

The Interaction Point

Events and Happenings
in the SLAC Community
March 1996 Vol. 7, No. 3



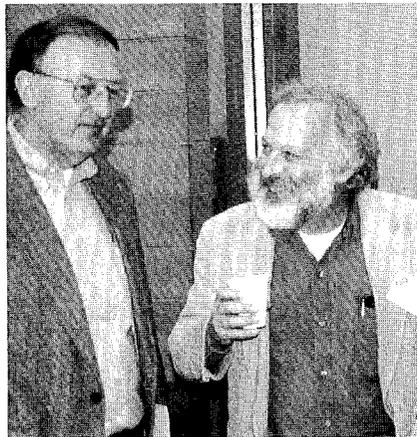
The Next Linear Collider: Physics for the Year 2001

by P.A. Moore

WHILE SOME OF US struggle to decide what to have for dinner tonight, others on this planet are focusing on the next century, especially when it comes to the Next Linear Collider (NLC). SLAC's Director Burton Richter is one of these futurists. Richter outlined the past and future of the NLC for over 200 participants at a recent workshop held at SLAC as part of a series in preparation for a summer study in Snowmass, Colorado, in June.

As far back as 1987, Richter believed that science should build on the experience of the SLC and continue electron-positron colliders to the TeV scale. Since that time, periodic international workshops have promoted general agreement about many technical issues surrounding the NLC and its physics goals. A global strategy has emerged to share the financial and scientific burden of testing various aspects of a TeV-scale linear collider.

A full-scale injector and damping ring complex is nearing completion at KEK in Japan; KEK, DESY, SLAC, and CERN are testing different types of high-performance accelerators. Because SLAC is the only laboratory with a working linear collider (the SLC), SLAC physicists have taken a lead role in developing the prototype design for such a collider, and an international collaboration has used the



Charles Baltay (left) of Yale chats with Peter Yamin of Brookhaven National Laboratory at the Next Linear Collider workshop in February.

SLAC linac to provide beam for the Final Focus Test Beam.

David Burke, workshop coordinator, sees positive response to the NLC. "Lessons learned from the SLC and from our international colleagues have led to design improvements. The NLC will be a challenge, but our preliminary studies show that we can meet that challenge by working with known technologies now and upgrading later."

In March an international committee will be at SLAC for consultation on the NLC goals and technical design. The Snowmass study in June comes next, when the NLC design will be presented to the US physics community.

How does the NLC fit with other big science projects? "The NLC is the continuation of the explo-



Photos P. A. Moore

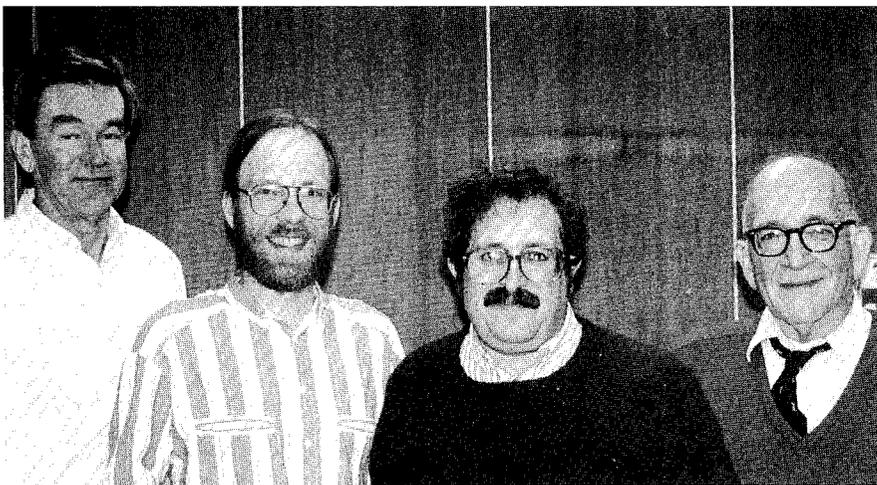
Charlie Prescott of SLAC and Kirk McDonald of Princeton Plasma Laboratory discuss the Next Linear Collider.

ration of the energy frontier with electron-positron collisions, just as the Large Hadron Collider at CERN is with proton collisions. These tools are essential and complementary ways of looking at nature," according to Burke.

