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By Matthew Early Wright

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By Heather Rock-Woods

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By Paul Bloom

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By Matthew Early Wright

The B Factory has been given permission by the Restart Validation Team (RVT) to resume operations after nearly five months of downtime. During this period, the staff has worked hard to ensure that the restart can proceed safely and efficiently.

The B Factory staff has updated many key safety protocols and made several necessary hardware upgrades, according to John Seeman, Head of the Accelerator Department. "Each individual, with their supervisor, has re-examined the safety issues of their workplace," Seeman said. "Many maintenance and construction procedures have been clarified or added to improve the safe operation of the linac, PEP-II and BABAR."

For example, the protocol for replacing worn klystrons has been updated to allow for enhanced safety. Of the nearly 245 klystrons installed in the linac, two to three per month require replacement, making this a relatively routine procedure.

The staff also updated department-level training procedures to grant workers clearance into the linac tunnels. The new training focuses extensively on how to safely enter the tunnels, what safety gear is required and how to conduct various routine maintenance operations.

In all, the RVT identified seven such protocols that required updating. Also, an electrical walkthrough in February identified 44 electrical items that needed fixing or replacing. In the last month, the B Factory staff has been working through this list making the necessary changes.

Tailoring procedures to make them both safe and practical has been the key challenge during this effort, Seeman said. "We can sit in our office and make procedures, but when we get in the tunnel, there are additional constraints," he added. "We have to be totally safe, but we also have to allow people in the field to continue their work."



Shown left to right: Michael Stanek, Sonya Hoobler, Tom Sommer, and Kathleen Donnelly (all AD) in the Control Room. The group has been hard at work over the last month preparing for the restart of PEP-II and the Linac.

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The RVT granted final approval for the restart, with concurrence from the SLAC Director and the DOE site office, on Thursday, March 24 at noon. Since then, the team has been turning on the klystrons and other hardware. After so much downtime, some of the equipment required tuning or minor repairs. Maintenance crews have been working hard to keep up with these repairs, Seeman said.

"Everything is essentially going according to plan," Seeman added. "Everyone is working hard, and we are all looking forward to having full beams and generating collisions for BABAR."

For more information, see: <http://www.slac.stanford.edu/accel/pepII/home.html>

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Director of Global Design Effort Announced at International Linear Collider Workshop

By Heather Rock Woods

The 2005 International Linear Collider Workshop kicked off March 18 by announcing the director for the newly formed Global Design Effort (GDE) for the proposed electron-positron collider.

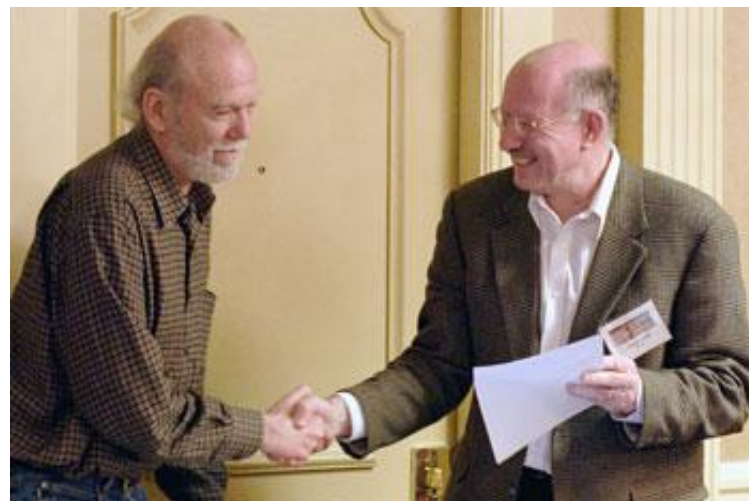
Jonathan Dorfan (DO), in his capacity as the head of the International Committee for Future Accelerators (ICFA), formally offered the job to Barry Barish, a Caltech professor of physics, during his speech welcoming the 370 participants. Barish, scheduled to speak next, accepted the job. He explained that the design effort will be a distributed one, not centralized in one location.

