**ScienceShots**

**Hot for teacher.** Bees seem to know when one of their comrades has returned from finding a nectar bonanza, possibly because the lucky forager warms up her body when she returns home. To see if honeybees (*Apis mellifera*) really can learn from temperature, researchers trained the insects to associate a sip of sugar solution with the touch of a tiny warm or cold plate to their antennae. Warm temperatures worked best. When the scientists later touched the bees with a warm plate, the insects were twice as likely to extend their proboscis (as if looking for the sugar solution), than when they were touched with the cold plate, the team reports online 13 November in *The Journal of Experimental Biology*. A hot tip for any bee trying to figure out where her friends have been. *(Photo: James C. Nieh)*

**Baby boomers.** There may be many more ticking time bombs in the universe than originally thought. Most stars that explode typically do so when they grow so large that they collapse upon themselves, no longer able to sustain their massive size—a common event known as a supernova. But astronomers have now uncovered a completely new type of stellar calamity, sort of a supernova-lite. Reporting online in *Science* on 5 November, the team says analysis of the light from a titanic blast that occurred in a distant galaxy reveals that it resulted when a white dwarf star—the burned-out remnant of a bigger sun—pulled massive amounts of helium away from its binary partner, until the helium detonated in a planet-sized thermonuclear explosion. Both stars survived, but the blast was bad news for anything that happened to be in the galactic neighborhood. *(Image: Tony Piro)*

**Gotcha?** Pity the unsuspecting wasp. As it flies towards a bright, yellow flower, it has no idea that a camouflaged female crab spider (*Misumena vatia*) is laying in ambush. It's a convincing story, but it turns out not to be true. When scientists tried to replicate such a scenario in the field—collecting yellow and white crab spiders from wildflower fields around Bern and then placing them on either yellow, white, or violet-colored flowers—they found that bugs avoided flowers with spiders, no matter what color pairing. In addition, camouflaged spiders were no more successful at grabbing dinner than mismatched spiders, the researchers report online 4 November in the *Proceedings of the Royal Society B*. So why the color change? Perhaps, says the team, the spiders alter hues to protect themselves from the sun's rays. *(Photo: Olaf Leillinger)*

**Blowin' in the wind.** Try as you might, you just can't seem to prevent your house from accumulating the stuff that fills vacuum cleaner bags: lint, hair, crumbs, and especially dust. It builds up on bookshelves, compiles on computer keyboards, and falls on the floor. But where does it come from? Researchers developed a computer model that can track individual particles back to their source. The result, reported in the 1 November issue of *Environmental Science & Technology*, is that most household dust—over 60%—comprises airborne and soil particles either blown in or tracked in from outdoors. Because of its exterior origins, dust can consist of substances such as lead and arsenic, which can be harmful to children who touch contaminated objects and then put their hands in their mouths. All the more reason to keep your home as tidy as possible.
Stranded in time. Amateurs hunting for dinosaur fossils along the southern coast of the United Kingdom have stumbled upon the oldest spider web ever discovered. Encased in amber, the 140-million-year-old filaments are so well preserved that they even harbor droplets of the sticky liquid that the long-dead spider used to ensnare its prey. They also harbor traces of Actinobacteria, organisms that digest wood and tree sap into soil, the discoverers report online 31 October in the *Journal of the Geological Society*. Call it a snapshot of an ancient forest, trapped in time. (Photo: Martin Brasier/Oxford University)

Spooky medicine. Now even fungi have something to be scared about on Halloween. Scientists have discovered that, true to the folk wisdom that pumpkins can heal certain ailments, the squash's skin contains proteins that act as antibiotics. In the 14 October issue of the *Journal of Agricultural and Food Chemistry*, the researchers report that the proteins inhibited the growth of *Candida albicans*, the fungus that causes yeast infections in women and diaper rash in infants. In other tests, they found that the pumpkin proteins halted the spread of several types of plant fungi. All in all, the skin of the jack-o-lantern may make for a frighteningly effective cure. (Photo: Wikipedia)

