INTERACTION POINT

August 15, 2003

Lessons Learned: NLCTA Modulator Fire

By Robert Reek

On July 9, a small fire occurred just after midnight in the PFN cabinet of NLCTA Modulator 1. This fire highlighted both the effectiveness of our emergency response systems and the ongoing need to analyze and respond to events such as this.

Photo by Keith Jobe

The inside of the PFN cabinet of NLCTA Modulator 1, where the fire took place. The coils are what remain of the high voltage capacitors.

Even a small fire can be destructive. In this case, the fire destroyed the cabinet and its contents, melting nearby water-cooling hoses. Water from the hoses then entered and overfilled the insulating oil tank which, in turn, caused the release of about 100 gallons of oil into the building.

Quick, safe response by the Palo Alto Fire Department (PAFD) and SLAC personnel allowed the fire to be extinguished and the spill to be contained within the building. Hence, there were no injuries or environmental releases.

The staff that responded were very effective in making correct and timely decisions to keep this emergency from being worse than it could have been, and the fire was quickly contained. However, the modulator will be unavailable for at least several weeks and possibly longer.

Analyzing the Incident

Two reviews of this incident were conducted and lessons learned were identified. These lessons include exploring the usefulness of enhancing the fire suppression systems in this equipment and possibly streamlining, coordinating and enhancing SLAC emergency response plans.

DOE's Integrated Safety Management System (ISMS) 'circle of improvement' provides a road map for the SLAC response to any incident such as this. Using ISMS, we analyzed the hazards highlighted by this event, developed further controls and are in the process of implementing them. In the future, we will perform the work with these additional safety elements in place. Subsequent feedback on these fixes will ensure that this improvement process is continuous.

Events like this teach all SLACers to "think fire safety and be safe."

SLAC Makes the World's Shortest Bunches

By Heather Rock Woods

Using all two miles of the linear accelerator (linac), as well as loops and bends in the beam, and a usually troublesome effect called a wakefield, SLAC has made the world's shortest bunches of electrons: 12 microns (millionths of a meter) long and 80 femtoseconds (one quadrillionth of a second) fast.

During its first run in May, the Sub-Picosecond Pulse Source (SPPS) made high current, ultra short bunches of electrons and turned them into very bright, ultra short pulses of x-ray light. These first x-rays made by a linear accelerator are 1,000 times shorter than those made by storage rings like SPEAR, enabling direct observations of atomic motion in matter that have never been seen before.

Physicists have always packed billions of electrons into bunches in order to acquire enough meaningful data. Now, manipulating the shape and size of the bunches has become like a science in itself.

SPPS relies on several tricks to compress the bunches, which contain 21 billion electrons, in order to reach a peak current of 30 kiloAmperes. That's about 1,000 times greater than the current found in a household fuse. "The big increase in energy from the beginning to the end of the SLAC linac allows us to do the gymnastics of rotating and compressing the bunches to reach such small final dimensions," said

(See BUNCHES, page 2)

DOE Gives SLAC "Outstanding" Rating for ES&H Performance

By Mike Grissom

Each year, the DOE assesses SLAC's ability to meet established Environmental Safety and Health (ES&H) standards. Based on both performance and process measures, SLAC received a rating of Outstanding from DOE for fiscal year (FY) 2002. Everyone at the Lab should be proud of his or her contributions toward achieving this rating.

Outstanding is the highest rating possible, and could not have happened without both the hard work of many individuals across the Lab and the results of improvements through SLAC's Integrated Safety Management System (ISMS). This assessment of SLAC's ES&H performance illustrates for DOE and Congress how well we accomplish high energy physics and synchrotron radiation research, and it will ultimately have an influence on future funding.

Measuring Performance

The Lab's ES&H performance is based on two types of measures: outcome performance and process performance.

Outcome performance measures, also called 'lagging indicators', are events that have already occurred, such as the number of Lost Work Days/Total Reportable Cases measured for Accidents and Illnesses. SLAC's lagging indicators are based on both ES&H Division activities and activities from work processes in other Divisions throughout the site.

Outcome measures for FY02 can be viewed at: http://www.slac.stanford.edu/esh/isms/perfmeas/outpm02.pdf

Process performance measures, called 'leading indicators', reflect processes designed 'up front' to improve the Lab's ES&H performance and promote accident/incident prevention, such as the completion of ISMS quarterly reviews, the development of a Behavior-Based Safety Program, or

(See DOE RATING, page 2)

Busy Schedule for QuarkNet 2003 Workshop

By Tom Glanzman and Molly Uhl

Earlier this summer, 18 high school and junior high school teachers became students once again in order to learn about particle physics. The QuarkNet workshop took place at SLAC and Stanford from June 19 to July 3, hosting teachers mostly from the Bay Area, but also from as far away as Washington State.

