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Office of Science Director Orbach Outlines Bright Future For SLAC

By Francoise Chanut

Raymond L. Orbach, Director of the Office of Science at the Department of Energy, lavished praise on SLAC's past accomplishments and promising future during a special address Thursday on the Lab's Green.

See whole story...

Read Orbach's Address...

SLAC's E158 Makes First Observations of Key Traits in Weak Force

By Heather Rock Woods

The E158 experiment at SLAC has made vital new observations that illuminate the nature of the weak force.

New Milestone for SPEAR3

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See whole story...

By Francoise Chanut

SPEAR3, SSRL's recently upgraded synchrotron radiation source at SLAC, reached 500 milliamps (mA) for the first time on June 20, and again on June 21.

The milestone was achieved as part of a series of tests designed to bring SPEAR3 to its full design performance. SPEAR3 has been running at 100 mA for the past year and a half but will ultimately operate at 500 mA routinely, generating brighter X-ray beams that will make new experiments possible.

See whole story...

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Office of Science Director Orbach Outlines Bright Future For SLAC

By Francoise Chanut

(Photo by Diana Rogers)

Raymond Orbach, director of the Office of Science at the Department of Energy, lavished praise on SLAC's past accomplishments and promising future during a special address Thursday on the Lab's Green.

"This is the finest laboratory in the world, with a history of discovery and a future of excitement," he said to an audience of more than 800 SLAC staff gathered under a 50-by-100 foot tent built for the occasion.

"No other place has a history and future of this magnitude," Orbach said, listing the many Nobel laureates and other distinguished scientists whose discoveries were made possible by SLAC.

Orbach emphasized the importance of SLAC's close ties with Stanford University, as illustrated by the Kavli Institute, whose nascent metal frame at the entrance of SLAC could be seen through the arches of the tent.

He congratulated the recent success of the SPEAR3 team, who ran the synchrotron source at 500 mA "without a hiccup" this week for the first time, as an example of the ingenuity of SLAC's engineers, faculty and students working together.

Orbach expressed great faith in the promise of the LCLS, which will produce X-ray beams "ten billion times brighter than any light source on Earth," he said.

He ended his talk by asserting his belief in American leadership, particularly in the field of ultrafast

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science.

“We’re going to insist on U.S. leadership in world science, which we could not carry out without the SLAC family and the support of Stanford University,” Orbach said.

SLAC’s director Jonathan Dorfan thanked Orbach for his enthusiastic and thoughtful remarks and assured him that SLAC would do its part.

“We will make this place not just one of the best, but the best,” Dorfan concluded, as the audience broke into applause.

Text from Ray Orbach's SLAC Address

Thank you, President Hennessy, for your very kind words; Jonathan, for your kind words, and the hospitality of SLAC and Stanford University. It is a great pleasure and privilege to be back amongst you and especially to receive this kind of welcome. Thank you all for coming out. It is a special tribute to SLAC to note, as we have seen it develop, that this is the finest laboratory in the world with a history of discovery and a future of excitement.

About 40 years ago, SLAC was started with the visionaries who had the dreams of building a pioneering physics center. Through the contributions of thousands of people, including scientists, engineers and staff, and collaboration with other scientists from around the world SLAC has successfully made those dreams come true and pushed forward our understanding of physics.

Raymond L. Orbach, Director of the DOE Office of Science
(Photo by Diana Rogers)

Some examples are:

Pief, who pretty much wrote the book on how things get done.

LINAC, SPEAR, PEP, SSRL and now the LCLS.

Bjorken: The elucidation of the Parton Model in scaling behavior in QCD, who won the Lorentz award in 1978.

Sid Drell: Quantum theory of radiation, arms control and more prizes than you can name.

Taylor: Key experiment proving protons are made up of smaller constituents; Nobel prize in 1990 with Kendall and Friedman.

Perl: Discovering the tau lepton; Nobel prize, 1995.

Richter: Discovery of the charm quark; Nobel prize in 1976 shared with Ting, led construction of SPEAR in the first detector, MARC I.

Quinn: Theory of CP violation and unified theories.

Addis et. al.: Created the first high-energy physics database in the mid-1970s, later evolving into SPIRES.

Prescott: Demonstrated a parity violation in neutral currents.

Winick et. al.: Development of the SSRL, using wiggler magnets to develop multiple high-power beams for users.

