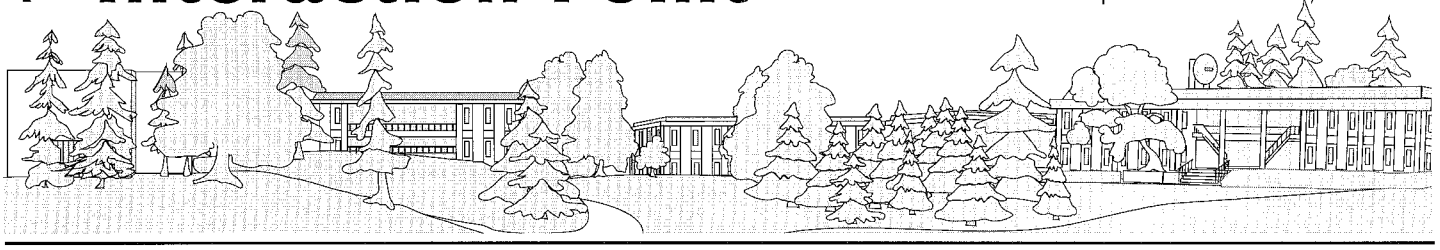
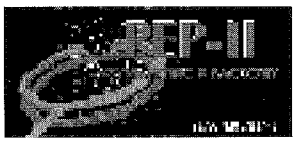
The Interaction Point

Events and Happenings
in the SLAC Community
April 1998 Vol 9, No. 3

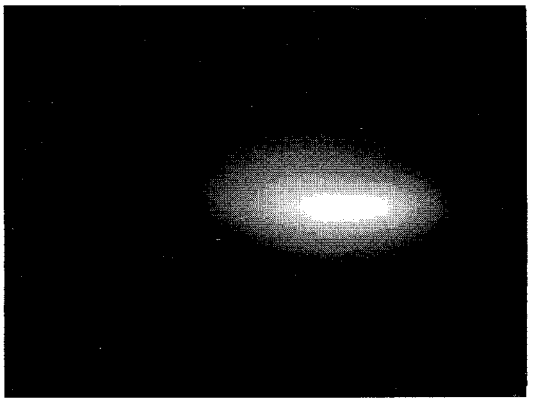


PEP-II Record-Setting January Run



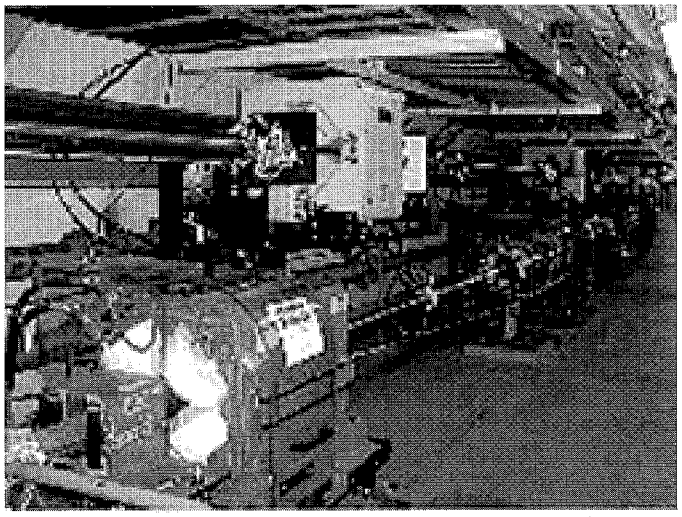
WHAT A RUN! It started after the holiday shutdown and ended the evening of January 31, setting new performance levels for PEP-II. There were 0.75 amperes (A) of stored beam in the High Energy Ring (HER) and a first beam to the Low Energy Ring (LER). This record setting run was the accomplishment of many people.

Thanks to David Schultz and the injection group, the positron and electron beams required for injection were quickly established. These beams were extracted from Sector 4 and Sector 10, respectively, in the linac and brought down the bypass lines to the PEP-II rings. We got PEP-II injection concurrent with the SLC/SLD colliding beam run going on.

