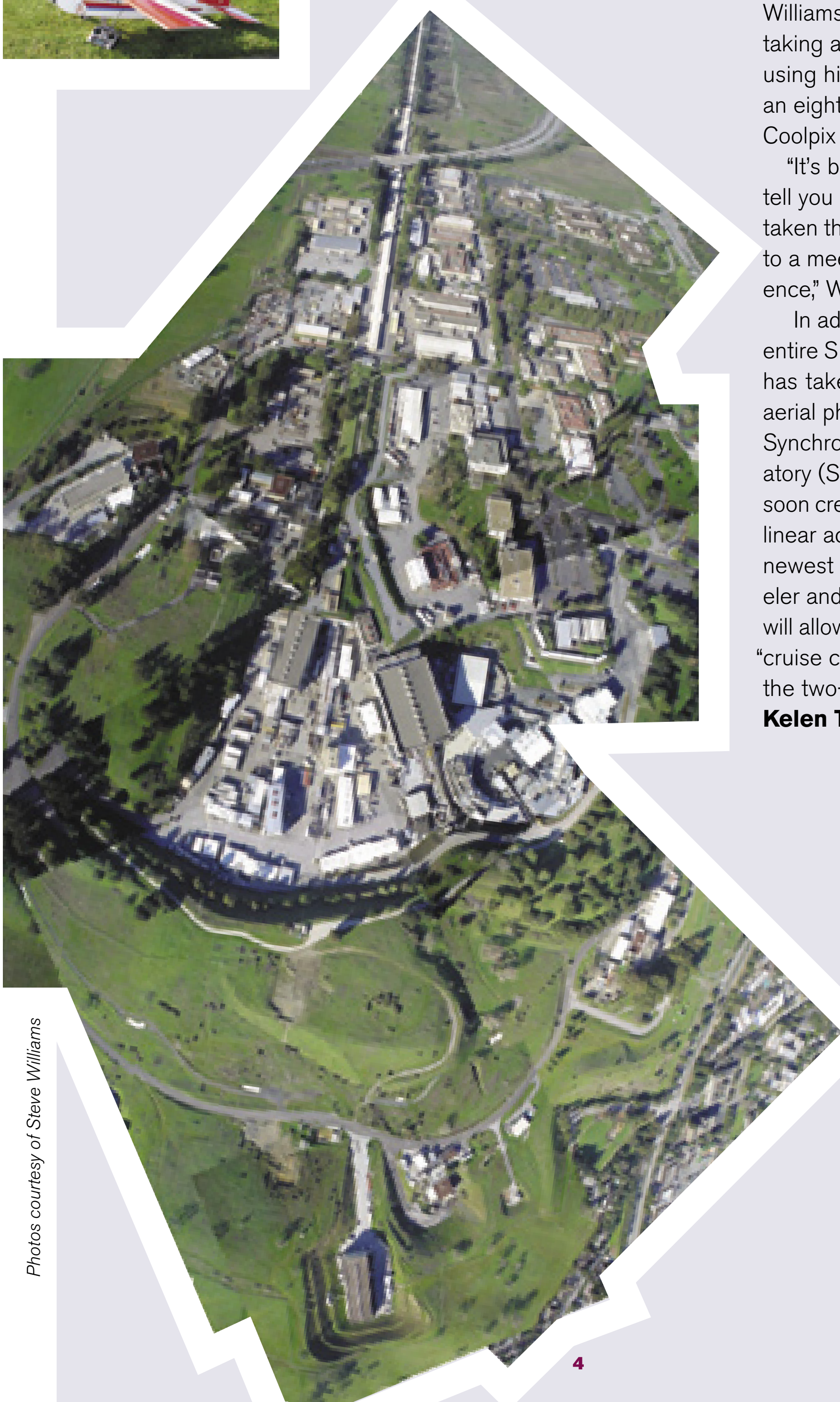
Model airplane provides view from above; Jolly Green Giant is getting old; Laura joins club of top scientists; engineering feats deep underground; tracking scientists by whiteboard; fashion statement: the Ziploc purse; letters.