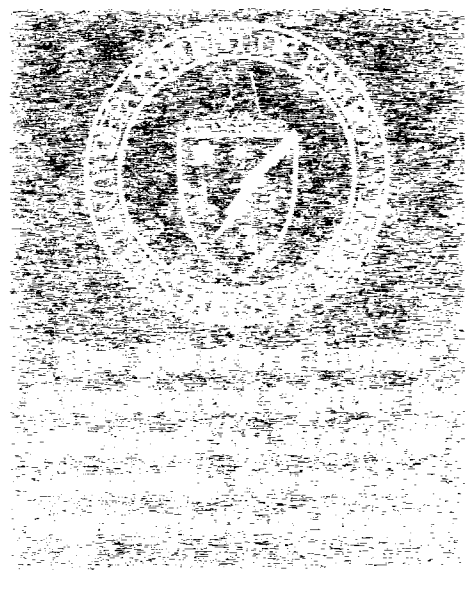
Four high school physics and chemistry teachers (Gene Csider, Ken Newberry, Earl Roske and Molly Uhl) had spent the summer last year at SLAC assisting in various laboratory groups. These four lead teachers, along with SLAC physicists, planned and implemented the 11-day workshop held this summer. SLAC personnel involved in QuarkNet include Helen Quinn (THP), Pat Burchat (BABAR), Tom Glanzman (EC), Harvey Lynch (BABAR), Abi Soffer (BABAR), and Willy Langeveld (SCS).

Similar programs have taken place at physics research centers across the country over the past five years, in an effort to expose teachers and students to cutting edge research and to establish connections between educators and research scientists. The QuarkNet program is based out of Fermilab (http://quarknet.fnal.gov/), and funded by the National Science Foundation and the DOE.

Photo by Diana Rogers

QuarkNet participants. Standing: Ken Newberry (Foothill HS, Pleasanton), Douglas Spalding (Royal Sunset HS, Hayward), Peter Herreshoff (Gunn HS, Palo Alto), Keith Geller (Palo Alto HS, Palo Alto), James Marshall (A. Castillero MS, San Jose), Helen Quinn (TH), Julie Hubbard (Liberty HS, Brentwood), Dylan Rich (Palo Alto Prep School, Palo Alto), David Lau (Mission San Jose HS, Fremont), Tom Woosnam (Crystal Springs, Hillsborough), Earl Roske (Leland HS, San Jose), I-Heng (Monta Vista HS, Cupertino), Travis Hambleton (Monta Vista HS, Cupertino), Lisa Breton (California HS, San Ramon), Lynda Nicholson (Charter School of Morgan Hill), John Currie (Mt. Tahoma HS, Tacoma, WA), Rafale Navarro (Morse HS, San Diego), Harvey Lynch (BABAR), Willy Langeveld (SCS), Thomas Glanzman (EC), Molly Uhl (Notre Dame HS, San Jose). Seated: Abi Soffer (BABAR), Brian Martin (Thurgood Marshall Academic HS, San Francisco), Dave Trapp (Sequim HS, Sequim, WA), Gene Csider (San Ramon Valley HS, Danville), Jennifer Docktor (SULI student), Manuel Reyes (SULI student)

(See QUARKNET, page 3)