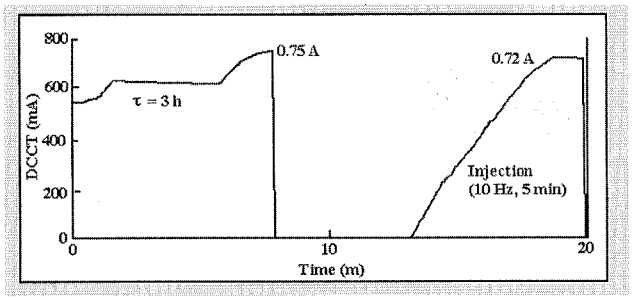


(Photos by PEP-II Project)

Synchrotron Radiation Beam Profile in the HER



LER (above) and HER (below) straight section tunnel view.



Record stored beam (0.75 A) in the HER, January 31, 1998.

The rf group under Heinz Schwarz, Matt Allen, and Paul Corredoura commissioned the five HER rf stations including the low level feedback systems. These stations all ran at full voltage and with full feedback working. How did they feel about this achievement? "Very satisfied," said the RF team.

The HER run led by Uli Weinands was a combination of magnet lattice work and high current running. The HER reached 0.23 A on January 11 after initial turn on (restoring our configuration from the September run). By January 22 a beam current of 0.41 A was stored following work on the transverse feedback system by Walter Barry and John Corlett (both from LBNL), and commissioning of the rf low level feedback. This high current was achieved with an injection rate of 1 pulse per second and an injection efficiency near 100%.

More achievements were reached on January 24 when a current of 0.55 A was stored. In the busy last shift of January the ring commissioners were able to push the beam current to 0.65 A with 1600 bunches and 0.75 A with 1222 bunches. This charge is sufficient to reach the design luminosity with the present 1.5 cm interaction region optics. Up to 0.5 A the

(continued on Page 4)

Work on Joint Linear Collider Optimization

JOINT EFFORTS TO OPTIMIZE the design of a SLAC/KEK linear col-lider moved into high gear, according to scientists who spent the last week of January in intense discussions about detailed aspects of the future machine.

Co-chaired by KEK's Nobu Toge and SLAC's David Burke, the first meeting of the International Study Group (ISG) began to identify overall design strategies and options for a TeV-scale collider based on room-temperature rf technologies.

Four working groups were created and respectively charged with reviewing overall parameters, injectors, the main linacs, and modeling of high-power rf systems including X-band pulse compression systems and klystrons.

With over fifty physicists and engineers working together, excellent progress was made. In contrast to earlier linear collider collaborative workshops between KEK and SLAC, participants at the ISG meeting were able to start from much closer parameters and could plunge into significantly more detailed aspects of their joint design. As an example, the work on the X-band accelerator structure (of which close to 10,000 might be needed), included discussions on design, machining tolerances, deburring of the cells, diffusion bonding and exacting cleanliness conditions during assembly. Similarly, the groups working on the injector chain (lower frequency linacs and damping rings) and on rf modeling made significant advances in bringing their designs and computer codes closer together and defining tasks ahead.

Joint assignments are now underway for all four working groups in preparation for the next ISG meeting to be held at KEK in early summer.

-Gregory A. Loew

SLAC T-Shirts at Bookstore

THOSE WHO MISSED THE SLAC sale of T-shirts, caps and coffee mugs can still get SLAC merchandise at the Campus Bookstore. The next on-site sale will be held in the Fall with a new line of merchandise and new art work.

Key Managers Explained

BACK IN 1991 A group called Key Managers was formed as a networking and communications mechanism for middle management. The starting group of 30 people soon grew to 60. With the increase in size, the original purpose of multi-level communication became difficult to achieve.

In its 1998 incarnation, Key Manager meetings provide time for networking, information from the Director and technical presentations. Members of the group are asked to disseminate information from the Key Manager meetings back to their departments.

What the group cannot do, by virtue of its size and public nature, is have substantive discussions on management issues. When such issues arise, they are delegated to smaller groups with a more focused agenda.

The agenda for the Key Manager meeting is developed by the Steering Committee with additions from the Associate Directors. The Steering Committee consists of representatives from each division, who serve a fixed term on the committee. Current members of the Steering Committee are Ed Garwin (Research Division); Robert Ruland (Technical Division); Bob Todaro (BSD); Herman Winick (SSRL); Stan Ecklund (B Factory); and P.A. Moore (Director's Office). The Key Manager Steering Committee can also recommend new members and submit recommendations to Associate Directors for approval.

Meetings are held the second Tuesday of each month as long as there is no conflict with a major conference or other large event. If you want to know who your key manager is, ask the member of the Steering Committee for your division or contact P.A. Moore, x 2605.