Photos courtesy of Steve Williams

Aerial photos of SLAC

Most people like to keep their hobbies and work separate. But not Steve Williams. The Director's Liaison for the construction of SLAC's Linac Coherent Light Source (LCLS), Williams spends his Saturdays taking aerial photos of SLAC using his model airplane and an eight-megapixel Nikon Coolpix camera.

"It's been quite useful. I can't tell you how many times I've taken these aerial photos along to a meeting to use as a reference," Williams says.

In addition to mosaics of the entire SLAC site (left), Williams has taken SLAC's most recent aerial photos of the Stanford Synchrotron Radiation Laboratory (SSRL) and hopes to soon create a collage of SLAC's linear accelerator using his newest toys: an automatic leveler and a gyroscope. These will allow him to set his plane on "cruise control" as it flies along the two-mile-long accelerator.

Kelen Tuttle

Photo: Reidar Hahn, Fermilab

Old giant hangs on

In biology, there is a loose rule of thumb that says the bigger an organism, the longer its life will be. If Fermilab's "Jolly Green Giant" is any indication, the rule may also apply to equipment in high-energy physics. The Jolly Green Giant (JGG) is a 250-ton magnet, named for its size and bright green color; finally, it might be retiring after a 40-year career of steering particles in high-energy physics experiments. A few weeks ago, two of JGG's four pancake-shaped coils shorted and started leaking water. "The magnet is not dead yet, but badly wounded," says Leon Beverly of Fermilab's Particle Physics Division. In magnet-years, 40 is really old. After performing in four different experiments, and getting a variety of patch jobs and face-lifts, the magnet has outlived the US industrial base that created it.

The JGG magnet was born at Harvard's Cambridge Electron Accelerator. The noted engineer Dave Jacobus designed it in 1964 to guide electrons in the Strauch-Walker experiment, which studied the photo-production of electron pairs involving large momentum transfer. After 20 years at Harvard, the JGG was broken into pieces and transported to Brookhaven National Laboratory (BNL) for the E776 experiment. Ed Hartouni, a University of Massachusetts physicist working at BNL at the time, remembers how the supervising engineer turned the rusty giant into a spectrometer magnet for the experiment. "There were a number of very cool rigging tasks that had to be accomplished. The best was getting the coils onto the steel without damage," Hartouni says. "The magnet was set out on a grassy field, and the place where the lower coils would rest was packed with dry ice, and the coils were set down on it. As the ice evaporated, it settled the coils gently into place."

In 1988, the BNL experiment was transferred to Fermilab's Lab G, and the Jolly Green Giant came with it. Fermilab physicist Dave Christian remembers when the magnet first arrived. "We made the entire floor of thick reinforced concrete, like a very high-quality US interstate highway, so we could put the magnet anywhere in the lab," he says. After helping the E690 experiment study proton-proton diffraction in Lab G, the magnet moved to Fermilab's Main Injector Particle Production (MIPP) experiment in 2002.

"Now we use JGG to bend the particles we've produced in collisions so we can track them," says MIPP spokesperson Rajendran Raja. He admits the magnet would be expensive to fix, and possibly impractical, but he isn't quite ready to say goodbye. "We can't quite write JGG off as dead," he says. "We just don't know yet."

Siri Steiner

Watch a video of the JGG being installed in the online edition of symmetry.

Forget Albert

Quick, give an example of a first name of a physicist. Albert? Benjamin? Sure, Albert Einstein and Benjamin Franklin are famous examples. But their first names are rather unusual. The SPIRES HEPNAMES database reveals that David is the most common first name among male particle physicists and astrophysicists, while Maria leads the list of female physicists (see table). The database, which contains verified records of almost 8000 scientists, shows more than 2700 different first names.

Does the first name of a scientist reflect any correlation with the area of research chosen? Sometimes. For particle physicists named David, there is about an equal chance for them to be theorists or experimentalists. But, according to HEPNAMES, a physicist named Bruce is ten times more likely to be an experimentalist, while Jose is almost four times more likely to be a theorist.

Although scientists from English-speaking countries are the largest group of people in the database, the last 15 years saw the rise of Jose and Elena among the most frequent names of PhD recipients in high-energy physics. The internationalization of particle physics continues to grow. But most importantly: next time you meet a woman named Laura, don't be surprised if she is a physicist.