Farcas and Wilson: RF pulse compression technology, effectively doubling the energy delivered by the main linac.

Kunz, Johnson et.al.: First United States www site and web server.

Breidenbach: Design, development and execution of the SLAC Large Detector, including the SLC, Stanford Linear Collider Controls.

Arnold: Led numerous fixed target experiments demonstrating electromagnetic properties of nuclei and their connection to QCD.

Atwood et al.: Led applications of high-energy physics technology, the space-based astrophysics missions—in particular, GLAST.

Dorfan: Spokesman for the first SLAC linear collider experiment, revamping MARC II and project manager for the PEP-II B-Factory.

Seeman: Design and commissioning of PEP-II as well as ongoing upgrades.

These are shining examples of how SLAC's family involvement and appreciation of the pioneering effort has always been the hallmark of this laboratory. It is, and will be, a strong foundation for new directions of the laboratory as it's about to embark on future success to come of comparable magnitude. There is no other place in the world that has a history and tradition and future of that magnitude.

Just recently—in fact, in an e-mail dated June 21st of this year, Tuesday—Pat Dehmer, who is the Associate Director of Basic Energy Sciences for the Office of Science, wrote, "The attainment of 500 milli-amps in SPEAR 3 is a great accomplishment. The fact that SPEAR 3 marched up to 500 milli-amps without a hiccup is a real tribute to the engineers at SLAC."

It's again a statement of the remarkable ingenuity and increase in current that you were able to bring about without a hiccup—a tribute to the faculty, to the staff, to the students at SLAC and your commitment. What I like most of all was the exciting remark and explanation made by Dave Dungan—"The machine behaved as designed"—which is pretty telling about the way in which things are done here and we are very grateful in the Office of Science to have the quality and the achievement that this laboratory presents.

Ray Orbach (DOE), Nancy Sanchez (SSO) and Jonathan Dorfan (DO) at the future LCLS site.
(Photo by Diana Rogers)

I also want to make a comment about Stanford, because as you know, Stanford is the contractor for this laboratory and in the Office of Science, when we measure the importance and the relevance of our contractors, we look at what we call "value-added." The value added by Stanford to SLAC—to our laboratory—is remarkable. The President has already mentioned the facility, the guest house. Behind us, we have the Kavli Institute. That was a private gift to Stanford University, which the university placed here on a federal government site—leased from Stanford, but run and owned by the federal government. I know of no other example of a contractor who has taken their own personal gifts and contributed it to the success of a national laboratory. With the Kavli Institute, of course, begins a whole new field of science that is becoming ever more relevant and more exciting to the future of science. But there's much more.

There will be the LCLS, the Linac Coherent Light Source. That concept started here. It started because of the quality of the beam in the linac and the ability to use that beam for spontaneous amplification of stimulated emission. And very, very true to the SLAC tradition, if you read the original paper by Herman Winick—this is dated 1993. Herman talks about, "The first laser would start operation at a wavelength of around 10 nanometers,"—that is a hundred angstroms—"in a single sub-picosecond pulse."

Well, thanks to the ingenuity of the SLAC staff, the wavelength will be one and a half angstroms in the hard x-ray range, the luminosity will be ten billion times any other light source on Earth at that wavelength, and the pulse length can be as short—with some real photons present—as three hundred attoseconds. When I first heard that, when Keith told me that number, I had to look up what an attosecond was because I hadn't heard it. If you remember your h-bar, that's of the order of a couple of eV—which means that that machine, which Herman described so modestly a little over a decade ago, will be able to envisage—able to see—the structure of a single macromolecule and see the chemical bond change in time—in real time—as the chemical processes develop. It opens up a field, both theoretical and experimental, with untold future opportunities. And it would not have happened had it not been for the ingenuity of the SLAC family.

The ability to see the structure of macromolecules that cannot be crystallized, the ability to see the chemical bond being formed during the process of a chemical reaction—Pauling never dreamed about it. It gives us opportunities—just think of time-dependent Hartree-Fock calculations, which we know to be modest in their accuracy—whole new areas of theoretical science will be developed. I've mentioned already the computational prowess of SLAC. The combination of the very large database research and the high-end computation power of SLAC, together with these opportunities, in the experimental domain, will give us simulation opportunities again not available elsewhere.