While the future location of the NLC is anyone's guess at this point, the workshop participants were more concerned with designs, calculations, and computer models, all of which are critical for moving to the engineering design phase, with the hope of a construction start in 2001.

Estimated to take six years to build, the NLC will keep physicists busy well into the next century, while some of the rest of us may still be deciding between frozen pizza or Chinese take-out.

Quantum field theory bookends



New quantum authors Dan Schroeder (center left) and Michael Peskin (center right) are flanked by veteran authors James Bjorken (far left) and Sidney Drell (far right).

BJORKEN AND DRELL move over—the newest addition to the body of knowledge on quantum field theory has arrived—Michael Peskin of SLAC and his colleague Dan Schroeder from Weber State University recently celebrated the publication of their book, *An Introduction to Quantum Field Theory*.

“We wrote the book to make the concepts of quantum field theory accessible to all physicists, not

just an elite group of experts,” said Peskin, who has been with the Theory Group at SLAC since 1982.

The book includes 30 years of progress in the subject since the notable two-volume text written in the 1960s by James Bjorken and Sidney Drell. Since that time the subject has developed in its conceptual framework and in its areas of application. When asked his opinion of the new book, Drell

commented, “I’m absolutely delighted. This book fills a real need and will no doubt be the standard on the subject for years to come.”

Dan Schroeder received his doctorate in physics from Stanford in 1990 and was a student of SLAC physicist Richard Blankenbecler, who recalls Dan as a student. “He is a unique personality and a person dedicated to disseminating knowledge, which makes him an excellent teacher, as well as a challenging student,” Blankenbecler added with a grin.

Schroeder gave up three summers to write the book. “It was difficult to do anything during the academic year because I never had big chunks of time. Michael seemed to be able to work in spurts.” Peskin meanwhile had an advantage—a well-timed sabbatical and no required teaching during this period.

What about the Peskin-Schroeder partnership? According to Schroeder, “Michael is a great collaborator. Even though we didn’t always agree, we were able to find a solution.”

—Penny Nichols

Black History Month observed

EVERY YEAR in February during Black History Month the Black Association of SLAC Employees (BASE) brings a bit of black history to share with the SLAC community in the hope that people become aware of and understand the many contributions of African Americans. This year a documentary about the Port Chicago Mutiny was shown. Henry Grey of the Power Conversion Department (left) and James E. Davis (right) of SLD helped arrange the showing.

Other Black History Month events at SLAC this year included a panel discussion and exhibits by local African American entrepreneurs.



Sexual Harassment Advisors appointed



Jean Hubbard

JEAN HUBBARD, senior buyer in Purchasing, and Doug Dupen, Personnel, have been appointed Sexual Harassment Advisors for the laboratory

Hubbard has been at SLAC since 1981 and previously worked as an expediting supervisor. "My job in Purchasing keeps me busy, but this appointment adds a special element of being helpful," said Hubbard, "and I am pleased to be asked."

Because harassment can happen to men or women, Doug Dupen has been appointed as well. The Stanford Sexual Harassment Policy is undergoing review; Dupen and Hubbard will work closely with the university and attend monthly meetings as part of their on-going training.

Jean Hubbard can be reached at ext. 3556 and Doug Dupen at ext. 2265. Copies of the revised campus policy on harassment (November, 1995 edition) can be requested from the SLAC Personnel Department.

—P.A. Moore

From the Director

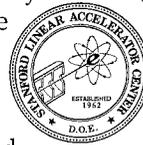
LIKE YOU, I have been saddened by the layoffs of SLAC employees who have contributed so much to this institution. I wish I could say that this staff reduction will be the last one we will face. That may not be the case. Budget decisions made by Congress and the DOE affect all of us and no one can predict the future in these uncertain times.

For those of us who remain, there is a range of feelings: we have concern for our colleagues and worry about our own jobs. The rumor mill increases our anxiety. Currently several inaccurate lists of names of those laid off are circulating around the lab. I feel that it is an invasion of a person's privacy to publish such a list and I would like to discourage

its circulation. I encourage managers and supervisors to share information with their staff, and in particular, correct inaccurate rumors.