"Why do I feel this is the right approach?" Barish said. "For one thing, we in particle physics know how to work this way. I believe it's the best approach to get the right people involved in the GDE, allowing them to contribute their expertise and capabilities without changing where they live. Although I am an American and I live in America, my job, and the job of the GDE, is to respond to the international ILC community."

The workshop was hosted by SLAC and sponsored by the World Wide Study for future e+e- Linear Colliders. It was the eighth in a series of workshops going back 14 years that have been devoted to the physics and detectors associated with electron-positron linear colliders.

Last year, the workshop took place on the Left Bank of Paris. This year, the conversations occurred in Palo Alto, at Stanford, and on a dinner cruise on the San Francisco Bay.

Barish's appointment is just one of the major steps taken since the Paris meeting last April. Other milestones include: the choice of superconducting (cold) technology, christening the project with the name International Linear Collider (ILC), the first ILC collaboration meeting on accelerator design (in Japan



Barry Barish (Caltech) with SLAC Director Jonathan Dorfan.

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last November), and the initiation of meetings between representatives from international funding agencies to discuss advancing the project.

During the workshop, 15 working groups tackled the nitty-gritty physics and detector issues—from beam polarization and calorimeters to Higgs and supersymmetry searches.

"A lot of detailed work was done in the working group sessions to design the detectors, address the interface between machine and detector, and do the physics calculations to support the detector design and sharpen the physics case for the machine," said local organizing chair JoAnne Hewett (THP).

A new working group made its debut this year. The cosmology connections group is looking at the substantive ways ILC could measure the properties of dark matter. "When you know the properties of dark matter, then you can make comparisons with cosmological observations," Hewett said.

In addition, three major international detector efforts gathered steam at the meeting. The three efforts correspond to different detector concepts rather than different geographical regions.

Dorfan wrapped up the meeting by emphasizing the discovery potential of the ILC. "The scientific terrain is vast and uncharted," he said. "Keep up the pace, keep up the momentum—the scientific imperative is compelling."

ILC physicists had been meeting internationally every 18 months to two years, and each geographical region (Asia, the Americas and Europe) met twice a year. From now on, regional and international meetings will be held annually.

The next stop for the ILC community: Snowmass, Colorado, where a two-week workshop this summer will welcome both the accelerator (machine) community and the detector and physics community.

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ES&H Safety Tip of the Week: Avoiding Slips, Trips and Falls

Slips, trips and falls are among the most common kinds of accidents at SLAC. Even worse, they are among the most common kinds of accidents causing death or disability.

Keep your work area clear—especially aisles, walkways and stairs. Make sure that stairs, ladders and guardrails are in good condition. Wear sensible shoes with nonskid soles and flat heels, and be especially careful around wet or slippery surfaces.

Most important, pay attention. Check the areas you are entering. Look for hazards. Keep your mind on what you are doing and where you are going. That's the best way to maintain your balance and your safety.

For more information take Course 293, Stairway and Ladder Safety, or Course 294, Walking and Working Surfaces. If you have any questions call the Safety Service Desk at Ext. 4554.



Remember to pay attention to your surroundings. The SLAC site has many sloped walkways that can lead to slips, trips and falls.

Photo by Diana Rogers

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SSRL Research Reveals Hidden World of CoWs

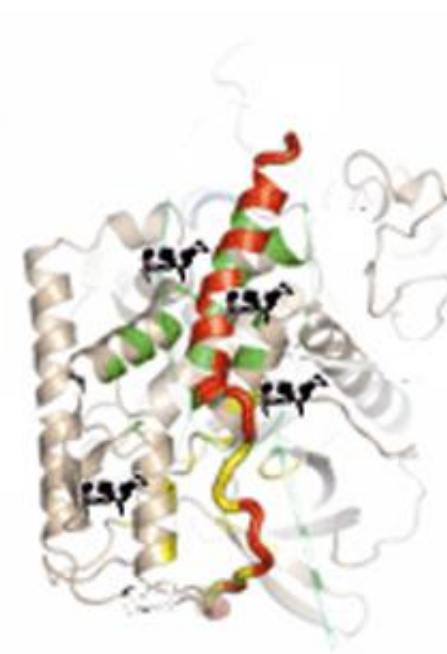
By Heather Rock Woods

Researchers from the Scottish highlands using the PXYZ technique at SSRL have made the startling discovery that a cobalt-tungsten (CoW) alloy contains a resonant lattice of miniature bovine forms.

