INTERACTION POINT

SLAC

October 17, 2003

Seeman and Oide Awarded APS Wilson Prize

By Anna Gosline

John Seeman, Assistant Director of Accelerator Systems for the Technical Division, was awarded the 2004 Robert R. Wilson prize for his outstanding achievements on the PEP-II collider. This award is given by the American Physical Society (APS) for exceptional accomplishments in the physics of particle accelerators. He shares this award with Katsunobu Oide of the National Laboratory for High Energy Physics (KEK) in Japan. The citation reads: "For technical leadership and direct contributions to the development of high luminosity B-factories at KEK and SLAC. These machines have set new world records for luminosities in colliding-beam storage rings."

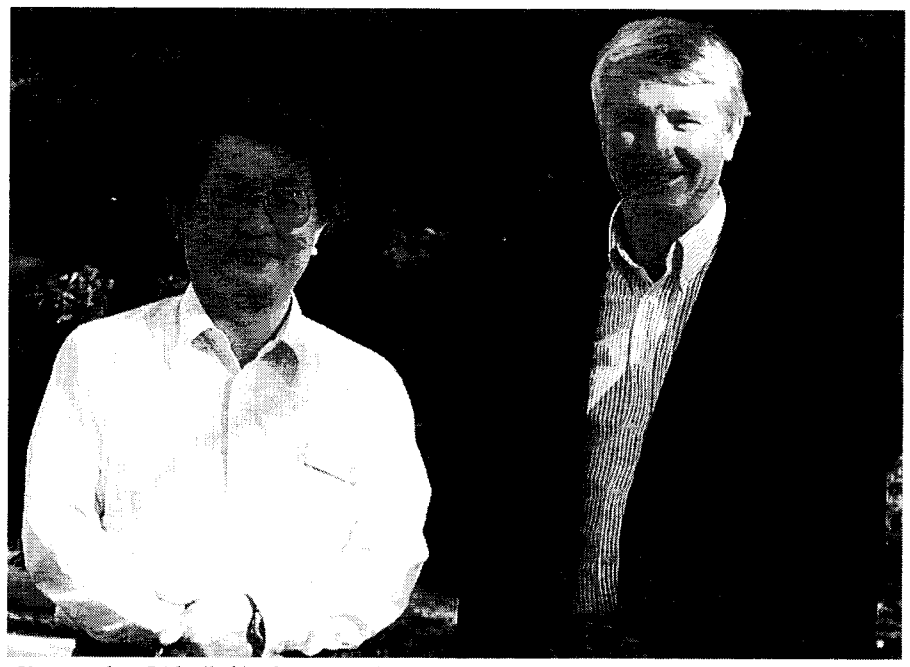


Photo by Diana Rogers

Katsunobu Oide (left) of KEK and John Seeman (right) of PEP-II were jointly awarded the APS Wilson Prize for 2004, to be presented at a ceremony next year.

"I'm thrilled," said Seeman, "and deeply honored by this special award. It also says a lot about the two laboratories that made these two world class colliders." Seeman is particularly happy to share this award with Oide, a long-time collaborator on accelerator design. "We've been sharing ideas since the early days of both accelerators," Seeman said.

After earning his Ph.D in physics from Cornell University and working on the Cornell Electron Storage Ring (CESR), Seeman came to work for SLAC in 1982. Early on, he led the Linac Group of the Stanford Linear Collider. In 1993, he joined the B Factory group and was named Head of Accelerator Physics in 1994. PEP-II achieved its first collisions in 1998. After more than two years of constant improvement, PEP-II surpassed its design specifications, achieving a world record luminosity. "Three years later, PEP-II's luminosity is now twice the design value and over one hundred times greater than the original PEP collider," says Seeman.

Luminosity refers to the accelerator collision rate. Increasing the density of particles in a beam and packing them into the smallest volume at the interaction point increases the number of collisions that occur when two beams pass by each other. The greater number of collisions, the more rare particle physics events will occur. The more rare events that occur, the more physicists can discover about the properties of matter and the forces of the universe.

Recently, KEK broke PEP-II's luminosity record although both colliders are advancing rapidly. Seeman has only praise for KEK's achievements and is optimistic for the future of high energy physics from both labs. "The particle physics results from both [machines] have been very similar. The fact that both machines are so close is very good. We build on each other's successes. Sometimes they discover something first, sometimes we do. It's a matter of weeks between "simultaneous" discoveries." Seeman and his colleagues are currently working on designs to further increase PEP-II's luminosity.