Remember that we have resources that can be of assistance: the campus Help Center is available and SLAC employee relations counselors are on site.

As I said in my State of SLAC message in November, SLAC has a strong scientific future and has good support in the physics community. While our future size will no doubt be smaller, I am confident that with your help the lab will remain a vital and strong institution.



Layoffs in TechPubs trigger reduction in services

THE RECENT STAFF REDUCTIONS have affected many departments at SLAC, and everyone is feeling the pinch of reduced services, as well as the loss of colleagues and friends from the workplace. Among the departments affected by the layoffs is Technical Publications. The SLAC Editorial Office was closed on March 15 (although the editors in that office actually stopped accepting new projects as of March 1 in order to be able to finish all work in progress).

The decision to close the Editorial Office was not made lightly or without consideration of the effects on the SLAC authoring community. In recent weeks, the Technical Publications Department staff has been developing informational resources designed to help authors who formerly relied on the Editorial Office staff to format their papers.

Realizing that the closure will necessarily change the ways some authors produce their papers, the TechPubs staff has created a set of templates (available in TeX, LaTeX, REVTeX and MSWord) to assist authors and their support staff in preparing SLAC Pubs. The SLAC Pub templates, information on how to use them, and other information that may be of use to TechPubs customers are now available on the World Wide Web at the following URL:

<http://www.slac.stanford.edu/grp/techpubs/help/>

The TechPubs staff plans to revise and add to the "TechPubs Help Pages" in the coming months, and welcomes input on which topics are most essential to the SLAC authoring community. Suggestions may be sent to henniss@slac.stanford.edu or may be made in person at one of the monthly Technical Publications User Group (TPUG) meetings.

The next meeting of TPUG will be on Thursday, March 28, at 2:30 PM in the Green Room (Bldg. 40, third floor). The topic for that meeting will be "Tips on Incorporating Figures into Text Documents."

—Kathryn Henniss

Fire cleanup celebration gives thanks to all



(Left to right) Scott Fisher, Tom Porter, Nan Phinney, Jim Scott, and Dick Zdarko (seated) share fire cleanup stories at the celebration.



Trying to put out the fire under the chaffing dish are (left to right) Ewan Paterson of the Technical Division, Javier Sevilla of Plant Engineering, and Fire Marshall Jim Scott.



Among the crews that worked long, hard hours were (left to right) Mer Baldoza and Lorenzo Soria (back) and Becky Limones and Brigitte Wilkinson (front), all with the Power Conversion Department.

AFTER THE SMOKE CLEARED on Saturday, February 10, it looked like the fire in the high-voltage distribution cables had put the North Damping Ring out of commission for many weeks. In an extraordinary effort, however, many of the laboratory's departments and shops rose to the challenge.

A recovery plan was developed within hours. By late afternoon the Mechanical Fabrication Department (MFD) labor pool was cleaning and scrubbing away the charred remains and soot. Electricians restored light and power quickly so that safety officers could trace the cause of the fire.

Using scaffolding erected by the labor pool, people clambered

into cable trays to sort out damage to the many subsystems. Controls and vacuum staff, instrument technicians, rf maintenance, and power conversion workers labeled and cut cables to remove damaged sections. The MFD vacuum group made sure that the delicate vacuum system was secure and pumping. Operational Health Physics stood by around the clock to see to it that the contaminated debris was handled properly. Riggers ensured that large items were safely removed and Facilities staff dealt with the inevitable complications caused by rain and water.

Cable pullers worked double shifts to install hundreds of new cables to the affected systems. As they worked, operators and Accel-

erator Department personnel traced cables and corrected system functions. Although the rf system had been completely severed, it came back on line smoothly, thanks to documentation and skilled assistance with cables and connectors. Recertification was completed in the late hours of the off shift, allowing Accelerator Maintenance West to test their new systems under full load. After all the activity, alignment crews checked that the precise positioning of beam line components was preserved.

Hundreds of pump cables were replaced and tested. Mechanical Fabrication gave the vault a fresh coat of paint. The vault chamber reverberated as people cooperated good naturedly in confined and often unpleasant conditions.

The result? Just 13 days and 10 hours after the first alarm, the beam was circulating once again, a testimonial to the care taken during repairs.

