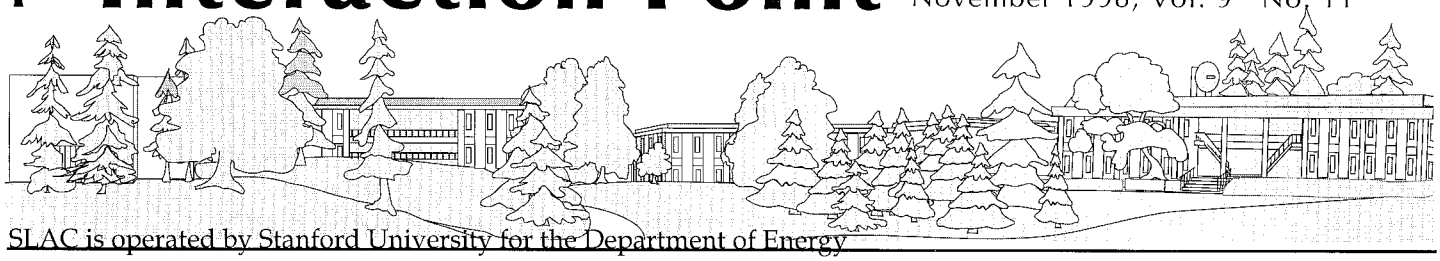
The Interaction Point
Events and Happenings in the SLAC Community
November 1998, Vol. 9 No. 11



SLAC is operated by Stanford University for the Department of Energy

Advisory Group Guides SLAC's Future Direction

WITH OVER 1200 STAFF and 2500 users from around the world, with domestic and international collaborations in place and a budget of about $177 million, SLAC is a major enterprise. Such an enterprise requires strategic planning to chart its future direction. Most laboratories use advisory boards to provide planning assistance. At SLAC, foremost among these advisory groups is the Scientific Policy Committee (SPC). See list at `http://www-ssrl.slac.stanford.edu/SPC.htlm`.

University Trustees appoint the SPC members on the recommendation of the President of the University. The 14 members on the current committee are from domestic and foreign universities and institutions and from the areas of high-energy physics, basic energy sciences and other related fields. There is a subcommittee on environment, health and safety topics.

The SPC meets on-site twice a year, each spring and fall, with the next meeting scheduled for November 6-7. Senior scientists make presentations to the SPC members and over the course of the two days, there is a great deal of discussion about the physics, the priorities and the balance between programs. The focus is on the long-term direction of the Lab and its management.

The SPC has the flexibility to consider any technical matter at the Lab. Sometimes the Committee will initiate topics which it considers to be of concern. At times they might bring up administrative matters that have a direct bearing on the scientific and technical work of the Lab.

Above all, the SPC assures itself that the facilities at SLAC are made available to qualified scientists from other institutions, subject to the quality of the research program. Quality is determined by peer review committees such as the Experimental Program Advisory Committee (EPAC) and the SSRL Peer Review Panel (PRP).

The charge to the review committees is to assess the scientific merit of research proposals and to determine if beam time is to be granted. EPAC is the group that assesses experiments in high-energy physics. While there aren't as many experiments as there have been in the past, the group nonetheless plays an important role, especially in the area of End Station A research. On the other hand, the PRP may have to read hundreds of proposals for beam time at SSRL. Arthur Bienenstock, the previous director of SSRL, is credited with making the PRP the success it is today. According to Herman Winick, "The advisory system operates very effectively and the perceived fairness of the group over the years has prevented many potential problems."

While we are administratively separate from Stanford University, we are academically linked. SLAC's Director, Burton Richter, is also a Dean of the SLAC faculty. There is an academic advisory board which reports to the Stanford Provost.

Finally, two other groups act as important liaisons between Laboratory management and our more than 2500 researchers from around the world. The user groups from high-energy physics and synchrotron radiation routinely make suggestions and recommendations regarding user facilities through their respective executive committees. Each of the groups reports to the SPC once a year on a wide variety of topics such as science, staffing and creature comforts. One year SSRL included the complaints about the coffee and the steps taken to alleviate those complaints!

At the conclusion of each SPC meeting, a written report is sent to the Stanford University President who then informs the Director of the Office of Science (formerly Energy Research) at the Department of Energy.

Laboratory management is not required to take the advice of advisory groups, but the give and take of ideas is invaluable. The Lab, the University and the DOE take SPC recommendations very seriously for the good of the Lab and its staff and users.

–P.A. Moore

Diversity Policy Statement

(The following memorandum was sent recently by Secretary Bill Richardson to all DOE staff.)

THE DEPARTMENT OF ENERGY is dedicated to contributing to the welfare of the Nation by using its extraordinary scientific and technical talent to fuel a competitive economy, improve the environment through waste management and pollution prevention, and reduce nuclear danger.

Creating an atmosphere that fully utilizes the talents and capabilities of a diverse workforce is critical to the achievement of this mission. The Department will have zero tolerance for discrimination or harassment in any form. Discrimination based on race, color, religion, gender, age, national origin, disability or sexual orientation violates the law, as well as the policies of this Department.

