

## Sub-Picosecond Photon Source To Illuminate Chemical Reactions

By Tom Mead

Anyone who has seen a strobe light in action knows that short, bright flashes of light can appear to 'freeze' the motion of a moving object. It is intuitive that to apparently freeze the movement of ever-faster moving objects, one needs ever-shorter pulses of light. The Sub-Picosecond Photon Source (SPPS) project takes this relationship to the Nth degree in order to produce informative images of movements that occur, even at the atomic level, during chemical reactions.

The SPPS project is made possible by an upgrade to the existing SLAC

### How are such beams generated?

Each electron bunch extracted from the linac damping ring is compressed to 1.2 mm in the ring-to-linac beam line. Each electron bunch is further compressed to 50  $\mu\text{m}$  (50 millionths of a meter) in the new 10 meter-long linac bunch compressor chicane that has recently been installed near the one kilometer point in Sector 10.

The 'dog-leg' bend of the Final Focus Test Beam beamline at the end of the linac does the final compression, yielding an electron bunch of 12  $\mu\text{m}$  (which in time equates to less than one tenth of a picosecond). Finally,

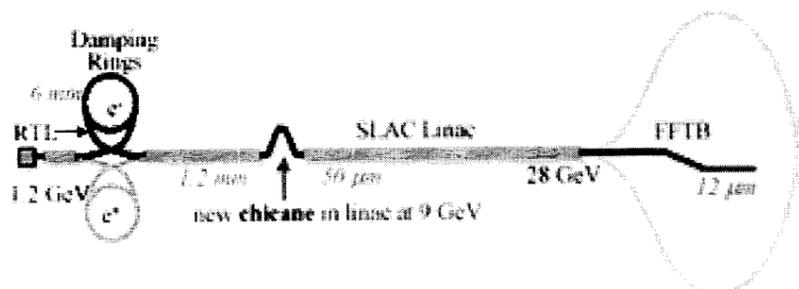


Illustration courtesy of SPPS

This illustration shows the general layout of the SPPS

linear accelerator (linac), along with specialized new instrumentation, to produce and deliver x-rays from bright electron beam pulses. This project provides a fast, relatively inexpensive way to begin experiments with a new generation of very bright, sub-picosecond (less than one millionth of one millionth of a second), hard x-rays.

'Brightness' is the measure of the quality of the photon beam. Bright beams have a small cross-section and the x-ray paths are nearly parallel. The 'pulse length' is the measure of the time duration of the x-ray beam.

For example, the beam needs to be bright and have a very short pulse length for experiments that begin to probe the motion of atoms relevant to aspects of chemical dynamics. Both features are provided by the SPPS.

a magnetic undulator—an array of permanent magnets—bends these bunches back and forth to produce ultra-short pulse, high-brightness x-rays whose time and special properties are derived from the electron beam.