Public Comment Invited

SLAC PARTICIPATES IN A local environmental group called Coordinated Resource Management and Planning (CRMP). This group is holding a public meeting on April 16 at 3pm at the Peninsula Conservation Center, 3921 E. Bayshore Road in Palo Alto to present a report describing and evaluating remedial alternatives for an underground storage tank at SLAC which previously held solvents. The period for public comment is April 16 - June 5. Contact the Environmental Protection and Restoration Department at x3019 to review the reports.

Money for Trash

HERE ARE SOME FREQUENTLY asked questions about SLAC's recycling program.

Does SLAC obtain a rebate for recycled materials?

Yes, SLAC will receive 50 percent of the subcontractor's market value for recycled material. Corrugated Cardboard and White Paper will yield the highest returns. Mixed Paper and Newspaper will yield lower returns. Beverage container returns are currently in negotiation. As an example, White Paper is currently valued at $115 per ton and Mixed Paper is valued at $15 per ton, both before the 50% split with the subcontractor. Do what's practical to separate the different types of paper. White paper that is free of colored paper provides a higher payback. It is devalued to Mixed Paper if contaminated. So be careful with the White Paper container and err to the Mixed Paper container if you aren't sure where to recycle certain papers. Newspaper is best recycled in the Newspaper container, not the Mixed Paper container.

What does one do to recycle a large quantity of material?

Large quantities can be handled in a number of ways. For example, if you have a large quantity of paper that may overflow the containers, consider holding some material for a week or try some other nearby containers. If you have a large quantity of material because of a special project, an office clean-out, or a special occasion, please call Facilities at x2207 to obtain a temporary container or bin.

What do we do with cardboard?

If it's corrugated cardboard (identified by three layers of cardboard with the middle one grooved), this material should be deposited in a "Cardboard Only" dumpster. Check with your Building Manager to identify how corrugated cardboard can be handled in your building. Other types of cardboard, usually called paperboard (looks like the same material used for cereal boxes or for boxes that store office paper) should be recycled as Mixed Paper.

Additional information on separation of materials is provided on the web at:
http://www.slac.stanford.edu/esh/recycle/.

–Richard Cellamare

Centralized Lost & Found System

SLAC IS IMPLEMENTING a more centralized lost and found system under the auspices of the Security Office. Here is how the process will work:
If you find property, you can:

- Take it to the Security Operations Office in Trailer #205/206; or
- Give it to any Security Officer at any of the gates; or
- Turn it over to any Security Patrol Officer.

You may also call x2551, and a Security Officer will be dispatched to pick the item up. The person finding the item will get a receipt from Security. A brief description of how or where the item was found will be needed in order to assist in the process.

Found property will then be locked up at Security and retained for a claimant, if any. The senior Security Officer on site will be the only one with access to the locked container and can be reached by calling x2551. There is a Senior Officer on-site 24 hours per day, 365 days a year. If you have lost something, call Security and describe the item. If there is a match between what was lost and what was found, then the item will be released.

Once a quarter, a list of items found, i.e., two rings, seven pair of glasses, one set of keys, etc., will be prepared and published. After one year in storage, items not claimed will be turned over to the Stanford University Department of Public Safety for disposal in accordance with University policy and State law.

If there are questions or comments on the process, feel free to call the Head of Security, Rick Yeager, x5333.

Work Safe, Work Smart

An incident ocurred on 2/16/98 that involved days away from work, according to Sharon Haynes, Workers' Compensation Coordinator. The last claim involving days away from work occurred on 1/26/98. The number of calendar days between claims was 21 days. SLAC's record numer of days between claims is 150 days.

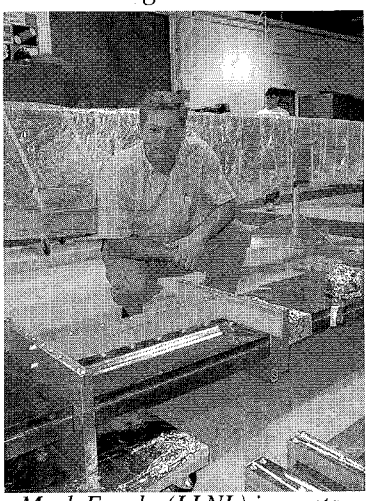
beam was completely stable, but above that level it had some small longitudinal jitter which can be cured during the next commissioning run.