"It's a surprising, yet strangely fitting, result," said Donaldson MacDonald, professor of chemistry and animal husbandry at Methodist Occupational Occident University (MOO U). "This is the first finding of mature bovine forms in a solid of less than 500 pounds."

The MOO U team is booking more beam time at SSRL to answer further questions. "We still want to know: how did they get in there, and what do they subsist on?" MacDonald said by phone from his Campbeltown farm and research headquarters, EIEIO.

The answers promise to expand the horizons of science and revolutionize the dairy industry, giving ice cream... APRIL FOOLS!



The CoW alloy clearly shows bovine forms.

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Important Changes in SLAC Safety Training

By Paul Bloom

With everyone's employee training assessment (ETA) due for update each year by May 1, around this time the ES&H Training team announces changes in the program. And there have been more than usual this year, especially in the last six months.

One change most of you are aware of is that **Electrical Safety for Non-electrical Workers (Course 239)** has become mandatory for most SLAC workers. This is one example of how the new electrical safety programs are impacting our work at SLAC.

In addition, we are initiating a non-employee safety training program (NESTP). This will impact contracted parties as well as users and students. Under this program, all non-employees will also be required to have an annual training assessment. Since the ETA no longer applies to just employees, the name is changing to the SLAC Training Assessment (STA) to better reflect the growing role of this tool.

The highlights of the 2005 STA are:

- The ETA gets a new name—SLAC Training Assessment (STA).
- Enhancements to the electrical safety training program, including:

Course 239—Electrical Safety for Non-electrical Workers. The name has been changed to General Electrical Safety and is mandatory for all who work at the Lab for more than 60 days in a year and/or work unescorted in industrial areas. There is a refresher requirement every 36 months.

Course 136—Lock and Tag for Affected Employees is now a prerequisite for **Course 157—Lock and Tag for the Control of Hazardous Energy**. Course 136 will not require refresher training and will be offered by computer-based training only.

Course 157 will continue to require refresher training every 36 months and will be offered by classroom only.

Course 251—Electrical Safety for Research and Development. We are now offering this as a seven-part, computer-based course that you can take at your desktop.

For more information on these and all the new changes to SLAC safety training see:

<http://www-group.slac.stanford.edu/esh/training/eta/changes.html>

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On-line Registration

Another exciting change beginning March 31 is a new on-line registration tool. This will eventually be a one-stop shop for all SLAC training, showing your STA information and the course catalog. It will allow you to manage training outside of the listed training curriculum, including recording what courses you have taken and handling payments and reimbursements for training and conferences.

For more information on the registration tool, see:

https://www-internal.slac.stanford.edu/ps_training_db/reg_tool_promo.htm

Updating Your STA

The STA, at https://www-internal.slac.stanford.edu/esh-db/training/slaonly/bin/ETA_ReportAll.asp?opt=6, is intuitive to use and easy to complete, especially since we have streamlined the process. It should take only a few minutes to fill out.

Remember, decisions regarding training should be made using results from the job hazard analysis and mitigation (JHAM) process, which by now you should be familiar with, along with the environmental controls in your area.

Use the Course Catalog

If you have additional questions about what courses are appropriate for your employees, please use our updated course catalog (https://www-internal.slac.stanford.edu/esh-db/training/slaonly/bin/catalog_index.asp). The catalog answers such questions as who should attend a course, prerequisites, refresher training requirements and options for taking the course (classroom, computer, etc).

Everyone who works at SLAC is required to have an updated STA. It is the responsibility of the supervisor or, in the case of non-employees, the SLAC contact, to ensure that a STA is current for their reports and that the identified training is completed.

