INTERACTION POINT

May 16, 2003

PEP-II Attains Record Beam Luminosity

By Heather Rock Woods

PEP-II recently attained its own record beam luminosity, generating twice as many collisions per second as the machine was designed to deliver.

During owl shift on May 3, the Main Control Center (MCC) operators achieved a record peak luminosity of 6.1 x 10^{33} $cm^{-2}s^{-1}$, double the machine's design luminosity. The best peak luminosity last year was 4.6 x 10^{33} $cm^{-2}s^{-1}$.

"We really have excellent performance," said accelerator physicist Uli Wienands (AD), system manager for the PEP-II storage rings. "For BABAR, higher luminosity means more events, which translates into more accurate results and the ability to find physics effects they otherwise couldn't see."

PEP-II collides a positron beam from one storage ring with an electron beam from the other ring. Luminosity is a measure of the concentration of these particle collisions, so that adding more particles to a given beam, or reducing beam size, increases luminosity. Picture a polka-dotted balloon: you can add more polka dots or let air out of the balloon—or do both—to increase the density of polka dots.

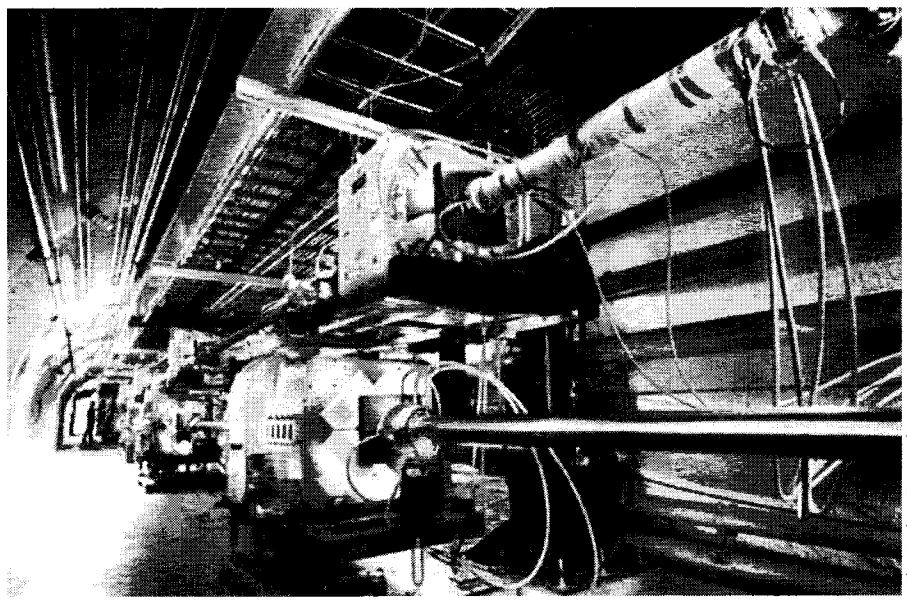


Photo by Peter Ginter

Two beam pipes of the PEP-II Storage Ring at SLAC—the upper pipe carries positrons, the lower pipe carries electrons.

New Cooling Systems

This remarkable improvement comes from several changes. During the downtime last summer and fall, the Accelerator Department added cooling systems in vulnerable spots. Before the upgrades, beam current was limited to prevent overheating and damaging parts of the vertex chamber. With new cooling systems in place, the beam current has increased 10 to 15 percent over last year, with further room to grow. More current equals more particles, which amounts to higher luminosity.

The huge challenge of adding a cooling system in the heart of the sensitive detector was met by a team of engineers, designers and technicians led by Stan Ecklund, Deputy Head of the Accelerator Department (AD), and Mike Sullivan, PEP-II Run Coordinator.

Balancing Act

The other big change required only tiny adjustments. Accelerator physicists finely tuned the machine,

(See PEP-II, page 2)

Helen Quinn Elected to NAS

By Linda DuShane White

Congratulations are in order for SLAC Theorist Helen Quinn, elected to the National Academy of Sciences (NAS) on April 29. A most prestigious means of recognition for a U.S. scientist, NAS was founded in 1863 by "a congressional act of incorporation, signed by Abraham Lincoln, which calls on the Academy to act as an official adviser to the

Photo by Diana Rogers

Helen Quinn (TH)

federal government, upon request, in any matter of science or technology," according to their Web site.