First stored LER beam January 7, 1998.

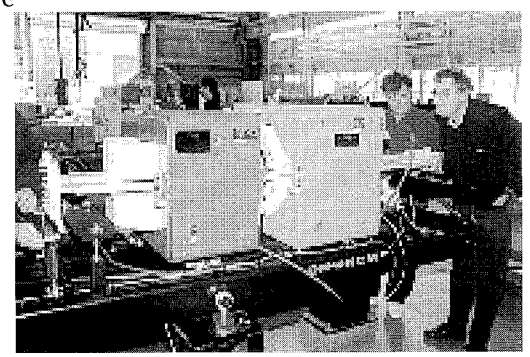
A Cool Vacuum System

These high current beam tests place a lot of synchrotron radiation power onto the vacuum chambers. Through careful design and construction, the vacuum system has proved very cool, so far. The copper vacuum chambers in the ring arcs increase about 20 degrees F, about as expected, and the fragile bellows modules increase only about 2 degrees F. Congratulations to the vacuum group led by Lowell Klaisner, Leo Giannini, Jim Davis, and Dave Bostic for these achievements.

To diagnose the longitudinal beam stability, we relied on the longitudinal feedback group under John Fox and Dmitry Teytelman. They took lots of helpful data on the "beam oscillation modes" as measured by the digital feedback hardware.



Mark Franks (LLNL) inspects LER Wiggler Chambers.



(l-r) Kurt Kennedy and Francis Younger (LBNL) inspect the LER magnets.

Tom Mattison and the Background Commissioning Group conducted many x-ray and lost particle studies. A new energy collimator in the HER was tested successfully and the background study data are still being analyzed.

During the previous run in September, the magnet focusing optics around the ring were a little off. James Safranek and Martin Donald suggested fixing these optics by changing the interaction region quadrupole strengths (less than a percent). These optics measurements and corrections were facilitated by a new "1000 turn" position monitor system and computer program written by Mike Zelazny, Linda Hendrickson, Tony Gromme, and Tom Himel.

Also commissioned successfully was the current monitor for each bunch made by Jim Hinkson and Mike Chen (both from LBNL), and the injection controller from Ron Chestnut. Precise injection patterns to fill the desired 1658 bunches to the correct intensity can now be made.

The HER synchrotron light monitor with Alan Fisher, Ralph Assmann, and others was recommissioned and a camera was used to observe longitudinal bunch motion over the train of 1600 bunches. Several very interesting scans were made showing bunch motion with varying bunch filling patterns.

LER Accomplishments

While all of the above work was done on the high-energy ring, there was also work being done on the LER. Installation of the LER injection line was completed in December by the team lead by Patrick Smith. The LER ring installation of the first 90 m was also finished in December by Tom Taylor, Bill Wagner, Al Mixon, Ron Yourd (LBNL), Tom Elioff (LBNL) and crews and included part of the injection straight section and the first three arc bending magnets.

A team led by Michael Zisman (LBNL), Robin Gray, Paul Bellomo, and Dave Macnair energized the magnets in this region and checked the diagnostics. A beam of positrons was passed through the line on January 9 and was visible on a screen located on the temporary beam dump at the end of the line. Finally, the beam energy was set to the desired 3.1 GeV. This marked the first beam to the low-energy ring!

(continued on Page 6)

Siemann named Editor

BOB SIEMANN, ARD-B Dept. Head, has been named editor of a new peer-reviewed electronic journal: *Physical Review Special Topics - Accelerators and Beams*. "We will handle all aspects of production electronically, from submittal through refereeing and copy editing, to production and distribution," said Siemann, "which ought to make the system run more quickly and efficiently."

The new journal will cover the full range of accelerator science and technology: subsystem and component technologies; beam dynamics; applications of accelerators; and design, operation, and improvement of accelerators used in science and industry. Contents will include high energy and nuclear physics, synchrotron radiation production, spallation neutron sources, medical therapy, and intense beam applications, among others.

Assisting Siemann is an editorial board of eleven experts in all areas of accelerator physics and technology from around the world.

The American Physical Society will ensure the continued availability of the electronic archive of these journals through future changes in electronic publishing technology, just as it will do for its other journals. A suite of authoring tools will be made available, and article submissions wil be accepted in a modified REVTeX, and in Microsoft Word. Guidelines for authors and for referees are available electronically through the APS publication's home page (http://publish.aps.org/).