Seeman has shared two other honors for his work with PEP-II, one from the DOE and one from the IEEE Nuclear Plasma Sciences Society. He is very pleased to have contributed to the new physics discoveries found at BaBar.

Management Has a Role in Protecting Workers

By Mike Grissom

A recent increase in accidents and injuries at SLAC serves to remind us that every manager has a key role in environmental protection and worker safety at SLAC. Even a simple activity such as climbing a ladder or putting gasoline in a lawn mower can prove hazardous enough to cause serious personal injury. Three steps managers can take to manage risk include:

- Learning to recognize hazards
- Taking actions to control hazards
- Verifying hazards are well controlled

Learn to Recognize Hazards

As part of the corrective action following the January 28 ladder accident at SSRL, the Hazard Analysis Working Group (HAWG) is developing a process to improve

(See MANAGEMENT, page 2)

The 5045 Klystron—A SLAC Success Story

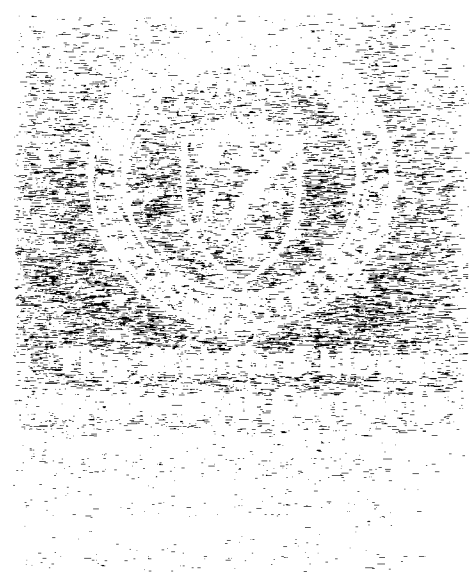
By Heather Rock Woods

When the Stanford Linear Collider (SLC) was on the drawing board 20 years ago, it called for klystrons more than twice as powerful as the existing ones, and needed hundreds of them reliably produced. The Klystron/Microwave Department developed the new klystron, known as the 5045, and was soon producing them at a rate of 12 per month.

"At the time there was real concern that the success of the SLC project might be jeopardized if these new high power klystrons could not be reliably manufactured," said Chris Pearson, who heads the department's manufacturing group. "Today it is clear that the 5045 design and production is a real success story."

Stationed every 40 feet along the Klystron Gallery, the 5045 klystrons supply radio frequency (RF) power

(See KLYSTRON, page 2)



Phenomenal Science Praised at 30th SSRL Meeting

By Heather Rock Woods

SSRL's annual Users' Meeting celebrated 30 years of phenomenal science and, in the packed Panofsky Auditorium, users from around the world were urged to communicate their scientific achievements to both the public and Congress.

Patricia Dehmer, Associate Director of Science for the DOE Office of Basic Energy Sciences, spoke before many of the 300 meeting attendees. She praised SSRL's remarkable science program and the outstanding science coming out of the facility.

Lab Director Jonathan Dorfan's opening remarks stressed the importance of communicating research results to the public, press and scientific peers, encouraging researchers to acknowledge the role big machines play in their ability to do the science, and to partner with the Lab to "get the message out in a way that's helpful to us as a community and to the public, who's funding this."