Quinn, who has been at SLAC since 1979, had no idea she was being considered for membership and, she said, "It is too soon to tell what form my participation in the Academy will take."

She had already been on an Academy study (before her membership) put together by the National Research Council at the request of Congress. Studies on scientific issues are undertaken by various arms of the Academy in order to advise the government.

Quinn was one of 17 women out of the 72 people elected as NAS members this year, a larger number than in the past. When asked if the Academy was purposely attempting to elect more women, SLAC Director Emeritus W.K.H. Panofsky said, "This election was not effected by that concern." He added that the Academy is currently debating how to best bring about more equitable membership in the future. About

(See QUINN, page 2)

Art for Science, Science for Art

By Neil Calder

Can you fit 500 people into the Breezeway? No problem, if 400 are photographic portraits and the remainder are the enthusiastic crowd who came to the opening of the exhibition 'Interface: People Who Make SLAC Work.'

'Interface' is the first exhibition organized by the new Art Committee and showcases wonderful photographs of SLAC staff and users taken by Diana Rogers. If you haven't seen the exhibition yet head over to the Breezeway now, you won't regret it.

The custom-made display structure, designed by Michael Hyde (TIS) and built by Alfred Suarez and Eric Gaillant (both MFD), will be re-used for future exhibitions the Committee has already planned.

Why an Art Committee at SLAC?

Physics research is a way of seeing: probably the most precise way of seeing that humanity has ever developed. Art, too, is a way of seeing: without the precision of physics but with more intuition and emotion.

Both ways of seeing are valid and at SLAC we have a unique opportunity to mix and compare both cultures. The physics we have in abundance, but so far, little art. The aim of the Art Committee is to organize exhibitions,

Photo by Marty Breidenbach

Photographer Diana Rogers (DO) and Lab Director Jonathan Dorfan celebrating at the exhibition opening

and eventually talks and events to inject art into SLAC daily life.

If you would like to help bring art to SLAC or are simply interested in art, get in touch with the Art Committee.

For more information, see: http://www2.slac.stanford.edu/art/

Know Your Computer: Dealing with Viruses

By Andrea Chan

What Do I Do About Viruses?

At SLAC we take various measures to protect e-mail and Windows computers from viruses and other malicious code. Users of the SLAC e-mail systems and supported Windows computers should contact their local administrators if they receive notification that they have a virus.

The local administrators work with SCS to disinfect compromised systems and infected files, and to determine the source and cause of the infection. However, if you are not using SLAC e-mail systems or your computer is not supported by your local administrator, these measures will not protect you.

Where Viruses Come From

The sources of infection are most commonly e-mail (e.g., attachments) but can also be files that get onto the local computer by other means (e.g., floppy disk, CD, download from Internet, SLAC servers). Such an infected file may then be sent back out as e-mail.

How SLAC Deals With Viruses

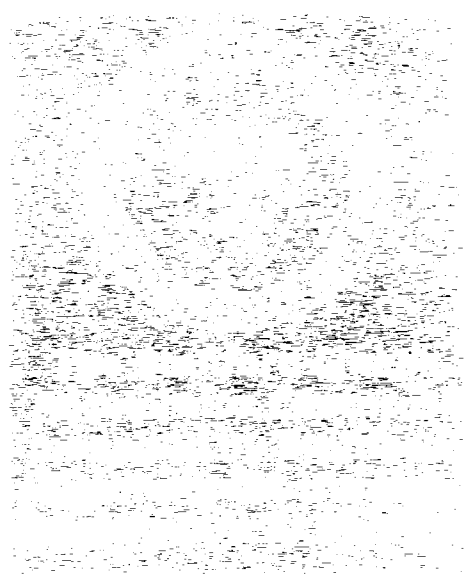
Anti-virus software on the e-mail servers scans incoming e-mail and removes suspicious attachments such as infected files, executables or Word/Excel files with macros. The intended recipients of these messages receive a substitute text file instead, informing them of that the attachment has been removed.

Outgoing e-mail is also scanned for viruses. Infected files are stripped and the sender is sent an e-mail notification.

Since the infected files never reach the user, there is nothing s/he needs to do unless the stripped file needs to be retrieved. (In these cases the user should e-mail the postmaster@slac.stanford.edu.)

Overall, SLAC has a good history of avoiding any widespread infections. This is thanks to the cooperation of the user community, as well as the anti-virus measures taken on the e-mail systems, Windows servers and on the supported Windows client systems.