Thank you for helping us all work more safely and productively in 2005.

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Nominate Someone for an Employee Recognition Award

By Carmella Huser

It's time to let your co-workers know that you appreciate them for being nice people and for making SLAC a better place to work. You can do that by nominating someone for SLAC's 5th Annual Employee Recognition Awards. The deadline for nominations is Friday, April 8.

Employee Recognition Awards are presented annually to members of the SLAC community who demonstrate good citizenship by promoting a positive, respectful and harmonious work environment. This year, the award is open to all members of the SLAC community. Individuals selected for the award earn the prestigious and coveted 'Globie' (SLAC's version of an Oscar), a Certificate of Recognition, a luncheon at the Stanford Faculty Club, a recognition letter in the employee's personnel file and his/her picture on the Wall of Fame in the A&E Bldg.

It's easy to nominate someone. Simply fill out the online nomination form (<https://www-internal.slac.stanford.edu/hr/er/eap/empaward.html>), or use the paper form you received via SLAC mail. You may nominate up to three people, using a separate form for each. Nominations must be signed, but your name will be kept confidential.

Don't miss this opportunity to recognize the good citizens at SLAC.



Carmella Huser (HR) displays a Globie at the 2004 award ceremony.

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Service Awards

5 Years

Healy, John (CEF), 4/3
Kubler, Kristina (AD), 4/3
Mayfield, Christopher (ASD), 4/3
Van Campen, Douglas (ESRD), 4/1

15 Years

Bong, Eric (ESD), 4/9
Cervantes, Teresa (HR), 4/1

Retirements

Dick, Billy (RP), 2/28
Scott, Joan (PUR), 3/07
Sorenson, Martin (AO), 2/28

Deceased

Barker, Clyde (ESD), passed away at the age of 56 on March 28, 2005

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

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

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Erbschloe from Office of Science Visits SLAC



Donald Erbschloe (shown second from left), nominated as the new Chief Operating Officer for DOE's Office of Science, toured the Lab recently. He is shown in the Klystron Gallery Visitors Alcove room, with (left to right) John Seeman (AD), Bob Wunderlich (DOE) and Neil Calder (COM).

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An Early X-ray Pioneer Finally Gets Her Due

By Heather Rock Woods

In 1952, Rosalind Franklin (King's College London) made key images of DNA that contributed to the discovery of the double helix structure of DNA by James Watson and Francis Crick. The two men received the 1962 Nobel Prize, but they gave no credit to her pivotal images and data—which they had seen without her permission or knowledge.

The speaker at last month's Women's Interchange at SLAC (WIS) celebrated Franklin's crucial role in one of the most significant scientific triumphs in the last century. Lynne Osman Elkin, Professor Emeritus of Biological Sciences at CSU East Bay, is writing a biography on Franklin. Elkin has also appeared in a NOVA documentary on Franklin's work (which WIS aired on March 14) and published an article on her in Physics Today in March 2003 (<http://www.aip.org/pt/vol-56/iss-3/p42.html>).

Franklin was a British chemist, an x-ray diffraction expert, and a superb experimentalist. "From 1953 to 1968 she was essentially written out of DNA history," Elkin said.

Her reappearance in the DNA chronicles—in Watson's 1968 book *The Double Helix*, 10 years after her death—didn't do her justice.

"According to Watson's book, she is an obnoxious assistant who gets data, won't give it to her boss, holds up the progress of science and is incompetent at interpreting her own data. That's their rational for appropriating her data," Elkin said.

It ultimately took the combined efforts of many theoretical and experimental scientists to solve the structure. The structural arrangement of DNA was a great puzzle: how could such a seemingly simple molecule, made up of just four different types of



Lynne Osman Elkin, foreground, (CSU, East Bay) gave the March WIS seminar on the pivotal DNA x-ray crystallography work done by Rosalind Franklin.

Photo by Diana Rogers

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nucleotides, encode all the directions to tell living things to grow and reproduce?