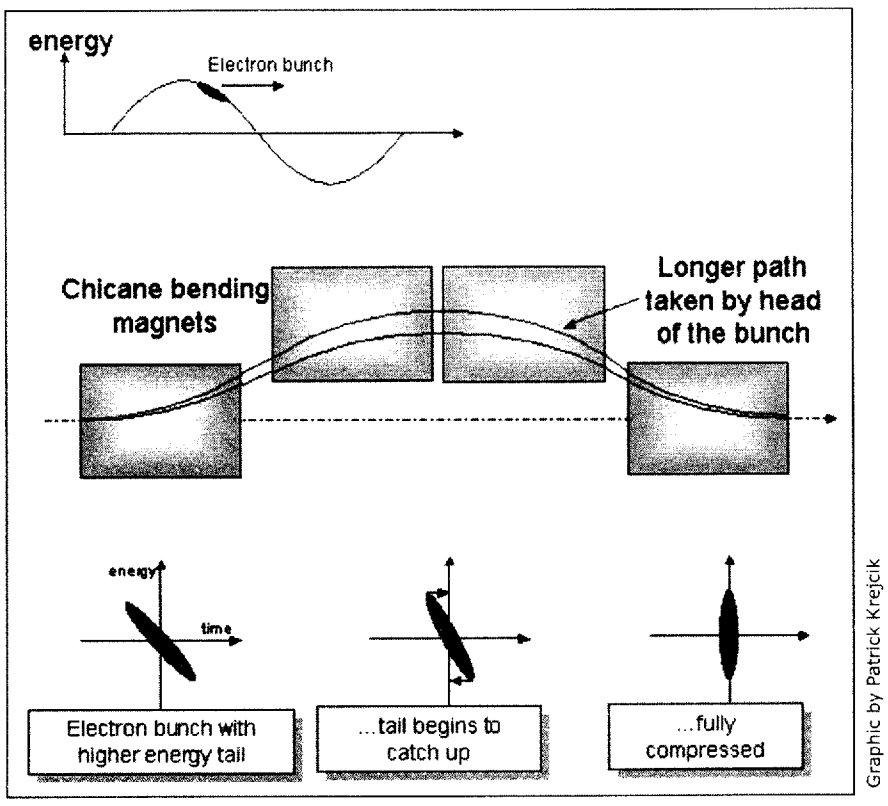


Bunches

(continued from page 1)

SPPS accelerator physicist Patrick Krejcik (AD).

The gymnastics occur in three stages, starting as the bunches leave the damping rings near the beginning of the linac. There, a bunch travels around the curve of the ring-to-linac (RTL) beamline and gets compressed from 6 mm down to 1.2 mm.



Graphic by Patrick Krejcik

To compress electron bunches, SPPS accelerates them below the crest of RF energy waves (shown top). That way, one end of the bunch has more energy than the other. When the bunch goes through the chicane in Sector 10, the lower-energy head of the bunch takes the longer path (shown middle) and the tail catches up (shown bottom), effectively rotating the bunch to be shorter.

Electron bunches are usually accelerated through the linac on top of radio frequency (RF) waves, similar to a surfboard riding the crest of an ocean wave. Bunches can be adjusted to ride on the slope of the wave, where they receive less energy as the slope descends. In the RTL, the bunch looks like a surfer climbing a wave: the front of the bunch has more energy (i.e., is closer to the top) than the back. Going through the curved path of the bending magnets, the low-energy tail takes the shortest path and catches up to the head, making the bunch shorter.

The second step in bunch compression takes place at Sector 10, one third of the way down the linac, where the electrons have been accelerated to nine billion electron volts of energy. Here the bunches are tipped to ride slightly ahead of the wave crest, so the rear gets accelerated more than the front. Entering a chicane with four bends, the higher-energy tail is able to take the shortest path and catch up again, compressing the bunch to 50 microns. Paul Emma (ARDA) calculated that this was just the right place to bend the beam. Lynn Bentson (AD) oversaw installation of the chicane, and Cherrill Spencer (NLC) designed the bend magnets in a way that would not introduce any optical aberrations into the beam.

The final step in compressing the bunch is something that could only be done at SLAC, picking up energy along the remaining 1.3 miles of the linac and using an effect previously considered a nuisance. As the electron bunches travel at the speed of light, they generate an electric wake (similar to the wake a boat makes), called a wakefield. In free space, the wake would spread out perpendicular to the travel path of the electrons, but in the beam pipe, the wake made by the head of the bunch bounces off the pipe and interferes with the tail.

Thus the tail has less energy than the head when a bunch reaches the end of the linac. Fortuitously, the bunch can be routed through the Final Focus Test Beam (FFTB), where the beam line jogs right then left. This geometry forces the higher-energy front to take a longer path, and the rear catches up again. Here, the bunch has rotated upright again and is now 12 microns long. At this length, the bunch of 21 billion electrons whizzes by a fixed point in 80 femtoseconds. After the compression, the bunches are wiggled by an undulator magnet to generate the x-rays. Eric Bong (AD) installed the undulator, on loan from Argonne National Laboratory.

"We need a way to measure the bunch length, so part two of the project is inventing new technologies to measure on the sub-picosecond timescale," Krejcik said.