Our commitment must extend far beyond simply reducing or preventing discrimination. Diversity means inclusion—hiring, developing, promoting, and retaining employees of all races, ethnic groups, religions, and ages; people with disabilities; and men and women. Through diversity, we gain different points of view and different approaches to problem-solving. We also gain mutual respect and the faith of our diverse citizenry. Diversity and inclusion are the prerequisites to excellence. During my tenure as Secretary, I am committed to ensuring that the Department is a model workplace where everyone has an equal opportunity to serve.

Each manager is responsible for nurturing and capitalizing on the talents that every employee has to give, just as each employee is challenged to give his or her best. We can do this by providing employees with the opportunities, tools and support they need to develop to their fullest potential and contribute productively to the mission of the organization. Helping employees balance work and family needs and providing appropriate accommodations and support systems for individuals with disabilities also contribute to the goal of a model workplace.

Although managers must lead the way in ensuring a talented and diverse workforce, every employee can get involved and participate by valuing the differences and cultures of others through teamwork and helping each other succeed. Working together will not only benefit the individual but also the Department and ultimately the Nation.

I call upon each of you to work with me in making the Department a leader in workforce diversity.

Work Safe, Work Smart

An incident involving days away from work was reported on 9/23/98, according to Sharon Haynes, Worker's Compensation Coordinator. There were 44 calendar days since the last incident on 8/10/98. SLAC's record number of days between claims involving days away from work remains at 150 days.

SSRL Users Pack the Site

WITH THE NUMBER OF overall users at SSRL topping more than 1500, this year's turnout of 250 people for the 25th Users Meeting was larger than in previous years, due in no small part to the excitement around the SPEAR3 upgrade. Conference participants heard the details of the planned construction schedule.

In summarizing the DOE Review back in July, Tom Elioff told the story about Daniel Lehman, who, at the conclusion of the SPEAR 3 Review, put up a blank transparency saying, "Here's our list of action items."

The Users meeting promotes interactions among a diverse set of scientific disciplines that utilize synchrotron radiation. In two days of workshops and seminars, participants heard about materials science, environmental tools, fourth generation light sources and instrumentation developments.

The meeting is also the time when Users elect representatives to the SSRL Users' Organization Executive Committee, which functions as the steering body for the organization.

When You Talk, We Listen!

COMMUNICATIONS ARE DEFINITELY IMPROVING between the Operating Safety Committee and the SLAC community. Many of the Associate Directors are meeting with their OSC divisional representatives to discuss just how those members can best hear the concerns of their whole division and distribute important safety updates as needed.

As a result, new communication methods are being tested. We're posting names and phone extensions of OSC representatives. We're holding periodic meetings with some division managers. All this is to help us achieve the safety goal expressed by the ES&HCC last May: "...to strengthen the existing mechanisms for raising safety issues through the OSC by making people more aware of the Committee and its purpose."

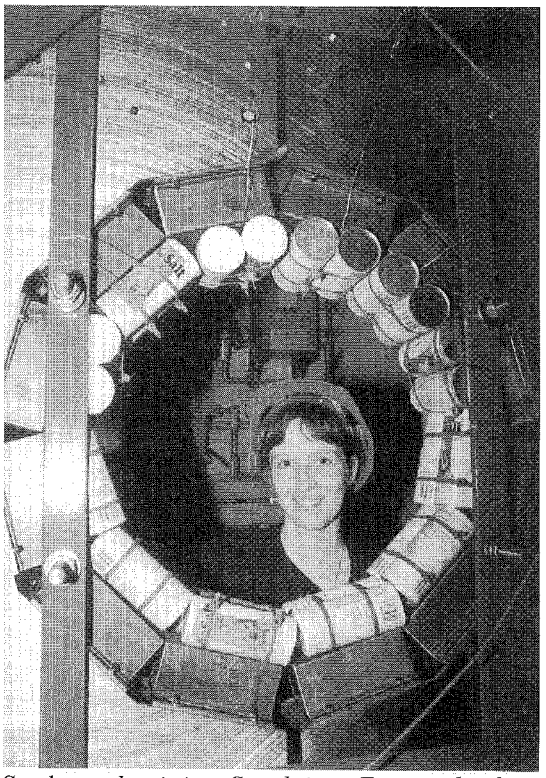
So get a jump on the latest trend by finding out the names of your division's OSC members on the Web at `http://www.slac.stanford.edu/esh/slaconly/oscmem.html`. Call them to introduce yourself and share any concerns or ideas. You can also phone the OSC Chair, Janice Dabney (ext. 3603), for names of your representatives or to offer any thoughts about safety communication efforts.