(See VIRUSES, page 2)



PEP-II

(continued from page 1)

slightly changing the number of betatron oscillations the particles make on each trip around the rings. With this 'tune' set just right, the interaction of the two electrically charged beams actually reduces—instead of increases—beam sizes at the collision point, thus increasing luminosity.

In tweaking the oscillations "to a very dangerous region, very close to a resonant value, you can actually use this 'beam-beam interaction' to reduce the beam size at the point where it matters," Wienands said. "But you lose the beam instantly if you hit the resonant value, so it's a balancing act."

It took several attempts to achieve the delicate balance, using a new technique developed at SLAC by accelerator theorists John Irwin and Yiton Yan (both ARD-A), working with students in their group.

The team used 'Model Independent Analysis' to help analyze the machine settings, calculate new magnet settings and verify that the machine did what it was set to do.

"It's really the fruit of cooperation between the Accelerator Department—the PEP people—and the Accelerator Research Department," said Wienands.

A third factor in raising performance was the experimental discovery that adjusting the particles' orbit positions very specifically in different locations (called 'orbit bumps') could increase luminosity. This work was done by Franz-Josef Decker (AD).

With changed machine settings and higher beam currents, Wienands said, "the operators are rapidly learning to work with this new, somewhat tricky machine. They are the ones who translate peak luminosity into delivered luminosity–the total number of events BABAR gets."

As the PEP team makes everyday performance as good as this new peak performance, the BABAR collaboration is looking forward to an abundance of data and even more striking experimental results.

For more on PEP-II, see: http://www.slac.stanford.edu/accel/pepii/home.html

Quinn

(continued from page 1)

Quinn's election, Panofsky said, "She was elected by an overwhelming majority."

In addition, she is President Elect of the American Physical Society (APS) and, she says,"I try to get some physics done in what time is left!" Her current research focus is on theory aspects of work going on at the B-Factory.

According to Quinn, her Academy membership will relate to her work, "not in terms of my research, but in terms of when I am involved in some other activity. When I state my opinion, my opinion as a member of the Academy carries a little more weight. It's a label which says this person is at the top of their field and is recognizable across fields. Within the physics community I already have that recognition."

Quinn's current activities include running the SLAC program for the Department of Energy [now] called Science Undergraduate Laboratory Internships (SULI), which brings 25 students from around the country to SLAC for summer research experience.

For more information on NAS, APS and SULI, see:

http://www.nas.edu/

http://www.aps.org/

http://www.slac.stanford.edu/gen/edu/undergraduate.html

Mentors Receive DOE Recognition

Photo by Diana Rogers

Pictured above (left to right): Persis Drell (RD), Tony Johnson (SLD), Helen Quinn (TH), Derek Tournear (EK) and Jonathan Dorfan (DO)

Congratulations to Derek Tournear and Tony Johnson, who were presented with special awards from DOE Secretary of Energy Spencer Abraham in recognition of their excellence in mentoring young scientists at SLAC.

The citation reads: "In recognition of your dedication as a mentor. For your willingness to share knowledge and to inspire and instill confidence in the next generation of scientists and engineers by setting high expectations, seeking creative solutions, and immersing inquisitive minds in the world of science."

Viruses

(continued from page 1)

What You Should Do

If you get a notification indicating that an infection has originated from one of your files, please immediately contact your local administrator. This will set in motion a process put in place to work with your local administrator and SCS.

• The anti-virus software may not be working properly

For these reasons, SCS needs to be notified by local administrators whenever there is an infection in order to investigate the cause.

Home Computers

It is important that you also have anti-virus software installed on your home computers. Make sure that the anti-virus signature files in your computer are updated frequently. If you belong to the Stanford community and have a SUNetID, you can download and install the Stanford anti-virus software for your home computers.