When you package them altogether, ultrafast science becomes a new science, a new field of study. And it's very reassuring that Stanford University has invested in a center for ultrafast science, that we will have a home in the LCLS building for ultrafast science here at SLAC. It's going to be a future opportunity that will not be available elsewhere. The United States will have a lead of at least a decade over the XFEL in Germany, if not longer. And we already have plans for an upgrade at the LCLS that will continue American leadership in this field for another decade to come. This is the commitment of the Office of Science. We can make it because of what you provide. We are going to insist on U.S. leadership in world science. And we will structure our investments, our budget and our commitment to being the very best in the world at what we do. We could not carry that off without the SLAC family and the support of Stanford University. Thank you.

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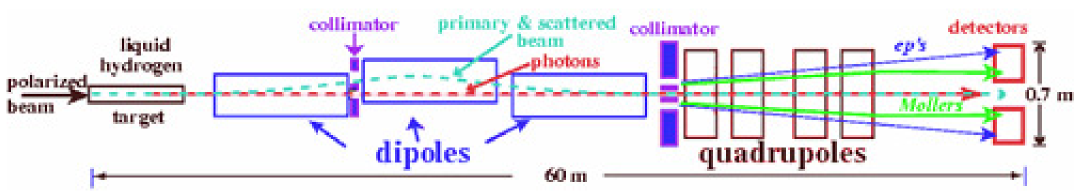
SLAC Experiment Make First Observations of Key Traits in Weak Force

By Heather Rock Woods

The E158 experiment at SLAC has made vital new observations that illuminate the nature of the weak force.

The weak force is tremendously important. Without it, there would be no life on Earth. The weak force causes radioactive decays, which are essential in making sunlight. Radioactive decays also warm the inner earth, enabling liquid magma to move continents and generate earthquakes. Radioactive decays can be used to measure the age of the Earth and archeological samples, and to diagnose and treat disease. The strength of the weak force affects how long the sun and stars last, and the mix of basic elements in our universe.

Using extraordinary precision, E158 made the landmark observation that the strength of the weak force acting on two electrons lessens when the electrons are far apart. The results have been accepted for publication in the field's primary journal, Physical Review Letters.



This illustration of the experimental setup in End Station A shows the beam hitting the target and going through spectrometer magnets to the detector region.
(Image courtesy of Mike Woods)

"Physicists have long expected that the weak force interactions would be weaker at longer distances, but proving it wasn't easy," said experiment co-spokesman Krishna Kumar, professor of physics at the University of Massachusetts-Amherst. SLAC physicists made up one third of the 60-person collaboration and led experimental operations.

"The experiment could only be done at SLAC, using the highest beam power SLAC has seen in 30 years," Kumar said. "We measured this minute effect with a massive beam. It was a huge technical achievement— most people were skeptical about our chances for success."

The precision measurements required enormous numbers of electrons. The SLAC linear accelerator sent

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500 billion electrons in a single bunch to a target, and repeated this 700 million times. In half of these electron bunches, the electrons were polarized to spin right-handed. The electrons in the remaining bunches were polarized to spin left-handed. Some electrons entering the target scattered off target electrons by exchanging a mediator particle. The mediator is almost always a photon, which transmits the electromagnetic force (think visible light, radio waves, x-rays). The collaboration's challenge was to find the rate of rare events, those one in a million electron-electron scatters that took place by exchanging a Z particle, which mediates the weak force.

Because there is an asymmetry in how the weak force acts, there is a slight difference in how often left-handed electrons scatter using a Z particle compared to the rate for right-handed electrons. On average, a bunch of right-handed electrons generates 20 million scattering events, including several dozen Z scatters. Left-handed bunches yield about five more Z-mediated scatters.

E158 made the first observation of this slight left-right asymmetry, called parity violation, in electron-electron interactions in 2003. The asymmetry is so tiny—131 parts per billion—that if you did the experiment with clocks, a left-handed clock would be only one hour faster after 1,000 years.

Researchers used their precision asymmetry measurement to calculate the long-distance strength of the electron's weak charge, which determines the strength of the weak force between two electrons. Precision measurements have a history of enabling scientific discovery, as in the case of inferring the existence of Neptune by observing Uranus' wayward orbit.

Previous experiments at SLAC and CERN in Geneva had measured the electron's weak charge at short distances. E158 has now demonstrated that, as predicted, at "long" distances approximately the width of a proton, the electrons are far apart and their weak charge is only half the size of the charge at short distances.

