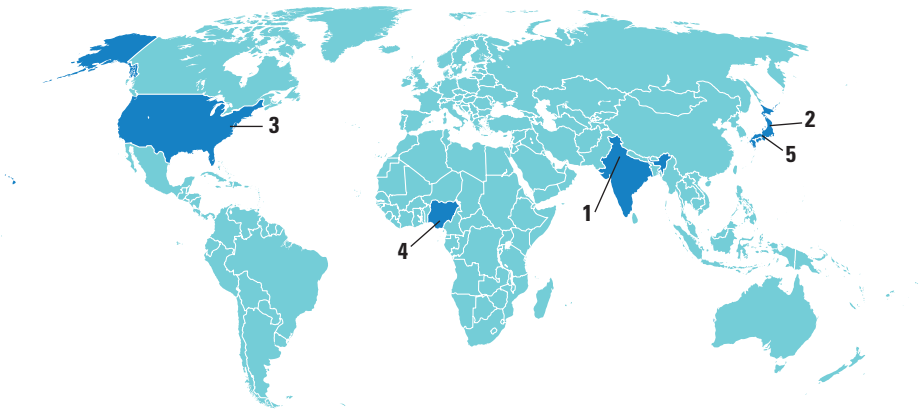
AROUND THE WORLD



New Delhi, India **1**

Superbug Gene Found In Tap Water

A gene that causes bacteria to become resistant to antibiotics has been found in drinking water in New Delhi, India. *NDM-1* is commonly found in *Escherichia coli* but can spread to other bacteria thanks to their ability to swap DNA. The gene confers resistance to antibiotics, including potent, last-resort drugs called carbapenems.

India's warm temperatures, over-crowding, and poor sanitation are likely to blame for the gene's spread into the main water system from bacteria in people's guts, write Timothy Walsh of Cardiff University in the United Kingdom and colleagues in a paper published online last week in *The Lancet Infectious Diseases.* The team, who found the gene in two out of 50 tap water samples and 51 of 171 samples taken from puddles and streams in the capital, say the gene could spread farther afield when tourists drink local water supplies and then return home. *NDM-1* has already been found in U.K. hospitals in bacteria infecting people who had medical treatment in India and those admitted with "traveler's tummy." The new finding raises concerns that resistant genes, so far found mainly in gut flora, are becoming widespread in natural environments, where they are highly mobile.

Fukushima, Japan **2**

Japan Widens Evacuation Zone

Japanese officials announced this week that they are expanding the evacuation zone around the stricken Fukushima Daiichi nuclear reactors after relatively high levels of radiation were found beyond the 20 kilometer evacuation zone and even the 30 kilometer zone within which people have been told to stay indoors. Japan's Nuclear Regulatory Commission is now recommending relocation over the next month for those living in areas where the accumulated dose over a year will reach 20 millisieverts. That's about seven times the annual dose from natural sources in the United States.

The contaminated areas lie northwest of the nuclear power plant, where weather patterns apparently blew a radioactive plume in the early days of the crisis. Radiation levels throughout the region have dropped over the past month as iodine, with a half-life of 8 days, decays. But the other main radioisotopes, cesium-134 and cesium-137, have half-lives of 2 years and 30 years respectively. This means dangerous levels of radiation could persist for years. **http://bit.ly/evac-zone**

Washington, DC **3**

U.S. Reaches Agreement On Spending

A deal between House Republicans and the White House to cut current government spending by $38.5 billion will mean a $TK-billion reduction in research activities at federal agencies for the next 6 months.

Negotiations that narrowly averted an 8 April government shutdown produced agreement to lower discretionary spending to $1.050 trillion for the 2011 fiscal year that ends on 30 September. As Science went to press, aides were still working out the details, which would then be taken up by both houses of Congress before legislators recess for 2 weeks.

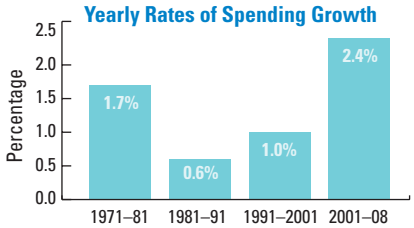
The budget cuts the National Science foundation's funding by TK million and NASA's budget by TK million. Meanwhile, the National Institutes of Health were cut by TK million, and the Department of Energy lost TK million.