The laboratory celebrated the restoration of the beam with a small party for the workers, where they had a chance to rekindle the flames of camaraderie formed while perched on scaffolds and crouched on cableways.

—Patrick Krejcik and Bill Pierce

Injury of the '90s: Carpal Tunnel Syndrome

CARPAL TUNNEL SYNDROME (CTS) is a frequent and painful disorder of the wrist, caused by bad posture, excessive force, or repeated hand movement without taking a break. The nerves and tendons that pass from the arm into the hand through the carpal tunnel can be pressed against the bone, causing nerve entrapment. Nerve entrapment symptoms can also be caused by dislocated or fractured bones and diseases such as diabetes mellitus, arthritis, and hypothyroidism; or fluid retention (as in pregnancy). People who are at increased risk of developing CTS include dentists, piano players, typists, and people who play racquet sports.

Initial symptoms of CTS (burning, tingling, and numbness of the hand that can cause someone to awaken at night) can progress to a weakened grip and severe pain in the arm. If you encounter any of these symptoms, get medical advice before the disease progresses. Once diagnosed, doctors may perform nerve conduction tests to check for nerve damage or may recommend surgery if the muscle damage is severe. Surgery is usu-

ally successful in restoring hand function unless the condition has been present for several years.

If you do not yet show signs of CTS, you can reduce your chances of developing it by following some simple steps:

- Always observe good posture.
- Do warm-up exercises.
- Use an alarm clock to remind you to change tasks every hour.
- Keep your wrist straight or at a neutral position.
- Type with a soft touch—don't pound the keys.
- Avoid working in the cold, when circulation to the hands may be decreased.
- Stop any activity that causes pain—pain is a signal that you should ease up.
- Call the Medical Department for a workstation ergonomic evaluation. As a result of the 118 ergonomic evaluations performed last year at SLAC, 18 employees were diagnosed with CTS, and 100 employees were helped by making adjustments to their work stations, which could help them avoid the onset of CTS.

If you already have CTS, you may have to make adjustments in your job or lifestyle that will help to reduce the symptoms.

- Take rest periods or task breaks every hour.
- Avoid caffeinated drinks and cigarettes.
- Use anti-inflammatory medications (such as aspirin, ibuprofen, and cortisone injections) and cold compresses to relieve pain and reduce swelling in the affected area.

Call the Medical Department at ext. 2281 to arrange for worksite ergonomics classes, workstation ergonomic evaluations, or to get more information about the SLAC Ergonomics Fair in June. The Fair will have door prizes, demonstrations, product displays, and even a masseuse!

You can also check out the following ergonomics web site from the University of Virginia:

<http://www.virginia.edu/~enhealth/ERGONOMICS/toc.html>

—Gloria Labrador

Inside Information: The World Wide Web at SLAC

THE INFORMATION SUPERHIGHWAY has become a reality, and what used to be a gravel road is now a paved multi-lane highway where speed is limited only by baud rate. World Wide Web pages offer a wide assortment of information about SLAC and the world. Check out the following Universal Resource Locators (URLs).

- The SLAC Highlighted Home Page:
<http://www.slac.stanford.edu/highlighted.html>
- The Associate Directors Committee on Computing (ADCoc) home page, with information about committee members and meeting summaries:
<http://www.slac.stanford.edu/grp/do/adcoc/adcoc.html>
- The draft SLAC Strategic Plan for Computing, available in PDF (portable document format):
<http://www.slac.stanford.edu/grp/do/adcoc/comstrat.html>
- The BSD home page, offering information about Business

Services at SLAC:

<http://www.slac.stanford.edu/grp/bsd/bsdslac.html>

- The BIS home page, which contains information on the incremental installation of the SLAC Business Information System recently purchased from PeopleSoft:

<http://www.slac.stanford.edu/grp/bsd/bis/bis.html>

- The Purchasing Department home page, with information about processing purchase orders and staff contacts:

<http://www.slac.stanford.edu/grp/pur/purch.html>

- The SLAC Users Organization (SLUO) home pageL:

<http://www.slac.stanford.edu/grp/rd/sluo/SLUO.html>

SLUO provides a forum for discussion of issues affecting use of SLAC facilities and also provides advice for the SLAC Directorate.