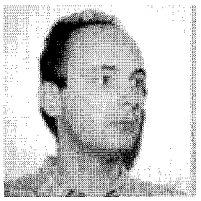
Submittal of papers began March 1, 1998, and the journal will begin publication in April. Instructions for submittal are given on the website listed above.

Angie Seymour will provide the primary administrative suport at SLAC for this effort.

LLNL Area Code Change

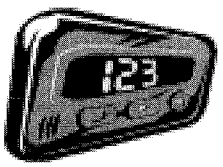
EFFECTIVE IMMEDIATELY, THE TELEPHONE area code for Lawrence Livermore National Laboratory and the city of Livermore is changed to 925. The old 510 area code will be valid until September, after which it will no longer work for Livermore.

SSRL Faculty News



MARTIN GREVEN JOINED THE Faculty of Stanford University, in joint affiliation with the Applied Physics Department and SSRL in January of 1998. He was born and raised in Germany, and received his Vordiplom (equivalent to an AB or BS) in Physics and Mathematics in 1988 from Heidelberg University. In 1995, he received his Ph.D in Physics from the Massachusetts Institute of Technology, where he stayed as a Post Doctoral associate until December 1997. Greven's research interests are in materials physics with an emphasis on advanced single crystal growth, x-ray scattering, and neutron scattering of high-temperature superconductors and materials which exhibit low-dimensional magnetism.

More than just a Pager!



REMEMBER WAY BACK IN August when we got a new area code? And when we changed our cell phones in January? AND when we changed our pagers in March? The next part of the quiz is, "Do you know what your pager can do?" (No, not windows or even Windows.)

One thing you can do with your new pager is to set up a Custom Greeting. There is a web page to help you accomplish this task: http://www2.slac.stanford.edu/comp/telecom/pager/cgreetpager.htm

Since the new pagers are alpha as well as numeric, you can also receive written messages via the SLAC TelAlert System. To use TelAlert, you must have a Unix account and be included in the TelAlert database. TelAlert allows alpha pages up to 256 characters long to be sent from any web browser at SLAC, as well as from any SCS maintained UNIX or VMS computer. See http://www.slac.stanford.edu/grp/scs/net/telalert.html.

Don't have a new pager yet? Fill out the new pager request form at: http://www2.slac.stanford.edu/comp/telecom/pager/Pager-Request.htm. This site contains links to other useful information.

The Interaction Point © 1998, is published by Stanford Linear Accelerator Center. Editor-in-chief, P.A. Moore; Production Editor, Vickee Flynn. Deadline for articles is the first of every month. Items are published on a space-available basis and are subject to edit. Submissions may be sent electronically to *tip@slac.stanford.edu* or by SLAC ID mail to TIP, MS 20. Phone 926-4208.

High-Energy Physics Report Favorable to SLAC

WHERE WILL HIGH-ENERGY physics be in the next ten years? To answer that question, the US Department of Energy asked the High Energy Physics Advisory Panel (HEPAP) to recommend a scenario for "an optimal and balanced program over the next decade." The long-awaited Gilman Subpanel made its report public in February and the recommendations include positive mention of PEP-II and work that SLAC is doing with KEK, Japan's national high-energy physics lab, on the next linear collider.

Over a one-year period, members of the subpanel visited labs, heard many presentations, and digested a great deal of data. Then they had to write a report which summarized not just a national point of view, but a global one, since there were some international projects under consideration.

The report made seven major recommendations to help position the future US physics program.

Effective use of facilities: The Subpanel recommended that funding for the Tevatron collider, PEP-II, and CESR "be at a level that ensures these facilities fulfill their physics potential."

US participation in the LHC at CERN: The Subpanel "strongly endorses the physics goals of the LHC and the US participation in the accelerator project." The report goes on to express "its gratitude to Congress, DOE and NSF for making possible US participation in the LHC."

R&D for a 1 TeV Linear Collider: There was a recommendation that a new facility "at the energy frontier be an integral part of the long-term national high-energy physics program"; that SLAC should continue to work with KEK; and SLAC be authorized to produce a conceptual design report. (See article, Page 2.)

Muon Collider R&D: The Subpanel recommended that "this R&D program be subject to review in about two years" to resolve the question of "whether this machine is feasible to build and operate for exploring the high-energy frontier."

Very Large Hadron Collider R&D: "The Subpanel recommends an expanded program of R&D...subject to additional review in about two years."