The overall federal budget is three times the size of the discretionary component, with the majority spent on so-called entitlement programs like Medicare and service on the national debt. So the next debate, over the 2012 budget and extending the $14-trillion debt ceiling, is expected to be even more contentious.

Nigeria **4**

African Countries Up Investment In Agricultural R&D

Funding for public agricultural research in Sub-Saharan Africa grew more than 20% to $800 million between 2001 and 2008, according to a report published last week by the International Food Policy Research Institute (IFPRI) in Washington, D.C. "African countries are starting to recognize the importance of funding agricultural research," says Calestous Juma of Harvard University, who studies agricultural innovation in Africa.



Just six of the 32 nations surveyed dominate these gains, and Nigeria leads the pack, accounting for a third of the overall increase. But as in several other African countries, the increases—mainly for salaries and building repairs—have not yet made up for the declines of the 1990s. "What these numbers hide is that Nigeria is making up for lost ground," says report co-author Gerd-Jan Stads of IFPRI. The funding situation has worsened in 13 countries, often due to large international grants ending.

Philip Pardey, an agricultural economist

CREDITS (TOP TO BOTTOM): ADNAN ABIDI/REUTERS/LANDOV; (SOURCE) IFPRI

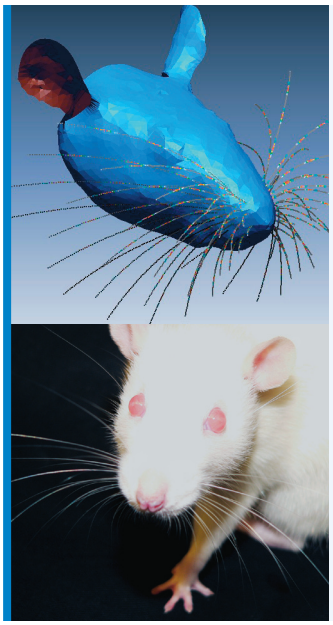
at the University of Minnesota, Twin Citites, says that rebuilding research capacity can take decades. African nations "have a very long way to go," he says.

Harima Science Park City, Japan **5**

World's Second X-ray Laser Shines

Scientists now have two x-ray lasers—almost. Shortly before an 11 April ribbon-cutting ceremony, officials at the SPring-8 laboratory in Harima Science Park City in Japan announced that physicists there have coaxed the first x-rays out of the SPring-8 Angstrom Compact Free Electron Laser, or SACLA, although they have not yet demonstrated "lasing."(ck) Still, "I think the ribbon-cutting ceremony says, 'Okay, it's built, it's ready to go,' " says Joachim Stöhr, a physicist at SLAC National Accelerator Laboratory in Menlo Park, California, home to the Linac Coherent Light Source (LCLS), the world's first x-ray free electron laser (XFEL), which turned on 2 years ago.

The announcement marks a coup for Japanese accelerator physicists. The Japanese government approved construction of the 700-meter-long, $300-million laser in 2006. In comparison, the German government gave initial nod to the bigger European XFEL in 2003, and it will not be complete until 2014. Experiments with SACLA won't start until later this year, but early results from the LCLS show that an ultra-bright XFEL can open new realms of inquiry for scientists.



Wise Whiskers

Why use eyes when you've got whiskers? Like the fingers of a hand, each of a rat's 60 whiskers moves independently of the others and of the muscles in its cheeks. As the whisker touches an object, the follicle in the skin recognizes both the angle and amount of pressure being applied. Each follicle then feeds into an individual cluster of neurons in the brain, which integrates the inputs to reveal the shape of the object the rat is exploring.

Now biological and mechanical engineer Mitra Hartmann of Northwestern University in Evanston, Illinois, and colleagues have laser scanned rat noses to create a computer model of this delicate phenomenon, published last week in *PLoS Computation Biology*. The model could lead to a better understanding of how the brain processes the sense of touch. It may also help speed the development of whiskered robots that could perform tasks by using tactile sensations in place of cameras. http://scim.ag/rat-whiskers

NEWSMAKERS

Three Q's

Classical archaeologist **Friederike Fless**, 46, last month left the Free University of Berlin to become the first woman to head the German Archaeological Institute (DAI) in its long history. Founded in 1829, the Berlin-based institute is funded by the German foreign ministry; it employs more than 120 archaeologists and runs excavations in dozens of countries around the world.