The evidence that the electron's weak charge varies with distance—called running—is the first demonstration of running in weak force interactions and confirms for the first time an important aspect of Standard Model theory, which describes the actions of the weak force, electromagnetism and the strong force.

The weak charge gets weaker because of quantum fluctuations. The vacuum surrounding every particle randomly spits out and reabsorbs virtual particles, making an ephemeral cloud that effectively forms a screen between distant interacting electrons.

"E158 is sensitive to this rich structure that exists in the microscopic world, the structure of nothing, of the vacuum," said Yury Kolomensky, leader of the analysis and assistant professor of physics at the University of California-Berkeley.

E158 was sensitive to (but did not find) indirect signals from Z' (Z prime) particles, hypothetical fat cousins of Z particles that would carry a yet-to-be discovered new force.

"E158 has been a real tour de force by a talented group of experimentalists," said Bill Marciano, Senior Theoretical Physicist at Brookhaven National Laboratory. Although not on the experiment, he has worked extensively on precision weak interaction calculations. “Their high precision measurement of a tiny parity violating asymmetry provides one of the best tests of the Standard Model and confirms the expected running of the weak charge,” he said.

The collaboration clearly demonstrated that its experimental technique can be used at current and future accelerators, making the experiment’s technical contributions as significant as its scientific success in drawing a more complete picture of one of nature’s fundamental and profound forces.

The collaboration involved 60 physicists from SLAC, University of Massachusetts, UC Berkeley, Syracuse, CalTech, Jefferson Lab, Princeton, Smith College, University of Virginia, and Saclay in France. SLAC is funded by the Department of Energy’s Office of Science.

For an animation, illustrations and details, see http://www-group.slac.stanford.edu/com/e158/

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New Milestone for SPEAR3

By Francoise Chanut

SPEAR3, SSRL's recently upgraded synchrotron radiation source at SLAC, reached 500 milliamps (mA) for the first time on June 20, and again on June 21.

"We were able to go to the design current without any problem related to instability in the electron beam," Piero Pianetta (SSRL) said.

This figure shows the duration of the high-current run.
(Image courtesy of SSRL)

The milestone was achieved as part of a series of tests designed to bring SPEAR3 to its full design performance. SPEAR3 has been running at 100 mA for the past year and a half but will ultimately operate at 500 mA routinely, generating brighter X-ray beams that will make new experiments possible. "It was a major step, the fruition of almost nine years of hard work and a lot of meetings!" Bob Hettel (SSRL) said. The SPEAR3 upgrade was first discussed in 1996 and made possible by funding from DOE and NIH, he said.

Hettel and members of a multi-disciplinary team tested SPEAR3 on June 20 and 21. They gradually increased the electron beam intensity from 100 to 500 mA over the course of four hours, carefully checking for potential damage to the equipment at every step. They did not encounter any problems, Hettel said. The electron beam did show some instability at first, but the problem was easily corrected the second night with the help of engineers from the CPE and Klystron/Microwave groups, he said.

"This achievement is a demonstration of the tremendous energy and teamwork of the SSRL SPEAR3 accelerator group working closely with other key staff at SLAC," said Photon Science Director Keith Hodgson. "Achieving maximum design performance so smoothly reflects the quality of the accelerator and control system and reinforces the value of the significant investment by DOE and NIH in building the new machine."

A test run of SPEAR3 at 200 mA a year ago had gone similarly smoothly, but further preparation was

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needed to meet the requirements of a DOE-mandated Accelerator Readiness Review before the 500 mA test.

The next big step now is to complete the upgrade of the synchrotron radiation beam lines. The first beam lines ready for 500-mA operation will be available to users in 2006, Hettel said.

“Operating at maximum performance levels, SPEAR3 will provide SSRL’s users with capabilities equivalent to the best in its class in the world, and enable scientific discovery in areas like study of nano-structured materials and microcrystal diffraction which will take full advantage of the high brightness of SPEAR3,” Hodgson said.

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EVENTS

More Oxidized Than Rust

By Heather Rock Woods

Iron metals oxidize to rust, losing electrons and gaining positive charge. Iron metals typically exist in an oxidation state of +2 or +3 (2 or 3 electrons less than a neutral iron atom). However, chemists have long thought that iron compounds with even higher oxidation states play important roles in enabling chemical reactions in metal-containing proteins.