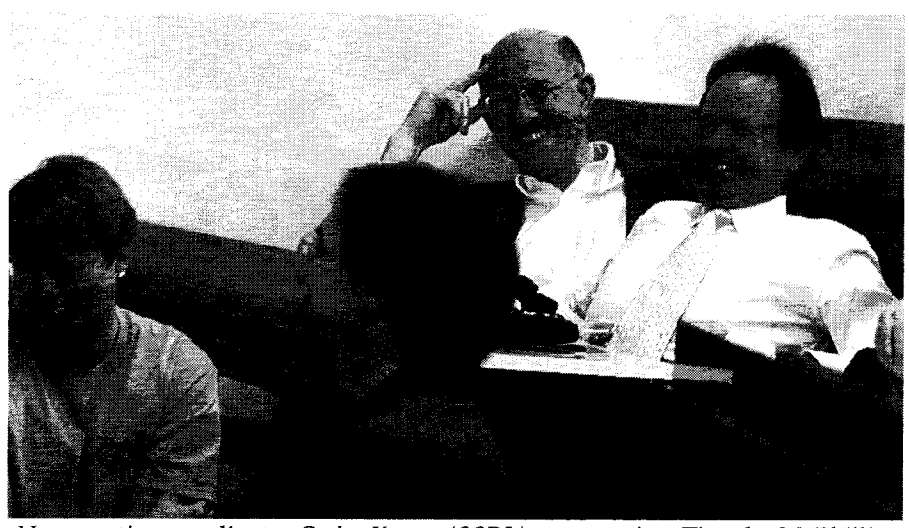


Photo by Diana Rogers

User meeting coordinator Cathy Knotts (SSRL), co-organizer Timothy McPhillips (SSRL), Jonathan Dorfan (DO), and Keith Hodgson (SSRL) enjoy Pat Dehmer's (DOE) talk.

Distilling 30 years of perspective, SSRL Director Keith Hodgson praised the Lab's "fantastic" staff, as well as seminal work in the field of synchrotron radiation, including pioneering many techniques and applications of synchrotron radiation and being a long-time leader in storage ring and magnet development. The 2003 fiscal year (shortened by the SPEAR upgrade) ended with 1,720 users working on active proposals. There have been 6,466 scientific publications since 1974 that relied on SSRL.

"We're well positioned for innovation in the future," Hodgson said, citing SPEAR3 (to come online in a few months), the new Sub-Picosecond Pulse Source (SPPS) project and the upcoming Linac Coherent Light Source (LCLS).

Management

(continued from page 1)

hazard identification, including general and task-specific hazard analyses. The requirements for HAWG are on the Web at http://www.slac.stanford.edu/esh/isms/perfmeas/FY03outPM051203.pdf

Even before HAWG completes its work, SLAC managers can access existing resources and tools that promote hazard awareness:

- Recall and refresh the hazard recognition process from your professional/technical training
- Consult with your Division/Department/Group ES&H Coordinator (also know as Safety Officer)
- Consult with ES&H Division subject matter experts about workplace hazard recognition
- Take appropriate ES&H courses on hazards known to exist in your workplace
- Refer to other online tools, such as the Hazards Analysis web site at http://www.slac.stanford.edu/esh/isms/hazanalysis.html

Take Action to Control Hazards

SLAC managers are responsible for ensuring all work under their supervision is adequately controlled. Good work planning includes the control of hazards. Methods for controlling hazards include:

- Designing and implementing engineered controls (i.e., machine guards to protect against rotating parts)
- Developing appropriate administrative controls (such as posting signs and installing area control ropes)
- Ensuring availability of necessary personal protective equipment (PPE)
- Confirming all employees have taken required safety training. Managers must review every employee's ETA annually and update as needed during the performance evaluation period.

Verify Hazards are Well Controlled

All SLAC managers are required to periodically conduct walk-throughs (also known as 'safety inspections') of the areas under their supervision, and the required frequency depends on the type of work area. Where there are particularly hazardous activities, there should be a walk-through every quarter; in office buildings and other areas with lower hazard activities, annual inspections are adequate.

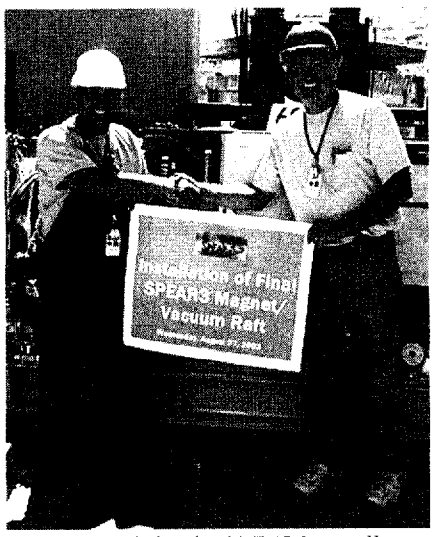


Photo by Diana Rogers

Recent work for the SPEAR3 installation at SSRL helps illustrate the role of the first line manager in ensuring safe operations.