Heath O'Connell, Fermilab

Most frequent names among HEP physicists, any age:

Male	Female
David (133)	Maria (16)
Michael (119)	Elizabeth (8)
John (97)	Anna (7)
Peter (90)	Elena (7)
Robert (85)	Jennifer (7)

Most frequent names of HEP theorists vs. experimentalists, any age:

Theorists	Experimentalists
Michael	David
Robert	Peter
David	John

Most frequent names, by year PhD awarded (indicating approximate age of scientist):

PhD 1950–1969

Men	Women*
David	Maria
William	
John	

PhD 1970–1989

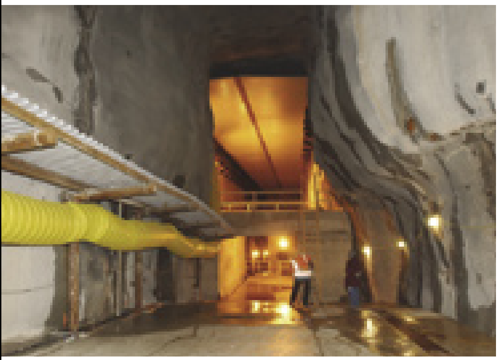
Men	Women*
John	Susan
Michael	Anne/Ann/Anna
Robert	

PhD 1990–2005

Men	Women
David	Maria
Michael	Elena
Thomas	Laura
Jose	

*Numerous female names tie for second and third place.

Source: SPIRES HEPNAMES *database*



Photos: Reidar Hahn, Fermilab

Engineering feats

Sometimes it takes the most impressive equipment in the world to find the smallest, most easily overlooked particles in the universe. Fermilab's Neutrinos at the Main Injector (NuMI) project is a perfect example. With a 4000-foot underground tunnel, two elevators that travel fifteen and thirty stories underground, a beamline of near light-speed neutrinos, and two large scientific labs 150 and 350 feet below surface, the NuMI project almost sounds like science fiction. The project's engineering feats are so impressive that NuMI is one of five finalists in the running for the 2006 Outstanding Civil Engineering Achievement Award (OCEA) given by the American Society of Civil Engineers (ASCE). The nomination puts the NuMI project on par with the world's longest cable-stayed bridge (last year's winner), which connects Peloponnese and mainland Greece.

The NuMI project, which seeks to determine neutrino mass and other properties, sends an underground neutrino beam 435 miles from the Fermilab campus in Batavia, Illinois, to a research laboratory in a former iron mine in Northern Minnesota. Produced by Fermilab's Main Injector accelerator, neutrinos travel through a 1000-ton underground particle detector on site, and then travel through solid bedrock to a 6000-ton far detector at the Minnesota mine. "It took over a million hours to complete this project, and this is a real tribute to the ability of everyone who worked on it," says project manager Greg Bock. "I still consider it a treat each time I visit the underground site."

The OCEA winner will be announced April 26, at the seventh annual Outstanding Projects and Leaders gala in Washington, DC. "The 2006 finalists are outstanding examples of how civil engineering can contribute to a community's economic success, improve residents' quality of life and facilitate scientific progress," says ASCE Executive Director Patrick J. Natale. "Every finalist is to be congratulated for their incredible achievements."

Siri Steiner

Signs of the times

Small whiteboards, hung on office doors, and ubiquitous bicycle helmets are signposts for the interactive, fluid nature of current endeavors at SLAC.

The whiteboard on Phil Bucksbaum's door has a hand-drawn calendar, titled "Days I am at SLAC." Bucksbaum is the director of the new Photon Ultrafast Laser Science and Engineering (PULSE) center, a collaboration between SLAC and Stanford University. For the spring semester, he's splitting his time between the lab and campus, and the University of Michigan, where he is wrapping up his professorial teaching duties.

Down the hallway, another whiteboard proclaims its owner "on campus." This building houses faculty of the Stanford Synchrotron Radiation Laboratory, part of SLAC. Many SSRL professors hold joint faculty appointments at Stanford. If Stanford is land and SSRL water, their graduate students and postdoctoral researchers are amphibians.