Franklin's work shares the same underlying principals as the protein crystallography work now done at SSRL. Proteins, and occasionally DNA, are crystallized to make x-ray diffraction patterns that reveal the structure of large, intricate molecules.

"She was a pioneer in crystallography," said Ana Gonzalez (ESRD). "The kind of analysis she used is still routinely used today to find heavy atoms in proteins and in DNA."

SSRL has been a modern pioneer in crystallography methods, and allocates more than a fifth of its beam time to crystallography studies—which play an important role in drug design. "A big difference today is we have much better x-ray sources," Gonzalez said. "There are differences in the diffraction by proteins, which form well-ordered crystals so you get sharp spots, and the diffraction by DNA, which is more like blobs."

Half a century ago, making x-ray diffraction patterns of DNA was very difficult, but Franklin was experienced, and a perfectionist. According to Elkin, Franklin spent so much time aligning the x-ray beam perfectly to her samples that it may have contributed to her early death from ovarian cancer at age 37.

Franklin came to King's College in London in 1951, just seven years after the first clear proof that DNA was the genetic material of life. Relations between Franklin and her new colleague, Maurice Wilkins, got off to a bad start when the head of the lab betrayed Wilkins by giving his project to Franklin.

"They couldn't stand each other," Elkin said. "They had diametrically opposite personalities (she was prickly, he was shy), and the head of the lab was a disastrous interpersonal manager."

Wilkins shared the 1962 Nobel for confirming the structure with his x-ray studies between 1953 and 1959. But before the discovery and confirmation, he shared Franklin's unpublished data and images with Watson and Crick without her knowledge.

In 1952, Franklin prepared DNA fibers and directed her graduate student, Raymond Gosling, to make a diffraction image of the fibers—the famous Photo 51. The image's X pattern was evidence of a helix, and contained vital information on the distance between atoms and the distance between the repeating pattern of the molecule (DNA's two strands are like the banisters on a spiral staircase). At the end of the year she wrote up much of her new data and analysis in an internal report.

Wilkins showed Photo 51 to Watson and Crick at the end of January 1953 and told them about the internal report, which they managed to acquire through their contacts. "In January 1953, where were Watson and Crick without her data? Nowhere," said Elkin. "At the same time, she was very close to the solution."

In fact, Elkin said, Crick later estimated Franklin was herself three weeks to three months away from solving the structure of DNA. Her data, combined with strong theoretical suggestions from their colleague Jerry Donohue, made possible Watson and Crick's correct model in early March 1953. In their Nobel speeches four years after Franklin died, neither Watson nor Crick mentioned her, while Wilkins succinctly

acknowledged that she made "valuable contributions." Elkin wants to show the world how truly valuable these contributions were. She is striving to clarify and bring due recognition to Franklin's essential part in the brilliant illumination of the elegant structure of DNA.

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SLAC Features Physics for Campus Community

By Nina Adelman Stolar

Bring your friends and family to Stanford Community Day to explore programs and exhibits including Arts, Culture and Music, Athletics, Health, Science and Research. Events range from faculty lectures to children's activities, centered around Serra Mall (near the top of the Oval) at the Stanford campus from 10 a.m. to 4 p.m. on Sunday, April 10.

Quantum Universe Exhibit Unveiled

Please join us in introducing our scientific research to the community. Modern-day Einsteins are still needed to be on hand to answer questions and conduct scientific demonstrations throughout the day for children of all ages. Look for us on the lawn area in front of Hoover Tower.

Highlighting the SLAC program, the Quantum Universe exhibit (<http://interactions.org/quantumuniverse/>) provides a preview of a revolution in 21st century particle physics. The exhibit describes a quantum leap in our understanding of the mystery and beauty of the universe.

Celebrating the World Year of Physics

Four Stanford physics professors will debate 'The Greatest Achievement in Physics During the Last Century.' Participants in the panel are Robert Byer (Hansen Experimental Physics Laboratory and Applied Physics), Andrei Linde (Physics); Nobel Laureate Douglas Osheroff (Physics) and Past APS President Helen Quinn (THP). They will present and defend what he/she believes to be the greatest physics achievement.