The group resuscitated a specialized accelerator cavity first used here in the 1960's that kicks the beam vertically (see TIP September 2000, "Rediscovering Deflecting Structures at SLAC") and inserted it into the beam line. When turned on by a klystron, this transverse deflecting cavity samples a bunch by sweeping it vertically across a screen where the vertical length gives a projection of bunch length when it is 50 microns. The SPPS collaboration is developing electro-optic sampling techniques, borrowed from the world of fast laser technology, to measure the bunches in the FFTB.

SPPS will operate over the next two fiscal years, taking data in anticipation of the Linac Coherent Light Source (LCLS) that will make even brighter x-rays. The ultra-short bunches will also be delivered to the E-164 experiment during its run in the next fiscal year.

DOE Rating

(continued from page 1)

the percent of Employee Training Assessments (ETAs) completed.

Process measures for FY02 can be viewed at: http://www.slac.stanford.edu/esh/isms/perfmeas/procpm02.pdf

Continuing the Trend

Recent DOE assessments of SLAC's ES&H performance are noteworthy:

FY1998: Outstanding
FY1999: Outstanding
FY2000: Outstanding
FY2001: Excellent
FY2002: Outstanding

The overall SLAC ES&H performance, taking into account the many kinds of work in process every day, is well recognized by DOE. SLAC ranks well compared to the other DOE laboratories.

How You Can Contribute

Each employee can influence the upcoming FY03 DOE assessment by contributing to the achievement of our performance measures. Future TIP articles will provide details about how individuals and managers can fully participate in the ISMS process. Details about SLAC's ISMS program, including the Safety Management System document, are available on the Web at: http://www.slac.stanford.edu/esh/isms/

Creating the Measures

Following the FY02 negotiation process, outcome performance measures were approved by SLAC and DOE's Stanford Site Office (DOE/SSO), with support from DOE's Oakland Service Center (DOE/OAK). The measures were developed by subject matter experts from DOE/SSO, DOE/OAK and SLAC. Guidance was provided to the experts by the Performance Measures Core Team, comprised of DOE/SSO, DOE/OAK and SLAC members, and chaired by a DOE/SSO representative.

A summary table providing the results for each of the outcome performance measures in FY02 is shown in the ES&H Quarterly Report for the period July–September 2002 at: https://www-internal.slac.stanford.edu/esh/divreports/02q4report.pdf

Process performance measures were approved as described above. Although the Performance Measures Core Team provided guidance to the subject matter experts, the FY99 and FY00 measures were largely developed in response to the ISMS Phase I and Phase II final reports' concerns and opportunities for improvement.

The FY01 and FY02 measures were designed to assess the ongoing SLAC ISMS program by conducting quarterly reviews of projects and/or activities. Future process performance measures are expected to fulfill the goal of providing leading indicators with metrics to demonstrate the health of the SLAC-wide ISMS program.

A summary table providing the results for the process performance measures in FY02 is shown in the ES&H Quarterly Report for the period July–September 2002 at: https://www-internal.slac.stanford.edu/esh/divreports/02q4report.pdf

Staff Pitch in at Menlo Park Event

Photo by Nina Adelman Stolar

Volunteers Linda White (DO), Nicolle Rager (COM) and Jasmine Rogers (BSD)

By Linda DuShane White

Nine SLAC volunteers staffed a soda booth at the 17th annual Connoisseurs' Marketplace: A Premier Festival of Food, Art and Music on Saturday, July 19. It was sponsored by the Menlo Park Chamber of Commerce.

The difference in staff participation this year was an organized SLAC presence. "This was an opportunity for people from SLAC to wear SLAC t-shirts, present a SLAC banner and show that the Laboratory is supportive of the Menlo Park community," explained SLAC Community Relations Coordinator Emily Ball. Over and above her own 3-hour stint in the soda booth, Ball spent the day at the fair. She extends her thanks to the volunteers: Barbara Hoddy (COM), Michael Laznovsky (ESD), Barbara Mason (HR), Nicolle Rager (COM), Jasmine Rogers (PUR), Mika Stratton (EC), Nina Stolar (COM) and Linda White (DO).

A festive array of tents displayed a wide variety of high quality arts and crafts: jewelry, ceramics, paintings, photography, clothing, leather goods, lamps, stained glass and even waterfalls, as well as a wide selection of specialty foods. For the first time, thrill rides and games were added this year. The Kidzone included a 24-foot Climbing Wall, Bouncy the Clown creating animals out of balloons, face painting, a trackless train and much more. Music filled the air in the Gentry Magazine Chef's Pavilion, where top local chefs demonstrated how to cook their favorites.