...and just in case you're getting ready to visit another DOE lab, check out The Weather Channel at

<http://www.weather.com/>

—Sharon Minton, BSD

Goodbye to Joe Murray

AFTER A LONG BOUT with Parkinson's Disease, Professor Joseph J. Murray died on January 29 at the age of 72. Joe had been a valuable member of the SLAC faculty until his retirement in 1989.

After retirement, Joe continued to commute to SLAC from his home in Half Moon Bay to keep up with the SLAC program and to stay in touch with his friends. An extremely versatile physicist, Joe was innovative in both experimental technique and theory, and he was especially skilled in electromagnetic theory. Beginning in 1966, Joe was involved in the design of almost every new primary and secondary beam at SLAC, including the arcs and final focus for the SLAC Linear Collider (SLC). He did not want and often did not receive credit proportional to his contributions to many SLAC projects.

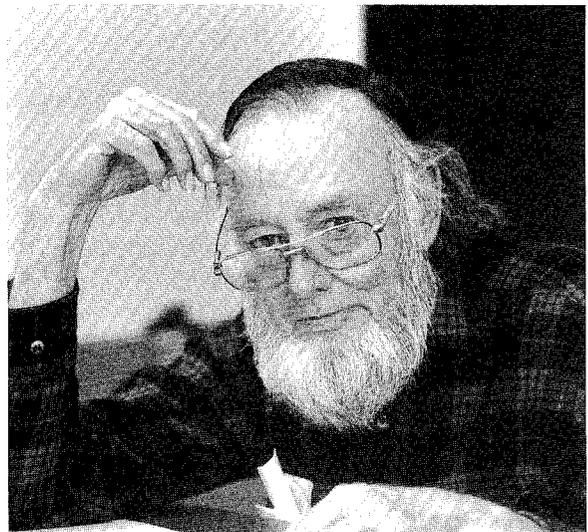
Murray earned his Ph.D. at Cal Tech in 1954 under Professor Jesse W. M. DuMond for work on beta decay spectra. Later he joined Luis Alvarez' group at Lawrence Berkeley Laboratory, where he participated in the bubble chamber experiments and in the analysis of several of the newly discovered resonant states. His major contribution was the design of particle beams feeding the chamber, including innovative electrostatic separators of his design, which selected the particle types entering the chamber.

At the same time, Joe became interested in studying the prospective experimental use of SLAC—for which ground had just been broken. When the 82-inch bubble chamber was moved from Berke-

ley to SLAC, Joe transferred with it. It was here that his combination of analytical and experimental talent came into full bloom. He designed a separated hadron beam to the 82-inch chamber, using a radio-frequency separation technique.

In addition to his work on charged particle beams, Joe was the leader in designing and commissioning a back-scattered laser beam to the chamber. This nearly monochromatic, polarized gamma-ray beam proved to be a unique and valuable tool in exploiting the capabilities of the 82-inch chamber by eliminating the low-energy background found in the conventional bremsstrahlung beam.

He became an intellectual leader in the Experimental Facilities Department, which was established at SLAC to give scientific and technical support to users of SLAC facilities. Known as an expert in the mathematical theory and the practical design of charged-beam transport systems, he was also proficient in radiation shielding calculations, ultra-high vacuum practices, and related work. He participated as a collaborator in many experimental groups and pursued his own unique experiments. Of particular interest in the latter category was the observation of gamma rays produced when high-energy positrons are "channeled" in crystals. For PEP-I, Joe invented the "skew quad" method of compen-



Tom Nakashima

sating for the adverse effect of large solenoid magnets on the circulating beam, thereby saving a great deal of time and effort when compared with using the method standard at that time.

Joe was a central figure in the Beam Dynamics Task Force, a group responsible for the design of the arcs and final focus for the SLC. He also shared in the design of the second-order optical transport lines for the damping ring, the first such beam line to be built at SLAC. He had the novel idea of an optical "swivel" that allowed the use of dc quadrupoles to simultaneously match electrons and positrons from the linac into the SLC arcs.

