

to maintain progress has been declining.

Even though the world now spends \$15.9 billion a year combating the epidemic, 9 million people who need treatment still have no access to ARVs, says the report. And more than two dozen countries offer ARVs to just 20% or fewer of their citizens who need treatment. UNAIDS estimates that increasing the number of people being treated to 15 million by 2015 will cost \$22 billion a year.

The report ushers in this week's U.N. General Assembly High-Level Meeting on AIDS, which will hammer out a new declaration about how best to address the epidemic. Michel Sidibé, executive director of UNAIDS, says that developing countries will be asked to shoulder more of the burden. <http://scim.ag/AIDS-30>

## NEWSMAKERS

### Trailblazing Nobelist Passes

"She is from New York. She is Jewish. She is a woman." That's what a prominent U.S. university wrote about Rosalyn Yalow while denying her a spot in its graduate program decades ago. Yalow, who went on to win a Nobel Prize in physiology or medicine, died on 30 May in New York City. She was 89.



Born to parents who never went to college, Yalow decided at age 8 to become a scientist. She became the first woman to earn a bachelor's degree in physics from NYC's Hunter College. But no graduate program accepted her until World War II, when the University of Illinois offered her a teach-

ing assistantship. She got her doctorate in nuclear physics from Illinois in 1945.

She began working at the Bronx Veterans Administration Hospital in 1950. There she and Solomon Berson developed the radioimmunoassay for measuring minute quantities of hormones in blood with radioactive tracers. The technique, which can also detect drugs and viruses, ushered in a "revolution in biological and medical research," the Karolinska Institute in Sweden said when Yalow was awarded the Nobel Prize in 1977.

### Tracers of the Universe's Architecture

In the early 1980s, scientists thought that dark matter, the mysterious stuff whose gravity binds galaxies, might actually consist of familiar, nearly massless particles called neutrinos. Then cosmologists Marc Davis of the University of California, Berkeley; George Efstathiou, now at the University of Cambridge in the United Kingdom; Carlos Frenk, now at Durham University in the United Kingdom; and Simon White, now at the Max Planck Institute for Astrophysics in Garching, Germany, proved that convenient idea untenable. Instead of "hot" neutrinos zipping about at near-light speed, dark matter had to consist of beefy, slow-moving, "cold" particles unlike any yet observed. That insight and the methods used to achieve it have won the quartet the 2011 Gruber Cosmology Prize and \$500,000 to share.

Using large-scale simulations, pioneered by Efstathiou, they showed that only cold dark matter would lead to the distribution of galaxies observed in so-called redshift surveys, pioneered by Davis. "Nobody

took it [cold dark matter] seriously until the four of them did their first large-scale simulations," says Julio Navarro, a cosmologist at the University of Victoria in Canada and a member of the prize committee. He adds: "They really started a whole industry in using this kind of simulation, ... which has become a primary tool in cosmology."



Clockwise from top left: Davis, Efstathiou, White, and Frenk.

### Shaw Prizes

The 2011 Shaw Prizes, announced this week, highlight achievements in astrophysics, immunology, and geometry. Enrico Costa of the Institute of Space Astrophysics and Cosmic Physics in Rome and Gerald Fishman of NASA's Marshall Space Flight Center in Huntsville, Alabama, share the astronomy prize for leading the development of space instruments that determined that gamma ray bursts—fleeting, energetic flashes of gamma rays—result from violent explosions in galaxies billions of light years from Earth. Discovering the molecular mechanism of innate immunity, which is the first line of defense against pathogens in all plants and animals, nets the life science and medicine prize for Jules Hoffmann of the University of Strasbourg in France, Ruslan Medzhitov of Yale University, and Bruce Beutler of the Scripps Research Institute in San Diego, California. And Demetrios Christodoulou of ETH Zurich and Richard Hamilton >>

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### Time Capsule From the Atomic Age

On 2 June, a crowd watched as workers pried a large slab from the corner of the Research Institutes building at the University of Chicago (U of C) to reveal a small box, placed there in 1949 by the legendary physicist Enrico Fermi, pioneer of the nuclear reactor. The crowd waited, hushed. What had Fermi hidden away for the generations? Scientific secrets? Predictions for the future?

Instead, master of ceremonies Roger Hildebrand, a U of C physicist and younger contemporary of Fermi's, held up a slim orange volume. "This is the telephone directory from the University of Chicago in 1948," he announced. Next came a road map from a gas station, followed by a bundle of airline timetables (including a five-stop one-way flight to San Francisco for \$113.75). And that was pretty much that.

In a TV interview after the event, U of C physicist Riccardo Levi-Setti, who first met Fermi as a Ph.D. student in 1949, seemed stunned: "I'm a little surprised that there wasn't really"—he paused for a long time—"something very inspiring." The building will be demolished in August to make way for the new Eckhardt Research Center.