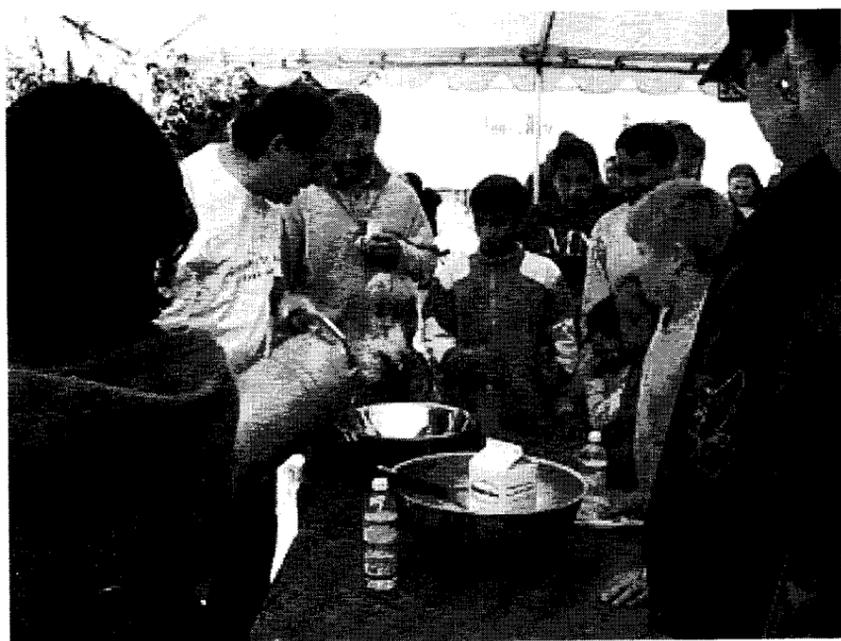
### Unique Features of SPPS

The most unique feature of the SPPS will be its combination of brightness and sub-picosecond pulse length. The peak brightness of SPPS will exceed that of any existing hard x-ray source by several orders of magnitude and its pulse length has been simulated to be about 80 femtoseconds (about a millionth of a billionth of a second).

This combination will allow us to collect diffraction images of the atomic positions of relatively strongly scattering materials as they

(See SPPS, page 2)

## Stanford Community Day a Smashing Success (Story on Page 3)



Keith Jobe (NLCTA) makes frozen yogurt with a special ingredient: liquid nitrogen

Photo by Nina Adelman Stolar

## Recent Incident Highlights Lab Safety Issues

By Irene Boczek

James Joyce said, "Mistakes are the portals of discovery." Similarly, SLAC takes the opportunity to learn from unfortunate incidents so we can prevent them in the future. We call this the 'lessons learned process.' This article explores the lessons to be learned from a recent accident at SLAC.

In January, an employee fell from a ladder and sustained a head injury. Fortunately, the employee has since returned to the workplace. On the day the accident occurred, SLAC began an investigation with the goal of better protecting employee safety. More severe accidents are investigated by the Department of Energy (DOE) and this accident met the DOE's criteria for additional review. DOE began their investigation a few days later.

Unfortunately, similar issues continue to be observed. During a recent DOE walk-through, ladder use and fall

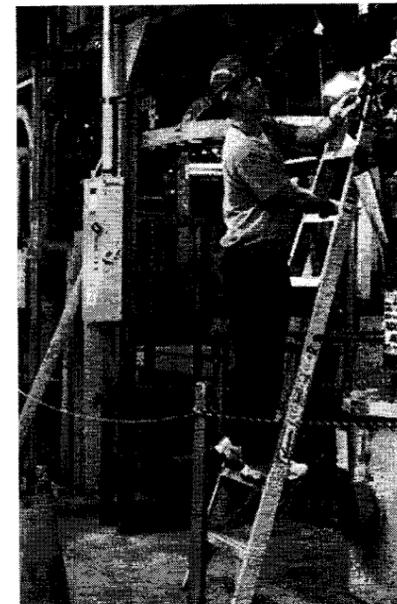


Photo by James Dayton

Aaron Gooch (ESH) demonstrates the proper use of a ladder

protection issues were brought to our attention. We quickly resolved the issues. As a result of the accident and of these incidents, SLAC and

(See SAFETY, page 2)

## Filling Out the Ranks

By Vickee Flynn

On the Channel 7 (ABC) news several weeks ago, there was a story about two couples who have a very special bond. One couple was called up to service in their respective reserve military units, and the other couple stepped in to take care of their infant son as well as their home. Turns out this story has a strong connection to SLAC.

Jimmy Dayton (OHP) met James Tyler (with Security at the time) about five years ago when Al Manual (SEM) introduced them to each other. Manual thought it was interesting that both of them worked at SLAC and both had purchased homes in Los Baños—as it turns out, around the corner from each other.

Tyler left SLAC in 1998 to take another job. He and his partner, Gaslyn Sweeney, continued their friendship with James and Elise Dayton. In 1999, the Daytons were in a five-car automobile accident in which both were injured. This, coupled with several deaths in the family, led to them having to sell their Los Baños home. Tyler and Sweeney invited them to live with them, and they moved into Tyler's home over a year ago.

Tyler and Sweeney are both in the Reserves, and they both spent time in the regular army where they had met. The couple has a son, Keeshawn, who was born August 28, 2002. Little did they know that their world was about to turn upside down.

Sergeant Tyler had been called up for service and was preparing to leave for active duty when Staff Sergeant Sweeney was herself told to report in four days. She was sent to Fort Leonard, Missouri, when her son was six months old. Tyler reported shortly after to Camp Parks in Dublin, CA.