Ball hopes that everyone will join the festivities at next year's Connoisseurs' Marketplace. Watch for an opportunity to participate, whether as a volunteer or a participant. As volunteer Hoddy said, "It's fun!" and Rogers concurred, adding, "It was fun to see all the families out together." And admission is free.

QuarkNet

(continued from page 1)

A Full Schedule

The visiting teachers started with a two-day crash course on the Standard Model on the Stanford campus, presented by Burchat. They also took tours of current particle physics and astrophysics experiments, including Gravity Probe B and the Cryogenic Dark Matter Search.

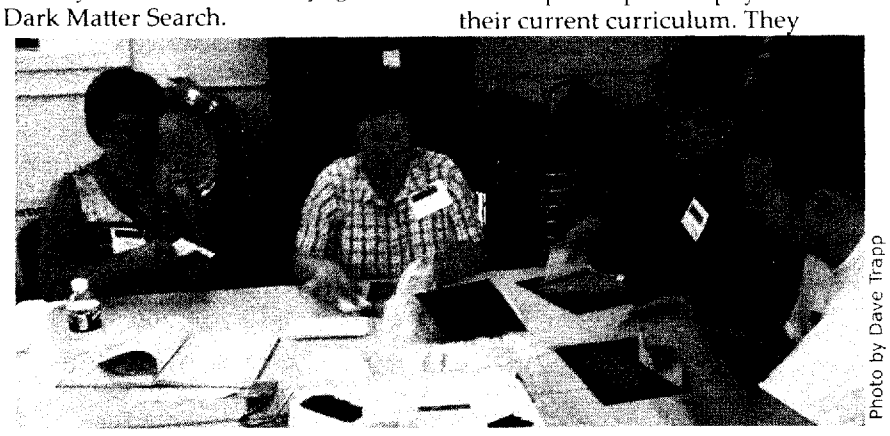


Photo by Dave Trapp

QuarkNet participants construct cosmic ray detectors for classroom use.

During the next two weeks, teachers were hosted by SLAC, where they heard talks about everything from the BABAR detector to neutrino oscillations. They were also given tours of many of the experimental facilities on site.

The teachers spent five afternoons getting their hands dirty–constructing cosmic ray detectors for classroom use. Here they learned the secrets of sanding and polishing scintillator plastic, checking and calibrating photomultiplier tube bases, constructing stands, and assembling and testing entire counters.

There is still a bit of ongoing work to tune these systems. In addition, SULI summer students Jennifer Dockter and Manuel Reyes are working on some Java software to control the equipment and provide histograms of the results. By early October we expect to have a set of working systems that SLAC can loan out to local schools for in-class demonstrations.

The ultimate goal of QuarkNet is for teachers to take back some of the content and methods of current physics research to the students they teach. The cosmic ray detectors are just one of the ways that these teachers will bring their experiences from this summer back to their students in the coming school year.

During the course of the workshop, teachers tried out various activities to incorporate particle physics into their current curriculum. They calculated the mass of the top quark based on data from Fermilab using conservation of momentum. They modeled the increasing distances between stars in an illustration of the expansion of the universe. They also discussed possible ways to expose their students not only to the subject of particle physics itself, but also to the realities of how science is done.

Ongoing Participation

QuarkNet did not end on July 3. Post-workshop meetings are scheduled for early October, and QuarkNet teachers will continue to meet, design new activities and share strategies for teaching science and incorporating particle physics. They will continue to receive help and resources from SLAC physicists through the contacts they made this summer.

For more information about the QuarkNet Workshop and the cosmic ray detectors, see: http://www.slac.stanford.edu/quarknet/Workshop2003

Training for the AIDS Honolulu Marathon

By Linda DuShane White

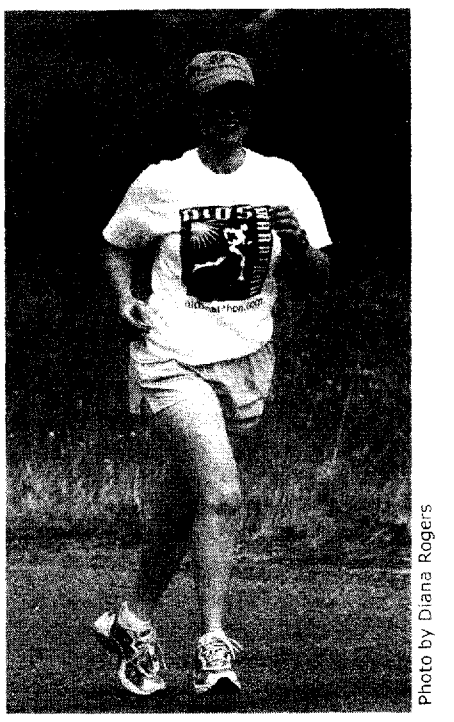


Photo by Diana Rogers

Lorin Sharp (BSD)