## Random Sample

## Mating of the Titans

**BEIJING**—As the scalpel sliced into the towering celebrity, a crowd gathered to watch history in the making. A few cuts later, just before 9:00 p.m. on 28 May, Niu Xia removed a 5-centimeter-square chunk of green flesh and inserted a syringe. The operation was a success, but still the patient had only hours to live.

The celebrity was titan arum, or corpse flower (*Amorphophallus titanum*), which boasts the tallest unbranched inflorescence on the planet, sometimes topping 3 meters. Famously hard to cultivate, the plant offers a noxious reward: When its flower-like spathe opens, the tiny female flowers inside stink like a rotting corpse. That attracts its pollinators: carrion-eating beetles and flesh flies.

In one respect, the corpse flower truly is the living dead. Cultivated individuals almost always begin dying hours after blooming. Sure enough, the night after the operation at Beijing Botanical Garden (BBG), the titan's spadix collapsed. That devastated Niu, who had raised the plant from when it was a mere tuber. "She cried all night," says fellow BBG horticulturalist Guo Ling. "It was like it was her baby."

The withering titan arum may yet have babies of its own. Half a world away, scientists at the Royal Botanic Garden, Edinburgh, in the United Kingdom will attempt to pollinate their own first-time bloomer with the Chinese plant's pollen. As Niu sliced into the spathe and extracted the yellow sacs, BBG Director Zhao Shiwei hovered like an expectant father. In a few weeks, Zhao will learn whether the Scottish plant has borne a cluster of 500 or so dark-orange berries. Then he can break out the cigars.



## BY THE NUMBERS

**1,211,287** Square kilometers of ice road-accessible Arctic lands that will be unreachable by 2050, a 14% decrease, according to a report online 29 May in *Nature Climate Change*. Iceland alone will lose 82%.

**8** Points out of 72 that a U.K. university admissions exam devoted to a math problem later found to be unsolvable. Nearly 6800 students took the test on 26 May.

## Antiatoms, Ready for Work

Six months ago, physicists trapped atoms made of antimatter for a fraction of a second. Now, the same team, which works with the ALPHA experiment at the European particle physics lab, CERN, near Geneva, Switzerland, has held individual atoms of antihydrogen, each consisting of an antiproton bound to a positron, for up to 15 minutes. That's long enough for an atom to radiate all of its internal energy and settle into its "ground state," a prerequisite for probing its inner workings.

The result, reported online 5 June in *Nature Physics*, brings physicists closer to their decades-old goal of precisely comparing the spectrum of light absorbed by antihydrogen to that of hydrogen. Any difference in the spectra would spoil a key symmetry thought to exist between matter and

antimatter and, hence, a symmetry of space and time that undergirds Einstein's theory of special relativity.

Measuring antihydrogen's spectrum with sufficient precision may take years, however, and ALPHA



ALPHA catches an antihydrogen atom.

faces competition from two other experiments, also at CERN. "This is clearly a very, very important experimental step forward," says University of Tokyo physicist Ryugo Hayano, who leads the rival ASACUSA team. "But that doesn't mean the next step is going to be easy."

<http://scim.ag/anti-H>

## &gt;&gt;NEWSMAKERS

of Columbia University take the mathematics prize for their work on nonlinear partial differential equations in Lorentzian and Riemannian geometry and their applications to general relativity and topology.

Hong Kong media mogul and philanthropist Run Run Shaw established the prizes in 2002. The winners in each category will split \$1 million to be awarded at a ceremony in Hong Kong in September.

## FINDINGS

## New Superbug Found in Cows and People

A novel form of deadly drug-resistant bacteria has turned up in dairy cows and humans in the United Kingdom. But don't toss that milk just yet: The superbug isn't a concern in pasteurized dairy products.

The bug is methicillin-resistant *Staphylococcus aureus* (MRSA), a drug-resistant form of the normally harmless *S. aureus* bacterium. It preys on people with weakened immune systems, causing about 19,000 hos-

pital deaths a year in the United States.

Mark Holmes of the University of Cambridge in the United Kingdom and colleagues stumbled upon a new MRSA strain while studying mastitis, or infected udders, in U.K. dairy cows. While clearly resistant to antibiotics, the strain came back negative on a standard PCR test for *mecA*, a gene found in all MRSA strains. Only by sequencing the bacterium's entire genome did the team find the gene in an altered form.

About two-thirds of 74 human samples of drug-resistant *S. aureus* from the United Kingdom and Denmark, despite also failing the usual PCR test, carried the new *mecA*, the team reported online 3 June in *The Lancet Infectious Diseases*. A nearly identical *mecA* gene has also been reported in human MRSA samples from Germany and Ireland.

The strain probably makes up less than 1% of all detected MRSA cases, the team says. And infected cows probably don't pass the bug to humans through milk, which is almost always pasteurized, but via contact with dairy workers who may become carriers. <http://scim.ag/new-MRSA>