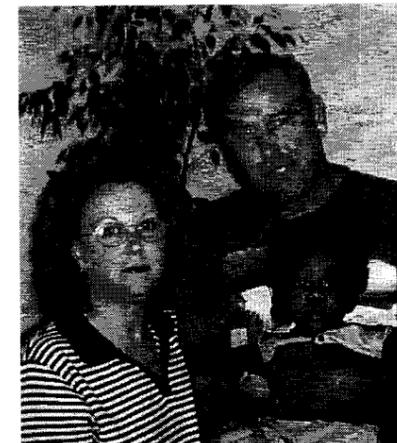


Photo by James Dayton

Elise and James Dayton (OHP) with Keeshawn Tyler, now 7 months old

They had thought at the time that Sweeney would be stationed closer to home, but it didn't turn out that way.

Sweeney's unit is filling in for those who were shipped overseas. Her tour of duty is for about a year. Her civilian job is at the Veteran's Hospital in San Jose, processing patients in the clinic. "I hope to get home for Memorial Day weekend," said Sweeney. Tyler is training soldiers in the 91st Division at Camp Parks.

(See RANKS, page 2)

## Safety

(continued from page 1)

DOE should and will look harder to ensure that the workplace is safe. It is the welfare of staff and users that motivates these activities.

We have all used ladders—but don't let this familiarity breed complacency. The American Academy of Orthopedic Surgeons recently published statistics that illustrate the dangers of ladder accidents. In the U.S., more than 500,000 people a year are treated for ladder-related injuries, and that number does not include people who suffered injuries but did not go to a medical care provider for treatment. About 300 people in the U.S. die from ladder related injuries annually.

### Safety Enhancements

The SLAC and DOE investigations recommended the following enhancements to SLAC safety systems.

First, to encourage improved safety accountability, safety must be included when preparing goals for SLAC at all levels, from divisions to employees. Moreover, SLAC staff must be held accountable to these goals within the performance evaluation process. In that way, all SLAC goals are identified,

responsibility for implementation is assigned and compliance is verified.

Second, when approaching work, all employees and supervisors should go through the process of scoping the work, identifying the hazards associated with that work as well as the cause of the hazards, identifying the controls associated with each hazard and then performing the work using appropriate controls. Then, while performing the work, think about what you are doing, not what you are going to do.

Third, employees and supervisors of employees who use ladders should remind themselves of proper ladder use by reading ES&H Manual chapter 15, 'Ladders, Scaffolds, and Work Platforms' and by taking the ES&H training course 'Stairway and Ladder Safety'. The ES&H Manual chapter and the course will remind you of your responsibilities when using a ladder and will refresh your understanding of ladder safety information.

World-class institutions are composed of world-class employees. Protect our most valuable resource—you and your fellow employees.

For more information on Environmental, Health and Safety at SLAC, see: <http://www.slac.stanford.edu/esh> ●

## Ranks

(continued from page 1)

An ironic twist in this story is that both Sweeney and Tyler had both gotten out of active military duty just prior to the Persian Gulf war. Now, over 10 years later, they were both called to active duty. Neither expects to go overseas, but their commitment is for at least a year of active duty.

### A Difficult Dilemma

Sweeney and Tyler were faced with a dilemma—where would Keeshawn stay while they were on active duty? Grandparents were back East, and they wanted him close by so that at least Tyler could visit him when he got leave. The Daytons immediately volunteered to watch over Keeshawn. "They are our angels," said Tyler.



James Tyler and Gaslyn Sweeney with their son, Keeshawn. This photo was taken three days before Sweeney shipped out to Missouri.

Photo courtesy of the Daytons

Jimmy Dayton is the surrogate grandfather. "Our children are raised and gone," said Dayton. "It is a unique situation and we are glad we are able to help." Dayton served in the National Guard for 21-1/2 years. His wife, Elise, is taking care of Keeshawn serving as both nanny and surrogate grandmother. "It is sad that Mama isn't here to see Keeshawn's 'firsts'," she said.

Tyler is able to get home, sometimes several times a week if he is lucky. There are so many soldiers called up to both camps that the overflow of reservists stay off-base in hotels while on duty since the base housing is full.