Lorin Sharp (BSD) knows people who have run marathons for many different causes, and she always thought she would like trying one. Then one day last spring, she saw a poster for the AIDS Honolulu Marathon (6 Months Training–You Can Do It) and felt it was perfect, offering excellent training and benefiting a cause she believed in.

This was not, however, a snap decision. "I did the reading, consulted with my husband and thought about the time commitment," said Sharp. "Everyone around you really has to be into it. My husband is a great supporter."

On December 14, Sharp will run in the Honolulu Marathon. She started her 6-month training and fundraising program at the beginning of June, training on her own for 60 miles a week and meeting with a group of runners on Sundays. There are several such groups in the Bay Area, and many more across the country.

The marathon will raise money and awareness for the San Francisco and National AIDS Foundations. Sharp is one of 75 people in her group, which is broken down into pace groups (smaller training and support groups) by ability and experience level. All ability levels are represented, from marathoners and full-time athletes to people who have never run a step in their lives.

Men and women from their teens to senior years, from all walks of life, form the groups. The majority of participants have never done anything like this before, yet ninety-eight percent of them will complete the 26.2 mile marathon.

The training program combines running and walking to increase endurance and strength with low risk of injury. "Every week we go another mile," said Sharp. "You are always succeeding, getting a sense of accomplishment. I feel good."

Sharp is still amazed at how well this huge challenge is working for her. Her pace group is now running 10.25 miles, where just a short time ago five miles seemed an impossible goal. They are training to run in the sun to prepare for warm Honolulu weather. And before the actual marathon, all participants will have run the full 26.2 mile distance.

All money raised is donated directly to the AIDS cause for research, vaccines, food, housing and medical services. Both financial contributions and volunteering are helpful. "Support of any kind is welcome," says Sharp. "We rely on volunteers to be sure we're on track and to give us water (water stations are every mile or so)." Volunteers are being sought in all parts of the Bay Area.

For more information see: http://www.aidsmarathon.com/participant.jsp?runner=SF-0203&year=2003

SPEAR2 Magnets Available to DOE Facilities

By Heather Rock Woods

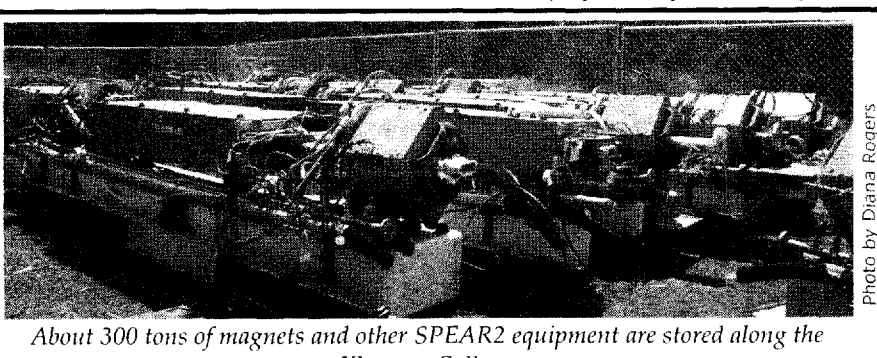


Photo by Diana Rogers

About 300 tons of magnets and other SPEAR2 equipment are stored along the Klystron Gallery.

Literally tons of magnets are free for the taking by groups at SLAC, Stanford and other DOE facilities.

The magnets ran SSRL's storage ring until it was dismantled in April to make way for SPEAR3, which will use more powerful magnets to create brighter x-rays with higher photon flux. About 300 tons of magnets, sitting on seven-ton concrete girders, were either rolled out of the SPEAR tunnel or lifted out by crane in the few places where the roof was removed.

SPEAR uses magnets to bend the path of electrons so they can travel in the circular beam line, and to bend or wiggle the beam at certain points to create the synchrotron x-rays used to investigate myriad materials. The original SPEAR2 equipment, which also includes vacuum chambers and ion pumps, is still in good working condition. The parts are currently stored along the Klystron Gallery.