Iron compounds are found in vital proteins, including the hemoglobin in our blood and the myoglobin of our muscle tissue. An iron-based drug currently used to treat cancer most likely involves a highly oxidized form of iron to cause oxidative damage to cancerous DNA.

“To work, certain chemical reactions seem to require going through an unstable, short-lived intermediate state involving iron +4 or +5,” said Serena DeBeer George (ESRD).

In recent years, scientists have been able to synthesize and characterize numerous iron +4 compounds [written Fe(IV)], but knew little about iron +5, Fe(V), compounds. Now researchers, using SSRL, have characterized a genuine Fe(V) species, which is even more oxidized and more positively charged than the iron in rust [Fe(III)] or Fe(IV).

Frank Neese and Karl Wieghardt (Max Planck Institute) and their colleagues, including George, used x-ray absorption spectroscopy (XAS), combined with other spectroscopic and computational results, to describe the lab-made compound.

Tuned to be sensitive to iron, XAS can pick up the amount of charge on the iron atom. The XAS ’K-edge’ corresponds to the excitation of the most tightly bound electrons in the iron atom. As the iron atom becomes more oxidized, the K-edge increases in energy, providing a signature for Fe(V). This study represents the first characterization of an Fe(V) species by XAS and serves as an important experimental marker for characterization of other Fe(V) species.

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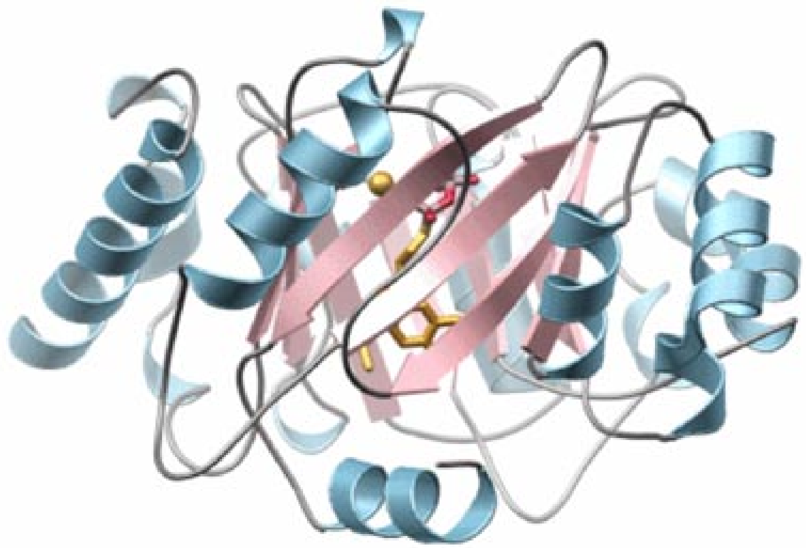
Bacteria Protein Structure Discovered

By Monica Bobra

Using SSRL, three scientists from the Salk Institute for Biological Studies have discovered the three-dimensional structure of a protein that bacteria use to make anti-cancer, anti-viral, anti-inflammatory and anti-oxidant compounds. By effectively engineering this protein, scientists may be able to create new drugs with therapeutic properties. The Salk Institute scientists reported their results in the June 16 issue of *Nature*.

The bacterial protein, known as Orf2, contains a previously unknown structure shaped like a barrel. Scientists discovered this structure using a process called x-ray crystallography, a technique in which x-rays, produced by synchrotron radiation, hit the protein's atoms and diffract to produce a two-dimensional pattern. Computers then interpret a set of such patterns and construct a high-resolution three-dimensional image. Researchers gathered data at SSRL, the National Synchrotron Light Source (NSLS) at BNL and the European Synchrotron Radiation Facility.



A schematic diagram of the Orf2 protein allows scientists to visualize it in three-dimensional space. The helical structure is known as a PT barrel. Thin strands of molecules reside within the PT barrel; the sphere in the protein's core represents magnesium.
(Image courtesy of Interactions.org)

"Looking at the protein's structure is like opening up a clock and understanding how all the parts fit together and work in unison," said co-author Joseph Noel. "With x-ray instruments from our lab at the Salk Institute, we looked at Orf2 from 30 feet away. With SSRL, we can look at it with a magnifying glass if we need to. That's an essential part of the whole process."