### Others Were Called Up

There are two other reservists from SLAC who have been called up to active duty: James Knopf and John Szelog, both in Tech Division's ESD Department.

Stanford issued a special policy on Military Service Leave in light of the uncertain situation in the Middle East.

A regular employee who is a member of the reserve military service, and has completed 12 months of continuous employment, and is called for active duty for an extended period to commence on or after February 10, 2003, will receive leave for

the period of active duty, up to 90 days. Stanford will supplement the employee's military pay for the scheduled working days of the absence. This leave is reviewable after the 90-day period. The policy will be re-evaluated during August 2003.

For complete policy details, contact Claudia Ransom in HR (Ext. 2366 or [claudia@slac.stanford.edu](mailto:claudia@slac.stanford.edu)). ●

## SPPS

(continued from page 1)

undergo changes in their atomic arrangements following an impulse from an ultrafast optical laser. These studies will provide the opportunity to gain direct insights into important processes such as structural changes during actual chemical reactions.

### LCLS Tie-In

The SPPS will also play a role in the accelerator and x-ray optics R&D for the future Linac Coherent Light

Source (LCLS) x-ray free electron laser project. For example, researchers will be able to develop and refine the diagnostic tools associated with the production and use of ultra-short electron and x-ray pulses. The researchers will gain valuable experience and expertise that will be needed for the successful early operation of the LCLS when it comes on-line, which is expected to be in 2008.

The Sector 10 chicane was installed last summer in the linac, and should be commissioned this winter. The

first SPPS experimental run is scheduled for Spring 2003. SSRL is coordinating and managing SPPS as a consortium involving laboratory and university participants. Foreign partners, especially Sweden's Uppsala University and Germany's DESY, are also making significant contributions.

For more information on SPPS, contact: Jerry Hastings (SSRL), Ext. 3107, [jbh@slac.stanford.edu](mailto:jbh@slac.stanford.edu)

For more information on SLAC's Accelerator Department, see: <http://www.slac.stanford.edu/grp/ad/>

## SC2003 Education Program to be Held November 15-18 in Phoenix

By Cathie Dager

Undergraduate faculty and K-12 teachers interested in learning about computational science and how to integrate it into the classroom are invited to participate in the SC2003 Education Program, which is to be held from November 15-18 in Phoenix.

The training program, held in conjunction with SC2003, the annual conference on high performance computing, offers programs for teachers and higher education faculty to meet with scientists and engineers and to explore the application of advanced computing technologies in classroom activities.

Applications are available at: [http://www.sc-conference.org/sc2003/education/edu\\_appinst.html](http://www.sc-conference.org/sc2003/education/edu_appinst.html). The deadline is May 26.

Support for travel and housing expenses will be provided to accepted Education Program applicants, pending funding.

With the support of SC2003, teams of undergraduate faculty and K-12

teachers from around the country will work on the integration of modeling and visualization tools into their classroom activities. Computational scientists will work with these teams to help them identify appropriate tools to apply to their curriculum.

The educators will adapt existing modules, as well as develop new curriculum modules for their classroom activities, and publish their results and experiences on the Web for use by other educators. The educators will participate in a year-long program of workshops, mentoring and support to assist them as they apply these new techniques in their classes.

Both computer novices and experienced users will find topics to suit them at the conference. Workshops will vary from teaching popular software such as Stella, Excel, and Mathematica, to computational science tools for specific applications.

### Focus on Undergraduate Educators

The organizers of this year's educational sessions have a particular focus on undergraduate

educators. They are seeking teams of two to six members consisting of either undergraduate faculty or a combination of faculty and middle and high school teachers.

Each year, thousands of scientific computing researchers meet at SC to discuss and share their latest work. And, each year, hundreds of undergraduate and middle and high school educators participate in the conference through the Education Program, and by attending the exhibits, plenary sessions, and special programs offered to all conference attendees.

The Education Program encourages the participation of underrepresented faculty and teachers, including faculty from two- and four-year colleges, primarily undergraduate institutions, and minority-serving institutions.

Computational scientists, educators, and technologists will work with these teams to aid them in identifying appropriate tools to apply to their curriculum to support collaborative learning opportunities for their students.