–J. Dabney

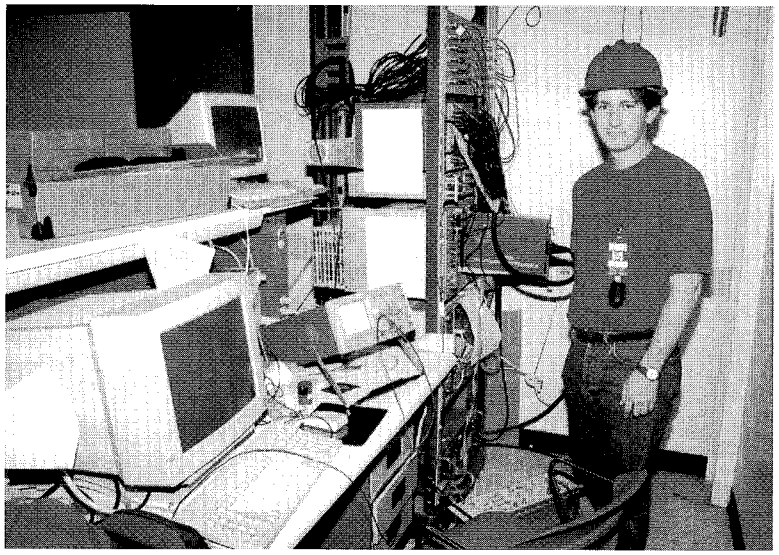
Pass the (No)Salt

IN APRIL 1997, a new particle detector arrived at SLAC, built by groups from the LAPP (Laboratoire d'Annecy-le-Vieux de Physiquedes Particules) and Saclay laboratories in France. The Crystal Ring has 12 crystals of cesium-iodide (CsI) with phototubes and digitizing electronics. It was designed to measure backgrounds at the interaction point of the PEP-II Collider, the future home of the new BaBar detector. The Crystal Ring started taking data as soon as the High Energy Ring of PEP-II had beam, and is in even more active use now that the Low Energy Ring is also running. Sandrine Emery, a postdoc from Saclay, spent over a year at SLAC studying backgrounds from PEP-II with the Crystal Ring under the supervision of SLAC physicist Tom Mattison.

When it is on the beamline, the PEP-II interaction point is in the center of the ring. Visible in several of the photographs are containers of potassium chloride (salt substitute). The Crystal Ring is sufficiently sensitive that the tiny natural radioactivity of potassium provides gamma rays of 1.5 MeV, just right for calibrating the CsI crystals (and available at the local supermarket!).

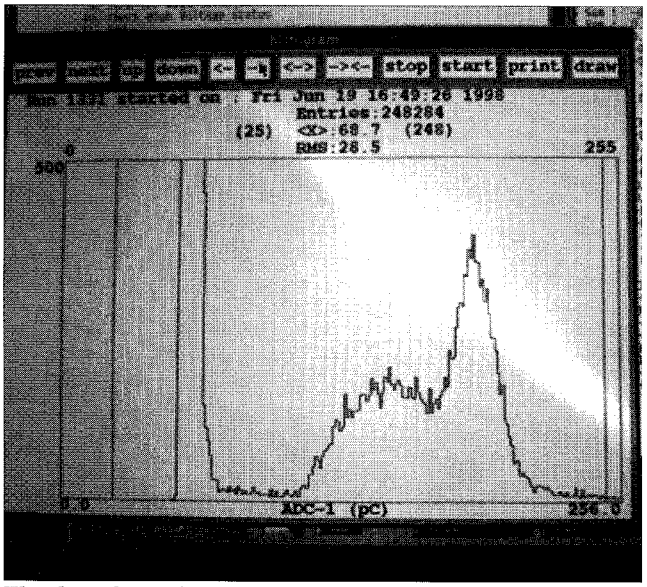


Saclay physicist Sandrine Emery looking through the center of the Crystal Ring detector. The twelve crystals of CsI are inside thin metal covers, and the containers of potassium chloride (salt substitute) are used as a very economical calibration source.



Saclay physicist Gianni De Domenico is standing next to the readout electronics and control computer for the Crystal Ring. All were shipped from France along with the detector.

(l-r) SLAC physicist Tom Mattison and Saclay physicist Sandrine Emery in front of the Crystal Ring detector, before it was lifted over the shielding wall and installed at the PEP-II interaction point.



The data from the Crystal Ring are recorded and plotted on a small Sun workstation provided by Saclay. The data here are with the PEP-II beam off, and show the peak from the 1.5 MeV potassium chloride calibration source.

(Photos courtesy of Ted Fieguth)

Master Substation Upgrade

"WE ARE ANNOUNCING a site-wide power outage for...." and SLAC staff seems to heave a collective groan. Perhaps an explanation about the construction at the Master Substation would help everyone understand why these outages are necessary.

Plant Engineering is in the final stages of rebuilding the main site substation (Master Substation). This project is the culmination of several years of effort, first for funding, and then two years for procurement and construction.