More information is available on the Windows FAQ and E-mail Web pages in two locations. See:

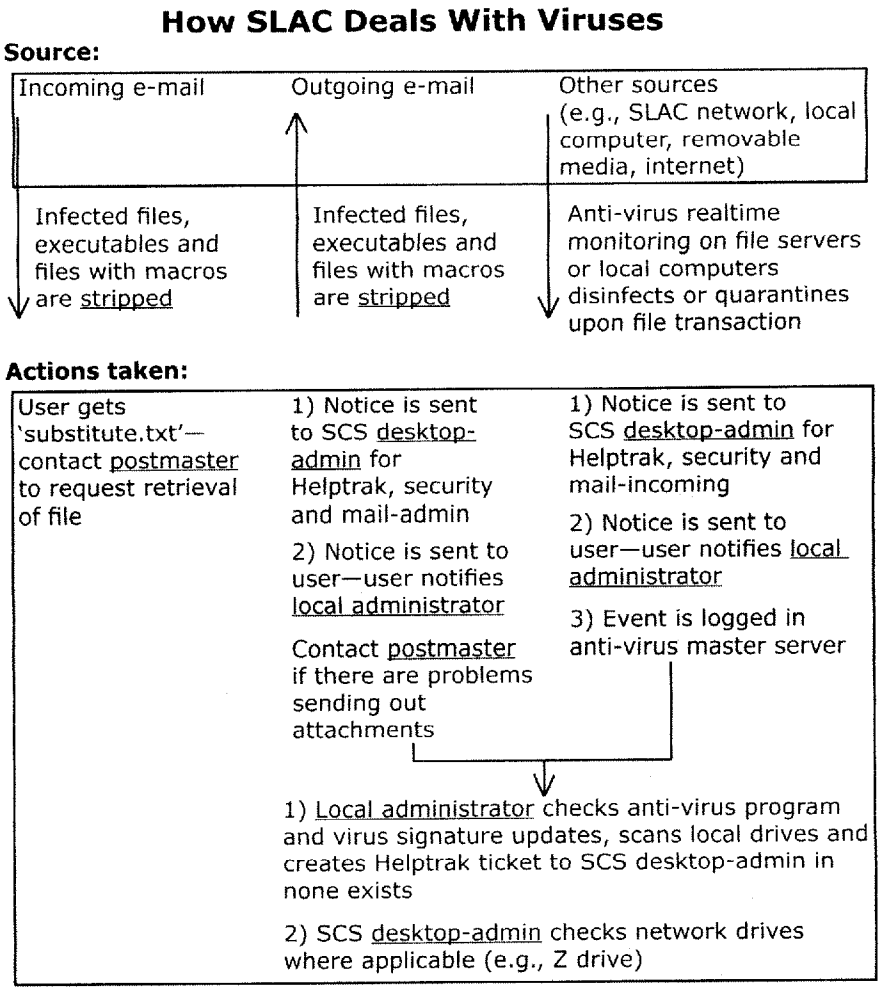
http://www2.slac.stanford.edu/comp/winnt/faq/faq.htm

http://www.slac.stanford.edu/comp/net/email/index.html

For a list of local administrators, see: http://www2.slac.stanford.edu/comp/winnt/local-administrators.html

For additional questions about dealing with viruses, e-mail desktop-admin@slac.stanford.edu or postmaster@slac.stanford.edu

How SLAC Deals With Viruses



Graphic courtesy of SCS

After your local administrator checks your anti-virus software to make sure that it is working properly and the signature file is up to date, s/he will scan your local system. SCS will also have received notification of the infection (if not, the local administrator will contact SCS), and will scan for any infections on the servers. Only SCS should check the servers because if this is not done in a coordinated manner it may cause a slowdown affecting the whole site.

Files May Still Get Infected

In spite of these measures, files may still get infected occassionally because:

• A new virus may infect files before the vendors update their anti-virus signature files to detect the new virus

WIS Seminar

The Women's Interchange at SLAC (WIS) is proud to present...

Laura Wilson, Director of Public Safety at Stanford University

Tuesday, May 27 at Noon in the Panofsky Auditorium

Wilson graduated from Stanford in 1991 with a degree in Biology. Come find out what led this former Science Major to become Stanford's first woman Chief of Police.

Wilson will share her experience, philosophy and vision for the Department of Public Safety. Her talk will last approximately 45 minutes with time for questions and answers.

All are welcome; bring your lunch and bring a friend along!

Photo courtesy of Laura Wilson

Laura Wilson being sworn in as Stanford Director of Public Safety

SLAC Champions of Green Government Receive EPA Award

By Richard Cellamare

Congratulations to Yolanda Pilastro (WM) and Ali Farvid (MFD), recipients of the U.S. Environmental Protection Agency (EPA) Champions of Green Government award.