"This is material that may be useful at other sites," said Roz Pennacchi (DO). SLAC hopes to find a project that can use the materials while they are in good condition, she said.

Currently in suspension storage, these items can't be recycled or reused outside of SLAC or other DOE facilities because they have been in a radiological area. "While a few items are radioactive, most are not and none are dangerous," said Jim Allan of Operational Health Physics (OHP).

In January 2000, DOE began a suspension on recycling metals from radiological areas (i.e., accelerator housings, radiation areas, high radiation areas, radioactive materials areas)–even if they are not radioactive. This suspension will last for at least another year until uniform release standards are approved.

OHP tests items for radioactivity before they are turned in to Salvage. Equipment exposed to beams where the energy is greater than 10 MeV (million electron volts) can potentially become radioactive, Allan explained. The measurable levels of radioactivity are very low and pose no danger. "The DOE threshold to determine if material is radioactive is 'anything detectable above background (radiation levels) with our most sensitive instrument,'" said Allan.

There are dozens of dipole bend magnets, quadrupole magnets and sextupole magnets, as well as beam scrapers and kicker modules. To see the full list of equipment, or visit the storage site, please contact Alan Conrad, Property Control (Ext. 2329, alanc@SLAC.Stanford.EDU).

The SLAC Art Committee is proud to present:

Masters of Matter

A new exhibition of photography by world-renowned photographer Peter Ginter

Opens August 19
Panofsky Auditorium Breezeway

Ginter has a unique style of photography, creating theatrical images by painting light and color over the surfaces of his subjects. Gray accelerators become red and green, detectors change color and glow like jewels. The exhibition is a selection from the images Ginter created during visits to DESY in 1997, CERN in 1998 and SLAC in 2002.

Don't miss this opportunity to see some of the most startling photos of particle physics ever created.

POLICIES AND PROCEDURES

SLAC Policy for Purchasing Office Supplies

Office supplies such as computer accessories and supplies, desk accessories and supplies, common office equipment and related supplies are examples of items covered by a site-wide contract between SLAC and Corporate Express (CE). The contract provides discounts off list prices which vary by product category. In order to fully utilize this benefit, it is SLAC policy that supplies, as listed in the CE catalog, will be purchased from CE using either the paper order form or the online "EWAY" system.

Please see your department administrator for either the paper form or to place an online order.

Purchase cards are not to be used to purchase office supplies from other vendors unless you receive prior approval. A request for advanced approval, with a justification to purchase elsewhere, should be submitted to Gail Gudahl (ext. 2616, gudahl@slac.stanford.edu) for review and approval.

Contact: Gail Gudahl, Ext. 2616, gudahl@slac.stanford.edu

Fiscal Year-End Procurement Dates

Please consider the following dates and dollar amounts if you are planning to submit a requisition that needs to be delivered and accepted before the end of FY03 (September 30, 2003).

Requisitions must be entered into PeopleSoft on or before these dates:

Friday, August 22
Requisitions for $101,000 and over

Friday, September 5
Requisitions for $25,000 - $100,000

Thursday, September 18
Requisitions for less than $25,000

Any purchase requisitions entered into PeopleSoft after these dates will be processed with a delivery date of October 1 or later.

Contact: Janet Adams, Purchasing Office, Ext. 8515, jadams@slac.stanford.edu

World's Particle Physics Laboratories Join To Create New Communications Resource

By Kathy Bellevin

Interactions.org, a new global Web-based resource, has been launched to provide the particle physics community with news, high quality imagery, video and other tools to support their communications needs.

The Web site (found at http://www.interactions.org) provides a newswire with all the latest developments in particle physics; links to current particle physics news from the world's press; high-resolution photos and graphics from the particle physics laboratories; links to education and outreach programs; information about science policy and funding; links to universities; a glossary and a conference calendar.

"Already we have hundreds of journalists, researchers and policy-makers using Interactions.org on a daily basis," said Judy Jackson, Director of Public Affairs for Fermilab. "This outstanding collection of materials represents the combined efforts of communications professionals from around the world. And this is only the beginning."

Interactions.org will help students, teachers, the media, the public and scientists in all fields better understand the nature and value of particle physics research as well as the current status of initiatives, people and facilities involved in particle physics and in other related fields.