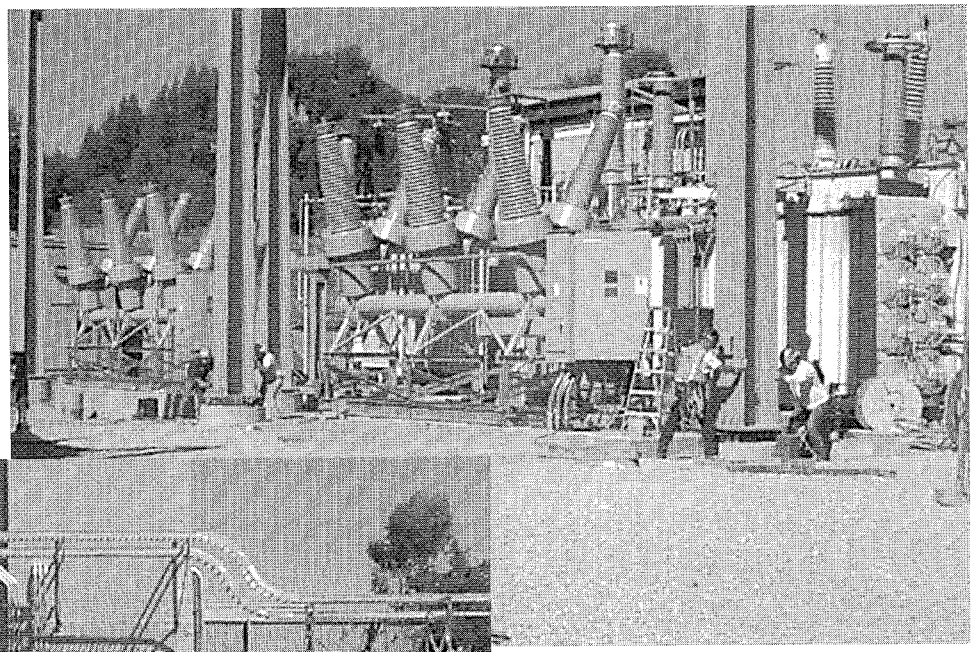
Two sources of power are available at SLAC: the original construction power at 60kV and the primary 230kV source. The Master Substation converts these high voltage sources to 12000 volts (12kV) for distribution throughout the site. Various levels of switching, monitoring and protective devices are required to protect SLAC and PG&E equipment in case of overloads, shorts, lightning strikes and cable failures.

This project is changing the configuration of the entire 12kV distribution system and reconfiguring the outdoor equipment to provide a more flexible system. The former Substation did not allow parallel operation of the two 230kV transformers; this will be the norm when this project is complete. With both transformers sharing the load equally, they will have a very long life and allow maintenance to be performed without interruptions.

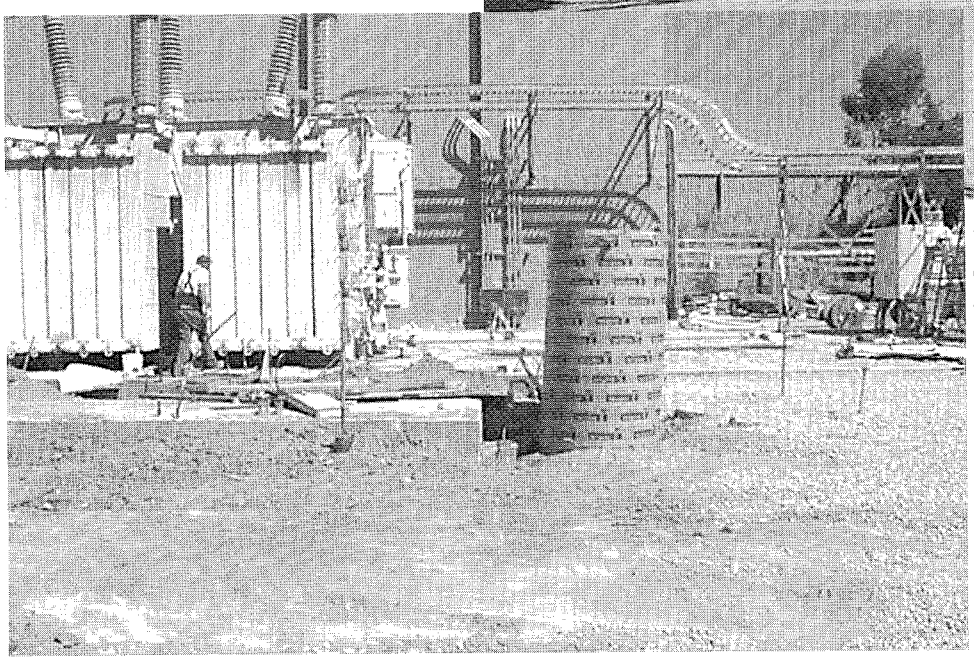
This is a challenging project. We have built a new building over the top of the existing substation and then dismantled the old building from inside. New custom-designed switchgear has been installed in phases allowing us to move distribution cables from one set of switchgear to another without outages. This is possible because all of the recently-installed substations around the site were configured as double-ended units with two sources of power.