Drifting to rest. For northern elephant seals (*Mirounga angustirostris*), finding time to rest isn't easy. The animals migrate for 8 months without stopping on land and spend about 90% of that time underwater. But data from six young seals off the California coast suggest that the animals take a break when they dive, researchers report online 28 October in *Biology Letters*. After an initial head-first decent, the seals stop paddling and roll over onto their backs. As the more than 1000-kilogram creatures continue to sink, they wobble and drift slowly in a spiral, like a leaf falling from a tree. The seals don't start resting until they reach depths of about 135 meters—past a killer whale's range—possibly so they can unwind without worrying about predators. (Photo: Yoko Mitani)

Boo! If a trick-or-treater appears on your doorstep wearing a mask topped by a horn with three eyes on it, don't assume that he's pretending to be an alien. Up-to-date tricksters are more likely to be impersonating a newly discovered ancient fly, one so unusual, scientists have placed it in its own family, Cascopleciidae. Found trapped in a piece of Burmese amber dating between 97 million and 110 million years old, the new fly—dubbed *Cascoplecia insolitis* (from the Latin *cascus* for "old" and *insolates* for "strange")—only looks scary, says its discoverer, zoologist George Poinar Jr. of Oregon State University, Corvallis. "It probably fed on the pollen and nectar of tiny tropical flowers," he says, and was docile. Its three high-rise eyes may have helped alert the fly to predators. But that adaptation didn't secure *Cascoplecia's* future. It was "obviously an evolutionary dead end," says Poinar, who announced the discovery in the October issue of *Cretaceous Research*. (Photo: George Poinar Jr.)

DVDs my eye! First, the vision system of lobsters inspired a next-generation detector for an x-ray telescope. Now, the peepers of the mantis shrimp (*Odontodactylus scyllarus*) could usher in a quantum leap in the performance of DVD and CD players. The otherwise humble crustacean possesses the most sophisticated vision system in all of biology: it can see in 12 colors (versus only three in humans) and discern several different types of polarized light simultaneously. Reporting 25 October in *Nature Photonics*, researchers admit they don't know why the shrimp boasts such a powerful visual array—they suspect it's either for detecting a mate, a predator, or potential prey in the dim light of murky water. But they think that by studying the creature's eyes they can design liquid crystals that mimic its functions. Applied to electronic audio and video devices, the new crystals could usher in unheard of levels of visual sharpness and audio clarity. (Photo: Roy Caldwell/UC Berkeley)
Battle of the sexes. The orb-weaving spiders of the Nephilid family are famous for their giant, circular webs up to 1 meter in diameter. In a new study, scientists report that the largest spider with this talent: *Nephila komaci*, a golden orb-weaving spider with a leg span of up to 12 centimeters. But the nephilid family has an even stranger trait—the females are up to 10 times larger than the males, the largest such disparity among terrestrial animals. Female nephilids have steadily increased in size over the course of evolution, while males have stayed the same, the team reports 21 October in *PLoS ONE*. The reason? Larger females can escape predators more easily and bear more eggs, especially in the competitive African habitat where the largest nephilids live. (Photo: M. Kuntner)

Success? That plume of lunar impact debris NASA had us all looking for has finally been sighted. On 9 October, the agency's LCROSS mission slammed a 2-ton rocket stage into the frigid shadow of the moon's Cabeus crater—but the dust explosion NASA had hinted at was nowhere to be seen. Now, thanks to considerable image enhancement, LCROSS scientists say they have spotted the plume (the 6– to 8-kilometer–wide puff of visible light in the circle). There's still no word from NASA or observers back on Earth, however, that anyone detected the long-sought water LCROSS was sent to blast into the lunar sky. Even the Hubble Space Telescope has so far drawn a blank. More analysis is required, say NASA scientists. (Image: NASA)

Stomping grounds. An animal that weighs 27,000 kilograms might be none too careful about what it steps on. That's apparently what happened more than 100 million years ago at a site near present–day Moab, Utah. There, researchers from Brigham Young University in Provo have found thousands of fossilized dinosaur bones, almost all of which had been snapped clean before they had a chance to harden. The state of the bones, the researchers say, suggests that hefty dinos--vegetarian sauropods and iguanodontids--trampled the bodies of dozens of their brethren that might have died during a drought. The team describes the fragmented find in the latest issue of *Palaeogeography, Palaeoclimatology, Palaeoecology*. (Photo: Brooks Britt/BYU)