### About SC2003

SC2003 is the leading high performance computing and networking conference and is sponsored by the Association for Computing Machinery and the IEEE Computer Society. The SC2003 Education Program is sponsored by these, by the National Science Foundation, and by many universities and research laboratories.

The Education Program runs from Nov. 15 through Nov. 18, although participants are encouraged to stay for the remainder of the week to participate in the full range of conference offerings.

Other activities at the conference will include a first-class technical program, student volunteer opportunities, and 'Student Days,' aimed at providing undergraduate and graduate students with information about careers in education, research, and industry.

For more information and a printable brochure, see: [http://www.sc-conference.org/sc2003/edu\\_general.html](http://www.sc-conference.org/sc2003/edu_general.html) ●

## SLAC Scores at Community Day: Crowd Wowed by Demonstrations

By Emily Ball

SLAC made its presence known on April 6 as Stanford University celebrated its second annual Community Day. Attracting children and their parents in droves, SLAC staff put an exciting spin on physics.

Michael "MO" Olson (EFD) presented dramatic demonstrations, and Community Day attendees learned about numerous physics principles through striking, theatrical presentations. The Bed of Nails in particular attracted quite a crowd.

"All up and down campus you could hear people talking about it," said Barbara Hoddy (PAO), who worked in SLAC's Community Day tent. "Everyone wanted to see someone getting smashed between a concrete block and a bed of nails with a sledgehammer!"

Keith Jobe (NLCTA) satisfied many a sweet tooth by making ice cream with a special ingredient: liquid nitrogen. Large groups of children and parents gathered around to watch mist pour over the demonstration table, amazed to see Jobe turn a liquid sludge-like mix into edible frozen yogurt.

In addition to Olson and Jobe's crowd-pleasing antics, SLAC's success was due to the many staff members who supported the event. Posters of our scientific projects helped provide visuals while Eduardo do Couto e Silva (EK), Norman Graf (SLD), Tom Himel (NLC), Michael Peskin (TP), Pablo Saz Parkinson (EK) and Derek Tournear (EK) explained the nature of our research to many interested visitors.

We appreciate the effort of those who ably provided advance preparations and behind the scenes support: Terry Anderson (TIS), Elliott Bloom (EK), Greg Bologoff (BSD), Neil Calder



Photo by Nina Adelman Stolar

*In the 'Bed of Nails' demonstration, Michael "MO" Olson smashes a concrete block with a sledgehammer, while a volunteer is sandwiched between two pieces of wood embedded with hundreds of nails. Because the force of the sledgehammer is distributed throughout the bed of nails, the volunteer remains unhurt, even though the concrete block above him is smashed to bits.*

(COM), Al Gaxiola (PAO), Eric Hassy (PAO), Mark Long (PAO), Herb McIntye (PAO), Rod Reape (PAO), Diana Rogers (DO), Nina Stolar (PAO) and John Weisend (EFD).

Anyone interested in volunteering or providing demonstration suggestions for community events can call the Public Affairs Office (Ext. 2204 or PAO@SLAC.Stanford.edu). "The greater the presence we have in important events like these," said Nina Stolar, Public Affairs manager, "the more we grow the awareness of—and appreciation for—the work we do here at SLAC." ●

## Buying Season Opens at Library

By Lesley Wolf

What do people want? What do they really, really want?

This is the first question posed to would-be reference librarians on their first day of library school. Posed in 100 different ways to 100 different library customers, this essential question represents the raison d'être of libraries and librarians everywhere.

So what the library staff here at SLAC still want to know, year after year, is WHAT DO YOU WANT on your library shelves?

It's buying season at the Library, and that means more new books. Every month the Library typically acquires and displays more than 150 titles.

### Who decides which titles to buy?

The Library's book buyers rely on the catalogs distributed by proven and highly regarded publishers such as Springer-Verlag, World Scientific, AIP and Elsevier.

Book reviews featured in journals such as *Nature*, *Science*, *Physics Today*, *American Scientist* and *New Scientist* also provide leads to the hot or not-so-hot picks in high energy physics.

We often compare title lists with sister laboratories such as DESY and CERN, looking for titles most desirable to the high energy physics and synchrotron radiation communities.

The best, most important source for book recommendations are the field experts themselves — SLAC employees and users. So we here in the Library are once again, in this book buying time of year, repeating that eternal reference library mantra: What do you want, what do you really, really want?