Funding for University-Based Research: The status of high-energy physics at universities was "intensively examined" with the recommendation that "the annual DOE operating funds for the university program be ramped up over two years by a total of 10% above inflation."

The report concludes by urging "the Administration, the Congress, and the American people to make possible the opportunities envisioned." Copies of the report are available for reading in the SLAC Library.

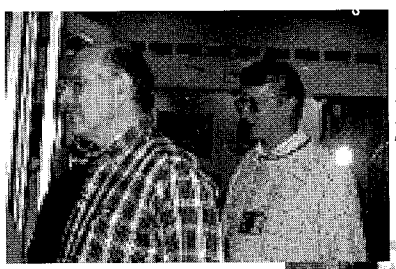
PEP-II Run *(continued from Page 4)*

Celebrations and Speeches

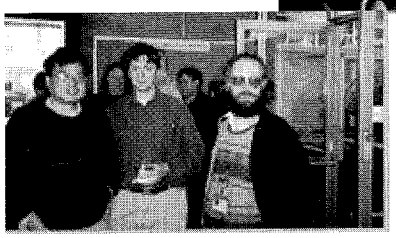
We celebrated the HER high currents and the first beam to the LER on February 12. Project Director Jonathan Dorfan led several others in giving congratulatory speeches, exhorting all of us to finish the LER and the Interaction Region by July. That's when the construction phase of PEP-II will close with the first LER stored beam and with demonstrated beam-beam interactions.

For the future we intend to run a week in May to test the first half turn of the LER and to run the full month of July to store a beam in the LER and to collide this beam with a HER beam for the first time. Collisions will be optimized during a run from October through December. Finally, the BaBar detector will be installed starting in January, with BaBar starting to take high energy physics data in April 1999.

-John Seeman



(l-r) PEP-II Associate Director Jonathan Dorfan, and PEP-II physicist John Seeman.



(Above and left) Various members of the PEP-II project (DOE and SLAC) enjoy the celebration buffet.

Planning a Conference?

IF YOU ARE PLANNING to hold a SLAC sponsored meeting or conference, the Public Affairs Office can provide advice and counsel. Whether your meeting is large or small you can start by looking up conference management including support, facilities use and audio-visual services on the web (www.slac.stanford/grp/pao/pao.html). For assistance with advance meeting or conference planning, take advantage of our professional expertise; make an appointment with Nina Stolar (x2282 or nina@slac.stanford.edu). For on-site meetings, please provide a copy of the agenda with the meeting dates and estimated attendance to the Public Affairs Office staff (MS 70, fax x5379).

To support the high level of activity, we must all make effective use of limited lab resources. Conference and meeting planners may find the following lab resources useful:

To list your activity on the *SLAC Event Calendar*, please send e-mail to nina@slac.stanford.edu. To list a seminar or meeting in the Seminars database (produced as the weekly *Compendium* and posted at www.slac.stanford.edu/grp/pao/seminar.html), please send e-mail to seminars@slac.stanford.edu.

Meeting space at the lab is in very high demand. Review the Meeting Room guidelines (www.slac.stanford.edu/gen/pubinfo/room.html) and call the meeting room contact listed to request the facility you desire.

For audio-visual support, contact Herb McIntye (x4787 or herbert@slac.stanford.edu) to discuss the technical details. An account number is required for all audio-visual technician time. Lead time is required for services to be provided. Audio-visual technicians work on an on-call basis and are not standing by.

For group tours of the laboratory during your activity, please contact Pauline Wethington (x2204 or lean@slac.stanford.edu). As soon as the idea of a tour occurs to you, please call Public Affairs so we can check the availability of facilities and guides to support your event.

The mission of the Public Affairs Office is to provide public access to the laboratory for information and visits with no impact on operations. The internal support provided by Event Services requires your cooperation. State your needs, provide information, and give lead time for the appropriate services that are requested.

-Nina Stolar

Next Project for KEK/SLAC

Pictured above (l-r) are Hirotaka Sugawara and Burton Richter in early February signing a Memorandum of Understanding regarding a new project between SLAC and Koh-Ene-Ken (KEK - the Japanese national high-energy physics laboratory). Scientists at both labs will work toward a common design of an electron-positron linear collider to operate at an initial energy of one trillion electron volts (1 TeV), extendable to 1.5 TeV. See related stories, this issue: HEPAP, *Page 6;* Work on the Joint Linear Collider, *Page 2.*

Springtime Critters

IT'S THE TIME OF year when the days are longer, nights are warmer, and the furry critters come out from their flooded abodes and sniff the springtime air...Splat.