Orf2 is one of a small number in a recently isolated family of proteins that create compounds with anti-microbial, anti-cancer, anti-viral, anti-inflammatory and anti-oxidant properties. It accomplishes this remarkable task by adding hydrocarbons known as prenyl groups to flat benzene-like molecules. By

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manipulating Orf2 using knowledge of its three dimensional shape, scientists could engineer therapeutic drugs.

“When we first looked at it, very quickly, we thought: this is one of the most common 3-D folds known in nature,” said Noel, referring to a common helical protein structure known as a TIM barrel. Soon after, the team realized Orf2’s shape was incredibly distinctive; its amino acids, which form the protein’s building blocks, are arranged in an entirely different manner.

“We currently use the protein as a surrogate chemist, allowing it to catalyze chemical reactions that would be difficult or impossible to do with traditional chemistry,” said Noel. In this way, the researchers slightly modify existing chemicals, which may lead them to discover new drugs. “We hope to use and engineer the protein to create novel compounds,” said Stéphane Richard, who helped make the discovery.

In addition, studying Orf2’s structure allows the scientists to understand the fundamental process of molecular evolution. The team is analyzing the amino acid sequence of closely related proteins to understand how Orf2 has changed over time. “Using laboratory techniques for genetic manipulation,” said Noel, “we can now make changes to Orf2 and its relatives in a manner resembling the path that evolution has taken over the last half a billion years or so.”

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SULI Students Here for the Summer

By Monica Bobra

Twenty-seven undergraduate science, math and engineering students from around the country are roaming about SLAC's campus this summer. They're part of an 8-week long Science Undergraduate Laboratory Internships (SULI) program that runs from Monday, June 20 to August 20. The interns will populate all of the research facilities at SLAC, according to program manager Helen Quinn (THP), who works with program director James Lindesay (HR).

In addition to conducting research with a mentor, preparing a formal report—and having a shot of publishing it in the DOE's Journal of Undergraduate Research—the students tour local high-tech industries, attend guest lectures and live together on Stanford University's campus.

SULI students Isabella Griffin (Norfolk State University), Marissa Cevallos (California Institute of Technology), Elizabeth Rivers (Wellesley University) and Matt George (Harvard University).
(Photo provided by Isabella Griffin)

Though the DOE-sponsored SULI program is in its fifth year, SLAC has been recruiting interns for the past thirty years. The selection committee looks for applicants under-represented in the physics community—such as minorities, women and students from little-known colleges. "At the 25-year reunion, people said the program literally changed their lives," said Quinn. The strength of the program, she says, is the student's research experience. "It lets them see how scientists actually work as opposed to how you learn science in school."

SSRL physicist Uwe Bergmann (ESRD), who is hosting his second SULI student, said mentors also learn a lot from the program. "If they ask good questions, you realize how poorly you understand things," said Bergmann. "You also realize what a highly specialized, tiny little domain you work in. You could talk to them and say a sentence in which they don't understand seven out of the eight words you say. It makes you think about how to express yourself."

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Summer Lights

By Monica Bobra

Forty-six students attended the fourth annual Stanford-Berkeley Summer School on Synchrotron Radiation, held at SLAC from June 13 to 17. The group of mostly graduate students hailed from around the world to learn about various synchrotron radiation applications by listening to fourteen lectures, participating in group problem-solving sessions and visiting both SSRL and the Advanced Light Source at LBNL.

Students in the lobby of Berkeley Lab, hanging out and discussing the different beam lines they visited.
(Photo courtesy of Jennifer Saltzman)

Anders Nilsson (ESRD), who directs the program along with Dave Attwood (LBNL), said the summer school grew out of their realization that the Bay Area had the largest concentration of synchrotron radiation facilities in the world. Nilsson added, “Students need to see the breadth of synchrotron radiation applications, to fields such as physics, chemistry, geoscience and material science.”

This year, students sat in on several experiments, such as one at ALS to study water formation on iron-oxide surfaces. The experiment consists of shooting synchrotron radiation through a vacuum chamber at a single hematite crystal enveloped in water vapor. The radiation knocks electrons from the metal, in an example of Einstein’s famous photoelectric effect, which allows scientists to observe how thin layers of water form on the sample. Studying the various experiments

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gave students a flavor of the many applications of synchrotron radiation.

About 60 percent of the summer school participants are graduate students, 30 percent are postdocs, and the remaining 10 percent is comprised of a mix of older scientists and undergraduates. They hail from various countries including Sweden, Spain, Germany, Belgium, Ireland and Canada — and all of them have a strong interest in synchrotron radiation, Nilsson said. This year alone, three of the summer students decided to change their research methods to include other synchrotron radiation spectroscopic techniques.