A member of the SLAC faculty since 1972, he adhered to extremely high standards throughout his career, both for himself and his colleagues, and was disdainful of illogical "wishful" thinking. He was often given the task of reviewing proposals for experiments or transport beam designs, and was occasionally cast as an adversary when he could show that a proposal had fundamental flaws or was

IN MEMORIAM

not practical. Joe was known to refuse to publish results when apparently minor inconsistencies between theory and experiment offended him. "He was extremely clever, yet at times a difficult collaborator, because he was such a perfectionist," recalled Karl Brown, a long-time friend and colleague.

The simplification of complicated problems allowing straightforward, practical solutions was one of Joe's special skills. He became a role model for many who were fortunate to work closely with him. Roger Gearhart, who worked beside Joe for 35 years, pointed out how often those around Joe came to him for guidance. SLAC owes him a great deal.

His free time was principally devoted to his family. He enjoyed working on his house and Volkswagen and sharing those experiences with his friends. He loved the sea and was an accomplished sailor and diver. In his youth he served as a radar and radio officer aboard a submarine. For years he and his wife Maisie maintained and sailed a small vessel on the coast.

Though his final years were afflicted by a progressive illness, Joe never complained; his thoughts and worries were always about the needs of his family. He and Maisie were ever concerned with the long-term care of their disabled son Dean. Joe's many friends at SLAC share a feeling of great loss and extend their deepest sympathy to Maisie and Dean.

A tree will be planted at SLAC in Joe's memory. Those wishing to contribute to this memorial should send their donation to Wanda Elliott, MS 20. Excess funds, if any, will be given to the Coastside Adult Day Health Center.

—W. K. H. Panofsky,
L. Keller, and T. Fieguth



Tom Nakashima

Ada Schwartz

ADA SCHWARTZ, a long-time SLAC employee who retired in 1993, died on January 13.

Ada started working as a typist in the Reports Office in 1961 when SLAC was still known as "Project M." By 1965 the Reports Office had grown to a staff of seven, switched from multilith to offset printing, been renamed the Publications Department, become settled in the A&E Building, and had given Ada the job of Publications Coordinator.

After over another decade in the helter-skelter of Publications, Ada decided that her original career decision to be a secretary had been the right one. She served in that capacity in what was then the Plant Office, then in Mechanical Engineering, Research Division administration, the Spectrometer Facilities Department, the SLC, Theoretical Physics, and lastly in the Personnel Department. She spent over eight years in the International Affairs Office until she retired in 1993.

Surely no one can claim a more varied and intimate lifelong relationship with our laboratory than Ada.

Ada is survived by three sons—Steve, David, and Peter. The family suggests donations to the Food Closet of the Urban Ministries, PO Box 213, Palo Alto, CA 94302.

—Doug Dupen

Regina Garnier

REGINA GARNIER died in Redwood City on Saturday, February 10, after a brief illness. She worked at SLAC for over eight years. Almost all of that time was in the SLAC Travel Office until she retired in 1995.

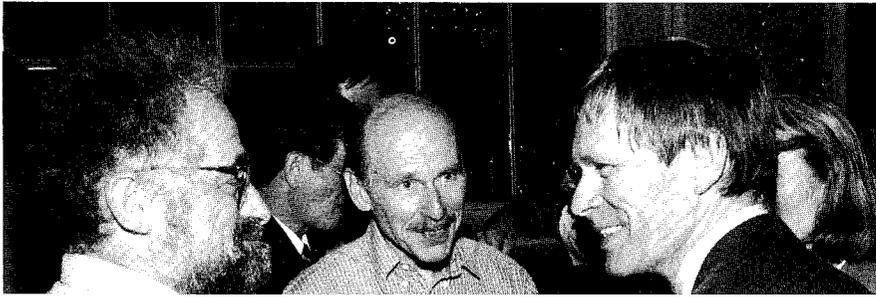
Regina was dedicated, efficient, and good at her job. She was keeper of the masses of paperwork in the Travel Office, and although each of us had our own system, she always knew who was doing what. She could trace the status of any document or file and follow it to its completion. She was responsible for making sure that the Travel and Expense Reports were accurate and processed quickly, but that was only part of her job.