El Niño made it difficult to keep on schedule, and lots of the civil construction had to be done in adverse conditions. We also had problems with delivery schedules. Plant Engineering staff have been working 12 hour days and 6 days a week to avoid long site-wide outages and to minimize the delays.

At the end of all this construction, the Master



This view of the installation shows the 230kV circuit breaker, visible between the columns of the metal support structure for the power lines.



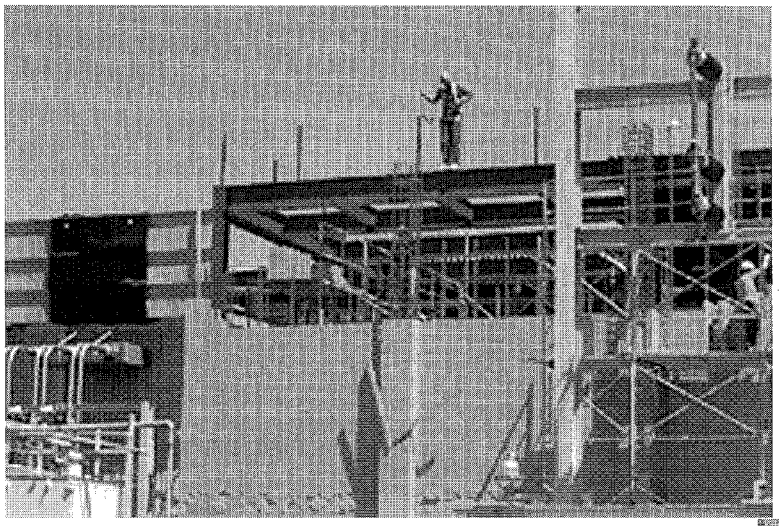
This view shows the relocated 230kV transformer on the south side of Bldg. 016 expansion. The new cable tray (see expanded view on opposite page) is visible in the background.

To Solve Power Outages

Substation will have new metering equipment, new 230kV circuit breakers, new 230kV disconnects, new 60kV disconnect, new 60kV transformer, all new 12kV distribution switchgear, new overhead and underground wiring, new fire protection system, and a new control system. It's safe to say we'll have fewer outages in the future with this upgrade.

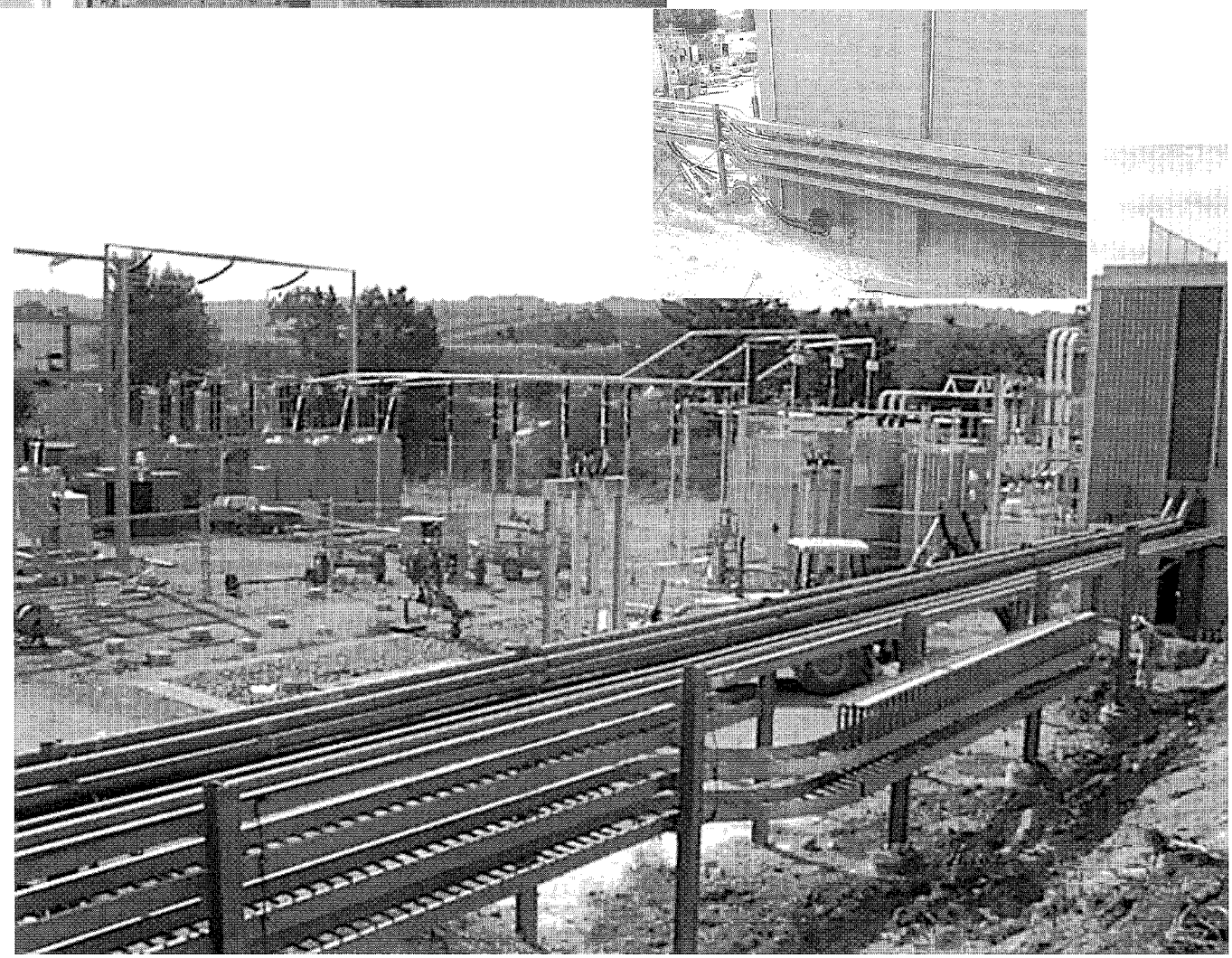
Plant Engineering staff appreciate your patience.