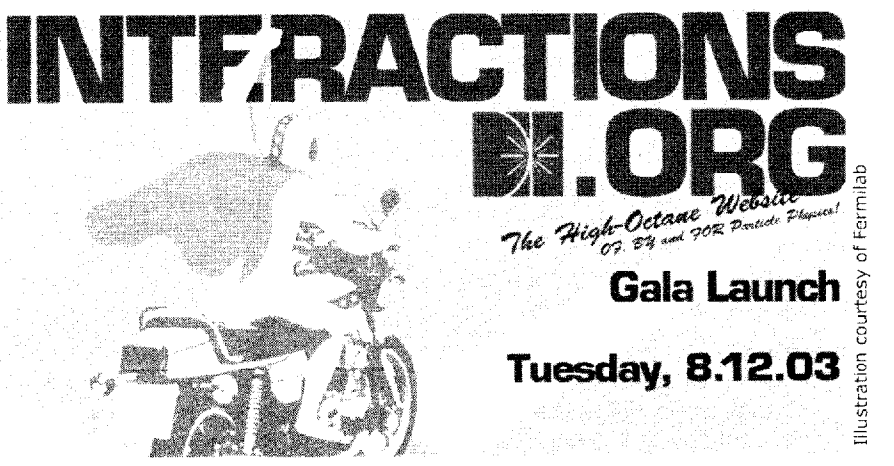


Illustration courtesy of Fermilab

Interactions.org was developed and is jointly maintained by the InterAction collaboration, whose members represent communications staff from all of the world's particle physics laboratories. The new site responds to the ever-growing demand to laboratories in Europe, North America and Asia for information and images. The most efficient action was to pool experience and resources to create a centralized repository.

"Global collaboration is the foundation of success in this era of particle physics research," said Neil Calder, SLAC Director of Communications. "Interactions.org will help facilitate that teamwork."

For more information, see: http://www.interactions.org

Upcoming Events

Fri., Aug. 15, 12:30 p.m.
SLAC, Green Room,
SLAC THEORY SEMINAR
Paul Hoyer, U of Helsinki
"Perturbative QCD in Hadron Physics"

Tues., Aug. 19, 2:30 p.m.
SLAC, Green Room
SLAC THEORY SEMINAR
Pervez Hoodbhoy, Quaid-e-Azam U
"QCD and the Proton's Spin"

Wed., Aug. 20, 4:15 p.m.
SLAC, Orange Room
(Refreshments 4:00)
SLAC ASTROPHYSICS SEMINAR
Derek Tournear, Stanford U
"Are Black Hole Candidates Black Holes?"

Fri. Aug. 22, 12:30 p.m.
SLAC, Green Room
SLAC THEORY SEMINAR
Yael Shadmi, Technion, Israel Institute of Technology
"Light GUT Triplets and Yukawa Splitting"

Aug. 25 - 29
Yerba Buena Arts Center, San Francisco
SLAC SYNCHROTRON RADIATION MEETING
H. Padmore, ALS/J. Stohr, SSRL
Synchrotron Radiation Instrumentation Conference
http://www.sri2003.lbl.gov/

Wed., Aug. 27, 1:30 p.m.
SLAC, Green Room
SLAC THEORY SEMINAR
Yitzhak Frishman, Weizmann Institute of Science
"Meson-Baryon Scattering in QCD_2 for any Coupling"

Sept. 8 - 11
SLAC, Panofsky Auditorium
SLAC PHYSICS MEETING
Richard Mount/Arla LeCount, SLAC
Statistical Problems in Particle Physics, Astrophysics and Cosmology
http://www-conf.slac.stanford.edu/phystat2003/

Tues., Sept. 16, 8:00 a.m.
SLAC, ROB Bldg, Redwood Rm
SSRL SCIENTIFIC SEMINAR
Cathy Knotts, Coordinator
SSRL Structural Molecular Biology Summer School

Wed., Sept. 24, 8:00 a.m. - 3:00 pm
SLAC, Panofsky Aud Lobby
SLAC/STANFORD BLOOD DRIVE
Linda Ahlf, SLAC
Call x2354 for appointment
Drop-ins Welcome!
http://www-group.slac.stanford.edu/hr/d/Blooddrive.html

Please send additions to: seminars@slac.stanford.edu

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

MILESTONES

Service Awards

10 Years
Jurgensen, Roger (ESD) , 8/16

15 Years
Barillas, George (KLY), 8/29
Regan, Mary (KLY), 8/29
Sopar, George (ESD), 8/18

20 Years
Collins, Brooks (SCS), 8/29

25 Years
Garcia, Luciano (KLY), 8/16
White, Lois (SCS), 8/21

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/

The Interaction Point

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Crystal Tilghman
Tineke Graafland

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