The walk-throughs should verify that engineered controls are in place and functioning properly, administrative controls are observed, and any needed PPE is used in the correct manner. If significant deficiencies are found (i.e., subcontractors or staff working on elevated surfaces without adequate fall protection), then the work should be stopped until the proper safety systems are put in place.

Details about the SLAC Integrated Safety Management System (ISMS) program, including the Safety Management System document, are available on the Web at http://www.slac.stanford.edu/esh/isms/

Reflective Materials Make You Safer After Dark

By Anna Gosline

As the days get shorter, runners, walkers and bicyclists on the SLAC site need to make sure they are visible to vehicles in the dark. Runners and walkers should wear reflective vests or shirts and carry a flashlight. Though walkers and runners are encouraged to keep on sidewalks, they are allowed on roadways and should obey normal rules of the road that you would follow downtown.

Walkers and joggers should keep to the right and stay in single file. By wearing reflective clothing and keeping clear of vehicles, runners and walkers can safely enjoy the beautiful trails and roads at SLAC.

Other Members of the SLAC Community Need Some Respect

By Anna Gosline

The SLAC grounds are home to skunks, raccoons, two species of foxes, rabbits, squirrels, two bobcat families and over 70 deer. Like all Stanford grounds, the SLAC campus is a wildlife sanctuary, devoted to preserving both animal habitat and biodiversity.

Many of the animals at SLAC come out at night, making them vulnerable to the increasing amount of vehicle traffic. Young deer, not used to traffic, are at the greatest risk and we lose two or three every year. Young foxes have also been killed by traffic in the past month.

The animals at SLAC are a constant source of joy for many employees here. It is everyone's responsibility to make sure they are protected. Obeying posted speed limits and keeping a watchful eye for wildlife could make all the difference in the world.

Photo by Diana Rogers

The deer isn't in the crosswalk, but a watchful eye will get him safety across the road.

Flu Shots Available Soon

The Medical Department will soon be offering flu shots to SLAC employees, users, contractors and retirees.

Dates and times will be announced on SLAC Today.

For more information, see: http://www-group.slac.stanford.edu/esh/medical/influenza03.html

Klystron

(continued from page 1)

to the accelerator beam at regular intervals, increasing its energy from a few thousand electron volts to about 50 million by the end of the linear accelerator (linac).

The department's modern manufacturing facility currently makes one to two klystron tubes a month to replace old or failing tubes among the roughly 240 that power the linac. The average running time between failures is now 70,000 hours, nearly double original lifetime predictions. Several klystrons are operating with over 100,000 accumulated hours (equivalent to more than 11 years of continuous running).

"Our production yield is also extraordinary," said Pearson. In the last three years, 100 percent of klystrons produced met all requirements at final testing; the figure is 96 percent over 10 years. It's unparalleled in this country's klystron industry.

The 5045 klystrons are 6 ft-high vacuum tubes, containing hundreds of components fabricated from copper, stainless steel and ceramic. They generate 3.5 microsecond, 67 megawatt pulses of microwave energy, (more than five times the power of any military or commercial tubes produced in the US).

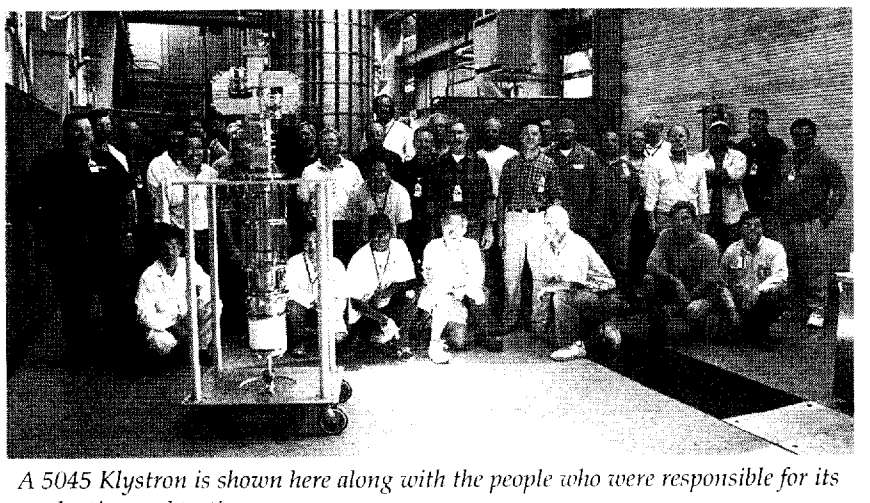


Photo by Diana Rogers

A 5045 Klystron is shown here along with the people who were responsible for its production and testing.