–Burl Skaggs



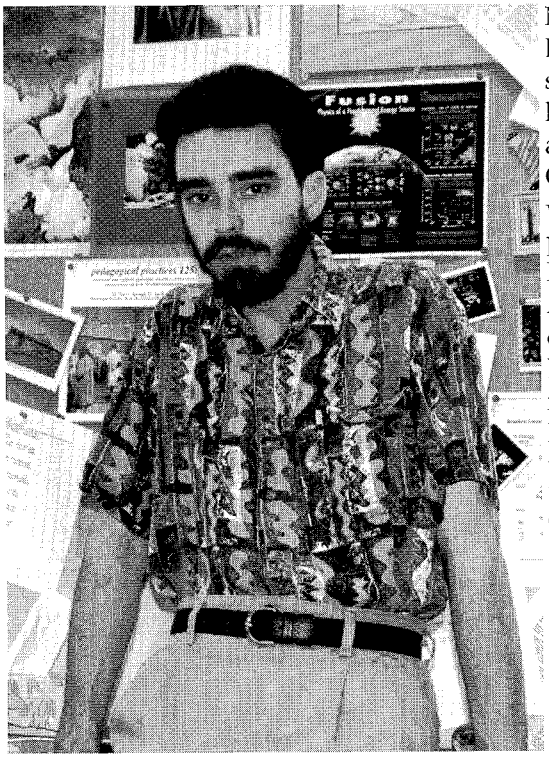
(Photos courtesy of Plant Engineering Dept.)

The Master Substation (Bldg. 016) expansion, southwall, as the concrete block erection is in progress.



The view from the Klystron Gallery road shows how the cable trays used to look going into the Master Substation. The inset gives a view of the same cable tray now going around the Bldg. 016 expansion.

Working the Software Side of the Street



MIKE KELSEY COULD BE the poster person for several colleges. He did his undergraduate work at UCLA, then went on to Cal Tech for his graduate work, where BaBar project leader Dave Hitlin was his advisor. After a stint in a foreign country (University of British Columbia), Mike is now Research Staff at Princeton, proudly wearing the Orange and Black and rooting for the Tigers.

Through it all, Mike has been at SLAC; for twelve years, as a matter of fact (which is quite an accomplishment for a fellow of 32). Starting here in 1986 when he was an undergrad, Mike moved to the SLAC Large Detector in 1988 and his main work was writing the computer code to monitor the liquid argon calorimeter.

"We've made big changes since then," says Mike. "We're capitalizing on the process and the infrastructure created for that project, so it's not a completely new learning curve." The SLD code is Fortran from about 10-15 years ago.

"We're using C++ and Object Oriented programs, plus some commercial products," says Mike. Working at the B Factory, Mike and many others are creating the interface between the electronics at the detector and the physicist at the computer, by providing the software that will allow the electronic signals to be read, interpreted, stored and converted for analysis.

The B Factory is operating at a fast pace to be ready for data collection early next year. At the end of August, Mike was recording cosmic ray data, using as much of BaBar's final production software as possible. "We recorded several million cosmic ray events in that time," Mike announced cheerfully. That data will be used for testing of the reconstruction, calibration, and analysis software.

"We are now more linked to physics worldwide. We're using tools from other labs, such as CERN and FermiLab, and are becoming more integrated," says Mike. Cooperating on software can have its downside, however. "There's less control over bugs and modifications" says Mike, "but we think that the collaborative aspect outweighs such problems." Mike quickly points out that this is his personal opinion and that others' opinions may differ.

Moving between Stanford and Princeton is no problem for Mike. "The physics world is really quite small. And after the B Factory, we hope a next-generation linear collider will provide plenty of physics opportunities ahead."

FactinOs

Signed and Sealed

Need a Notary Public? Look to Barbara Johnson in the Personnel office, A&E building, Room 240, or call x2354.