The Kavli Institute for Particle Astrophysics and Cosmology (KIPAC) is another relatively new SLAC-Stanford joint venture. Scientists frequently bicycle between office and lab space at SLAC and on the Stanford campus, building formidable leg muscles during the uphill ride. The flow between campus and lab is so frequent that individual whiteboards would not do the trick, says KIPAC administrator Martha Siegel, although group members do note their travel dates on a large whiteboard in the hall.

Their locales for the day often revolve around weekly events: KIPAC hosts Tuesday teatime talks at Stanford and a Friday coffee series at SLAC, while a seminar series alternates between the sites.

"Everyone takes their laptops and is always in email contact. It feels like the building on campus is just a different building at SLAC," Siegel says.

And soon, the ever-roving group will move to new home bases: the recently-completed Kavli building at SLAC, and a building now under construction on campus.

Heather Rock Woods

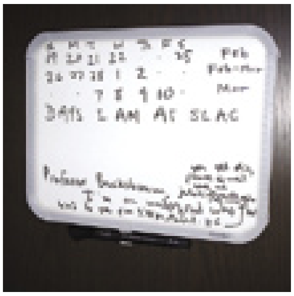


Photo: Heather Rock Woods

The Ziploc purse

During a recent trip to CERN on the Franco-Swiss border, my fellow International Linear Collider communicators and I gathered in the cafeteria for tea and coffee. Waiting in line to pay, I sheepishly pulled out a Ziploc plastic bag, filled with Swiss francs, and started to sort through the unfamiliar currency—desperately trying to distinguish one franc from a 20-centime coin.

I normally carry my money in a fashionable mint green leather wallet (which more than often matches my shoes and purse) and blushed at my plastic method of carrying foreign currency. The only thing fashionable about it was its guarantee to protect my money from freezer burn.

To my amusement, a physicist from Germany's DESY lab standing next to me also pulled out his own plastic bag of foreign coins. He and I looked at each other and laughed, then started to describe just how many plastic bags each of us has at home with various currencies. Then I told him what had happened the previous night: I was at a dinner party across the border in France, and somebody needed money for the cab fare. Our host pulled out her own plastic bag, filled with Swiss francs and euros.

Photo: Reidar Hahn, Fermilab

Apparently Ziploc bags are the way to carry your currencies when you are traveling in the world of particle physics. You might not get great interest rates, but your money will stay fresh.

Elizabeth Clements, ILC GDE

Letters

Public suspicions of knowledge reliability

Thanks for Simon Singh's essay "The pop star controversy" (*symmetry*, February 2006), which in my view nicely respects the difference between what's serious and what's not, and between what's art and what's earnest fact–distinctions that I'm not always confident scientists and science handle as effectively as they might. I'm glad Singh found a constructive, friendly way to convey a point about a pop song's misrepresentation of the reliability of certain cosmological knowledge. Maybe he, or someone, will figure out some comparable way to defray a comparable problem: public suspicions about the reliability of climate-change knowledge.

Steven T. Corneliussen, Jefferson Lab
Newport News, Virginia

Correcting a correction

I enjoy reading *symmetry*–it is fantastic. I'd like to correct Simon Singh's correction (February 2006). The age of the universe may be 13.7 billion years (I will not bother to list the uncertainties or assumptions that go into this result), but the distance to the edge of the universe is another matter.

The universe is expanding at the same time light travels through it. So by the time light from the cosmic microwave background reaches us, it has been travelling for approximately 13.7 billion years but the point of origin is now much further away. The distance (more specifically, the co-moving radial distance) is actually about 14,000 Megaparsecs, or about 46 billion light years. You can check this for yourself: visit www.astro.ucla.edu/~wright/CosmoCalc.html and plug in z=1100 for the redshift to the cosmic microwave background.

Someone should tell Katie Melua. We're 46 billion light years from the edge of the observable universe.

Robert Caldwell, Dartmouth College
Hanover, New Hampshire

Singh responds:

You are absolutely right, but my impression was that Katie was multiplying the age of the universe by the speed of light to get a distance to the cosmic light horizon. So I merely corrected her age of the universe and suggested a more accurate value for the cosmic light horizon.

Correction

In the March 2006 issue, an uncaptioned photo of the KEKB control room was included in a story about the Super-Kamiokande experiment. We regret the confusion.

Letters can be submitted via letters@symmetrymagazine.org