Both Attwood and Nilsson enjoy leading a small group of students to foster one-on-one teacher-student time. The directors conduct a two-hour feedback session on the last day of the program, telling each student how synchrotron radiation could benefit their current research. “Everybody is very positive about it,” Nilsson said.

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From the Benefits Office:

Have Questions About Investing Your Retirement?

Representatives from Fidelity, Vanguard, and TIAA-CREF will be holding individual counseling sessions at SLAC. Please contact the company directly to set up an appointment:

Fidelity
July 12
August 9
September 13
(800) 642-7131

Vanguard
July 7
August 3
September 7
(800) 662-0106, Ext. 14500
www.meetvanguard.com

TIAA-CREF
July 20
August 17
September 21
(800) 842-2007
www.tiaa-cref.org/moc

All sessions will be held at: Building 280, Module A, Room 180.

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Service Awards

5 Years
Brunger, Axel (ESRD), 7/1
Czech, Sandra (HR), 7/10
Vailionis, Arturas (ESRD), 7/1

10 Years
Park, Sanghyun (ENG), 7/1

15 Years
Economos, Evan (BU), 7/1
Langton, J. B. (LCLS), 7/12
Snyder, Arthur (EC), 7/1

25 Years
Fernandez, Louis (ESD), 7/7
Olsen, Jeff (ESD), 7/1

35 Years
McDonald, James (EC), 7/6

Retirements
Koontz, Ron (KLY), 6/1
Lee, Martin (ARDA), 6/1

Deceased
McDonald, Mick (formerly ESH), age 57, passed away on June 15, 2005

To submit a Milestone, see: http://www.slac.stanford.edu/pubs/tip/milestoneindex.html

See Awards and Honors at: http://www.slac.stanford.edu/slac/award/

INTERACTION POINT
July 1, 2005

Annual Connoisseur's Marketplace

WHO?
SLAC Ambassadors step forward and join us by contacting Barbara Mason (ext. 4130, bmason@SLAC.stanford.edu).

WHAT?
Help staff a soda booth and show SLAC's community spirit

WHEN?
Saturday, July 17, from 10 AM to 6 PM
(may also staff booth on Sunday if enough interest)

WHERE?
Connoisseur's Marketplace along Santa Cruz Avenue in Menlo Park

WHY?
A great local community outreach opportunity with neighbors & visitors

For SLAC outreach information, see:
http://www.slac.stanford.edu/grp/pao/MP_2005.html

For general Connoisseur's Marketplace information, see:
http://www.miramarevents.com/marketplace/index.html

INTERACTION POINT

July 1, 2005

Kids Day @ SLAC, 2005

Kids Day @ SLAC 2005, will be held on Wednesday, August 10. As in the past, SLAC employees and contractors may sponsor a child who can attend. This year there will be 19 hands-on workshops for the kids to attend. These include electronics, mechanics, welding, rockets, magnetics, radiation, vacuum and paleontology to name a few. There are four new workshops added to the choices: monster muscles, catapults, optics and electric motors. The workshops are grouped so that each kid attends different workshops in the morning and the afternoon. A kid would need to attend Kids Day for six years in order to attend all of the workshops!

Registration will begin Monday, July 5, and will be closed on Friday, July 22. There are additional safety considerations this year and each parent will be required to read about the risks involved in each workshop as well as to comply with required PPE (long pants and closed-toe shoes) for each kid. The cost for the day is $12 and will cover a t-shirt, lunch and ice cream. This year's t-shirt logo design winner is Jenine Fernandez, age 14. Her central figure is an inquisitive Albert Einstein—very timely for 2005, the 'Year of Einstein!'

For more information, see:
http://www-project.slac.stanford.edu/kidsday/2005/detailhtm.htm

INTERACTION POINT
July 1, 2005

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The Interaction Point

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The Interaction Point is published twice monthly every first and third Friday. Submissions are due the second and fourth Tuesdays of each month.

Send submissions to tip@slac.stanford.edu, or mail to TIP Editor, MS 58, Stanford Linear Accelerator Center, 2575 Sand Hill Road, Menlo Park, CA 94025.

TIP is available online at:
http://www2.slac.stanford.edu/tip/