### Give us a shout...er, whisper.

Let us know what book titles you would like to see on Library shelves. You can use our online order form (<http://www.slac.stanford.edu/library/slaonly/forms/purchase.html>), or stop by the Library where you can pick up a 'Book Shopping List' on which to jot down work-related titles you see on your evening or weekend trips to the bookstore.

You may also contact us with your book suggestions (Ext. 2411 or [librcirc@slac.stanford.edu](mailto:librcirc@slac.stanford.edu)). ●

## EB Welding Machine Helps MFD Build Complex Assemblies

By Kelley Ramsey

The Mechanical Fabrication Department (MFD) has an advanced manufacturing resource housed in a class-1000 clean room in Building 31. Few facilities in the world have this unique tool.

The Electron Beam (EB) welding machine was custom built by Sciaky, Inc. to SLAC specifications for PEP-II construction. It is one of the largest of its kind in the world.

What makes it special is the low contamination vacuum pumping system with a very large capacity vacuum work chamber. Particulate and hydrocarbon contamination, which are destructive to vacuum systems, are minimized in this machine by using cryogenic pumps (as opposed to diffusion pumps that emit hydrocarbons), special vacuum clean lubricants and stainless steel construction.

The machine has five axes of motion and a computer controlled articulated head with 30 kW of welding power. It can be line-of-sight focused on large parts up to 22 feet long, 23 inches wide and 15 inches tall.

EB welding uses an electron beam to fuse two pieces of metal together without a filler material. The high power and the narrow beam allows the welding of thick and difficult materials with minimal heat-related deformities. The EB welder can penetrate into two inches of copper, four inches of steel and six inches of aluminum.

Copper is one of the more difficult materials to weld since it can absorb a lot of energy. MFD is a world leader in welding oxygen-free copper. EB welding was the only way to join large, long copper chambers and keep the copper's structural integrity.

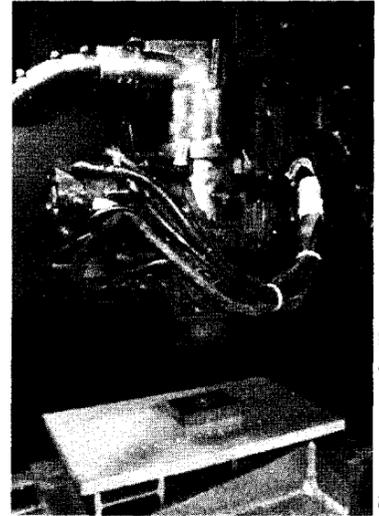


Photo courtesy of MFD

*The Electron Beam (EB) Welding machine was custom built by Sciaky, Inc. to SLAC specifications for PEP II construction. It is one of the largest of its kind in the world.*

Manual welding processes such as GTA-Gas Tungsten Arc, MIG-Metallic Inert Gas, torch welding and stick welding could not achieve the level of control that is needed for the complex assemblies required by SLAC.

EB welding minimizes the turbulent mixing of metals during the welding process. The rapid liquefaction and solidification of the metals to be joined reduces the heat-affected zone and helps keep the structural integrity of the part. This process is performed in a  $10^{-4}$  torr vacuum with welding parameters developed especially to meet our technical needs.

For more information on the Mechanical Fabrication Department, see: <http://www.slac.stanford.edu/grp/mfd/> ●