A Credit to All

Professor Robert Laughlin of Stanford recently won the Nobel Prize for physics - the fourth in a row from Stanford University to be honored for physics. LLNL would like to add that the seminal prize work on the fractional quantum Hall effect was done at LLNL under DOE auspices in the early 1980's. Professor Laughlin continues to work part-time at LLNL's H-division.

All's Fair

The SLAC Breezeway/Auditorium and Lobby will be the scene of two fairs in November.

- On November 4, stop by for the **Computer Fair** from 10 AM to 4 PM for presentations and demonstrations on the various systems in use at SLAC.
- On November 10 the SLAC **Benefits Fair** will be held. The fair falls in the middle of Benefits' open enrollment period (from November 1 until midnight November 22).

QuickNews OnLine Weekly

For those who want their news short and sweet, or tart and pithy, check out the Announcements section of the SLAC Web Home Page each Friday. QuickNews is a digest of news tidbits about life at SLAC.

Mix It Up

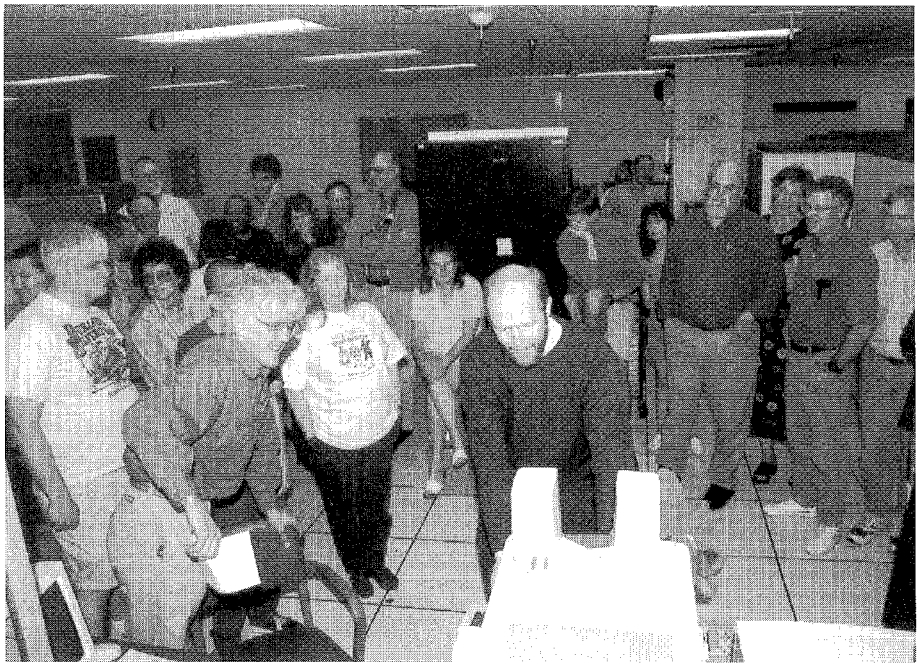
SLAC's Mixed Bowling League started September 10. They are looking for a few good bowlers–four, in fact–to make up a 6th team. If you are interested, call Crystal Tilghman at x2677.

Surf for SLAC Tee Shirts

The Stanford Bookstore will offer SLAC merchandise online at `www.bookstore.stanford.edu`. There's a 20% discount if you order between November 16-20, and goods will be delivered to SLAC for pickup on December 4.

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.

Goodbye, VM...Hello, Sun Enterprise 10000



SYSTEMS COME; SYSTEMS GO. SLAC old-timers Chuck Dickens, John Ehrman, and Ted Johnston were among the many friends and users of SLAC's 17-year-old IBM's Virtual Machine (VM) system who attended the VM Shutdown celebration on October 5th in the machine room on the second floor of the Computer Building.

Joe Perl remembered that he was one of the first to be allowed to use VM as a graduate student at UCSC, and that it is still the most blindingly-fast machine he has ever used—especially when only two people were logged on. Frank Rothacker told of the time Jerry Friedman showed up in his office with an Ambassador terminal asking Frank to keep it in his office for trying out the then-new VM system. Jerry asked Frank to come back to him when Frank had figured out VM. To this day, Frank said, the Ambassador terminal still sits in his office and he never did get back to Jerry.

Chuck Boeheim officiated for the actual shutdown of VM. Chuck remarked on how VM had really been the Lab's first "Personal Computer", with every user getting their own virtual machine that they could customize in any way they wanted. VM was also the first ubiquitous computing system, with terminals found in nearly every office on site, including the guard house at the front gate. It provided email and news services, the Binlist directory, and the SPIRES Preprints and Books databases to the entire site, years before such things became possible with networked workstations. Chuck had given VM a "voice" with which it could say good-bye. A la HAL from the movie 2001, VM's tremulous voice was heard to say: "Just what do you think you're doing, Dave? ... My mind is going ... I can feel it ... I'm afraid," followed by: "Daisy, Daisy, give.. me... your.... answer..... do....," ending in "Good-bye." Bill Weeks then typed the final shutdown command on the keyboard of VM's monitor which was wearing a red ribbon. The party concluded on the third floor with cake decorated with "Farewell to VM" and sparkling cider served in champagne glasses. Sitting behind the cake was a gray 3-foot tall tombstone inscribed with "RIP VM."