Some get in the path of our automobiles. This is especially true of fawns who aren't yet initiated about the wheeled wonders that share the planet.

Others just get in the way. Prop open a door to smell the flowers, and you might get another scent instead. Expectant mother skunks look for nesting sites in the spring. When Stinky gets inside, it is often difficult to get her out again.

Slithery friends also come out to sunbathe, frequently along the linac. Those who travel that road on a regular basis carry a snake-stick to flip the critters back into the grass out of harm's way.

What's a person to do in the face of all this Nature? Regarding the deer, drive carefully and mind the speed limit. We have a population of about 200 deer on-site over 400 acres. There should be enough room for us all to get along. Animal records are kept by Security when a vehicle is involved and Facilities has to pay for any carcass removals.

Skunks and racoons may be cute, but they are pests and can carry rabies. If your building is in an area where critters live, keep doors closed and dispose of rubbish properly.

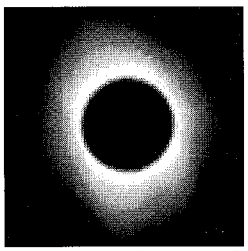
If you find a way to keep the deer and the gophers out of the SLAC veggie gardens, be sure to let us farmers know!

Thrice Eclipsed

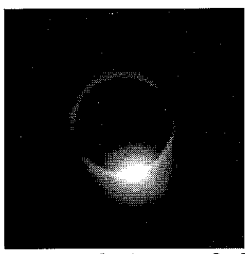
Cherrill Spencer and her family aboard cruise ship during February 1998 eclipse cruise in the Caribbean.

CHERRILL SPENCER, A MAGNET physicist at SLAC, likes to combine travel to warm vacation spots with watching total solar eclipses. Cherrill went eclipse-hunting in Java in 1983, in Hawaii in 1991, and in the Caribbean this past February. How do eclipses compare? "Java was the longest eclipse in 20 years, but both Java and Hawaii had some clouds. Eclipse viewing from a cruise ship increases your chances of clear skies since the ship can move away from cloud cover." While the Caribbean event lasted only 3 minutes and 15 seconds, the cruise lasted a week.

Photos were taken at Guadalupe Passage aboard the cruise ship Monarch of the Seas on February 28, 1998.



Corona taken with 400mm lens at F6.3 with 0.5 sec. exposure.



Diamond ring at 3rd contact.

Welcome Guests and New Employees

The following people joined SLAC as of mid-March: **Lynn Bentson**, Accel Mech; **Antonia Bolton**, PAO; **Alexandr Bukin**, EE; **Axexey Buzykaev**, BaBar; **Francisco Castillo**, PE; **Riamond Cuadrado**, PE; **Gabriela Figueroa**, BaBar; **Sergey Ganzhur**, BaBar; **Brent Johnson**, PE; **Paul McGrath**, BaBar; **Patrick Shen**, EFD; **Le-Xuan Thai**, ES&H; **David Toews**, PE.

FactinOs

Barbarians at the Gate

We'll soon see an influx of researchers for BaBar and housing is still desparately needed for these visitors. Clean out that spare room, send the kids to camp and earn some spare change by hosting our foreign guests. Call SLAC housing at x3111 for more details.

Again?

Yep, traffic made it to one of the top items on the site-wide safety list. Who is that person who is speeding, running stop signs, and causing us all to jump out of the way? Lest we sound like a broken record, a new hazard this year was the complaint about sick people coming back to work too soon and sharing their germs.

Sid Fest

Mark your calendars for July 31 when the Lab, the University, and the world mark the retirement of Professor Sidney Drell, SLAC Deputy Director. Program activities and a registration form can be found on the Web (http://www.slac.stanford.edu/conf/drell98/). Stay tuned for more details.

MayDay Concert

On May 1st we'll have our annual spring concert starring the famous Jamie Davis and Friends. Jamie is back from a European tour of clubs and hot spots, but he wants to let you know that he is still humble enough to play gigs at home.

It's Up to You

Quick! Not a moment to lose. Look at the dates in big letters on your SLAC ID. That's when your safety training expires and it's your job to get recertified every two years.