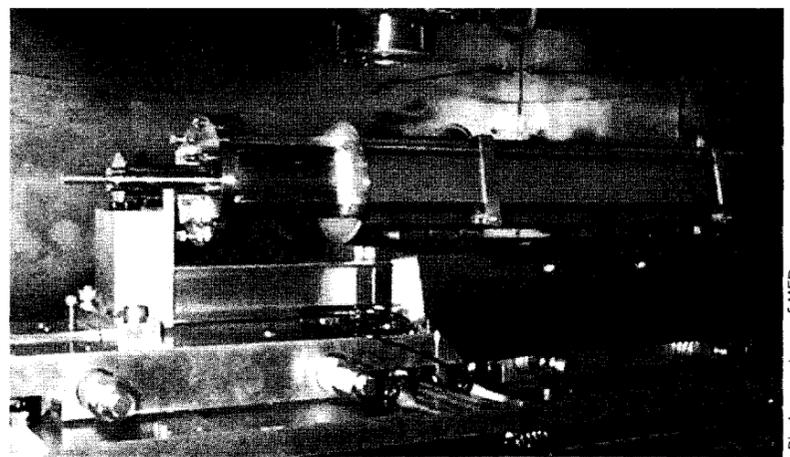


Photo courtesy of MFD

*Example of an EB welded assembly*

## Reminder: Quarterly Dosimeter Exchange Underway

The SLAC Dosimetry office would like to remind all RWT workers who are wearing the quarterly dosimeter to exchange and return their old dosimeters by the 15th of the month following the wear period.

New RWT badges for the second quarter have been issued, and all quarterly dosimeters for the first quarter (January to March) should be returned either to the Point of

Contact or directly to the following address: Operational Health Physics, Dosimeter Return, MS 84.

To help increase the dosimeter return rate, courtesy reminder banners will be posted at the Main Gate and at the Alpine Gate for seven days during the second week of each calendar quarter.

Contact: Henry Tran, Ext. 3793, [hhtran@slac.stanford.edu](mailto:hhtran@slac.stanford.edu)

## Web Server Upgrade and Fixing Broken Links

By Ruth McDunn

For the past few months, work has been underway to upgrade our old Windows web servers to new hardware and software. As with our workstations, it is necessary to move our servers off the Windows NT operating system as it will no longer be supported by Microsoft. It is essential that the web servers be properly maintained and frequently updated, in order to reduce the chance of being hacked.

There are two parts to the upgrade process. The first step is to move all web materials that need restricted access to all SLAC Windows account holders, or a subset, to our intranet server at <https://www-internal.slac.stanford.edu>.

This has, unfortunately, caused a large number of broken links throughout the SLAC web and probably broken bookmarks as well. We are diligently trying to find and fix broken links. You can help us by reporting these on the form at: <https://www-internal.slac.stanford.edu/serverupgrade/brokenlink.html>.

We are also in the process of adding search capability to this server so it will be easier to find information stored on the server.

The second step is the physical move of all the files that make up the webs on the server. We make an initial copy of all the files on a web server to the new hardware and software at a temporary address, and set up all the authoring permissions and database connections. Web authors are asked to confirm that everything is working correctly on the new hardware.

Then, at an agreed upon time, the web server is disabled, a final copy of files made, permissions and function spot-checked, and the new server is set up at the permanent address. For the servers processed so far, the down time has been two hours or less.

We have only two remaining servers to upgrade: [www-group.slac.stanford.edu](http://www-group.slac.stanford.edu) and [www-project.slac.stanford.edu](http://www-project.slac.stanford.edu). Authors have been or will be contacted regarding their role in the upgrade process.

For more information on this process, see: <https://www-internal.slac.stanford.edu/serverupgrade/>

## Communications Group Welcomes New Staff Members

By Nina Adelman Stolar

Two new staff members in the Communications Group are ready to provide services to the public and the laboratory community.

Emily Ball, Community Relations Coordinator, started in January and is responsible for community relations, including public outreach and the tour program.

Barbara Hoddy joined us in March as the Public Affairs Administrator. Hoddy's responsibilities include multimedia service requests and public inquiries, maintaining the Seminars database and reservations for the Auditorium Conference Facility and the Orange Rooms.

### About Emily Ball

Ball most recently hails from Red Hat (yes, the Linux folks) in Raleigh, North Carolina where she spent four years working as marketing manager for education programs.

Ball managed the speakers bureau and user group program. As manager of global learning services she spearheaded their federal marketing campaign, working with many sectors of government. In education marketing, she established the first educational Linux pilot program in the country. Ball earned her Bachelors degree in English with a focus in American Literature at UCLA.



New members of the PAO team: Emily Ball (left) and Barbara Hoddy

### About Barbara Hoddy

Hoddy spent last summer on the editorial staff for SLAC's 40th Anniversary Photo History book. Her recent work experience includes graduate admissions at San Jose State and processing archival and pictorial collections at UC Berkeley's Bancroft Library. With all this history behind her, Hoddy is now learning what it takes to provide services to the public and academic community for the laboratory.