Pilastro and the Hazardous Waste Management Group staff received this award for implementing projects that reuse and reclaim hazardous materials, avoiding the expenses

Photo by Diana Rogers

EPA award recipients and their teams being congratulated by Lab Director Jonathan Dorfan. The third award in the picture was given by ES&H to Richard Cellamare (WM) for his efforts in promoting the waste minimization and pollution prevention program at SLAC. Shown left to right: Dave Macias (WM), Clair Stevens (WM), Dorfan, Cellamare, Ron Sanchez (WM), James Smith (WM), Pilastro, Michael Sharfenstein (WM), Ardie Jacob (WM), Parvinder Pataria (MFD), Wilevaldo Benitez (MFD), Jose Magana (MFD), George Laxson (MFD), Krishan Narula (MFD), Balbir Gosal (MFD), Farvid and Oscar Zelaya (MFD)

associated with managing these materials as hazardous waste.

This award is given to federally funded facilities for efforts in preventing pollution and exercising environmental stewardship. The work performed by Pilastro and Farvid, along with their teams, represents their contributions in waste reduction and pollution prevention to both SLAC and DOE.

Farvid and the Plating Shop staff received the award for reducing hazardous waste generation by extending the life of electroplating bath solutions.

To accomplish this, Farvid purchased analytical equipment that allowed metal finishing operators to make adjustments to plating bath solutions, which would otherwise be discarded as hazardous waste. This reduced hazardous waste generation from electroplating operations down from 10,000 to 5,000 gallons per year at an annual cost savings of $35,000 to $50,000.

Additionally, Farvid replaced ferric chloride, a coagulant used in rinse water treatment operations, with a system that generates the coagulant electrochemically. This reduced hazardous waste generation in rinse water treatment operations, saving $3,400 per year.

Projects included returning old fire protection and gas cylinders to the original manufacturers; returning empty chemical containers to vendors; sending lab chemicals and hazardous products to on-site users; collecting and crushing empty metal containers and sending the metal to recyclers; and collecting and recycling empty plastic containers containing household cleaners.

This effort managed to divert 36 metric tons of hazardous waste in 2002 and saved an estimated $121,000 by eliminating the need to send the waste to a permitted, off-site treatment and disposal facility.

Pilastro and Farvid both played important roles in helping SLAC and DOE achieve environmental stewardship and waste reduction performance goals.

If you have any questions or are interested in participating in waste reduction or pollution prevention opportunities, please contact Richard Cellamare (Ext. 3401, rcellamare@slac.stanford.edu).

SLAC Academic/Career Counseling Center Open

By Linda DuShane White

SLAC now has an Academic/Career Counseling Center which is open to all employees, free of charge and absolutely confidential.

The Center was founded by Pauline Wethington, who wrote about her wish to offer career counseling at SLAC in her application for the Al Ashley Fellowship last year. Funded by the Fellowship, Wethington's Center has expanded beyond her wildest dreams in "unexpected and welcome ways."

Wethington is currently assisting 25-30 employees in learning how to further their education and/or careers.

Many of these employees (often sent by their supervisors) already have

"My supervisor has known that I'd like to return to school," the employee said. "It's been a long time since I've taken any classes outside of SLAC, and she recommended that I see Pauline. I was feeling unsure about the whole thing but with Pauline's encouragement and enthusiasm I was motivated to try.

I've now enrolled at DeAnza College and I'm taking one class just to get myself started. It has given me confidence to know I have a career counselor for support and help with any questions that I might have. I feel her door is always open."

According to another employee, "I was surprised to see the connections she has and am pleased with her persistence in keeping me on track. I have tried to do this on my own and

Photo by Diana Rogers

Pauline Wethington (PAO) and Sandra Czech (HR) discuss educational programs during a counseling session.

some credits toward a degree but need help cutting through red tape to reach their goals. SLAC parents can even get advice for their teenage children's education, career planning and internships.

Wethington has extensive contacts with Northern California colleges and offers services covering the areas of academics, career, resume writing and interviewing, as well as how to get tuition reimbursement at SLAC.

One current employee said of the service, "It's really good to meet with Pauline. She helps you to focus and you don't feel you're wasting your time."

have never gotten this far. It means a lot to me."

Wethington's enthusiasm shines through when she says of her clients, "If they are excited, I am excited."

The Center's services are currently being offered through the fall of 2003, so if you are thinking about using it be sure to make an appointment soon.

