellation Cygnus, is undergoing the fate of the Sun--shown in the middle with Earth's orbit--which in 5 billion years will begin to exhaust its hydrogen fuel. Then it will grow dimmer and expand, eventually swallowing the four inner planets, including Earth. Also like Chi Cygni, the sun will begin to throb ([animation](#)), as though exhaling and inhaling. Astronomers described the giant star's breaths, each cycle of which takes 408 days, in the 10 December issue of *The Astrophysical Journal*. In particular, they are watching as Chi Cygni expels its outer atmosphere, which someday will fill that area of the Milky Way with a bright planetary nebula. (Photos: CFA)



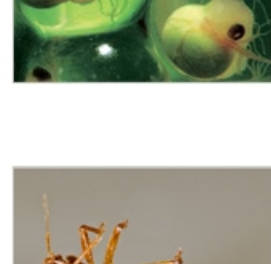
You lookin' at me? If you've ever had the uncomfortable sensation that someone was staring at you, there's a good chance the person was angry. Scientists asked volunteers to look at photographs of faces that were either angry, fearful, or neutral whose eyes were looking to the left, right, or straight ahead. Subjects were more likely to indicate that angry faces were looking right at them compared with fearful or neutral faces, even when the eye gaze of the faces was shifted to the left or right, researchers [reported](#) online 20 November in the *Journal of Vision*. This paranoid behavior, the team says, may give us an evolutionary advantage in escaping danger. (Photo: Michael Ewbank)



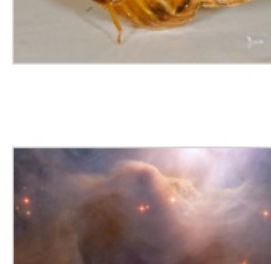
Unforgettable. Flash memory devices have become popular because they can hold gobs of data and retain it even when their power supply has been cut off. But the silicon-based chips are too rigid and bulky for some applications, such as radio-frequency-identification transponders, basic versions of which are embedded into credit cards and ID badges. Now scientists have found a way around that problem by embedding the circuitry in flexible plastic semiconductors. In the 11 December issue of *Science*, researchers report that just like conventional flash memories, the devices can acquire data and maintain that data even when their power is off. But unlike their fatter cousins, the flexible chips can be folded into wallets. (Photo: Science/AAAS)



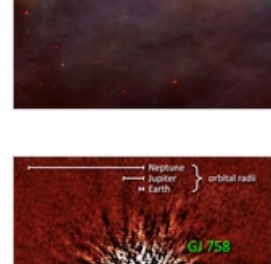
Head start. You're never too young to learn, even if you're an embryo. Over the course of 7 days, researchers exposed the eggs of woodfrogs (*Rana sylvatica*) to plain water or water containing the mixed smell of salamanders (their natural enemy) and crushed tadpoles during the times of day when salamanders are most active. Tadpoles generally slow down when they encounter predators, but once they hatched, they only put on the brakes when placed in the salamander-cum-diced-tadpole brew at the same time they had been placed in the concoction as embryos. That indicates, researchers report 9 December in *Biology Letters*, that--even before they hatched--the tadpoles had learned the time when salamanders are most dangerous, giving them a better shot at survival as they grow up. (Photo: Karen Warkentin)



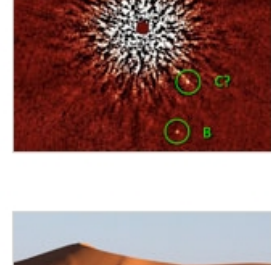
Bug-off! Bedbug mating is a violent affair. Males inseminate females by stabbing them in the gut with their penises. However, the bugs can't discriminate between the sexes, so same-sex mountings sometimes occur. To discourage these accidental hookups, males on the receiving end of another male's advances release a pheromone typically used to warn other bugs of approaching predators, researchers [report](#) in the December issue of *Animal Behaviour*. The would-be Lotharios spent about 30 seconds longer mounting male partners on average if those targets had their pheromone glands blocked with nail polish. It's an unusual double use for a single signal, but the team found that reluctant females don't issue the same alarm--even though they can. Why? The pheromones may be too costly, sapping energy that they need to make eggs. (Photo: Rickard Ignell)



Redhead. This Hubble Space Telescope close-up of the Iris nebula may make a beautiful portrait, but it poses a nagging mystery for astronomers. The nebula is officially designated as NGC 7023 and is located about 1400 light-years away in the constellation Cepheus. Iris is a reflection nebula, meaning it reflects and diffuses starlight but is not dense or hot enough to shine on its own. The problem is that all other known reflection nebulas appear mostly blue, while this portion of Iris shows a rosy hue. It's so red, in fact, astronomers can't explain what's causing the crimson effect, though they suspect that hydrocarbon molecules in the nebula's minuscule dust particles play a role. (Image: NASA/ESA)



Behold! The tiny dots near the bottom of this image may not look like orbiting a Sun-like star. An international team snapped the objects with the Subaru Telescope in Hawaii last May and August. Both are orbiting GJ 758, a star located about 50 light-years away. And both are about 40 times more massive than Jupiter. That means they might not be planets at all, but brown dwarfs, objects that are too massive to be gas-giants but not quite massive enough to ignite into stars. Yet current theory says two brown dwarfs can't exist so close to each other without merging. Stay tuned. (Image: Max Planck Institute for Astronomy/National Astronomical Observatory of Japan)



No oasis. It's not easy to cross the Sahara--even if you're flying. Scientists tracked the autumn and spring migrations of 46 raptors, including ospreys and honey buzzards, by satellite as they flew over the vast desert. The birds showed signs of trouble during about 40% of these crossings. Many changed course, others slowed down, and some took a break on the ground. Four birds even landed around. Those that had trouble crossing the desert reached their breeding grounds later and were about 40% less likely to reproduce, the researchers [report](#) online 2 December in *Biology Letters*. But things weren't always so tough: About 5000 years ago, the western Sahara was a cool, dry [forest](#). (Photo: Frederic Brosset/Getty Images)



Time to slice. The brain of Henry Molaison is about to go under the knife--again. Molaison became profoundly amnesic after a surgeon removed two chunks from the temporal lobes of his brain in 1953 to treat severe epilepsy. The experimental surgery helped stop the seizures but left Molaison virtually unable to form new memories. Until he died last year, Molaison cooperated with psychologists and neuroscientists, who gained many insights into the nature of human memory by studying his condition. Tomorrow, on the first anniversary of Molaison's death, University of California, San Diego, neuroscientist Jacopo Annese will begin slicing Molaison's brain into paper-thin sections, a delicate 30-hour operation that will be a crucial step in creating a digital atlas of one of the most studied human brains of all time. (Neuroscience reporter Greg Miller wrote an [overview](#) in June of Molaison's life, what researchers have learned from him, and Annese's plans for digitizing his brain.) More images of Molaison's brain and a live webcast of the cutting can be found on Annese's [Web site](#). (Photo Credit: Jacopo Annese, Peter J. Chon, and Alex Ghatan)

Archived ScienceShots from ScienceNOW >