Hoddy was Archives Assistant at Foothill/DeAnza Community College District and spent some time at the Registrar's Office at the University of San Francisco and as Library Assistant at their Gleeson Library. She earned her Bachelors degree from Arizona State University.

Please stop by and welcome them next time you're in the Central Lab (Bldg. 40). The Public Affairs Office is in Room R132 (Ext. 2204 or e-mail [pao@slac.stanford.edu](mailto:pao@slac.stanford.edu)).

## MILESTONES

### Awards

Teams headed by Farvid, Ali (MFD) and Pilastró, Yolanda (WM), EPA Region 9 Awards, DOE and SLAC 'Champions of Green Government', announced on 4/2

### Retirees

Johnson, Lester (ESD), 3/31  
Menegat, Al, (KLY) 4/18  
Nelson, Ruth (HR), 4/4  
Putallaz, Gerard (REG), 4/30

### Service Awards

#### 5 Year

Wai, Lawrence (EK), 4/1  
Wong, Lily (AAO), 4/6

#### 10 Year

Munro, Morrison (NLC), 4/19  
Counts, Jeraline (PUR), 4/20

#### 15 Years

Smith, Howard (ACC), 4/7  
Wilson, Cordell (ESD), 4/12  
Baker, Alonzo (ACC), 4/25  
Kase, Kenneth (DO), 4/27

#### 20 Year

Gioumousis, Andrew (ESD), 4/1  
Craft, James, (ESD) 4/25

#### 25 Year

Anderson, Ronald (SEM), 4/3  
Barrett, Ron (SCS), 4/15

#### 30 Years

Rochester, Leon (EA), 4/12

#### 35 Years

Porter, Thomas (ESD), 4/29

### Deaths

Lee, Ned, retired from SLAC in 1975, on March 31, 2003

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/>

## Upcoming Events

### Mon. April 21, 4:15 p.m.

SLAC, Panofsky Auditorium,  
(Refreshments-3:45)

SLAC DEPARTMENTAL  
COLLOQUIUM

Robert J. Goldston, PPPL

"Scientific Progress in Magnetic  
Fusion, ITER and the Fusion  
Development Path"

### Tues. April 22, 4:00 p.m.

SLAC, Green Room  
SLAC PHYSICS MEETING  
Lab Community, SLAC and more  
Scientific Discussion Hour

### Sat. April 26, 8:00 a.m.

SLAC, Panofsky Auditorium  
(Registration Required)  
IEEE \*SPECIAL\* EVENT  
"Future Directions in Broadband  
Communications"  
([http://www.mtt-scw.org/short\\_c.html](http://www.mtt-scw.org/short_c.html))

### Tues. April 29, 8:00 a.m.-3:00 p.m.

SLAC, Panofsky Aud Lobby  
SLAC/STANFORD BLOOD DRIVE  
Linda Ahlf, SLAC  
Call x2354 for BLOOD DRIVE  
appointment—drop-ins welcome!  
(<http://www-group.slac.stanford.edu/hr/d/Blooddrive.html>)

### Tues. April 29, 4:00 p.m.

SLAC, Green Room  
SLAC PHYSICS MEETING  
Lab Community, SLAC and more  
Scientific Discussion Hour

### Mon. May 5, 4:15 p.m.

SLAC, Panofsky Auditorium,  
(Refreshments-3:45)  
SLAC DEPARTMENTAL  
COLLOQUIUM  
David Goldhaber-Gordon, Stanford U  
"A Survey of Kondo Effect in  
Mesoscopic Systems"

### Thur. May 8, 9:00 a.m.

SLAC, Redwood Room, May 8-10  
SLAC PHYSICS MEETING  
David Hitlin, Cal Tech  
Workshop on the Discovery  
Potential of an Asymmetric B  
Factory at 10 Luminosity ([http://www.slac.stanford.edu/BFROOT/www/Organization/1036\\_Study\\_Group/0303Workshop/](http://www.slac.stanford.edu/BFROOT/www/Organization/1036_Study_Group/0303Workshop/))

Please send additions to:  
[seminars@slac.stanford.edu](mailto:seminars@slac.stanford.edu)

For complete event listings, see:  
<http://www.slac.stanford.edu/grp/pao/seminar.html>

## The Interaction Point

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