Q: What has happened to the DAI's excavations in North Africa recently?

We were lucky. In Egypt, I think we have no problems—the people living near our excavations defended the sites against looting. We had been working in Tunisia, Morocco, Algeria, and Libya before the changes, and now we want to strengthen that work—although it's not possible to work in Libya.

Q: What are your priorities?

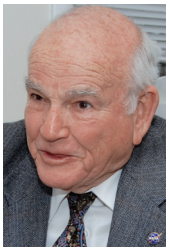
Fundraising is an important thing for me. It's an international phenomenon that we have financial problems. Universities in America are having the same issues; everyone's struggling with financial cutbacks. We have to work on raising the profile of the DAI, and this is one of the most important things I have to do in the next few years.

Q: What are your thoughts on being the DAI's first female president?

It's not a problem for me. I've been living with this situation for 46 years. For German society, I think it's a normal development. Change started years ago: First we had more female students in the universities, then more female graduate students and professors. At a certain moment, it's a natural development that the DAI has a female president.

Peripatetic Nobelist Dies at 85

Baruch Blumberg, who went by the nickname Barry, is best known for winning the Nobel Prize in physiology or medicine 1976 for discovering the hepatitis B virus and developing a vaccine against it. When he died on 5 April at age 85, apparently of a heart attack, he was hundreds of miles from his home base in Philadelphia, at a NASA conference in California.



That was right in character for Blumberg. On top of years spent working with and even leading NASA's astrobiology program and a long career at Philadelphia's Fox Chase Cancer Center, Blumberg remained constantly on the move. Last summer, *Science* visited him at his home for a story about retiring researchers who have large collections of samples (see *Science*, 9 July 2010, p. 135). Blumberg's was among the most massive: at the time, he guessed that he'd amassed 450,000 blood samples during his career. To acquire them, he ticked off where he'd traveled to: West Africa, the Arctic, Romania, Italy, Taiwan, the Pacific Islands, and more. His geographic reach was so great that his face appeared on stamps in the Maldives and Angola. "I carried a lab around the world," he said.

FINDINGS

Cosmic Feast May Be Producing Universe's Biggest Blast

Astronomers have observed possibly the biggest blast ever seen in the cosmos. When NASA's SWIFT space observatory first spotted it on 28 March, observers thought it was a massive star blowing up as a supernova and expected it to fade within hours or even minutes. But as *Science* went to press, the burst, while considerably fainter than its maximum intensity, was still going strong. >>

CREDITS (TOP TO BOTTOM): MITRA HARTMANN; FOX CHASE CANCER CENTER/PAUL COHEN; I. WAGNER/DAI

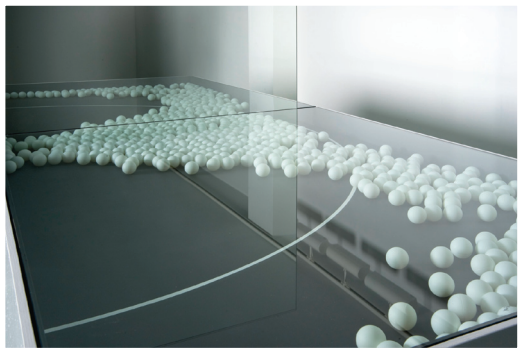
BY THE NUMBERS

37.9 Height, in meters, of Japan's 11 March tsunami in one area, according to a team examining signs of the tsunami's reach. That's tall enough to engulf a 10-story building; seismologists say they expect to find even higher water marks.

30.3% Percentage of U.S. universities where the average faculty salary decreased in 2010–2011, according to a survey by the American Association of University Professors. Male full professors on average made $114,421, about 14% more than their female counterparts.

Random Sample

Beyond Entropy



When designing a building or a city, architects usually put things together in an orderly fashion. But in a month-long exhibition beginning 3 May at the Kallaway Gallery in London's Soho district, Italian architect Stefano Rabolli Pansera has challenged artists, architects, and scientists alike to embrace order's nemesis: entropy.