Wethington can be reached by phone (Ext. 4559) or by e-mail (lean@slac.stanford.edu).

SSRL/SLAC and IMSS/Photon Factory Sign Collaborative MOU

By Keith Hodgson

A signing ceremony was held on April 14 at KEK in Tsukuba, Japan at which the SSRL Division of SLAC and the Photon Factory Division (PF) of the Institute of Material Structure Science (IMSS) at KEK agreed to collaborate in areas of mutual interest.

An annex of the signed Memorandum of Understanding (MOU) provides the opportunity for scientific users of SSRL and the PF to receive beam time at either facility in certain areas and under certain circumstances (such as the shutdown of one or the other facility for a major upgrade).

This agreement will be of immediate benefit to SSRL users working in the area of small angle scattering. Several groups will soon be scheduled for beam time at the PF under their SSRL proposals.

We look forward to expanding scientific and technical interactions with our colleagues at KEK as facilitated by this MOU.

For more information contact: Keith Hodgson (hodgson@ssrl.slac.stanford.edu)

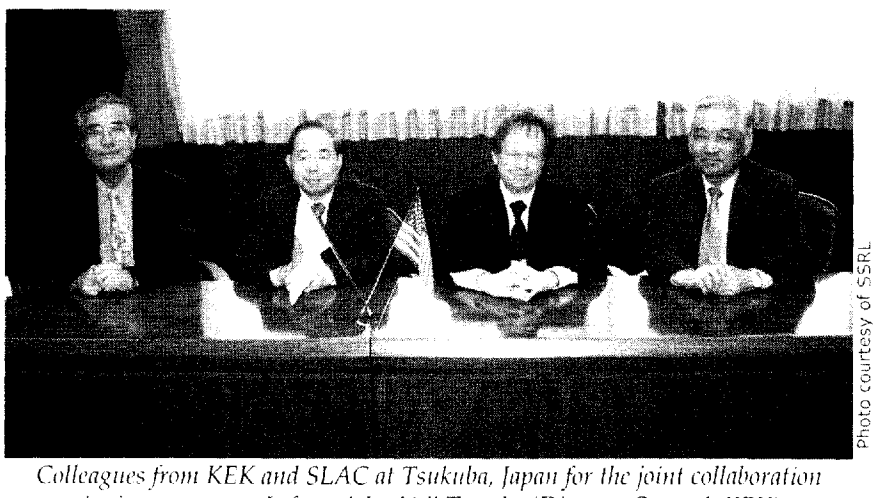


Photo courtesy of SSRL

Colleagues from KEK and SLAC at Tsukuba, Japan for the joint collaboration signing ceremony. Left to right: Yoji Tatsuka (Director General, KEK), Atsushi Koma (Director, IMSS), Keith Hodgson (Director, SSRL) and Tadashi Matsushita (Deputy Director, IMSS).

Get Ready for Kid's Day 2003—
June Registration for July 15 Event

Photo by Diana Rogers

Kids Day 2002 participants wear 3-D glasses in the Biology workshop. They are looking at proteins that are projected from a microscope to a video monitor.

By Lisa Mongetta

What do electronics, ice cream, metrology, Graham George, hot dogs, cryogenics and 156 excited children have in common?

They are all part of Kids Day @ SLAC 2003. Mark your calendar for Tuesday, July 15, as this promises to be another fun filled educational and career choice exposure event for our children as well as our many volunteers.

Register in June

Registration for this event is from June 1 to June 27, or until the workshops fill—and they fill fast!

In response to last year's requests, lunch will be included in the day's festivities, and each child will receive a commemorative T-shirt with a very cool design. There will be a charge of $10 per child to cover these items.

Workshops will include: Metrology, Cryogenics, Electronics, Vacuum, Mechanics, Biology, Radiation, Magnetics, Waves and Video Conferencing. Additional features of the day include a welcome from our Director Jonathan Dorfan, a tour of the Fire Station at lunch, an ice cream social and a Science Talk (and booms) with Graham George.

Volunteer escorts are needed and appreciated! Please watch for additional information in your SLAC mail box and on the Web site.

