

Harima Science Park City, Japan 5

World's Second X-ray Laser Declared Done

Scientists now have two x-ray lasers—almost. Physicists at the SPring-8 laboratory in Harima Science Park City in Japan have coaxed x-rays out of the SPring-8 Angstrom Compact Free Electron Laser, or SACLA, lab officials announced. The first x-ray free electron laser, or XFEL, turned on 2 years ago at SLAC National Accelerator Laboratory in Menlo Park, California. However, scientists in Japan have not yet demonstrated “lasing” with the new machine, says SPring-8’s Tsumoru Shintake, technical director for the project. But the Japanese government wanted SACLA completed by the end of its 2010 fiscal year, which ended 31 March, so physicists put on a demonstration that it basically works, Shintake says.

Even if SACLA isn’t quite up and running, the announcement marks a coup for Japanese physicists. The Japanese government approved construction of the 700-meter-long, \$300 million laser, previously known as XFEL/SPring-8, in 2006. In comparison, a bigger XFEL in Europe, funded by Germany, was approved in 2003 but will not be complete until 2014. Experiments at SACLA will begin early next year.

NEWSMAKERS

Three Q’s

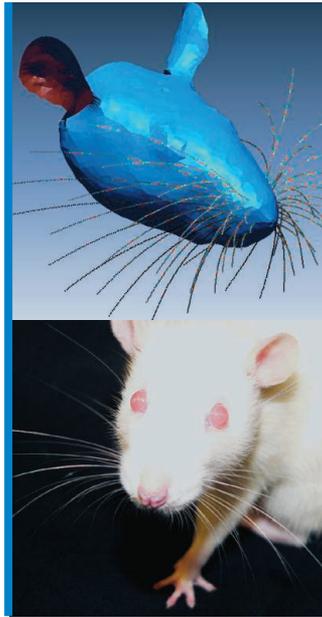
Classical archaeologist **Friederike Fless**, 46, left the Free University of Berlin last month to become the first woman to head the German Archaeological Institute (DAI) in its long history.



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.



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 the 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. The model, published last week in *PLoS Computational Biology*, 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>

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.

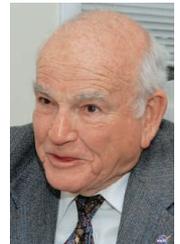
Peripatetic Nobelist Dies at 85

Baruch Blumberg, who went by the nickname Barry, is best known for winning the Nobel Prize in physiology or medicine in 1976 for discovering the hepatitis B virus and inventing a vaccine against it. When he died on 5 April at age 85, apparently of a heart attack, he was thousands 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 (*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 blast, while considerably fainter than its maximum intensity, was still going strong.

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. >>>

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.

>>FINDINGS

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 jetlike bursts of particles.

Although astronomers have seen black holes gobbling stars, this blast is putting out far more energy than previously seen. If it 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

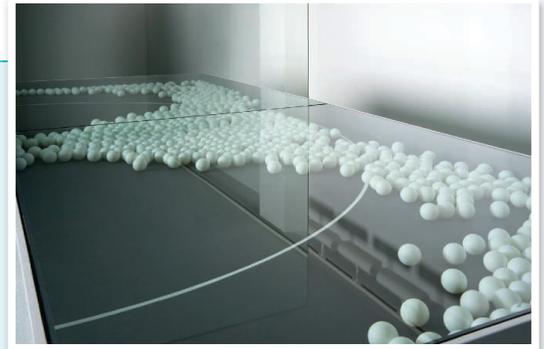
Random Sample

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 Architectural Association School of Architecture in London, Italian architect Stefano Rabolli Pantera 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 continuously projected 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.

Pantera 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.”



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 suggest that other genetic variants also come into play.

<http://scim.ag/coffee-gene>



Sex After a Field Trip Yields Scientific First

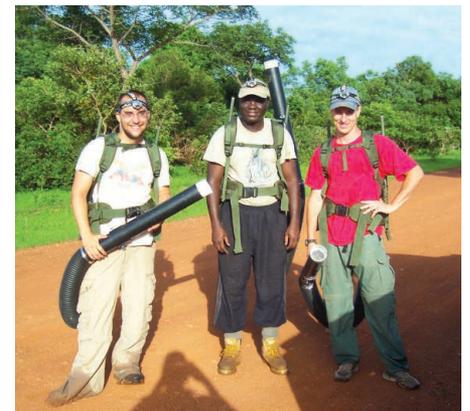
A U.S. vector biologist appears to have accidentally written virological history simply by having sex with his wife after returning from a field trip to Senegal.

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, Kobylinski 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 of the paper.



Bitten. Kobylinski (left) and Foy (right) with entomologist Massamba Sylla in Senegal.