Neatly scrunched. Nature is an amazing packer: Our genome's two meters of uncoiled DNA fits inside a micrometer-wide cell nucleus without knotting up into a tangled mess. The trick may be folding DNA into a fractal—a geometric shape in which smaller parts resemble the whole—scientists suggest in the 9 October issue of *Science*. This so-called fractal globule forms when stretches of a DNA strand start to crumple up into balls to form what would look like a string of beads. Then these balls scrunch up with others to form a string of larger beads. The folding continues until million–base stretches of a chromosome become balls of scrunch–up balls. The researchers say this shape would allow proteins trying to access buried genes to yank on a part of the ball without disrupting the entire fold. (Photo: Leonid A. Mirny and Maxim Imakaev)

Look ma, no egg! Not all lizards start life by breaking through an eggshell. Some are born live, like mammals. To find out what led to this evolutionary switch, researchers studied the family tree of Iguanian lizards, which include iguanas and chameleons and whose members evolved live birth multiple times. Of the 14 species they studied, nine branched off from their egg-laying relatives and adopted live birth between 35 million and 50 million years ago, the scientists report online 7 October in *Biology Letters*. This period, known as the Eocene epoch, marked the beginning of a gradual cooling–off trend in Earth's history. The scientists believe that lizard mothers may have switched to live birth to keep their embryos warmer than those exposed to the elements inside an egg. (Photo: James Schulte)

Dustoff. The newly rejuvenated Hubble Space Telescope has captured a rare event: a galaxy in a heap of trouble. Like a sandcastle in a gale, gigantic amounts of NGC 4522's gas (brown halo) are being stripped away by what astronomers call ram pressure. This happens when a galaxy loses a gravitational
tug of war with a large group of its neighboring galaxies in a cluster. That tug can pull the galaxy through the intergalactic medium at blinding speeds—up to 10–million kilometers per hour. Pressure from the medium compresses some of the galaxy's constituent gas into thousands of new stars (blue areas), but it rips much more of the gas away. Eventually, NGC 4522, located about 60 million light-years away in the constellation Virgo, will lack enough gas to make any new stars. Then, over many billions of years, it will grow cold and dark in the cosmos. *(Photo: NASA/ESA)*

**A rite of spring.** Last 12 August, NASA's Cassini spacecraft caught Saturn's majestic rings at a once-in-15-years moment— the spring equinox, when the sun stands directly over the equator and illuminates the rings edge-on. Made up of trillions of icy particles, the rings measure only 10 meters thick, but 270 million meters across. They nearly go dark at equinox (except where light reflected from Saturn reaches, left), which gives scientists an oddly informative view. Only ring features that rise above the ring can show up—as on the right side of this enhanced mosaic from Cassini. They include ripples and spiraling waves induced by tiny moons, clumps of particles caught in ring traffic jams, and clouds of dust raised by meteorite impacts in previous days. Cassini will probe Saturn for at least another year, but it won't likely be working for the next equinox. *(Credit: NASA/JPL/Space Science Institute)*

**Stowaway.** The two-toed sloth's (*Choloepus hoffmanni*) genome hides a viral fossil. Like dinosaurs leaving behind footprints in tar, retroviruses can shed snippets of their DNA into an animal's genome. Researchers found ancient pieces of foamy viruses—which still infect mammals today and cause infected cells to fuse together into what looks like soap suds—in the sloth's genome. They estimate that the viruses started infecting the animals more than 100 million years ago. A reconstructed version of this sloth virus revealed that the foamy virus evolutionary tree mirrors the mammalian one, the team reports in the 18 September issue of *Science*. So these viruses have been changing with their hosts since mammals shared the planet with dinosaurs. *(Photo: Leyo/Wikimedia)*

**Group high.** Feel a euphoric rush on your morning jog? Next time try running with some friends. Endorphins, the pain-killing chemicals behind the so-called “runner's high,” also play a role in primate social bonding. So researchers wanted to test if people release more endorphins when they exercise in synchronized groups. They compared the pain thresholds of 12 rowers before and after either rowing with their crewmates or working-out alone on a rowing machine. The rowers tolerated more constricting pain from a blood pressure cuff after the group work-out, the team reports online 16 September in *Proceedings of the Royal Society B*, meaning “rower's high” may soon be entering the lexicon. *(Photo: Eric Baetscher)*