EEOICPA Traveling Resource Center to Visit the Bay Area

The Traveling Resource Center associated with the Energy Employees Occupational Illness Compensation Program Act (EEOICPA) will be visiting the Bay Area on:

Monday, June 2, through Thursday, June 5, from 8:30 a.m. to 6:00 p.m. at Sheraton Four Points Hotel, 5115 Hopyard Road, Pleasanton (925) 460-8800

You may drop in or make an appointment by calling toll free 1-866-697-0841 between the hours of 8:30 a.m. and 6:00 p.m. You can also get more information or file a claim through this number.

SLAC and DOE wish to inform you that you may be eligible for this important Federal benefits program.

As a reminder of this program, during the Cold War, workers employed in the nation's atomic weapons program or other programs may have been exposed to radioactive and toxic substances. In 2000, Congress passed The Energy Employees Occupational Illness Compensation Program Act (EEOICPA) to provide assistance to those workers who have become ill as a result of employment at atomic weapon facilities or other facilities. Individuals, or their eligible survivors, who were an employee, contractor, or subcontractor at a DOE facility, such as SLAC, may be eligible for benefits under this Program.

The Program Administered by the Department of Labor

The federal portion of the EEOICPA, administered by the Department of Labor (DOL), was enacted to provide compensation to workers with cancer, beryllium disease, or silicosis. Employees, or their survivors, whose claims are approved may receive a lump-sum payment of $150,000 and medical benefits for the covered illness.

The Program Administered by the Department of Energy

DOE has established independent physician panels of occupational medicine doctors to review whether workplace toxic exposures may have caused or contributed to DOE workers occupational illnesses. If there is an affirmative finding, DOE will assist the worker in filing a claim with the state workers' compensation program. Toxic-related illnesses could include: asbestosis, liver disease, nervous system disorders, non-cancerous respiratory or kidney disease, heavy metal poisoning, certain reproductive disorders or other diseases.

How to Apply or Get More Information

The Departments of Labor and Energy are sponsoring a Traveling Resource Center to help current, retired or former SLAC workers file applications or get more information about the EEOICPA program.

If you have any questions about the Energy Employees Occupational Illness Compensation Act or wish to file an application, please visit the Traveling Resource Center in Pleasanton on the dates and at the location given above.

Contact: Lee Lyon, Human Resources, Ext. 2238, lyon@slac.stanford.edu

MILESTONES

Awards

Quinn, Helen (TH), elected to the National Academy of Sciences, 4/29

Deceased

Mike Mitchell (KLY), April 11, 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/

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Upcoming Events

Mon.-Thurs., May 19-22
Redwood Room
SLAC MEETING
Zach Wolf/Vivian Kirby, SLAC
International Magnetic Measurement Workshop

Mon., May 19, 10 a.m. - 3 p.m.
Orange Room
SLAC SCENARIOS STUDY SEMINAR
Talks on Advanced Two-Beam Accelerator Options followed by Open Discussion
http://www-project.slac.stanford.edu/lc/local/scenario

Mon., May 19, 4 p.m.
SSRL 3rd Floor Conf Room
SSRL SCIENTIFIC SEMINAR
Pascal Balleguier, Bruyeres le Chatel
"A High-Charge and Low-Emittance Photo-Injector-Driven Linac in Bruyeres le Chatel"

Mon, May 19, 4:15 p.m.
Panofsky Auditorium,
(Refreshments-3:45)
SLAC DEPARTMENTAL COLLOQUIUM
Pierre Sokolsky, U of Utah
"Ultra High Energy Cosmic Rays"

Fri., May 23, 12:30 p.m.
Orange Room
SLAC JOINT ASTROPHYSICS/THEORY SEMINAR
(NOTE DAY/TIME/ROOM!)
Alvaro de Rujula, CERN
"Gamma Ray Bursts, An Enigma Being Unraveled"

Wed., May 28, 4:15 p.m.
Orange Room
(Refreshments-4:00 p.m.)
SLAC ASTROPHYSICS SEMINAR
William Craig, LLNL
"Next-Generation Focusing Instruments for High Energy Astrophysics: Technology Development for the Constellation-X Hard X-Ray Telescope"

Mon., June 2, 4:15 p.m.
Panofsky Auditorium,
(Refreshments-3:45)
SLAC DEPARTMENTAL COLLOQUIUM
Su Dong, SLAC
"Prospects of the Measurement of R with Radiative Return at BABAR"

Please send additions to: 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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The Interaction Point is published bi-monthly every first and third Friday. Submissions are due the second and fourth Tuesdays of each month.

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

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