For the Community Day schedule and activities, see:
<http://www.stanford.edu/dept/news/neighbors/communityday/>

For additional details, see: <http://www.slac.stanford.edu/grp/pao/slaonly.sucomday05.html>

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Supervisor Training Certificates Awarded

You may recognize some of your colleagues at the most recent graduation ceremony for the Certificate in Supervision Program. The next series began March 31. The nine-class training program is designed to teach effective leadership skills to meet the demands of the Laboratory.

The graduating class for this series included representatives from throughout the Lab (listed in alphabetical order):

Perry Anthony (CEF), Nicholas Arias (ILC), Henry Atilas (MD), Leslie Bachant (CEF), Mer Baldoza (ESD), Aaron Bator (KM), Pete Budrunas (CEF), Kingston Chan (CEF), Ambrose Chu (SCS), Wesley Craddock (CEF), Markus Cristinziani (EC), Raimond Cuadrado (CEF), Nancy D'Amico (HR), Thomas Eriksson (ESRD), Louis Fernandez (ESD), Jo Beth Folger (LCLS), Richard Gonzales (KLY), Ana Gonzalez (ESRD), Patrick Grygutis (CEF), Roger Jurgensen (ESD), Glen Kerr (ESRD), George Kuraitis (CEF), Charlotte Los Banos (CEF), Stephen Lowe (ESD), Chris Mayfield (ASD), Scott McPhillips (ESRD), Judy Meo (EE/EG), Eleanor Mitchell (DO), Daphne Mitchell (BSD), Sharon Oden (KM), Chris Ramirez (ASD), Robert Reek (SHA), George Sandoval (CEF), Ronald Scholz (ESD), Joan Scott (PUR), Linda Sewell (KLY), Victoria Sha (TIS), Knut Skarpaas (REG), Nina Stolar (PAO), Von Taylor (KLY), Ruth Thomas (BSD), EunJoo Thompson (CEF), Richard Torres (CEF), Ann Trautwein (ASD), Cecilio Vazquez (KLY), John Weisskopf (SCS), Larissa Williams (KM), Araceli Zapata (CEF).



For complete details, see: <http://www-group.slac.stanford.edu/hr/t/supervision.html>

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Tsunami Disaster Relief Fundraising Luncheon

Indian Food and Dance Celebration

Friday, April 8, At Noon
SLAC Computing Services
Bldg. 50 Picnic Area

Tickets \$15 (\$10 food, \$5 donation)

Please purchase your ticket by
Tuesday, April 5 from: Michelle Steger,
Neil Adams, David Saenz, Yo
Wackerman, Katherine Bellevin,
Garima Srivastava, Barbara Mason or
Fran Spiller

Sponsored by DRAS
Disaster Relief at SLAC
<http://www.draslac.org>

DRAS Writes First Check for Tsunami Relief



DRAS officers Ziba Mahdavi (shown left, BSD) and Teresa Troxel (shown right, ESRD) are shown giving the first check in the amount of \$2,000 to Kay Ganapathi (MFD), center. The funds will go to the Chinmaya Mission in India, which is spearheading the effort to rebuild schools that were wiped out in the devastating tsunami last December.

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Winter Closure and Running Schedule

As has been the case in the past, SLAC will shut down over the winter holiday period. This year we will shutdown for 12 days from December 22 until January 3. This will require staff to use four days of vacation, PTO or leave without salary to cover the total time off.

In contrast to the last few years, however, the Laboratory has made the decision to run both SPEAR3 and PEP II/BABAR during the shutdown in order to maximize the science. This means that some employees closely associated with the running of the two machines will be required to work during the shutdown. At this time, the exact schedules are unknown, but SPEAR3 will probably run throughout the period except on the designated holidays; PEP II/BABAR is likely to run every day throughout the winter break.

More details on the shutdown and the running schedules will be forthcoming in the early fall or as soon as we are more certain of the facts.

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

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The Interaction Point

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