Inside the klystron, an electron gun emits a beam of electrons that travels through six copper cavities. Each cavity resonates to support an electric field that creates a series of tightly bunched electrons. The last cavity transforms the electrons' kinetic energy into microwave (RF) energy. This power travels through a waveguide (a copper tube) to the accelerator where it boosts the energy of the electron beam.

"Although the whole thing is one big electronic device—an RF amplifier—there are no wires, chips or circuit boards inside. Manufacturing these klystrons is essentially a mechanical problem, requiring careful attention to materials, precision machining, and vacuum processing," said Pearson, whose group uses rigorous quality control, which is necessary to create and preserve the ultra-high vacuum inside each klystron that prevents arcing damage to the tube.

Most metal components are joined by brazing (an alternative to welding) because it leaves no cracks or joints that can harbor vacuum contaminants. Critical components are pre-fired at temperatures of up to 1100 degrees Centigrade. Finished klystrons are baked in specialized vacuum furnaces (heated to 550 degrees centigrade, for two weeks or longer) to bring the tube to its final vacuum.

With the exception of a few parts, "we do everything necessary to build a klystron tube from blueprints to final test," said Pearson. "The fabrication process is long, arduous, and includes many unique processes."

The department gets help from other groups at SLAC. The Mechanical Fabrication Department manufactures several of the klystron components, as well as chemically cleaning parts before assembly; and the Physical Electronics Group does metallographic testing of component materials.

The Klystron/Microwave Department is currently developing and producing powerful new X-band klystrons to power the high-gradient accelerator structures for the Next Linear Collider.

Industrial Hygiene: A Primer

By John Shepardson

The SLAC Industrial Hygiene program (IH) is the recognition, evaluation and control of health hazards in the workplace. The industrial hygienists in the Safety and Health Assurance Department (SHA) of ES&H use surveys and on-site evaluation to control health hazards. Industrial hygienists are trained in engineering, physics, chemistry and biology to understand how workplace operations can effect our employees. We use workplace monitoring and analytical methods to assess worker exposure and employ controls on potential health hazards.

Early Industrial Hygiene

In the first century AD, Pliny the Elder discovered health risks for those working with certain minerals. He devised a face mask (made from animal bladder) that protected workers from breathing lead dust. In the second century AD, the Greek physician Galen identified the pathology of lead poisoning and recorded the hazardous exposure of acid mists to miners. In 1556, the German scholar Agricola advanced the science of industrial hygiene even further in his book, *De Re Metallica*, where he described the diseases of miners and included suggestions for mine ventilation and worker protection. In 1700, Ramazzini, known as the father of industrial medicine, published the first comprehensive book on industrial medicine, *De Morbis Artificum Diatriba* (The Diseases of Workmen). By suggesting that occupational diseases should be studied in the work environment rather than in hospital wards, Ramazzini defined the modern approach to IH.

Industrial Hygiene Today

Here at SLAC, IH involves the control of health hazards that occur in everyday work. Some examples of hazards controlled by IH include:

• Chemical Hazards: Harmful chemical compounds in the form of solids, liquids, gases, mists, dusts, fumes and vapors can exert toxic effects through inhalation (breathing), absorption (direct contact with the skin) or ingestion (eating or drinking).

• Biological Hazards: Bacteria, viruses, fungi and other living organisms can cause acute and chronic infections by entering the body either directly or through breaks in the skin.

• Physical Hazards: Non-ionizing electromagnetic radiation, magnetic fields, noise, illumination and temperature extremes can influence worker health.

For industrial hygiene support at SLAC, contact the IH department. You can find contact information on the resource list for ES&H, available on the web at http://www.slac.stanford.edu/esh/resource.pdf

Don't Abuse 9-911

By Steve Mahaley

Although everyone knows this, it's worth reminding ourselves the 9-911 emergency system is only for reporting police, medical, or fire emergencies. Non-emergency calls will cause delays to those calls that require immediate attention. Below are guidelines on the proper use of the 9-911 system.