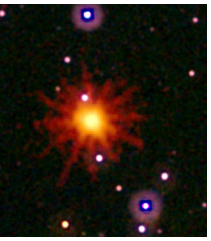
In the show, titled "*Beyond Entropy*," eight interdisciplinary groups explore the second law of thermodynamics in the context of sound, electricity, heat, and gravitational potential energy. The works include a swinging pendulum, connected to a continually projecting image of a building being simultaneously built and destroyed; a 1-meter-high spinning "time machine," and a pinball-like game (pictured) that invites viewers to flick ping pong balls through a gap in a mirror while ruminating about potential energy. In preparation, each of the teams visited scientific institutions, including the Large Hadron Collider near Geneva, Switzerland, for inspiration.

Pansera says that his motivation for the show is to get people to think about energy not as a problem to try to solve, but "as a new way to think about space."

>>FINDINGS

Observations by the Hubble Space Telescope and NASA's Chandra X-ray Observatory pin the source to the center of a galaxy 3.8 billion light-years away, suggesting that it's a black hole.

It could be that a star flitting too close to the black hole has been grabbed by its gravitational pull. As the black hole consumes the star's gas, it releases enormous amounts of energy in a jetlike blast of particles.



Although astronomers have previously seen black holes gobbling stars, the bursts are putting out energy far greater than any ever seen. If the burst stays bright for weeks, astronomers say, they will have to look for another explanation, such as a dormant quasar suddenly turning on.
http://scim.ag/big-blast

Caffeine Fiend? Could Be A Gene Thing

Researchers have found two genetic variants that may help explain why some coffee drinkers keep going back for refills.

Twin studies suggest that genes may account for between 43% and 58% of the variability in coffee-drinking habits. To pinpoint the responsible genes, genetic epidemiologist Marilyn Cornelis of the Harvard School of Public Health, along with colleagues at six institutions, scanned the entire genomes of 47,341 adult subjects from five U.S. studies that had collected data on caffeine intake. Two variants emerged. One neighbored a gene called *CYP1A2*, which "is up to 95% responsible for caffeine metabolism," Cornelis says.

The other big hit, the team reported last week in *PLoS Genetics*, was a variant near a gene called *AHR*, which regulates how *CYP1A2* is expressed. Cornelis speculates that the variants could ramp up caffeine metabolism, meaning people who have the variants require more refills to maintain the same buzz as those who don't. But she says the findings also suggest that there are other genetic variants that also come into play. **http://scim.ag/coffee-gene**

Sex After a Field Trip Yields Scientific First

A U.S. vector biologist appears to have accidentally written virological history simply by having sex with his wife after returning from a field trip to Senegal.

Brian Foy of Colorado State University in Fort Collins and graduate student Kevin Kobylinski got bitten mercilessly while collecting mosquitoes in Senegal for their malaria research. About 5 days after returning home on 24 August 2008, both researchers developed a rash, fatigue, swollen and painful joints, and other unpleasant symptoms. Days later, Foy's wife, Joy Chilson Foy, fell ill as well.

The scientists suspected a mosquito-borne virus, but lab studies failed to turn up a culprit. On his next Senegal trip, however, Kobylinkski told the tale to Andrew Haddow, a medical entomologist at the University of Texas Medical Branch at Galveston whose grandfather had isolated a virus called Zika in Uganda in 1947. Haddow suggested that the obscure mosquito-borne agent might be to blame—and sure enough, lab tests turned up Zika antibodies in samples from all three.

Zika-transmitting mosquitoes don't live in northern Colorado. A paper published online 2 weeks ago in *Emerging Infectious Diseases* points instead to "vaginal sexual intercourse in the days after patient 1 [Foy] returned home"—which would be the first known case of sexual transmission of a mosquito-borne virus. "My wife wasn't happy," says Foy; she is, however, an author on the paper.

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CREDITS (TOP TO BOTTOM): VALERIE BENNETT/THE ARCHITECTURAL ASSOCIATION SCHOOL; ISTOCKPHOTO.COM; ASA/SWIFT/STEFAN IMMLER; COURTESY OF BRIAN FOY