**Stormy weather.** The Cassini spacecraft has been tracking a mother of a thunderstorm on Saturn since mid-January. It's the white patch on the planet's surface—which dwarfs Tethys, Saturn's 1000–kilometer-wide moon, passing above it—and it's the longest–lasting Saturnian storm on record. Mysteriously, thunderstorms on Saturn, which can be up to 10,000 times more powerful than those on Earth, have only been observed on or below the ringed planet's equator. Scientists think there must be some peculiarity about the Southern Hemisphere that creates conditions amenable to lightning and thunder, but so far they haven't found the answer. *(Photo: NASA/JPL/Space Science Institute)*

**Heavyweight.** If you lived in New Zealand as recently as 500 years ago, you might have seen this fearsome creature patrolling the skies. In this artist's conception, Haast's eagle (*Harpagornis moorei*) attacks another extinct giant, a flightless, plant–eating bird called a Moa. Until recently, however, the Haast's eagle was thought to be too heavy—up to 18 kilograms—to be an agile predator. But a new analysis published this month in the *Journal of Vertebrate Paleontology* argues that, heavy or not, Haast's eagle was a fearsome killer.
Researchers found that the holes in creature's hip bone, which carried the nerves for its back legs, gave its talons more than enough strength to snatch living prey and carry it off to certain doom. (Image: Ray Jacobs/Canterbury Museum)

Animated apes. A yawn is so contagious, chimpanzees can even catch it from a cartoon. Researchers wanted to know if the animals could relate to animated versions of themselves, like humans do. So they played videos of computer-animated chimps yawning to see if the real animals would join in. Previous studies have shown that yawns are contagious among real chimps, just as they are in humans. The scientists report online 9 September in the Proceedings of the Royal Society B that yawning cartoons elicited almost three times more yawns from the real chimps than did excited hoot-call videos or playful chimp grin animations. Whether Saturday morning chimp cartoons have a future, however, remains unclear. (Photo: Yerkes National Primate Research Center/Living Links)

Cosmic butterfly. The Bug Nebula is getting a makeover thanks to two new instruments mounted on the Hubble Space Telescope last May. Located 4000 light-years away, the nebula has been imaged several times before, but this shot—taken 27 July and released 9 September—captures the physics of the dying star at its center like never before. Scientists say the image will provide a richer understanding of the elemental composition of the nebula's gossamer wings, gigantic swirls of gas that span 2 light-years. Although the Hubble has brought researchers countless images from the near and far universe over the years, the new images continue to enthral. "You don't lose the wonder, you don't get jaded," says Heidi Hammel, a research scientist at the Space Science Institute in Boulder, Colorado. (Photo: NASA, ESA, and the Hubble SM4 ERO Team)

Fluorescent fruit. As bananas ripen from yellow–green to dull brown on your kitchen counter, your eyes miss another colorful signal that the fruit is past its prime. When cells around microscopic pores called stomata start to die in banana skins, their chlorophyll breaks down into fluorescent molecules. These molecules are short–lived, but if you had an ultraviolet lamp, you could watch blue fluorescent halos glow around the skin's growing brown spots, researchers report online 7 September in Proceedings of the National Academy of Sciences. The scientists speculate that some animals may have evolved to see these halos in order to avoid eating rotten fruit. (Photo: Proceedings of the National Academy of Sciences)

Groovin'. Monkeys aren't that into human music. But monkey music? They can get into monkey music. When researchers composed arrangements for cello and voice based on cottontop tamarins' calls and then played the music for the monkeys, the animals responded to the emotions of the music: Threatening pieces made them anxious and soothing pieces caused them to lounge around and eat chow. Peaceful human music had no effect on the monkeys, the team reports online 2 September in Biology Letters, although some hard–rockin' songs by the band Metallica mellowed them out a bit. Whether the tamarins were actually appreciating the music the way we do is still an open question, however. Maybe to them, the monkey music just sounds like monkeys. (Credit: Bryce Richter)