1. Only use 9-911 for life-threatening emergencies such as:

• If someone is having difficulty breathing or if breathing has stopped

• Choking (can't talk or breathe)

• Constant chest pain (more than two minutes)

• Uncontrollable bleeding or vomiting

• Drowning or electrocution

• Drug overdose or poisoning

• Sudden fainting or unconsciousness

• Convulsions or seizures

• Major burns (white or charred skin; blisters and redness over large area)

• If someone will not wake up, even if shaken

• Severe injuries from traffic accidents, head injuries or falls

2. When calling 9-911, tell the operator critical information:

• The nature of the emergency (police, fire or medical problem)

• Your location (state you are at SLAC, and give building number or approximate location if outside)

• The age and number of people that need help

• If there are any hazardous materials involved

• If person is conscious and breathing

3. Stay on the phone until the operator tells you to hang up:

Remain calm and give direct answers to the questions asked. Speak slowly and clearly. You will be asked additional questions so the operator can send the right type of help. All questions are important.

The operator may also provide you with critical first-aid instructions such as CPR (for heart attacks or non-breathing) or the Heimlich maneuver (for choking).

4. Do not call 9-911 for non-emergency situations such as:

• Minor illness or injury not requiring immediate help (flu or common cold symptoms, chronic aches and pains, minor cuts, or broken fingers or toes)

• Emotional upset

Non-emergency medical problems can be treated at the SLAC Medical Department (Bldg. 41, Rm. 135, Ext. 2281). They are open Monday through Friday, 8:00 a.m. to 4:30 p.m. In the event the Medical Department is closed, a nurse or doctor can be contacted by cell phone (650) 823-7163 or pager (650) 849-9558.

Remember, these are general guidelines. If you have any doubts as to the nature of your emergency, do not hesitate to call 9-911.

Understanding when to place a 9-911 call will help the system run efficiently and send you emergency service in the shortest possible time.

If you have questions about the 9-911 system, please contact Steve Mahaley, Emergency Management Coordinator, at Ext. 2095.

SLAC Physicists Promote Interest in Science at Sally Ride Festival

By Anna Gosline

Though Britney Spears might be cooler than British Thermal Units, nothing is cooler than ice cream—except maybe ice cream made with liquid nitrogen. On October 5, a group of young SLAC physicists marched over to the Stanford campus and hit a real sweet tooth with the enthusiastic throng of middle school girls who had come out for the Sally Ride Science Festival.

These festivals, held nation-wide over the past two years, are the creation of Sally Ride, who rocketed into stardom in 1983 as the first American woman in space. Over the years, Ride realized the need for programs that would encourage girls to continue on the science and technology path. "Girls start to fall away from science in middle school in much higher percentages than boys," said Ride. In 2000 she founded Imaginary Lines, a company created to keep middle school girls engaged in science by connecting them with people and ideas to nurture their relationship with science and to give them the confidence to achieve their dreams.

The Science Festivals are an integral part of this plan. These events give girls the opportunity to interact with women in science and technology and gain a better appreciation of the careers and possibilities that are open to them. "[Festivals] give them a push," says Ride.

SLAC had an enormously successful display booth featuring liquid nitrogen-made ice cream and a mysterious cloud chamber full of cosmic rays. Large queues of hungry girls crowded around the SLAC table, watching with amazement as steaming cascades of liquid nitrogen were poured into giant bowls of cream and sugar and whisked to make ice cream. SLAC volunteers gave out posters and specially designed SLAC mirrors, whose shining reflections could be seen glinting all over the festival.

Photo by Nina Adelman Stolar

Steaming liquid nitrogen draws curious onlookers at the SLAC booth on the Stanford Campus.

The SLAC booth was one of the most popular destinations at the festival and many of the girls and their families signed up for SLAC tours later this month. "[The girls] leave these events totally energized about science, but they often don't have anywhere to direct it," said Ride. "It's great that SLAC has tours to follow up on the festival." Ride also commented on the great success of the SLAC demonstrations. "Liquid nitrogen to make ice cream; a cloud chamber, what could be better?"

HazMat Program Working Well

By Mike Scharfenstein

SLAC welcomed two separate reviews of its hazardous material and waste management programs in September. The first one was an audit to support our independent oversight program with the DOE. The second one was an annual inspection by San Mateo County. The audit and inspection took place at the same time due to unavoidable schedule conflicts.