On a very small part of the floor space used by the VM system now sits the new, 100-times-more-powerful SUN Enterprise 10000. The following comparison of the two systems will give you some idea of the progress computer technology has made since the final days of VM. (The comparison with the first VM system would be even more astonishing.) Chuck backed up a entire roomful of VM disks on six SCSI disks and then backed all of those up onto one DLT cartridge that can be accessed by the new machine.

VM ES/9000 model 580	**SUN Enterprise 10000**
--512 MB memory	--12 GB memory
--90 GB disk	--500 GB disk
--3 processors	--24 processors
--75 MIPS processing power	--7500 MIPS processing power

–Chuck Boeheim and Ilse Vinson

Why BaBar?

HARVEY LYNCH WILL GIVE an introductory talk for non-physicists on the why, what, and how of BaBar.

Why: "Why do we exist?", a physics question, not a religious question.

What: Point of origin of tracks, momentum, energy, and the identity of particles.

How: Specific devices designed for the characteristics sought.

Friday November 6th, 1998 @ Noon
Computer Center
3rd Floor Conference Room

News from the
Web Information Manager
Ruth McDunn, mcdunn@slac

New Links on the Home Pages

If you take a look at the detailed or highlighted home pages, you'll see two new links:

* **SLAC Telephone Users' Guide** (under *Working at SLAC/Communications and Directories)* is now available online as a set of html pages or a PDF file. To view or print the PDF file, you need to use Adobe Acrobat Reader, a free browser plug-in. The guide URL is `www2.slac.stanford.edu/comp/telecom/phone/phoneusersguide/TableofContents.htm`.
* **Video Lectures** (under *Scientific Information/Newsletters, Periodicals, and Videos)* leads to a page where you can view, over the Web, video transcripts of many lectures and colloquia held at SLAC this past year. The videos are provided using a technology called "Streaming-Media." A browser plug-in (RealPlayer, free at `www.real.com/products/player/index.html`) delivers just enough data to keep the video running, instead of downloading the entire file before viewing. Since the quality of the video does not always allow you to read the overhead screen, PDF versions of the transparencies are provided for many of the lectures. The lectures are found at `www-project.slac.stanford.edu/streaming-media/`.

Group K Gets Ready to Launch

THE PHYSICS PROGRAM OF Group K is a multi-faceted particle astrophysics effort. The group's near term work in this area involves analyzing archival x-ray and gamma ray data and collaborating, primarily with the Naval Research Laboratory, on the Unconventional Stellar Aspect (USA) satellite experiment. For the longer term, there is an effort on a Gamma ray Large Area Space Telescope (GLAST) that is planned as a follow-on space mission to the Energetic Gamma ray Experiment Telescope (EGRET) currently operating on the Compton Gamma ray Observatory (CGRO).

The GLAST program is a major part of Group K's effort and was discussed in some detail in a recent issue of The Interaction Point (*Oct. 98, Vol. 9 No. 10*). The GLAST program began at Stanford in early 1992, and has progressed considerably since that time. Group K physicists are currently working in the context of a growing international GLAST collaboration of astrophysicists/astronomers and particle physicists. The GLAST mission is in the strategic plan for NASA, and is proposed for a new mission start in 2002 and a launch in 2005. The GLAST instrument design and proposed physics program have also been given high marks in DOE reviews.

In carrying out our X-ray astrophysics program, the members of Group K are using data from NASA's Rossi X-ray Timing Explorer (RXTE) satellite and preparing for a launch of the new USA experiment. The x-ray measurements are focused on timing and energy of x-rays emitted by neutron stars and black hole binary systems in our galaxy and nearby galaxies, and will be used to study the strong gravitational fields of these compact stellar objects.

After about 8 years of planning, construction and testing, in early 1999 the U. S. Air Force will launch the USA experiment into low earth orbit on the ARGOS (P91-1) satellite. Data from USA will yield unprecedented high-resolution timing information, correlated x-ray energy measurements, and about a factor of 10 or more longer x-ray exposures than previously obtained from about 40 selected astronomical sources. Group K is a major collaborator for USA, and has built part of the hardware for the experiment; we have helped design and program some of the flight software, and are participating in launch preparations and science planning. Group K physicists are also using the RXTE x-ray data mentioned above to help develop the data-analysis software for USA, as well as getting physics results from this data.

Group K is a cross-disciplinary group with physicists, engineers, Stanford physics and engineering graduate students, technicians, and clerical workers all working closely together to learn more about the fundamental physics of the universe.

–E. Bloom

SLAC Milestones

RETIRING

Bjorken, B.J., Theory, 9/30/98
Fryberger, David, EFD, 10/31/98
St. Lorant, Steve, EFD, 10/9/98

DEATHS

McLaughlin, Frankie, RD, 10/18/98