Results were favorable from both reviews and demonstrate that SLAC is committed to managing hazardous materials and waste in an appropriate manner. While there are always improvements to be made, the programs are evolving into the type expected of a world-class science facility like SLAC.

You can help improve the program by making sure all your chemicals and waste are properly labeled, inspected weekly and appropriately stored. Don't forget how important good housekeeping is to maintaining a safe work environment as well.

Thanks to all who participated in the successful reviews. For comments, questions or suggestions, contact Michael Scharfenstein (scharf@slac.stanford.edu or Ext. 3341).

WIS Seminar

October 28

12:00-1:00

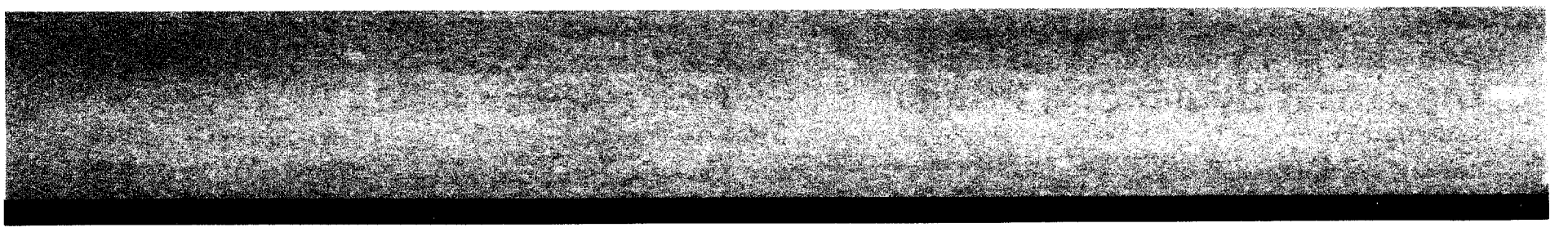
Panofsky Auditorium

Alexandra Barnett, Executive Director of the Chabot Space & Science Center in the Oakland Hills presents

"Adventures at 2:00 in the Morning"

This talk will review issues Barnett has faced and still faces as a woman scientist, science communicator and businesswoman. Barnett is known for her lively presentations!

Join us, bring lunch and a friend!



POLICIES AND PROCEDURES

SLAC Temporary Personnel Policy

This policy is effective November 1, 2003. It applies to personnel performing non-bargaining unit work at SLAC who are hired through temporary staffing agencies (commonly referred to as "job shoppers"). It specifically excludes temporary personnel performing construction work subject to Davis-Bacon Act regulations. Temporary personnel doing work normally performed by bargaining unit workers are covered by Side Letter #6 of the Labor Agreement between Stanford University and United Stanford Workers.

Temporary personnel may be hired to fill in during extended absences of regular staff, to cover time between a termination and the filling of that position, to cover peak workloads, to provide a short term buffer for fluctuating work loads, or to assist on projects of short term duration (typically a year or less).

Given these uses of temporary staff, it is SLAC policy that temporary personnel are limited to a maximum one-year assignment. At the conclusion of one year, the temporary assignment must end and the temporary person must be let go or hired as a regular or fixed term employee; the position may not be filled with another temporary staff person.

Exceptions to this policy will be considered on a case-by-case basis and must be approved by the Division Director and the Director of Human Resources (HR).

Temporary personnel who have been in an assignment at SLAC longer than one year as of November 1, 2003, will be allowed to remain for up to six months before the provisions of this policy are enforced. All other temporary personnel will be subject to this policy as their assignment reaches one year.

Contact: Lee Lyon, Director, Human Resources, Ext. 2283, lyon@slac.stanford.edu.

Items Blocked on Corporate Express Account

Certain items under the Corporate Express (CE) contract are blocked from ordering because they are considered unallowable expenses—items that cannot be purchased using taxpayer dollars.

From time to time, the Purchasing Department expands the list of blocked items as part of our ongoing monitoring of purchases made under the CE contract.

Additional items now blocked from the Corporate Express account are: eating utensils, facial tissues, cups (except #NIB001623006), plates, tablecloths, umbrellas, dish soap, luggage carts, cameras, eyeglasses, hand lotion, coffee filters, coffee decanters, sugar, and artificial sweetener.

Please note that fax machines, copiers, and printers should not be ordered under the Corporate Express EWay system. For Property Control purposes, these items must be requested under a purchase requisition.

Contact: Bob Todaro, Purchasing Officer, Ext. 2425, rocker@slac.stanford.edu

2004 Open Enrollment: Make Informed Benefits Elections

Open Enrollment will begin at 7:00 a.m. on Monday, November 3, and end at midnight on Friday, November 21. Open Enrollment packets will begin arriving in home mailboxes during the last week of October.

Please notify the SLAC Benefits Office (benefits@slac.stanford.edu or Ext. 2356) if you don't receive your packet by November 10.

Have You Moved?

If you moved in the past year, be sure that you have notified the Benefits Office of your new address.

Dates to Mark on Your Calendar

Tuesday, November 4, from Noon until 1:00 p.m: Bring your Open Enrollment questions to the Informational Meeting in the Panofsky Auditorium.

Thursday, November 6, from 10:00 a.m. until 3:00 p.m: Pick up informative brochures and speak directly with representatives from our health benefits vendors at the SLAC Benefits Fair in the Auditorium Breezeway.

For more information, contact: Anita Piercy, Ext. 2356, anita@slac.stanford.edu

GLAST LAT Project Shows Its Team Spirit

By Debbie Nicholson

Photo by Diana Rogers

The SLAC members of the GLAST LAT Team celebrated 'Team Week' with a tailgate barbeque held in the parking lot in front of the Instrument Project Office. Team members were asked to dress in their favorite sport, or represent their favorite sports team. We had quite an assortment of costumes and outfits, showing the many personalities of our project. Lowell Klaisner, Project Manager, handed out ribbons and trophies to those who went above and beyond in their preparation for the Team Week spirit.

MILESTONES

Awards

Brunger, Axel (SSRL), the Gregori Aminoff Prize 2003, in Stockholm, presented on September 10

Seeman, John (AD), the 2004 Wilson Prize for outstanding achievement in the physics of particle accelerators, announced October 6th

Weisend, John (EFD), the 2003 Robert W. Vance Award of the Cryogenic Society of America, presented at the 2003 CEC-ICMC in September

Service Awards

5 Years

Van Pelt, John (KLY), 10/16

10 Years

Eberle, Brenda (SCS), 10/25

15 Years

Gorecki, Wanda (ESD), 10/24

Perl, Joseph (SCS), 10/18

Yott, Tracy (ESRD), 10/17

20 Years

Carter, Cole (TD), 10/17

25 Years

Aston, David (EB), 10/20

Magana, Jose (MFD), 10/16

Narula, Krishan (MFD), 10/18

Va'vra, Jaroslav (EB), 10/16

30 Years

Bane, Karl (ARDA), 10/29

35 Years

Wilson, Edward E. (ESD), 10/23

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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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/

Upcoming Events

Oct. 20-24
Doubletree Hotel, Portland, Oregon,
IEEE/NSS PHYSICS MEETING
Ralph James, BNL
IEEE Nuclear Science Symposium
http://www.nss-mic.org/2003/nss2003.html

Mon., Oct. 20, 4:15 pm
SLAC, Panofsky Auditorium,
(Refreshments-3:45)
SLAC DEPARTMENTAL COLLOQUIUM
Douglas Osheroff, Stanford U
NASA

Tue., Oct. 28, 12:00 pm
SLAC Panofsky Auditorium,
SLAC Women's Interchange Seminar
Alexandra Barnett, Chabot Space & Science Center
"Adventures at 2:00 in the Morning"

Mon., Nov. 3, 4:15 pm
SLAC, Panofsky Auditorium,
(Refreshments-3:45)
SLAC DEPARTMENTAL COLLOQUIUM
John Bahcall, Princeton U
To be announced

Tues., Nov. 4, 11:30 am
SLAC, Panofsky Aud. Breezeway
SLAC HUMAN RESOURCES EVENT
Anita Piercy, Coordinator
Benefits Open Enrollment Fair

Thur., Nov. 6, 9:00 am
SLAC, Panofsky Aud. Breezeway
SLAC HUMAN RESOURCES EVENT
Anita Piercy, Coordinator
Benefits Fair for Active Employees

Mon., Nov. 10, 9:00 am
SLAC, Panofsky Aud. Breezeway
SLAC HUMAN RESOURCES EVENT
Anita Piercy, Coordinator
Benefits Fair for Retirees

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

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