Regina was a people person. Working in Travel put her in contact with SLAC travelers and visitors from around the world, and this is where she excelled. She communicated warmth and sincerity to everyone. She could calm a nervous traveler and get a chuckle from a grumpy one. She was always smiling and brought happiness to the office and to those she encountered as she made her daily rounds in the A&E Building. People still come to the Travel Office to express their sadness and disbelief about Regina's sudden passing because she was so alive.

Regina loved her garden and flowers. She planned to spend her retirement tending and enjoying them with her husband of thirty-two years, Edward. Sadly, it was not to be. Regina also leaves three sisters and a brother, all of Brocton, Massachusetts.

—Fran Kaufmann

Hofmann wins Wilson Prize



Daresbury/Rutherford

Left to right: Albert Hofmann, CERN; Gottfried Muelhaupt, ESRF; and Uwe Trinks, TU Munich in conversation at the European Particle Accelerator Conference in London in 1994.

THE STUDY OF PHYSICS often leads to unexpected conclusions. For example, Albert Hofmann, winner of the 1996 Wilson Prize from the American Physical Society (APS), noticed that the moon had an effect on the energy calibration of the Large Electron Positron (LEP) collider, a concept that was also posited by the late Gerry Fischer of the Accelerator Department. Hofmann was the leader of the team that commissioned LEP and is currently involved in the LEP upgrade at CERN.

SLAC remembers Hofmann for his long involvement with SSRL starting in the mid-1970s. Hofmann was the first joint SLAC/SSRL faculty appointment. While at the laboratory Hofmann made wide contributions to the develop-

ment of SPEAR and PEP as light sources. He is currently on the PEP-II Machine Advisory Committee in addition to advising on other projects world-wide.

Hofmann's citation from APS enumerates his contributions and talents in accelerators and storage rings. He was also commended for his experimental innovations in synchrotron radiation production and his teaching.

Herman Winick, a colleague at SSRL who has worked with Hofmann over the years, says "Albert has taught many courses at accelerator schools in the US, Europe, Taiwan, and elsewhere. He is a superb teacher and is universally admired. I am absolutely delighted that he has won this award."

—Penny Nichols

Welcome Guests and New Employees

Shozo Anami, Klystron; Hector Avina, Mechanical Fabrication; Thomas Barnes, Mechanical Fabrication; Michael Copeland, Mechanical Design; Dennis Davis, Mechanical Fabrication; Paul J. Dervan, SLD; Andrea DiCicco, SSRL; Alberto Fasso, Radiation Physics; William Kopp, Mechanical Fabrication; James Lewis, Mechanical Design; Richard Martin, Mechanical Design; Evgeny Medvedko, Controls; Clarice Rinard, SCS; Achim Stahl, Experimental Group E; Michael Stevens, Manufacturing; Tsuyoshe Suwada, PEP-II; Fred J. Wilkins, Metrology.

Mark your calendars!

ON APRIL 23 Roland Sharpe, the original supervising designer of all the structural, architectural, mechanical, and electrical design at SLAC, will present "How SLAC Was Built" from 12 noon to 1 PM in the Auditorium. Pief Panofsky, Director Emeritus, will give the introduction. Bring your lunch and a friend to hear the story of SLAC's inception.

All meetings are held in the Orange Room, unless another location is listed. Larger meetings and conferences have a contact listed. Please notify the Public Affairs Office of any updates (send e-mail to nina@slac.stanford.edu or call ext. 2282).

March 28, 2:30 PM

TechPubs Users Group
Green Room

April 9

SLUO Physics Forum
Auditorium

April 10-12

SLD Collaboration Mtg.
Atherton

April 10, 1:30 PM

SLAC Web Users Group
Meeting
SCS Conf Room

April 11-13

PEP-II Machine Advisory
Committee

April 12

BES Collaboration Mtg. SSRL
Conf. Room, 2nd floor

April 15

BaBar Technical Board

April 16

BaBar Executive Board
BaBar Conference Room

April 17-20

BaBar Collaboration Mtg.
Auditorium
D. Hitlin/V. Luth/A. Pacheco

April 18, 7:00 PM

Bay Area Object-Oriented
Interest Group
Auditorium

April 22-27

CERN Accelerator School
Grenoble, France

April 22, 7:00 PM

OS/2 Users Meeting
Auditorium

April 23, 12:00 Noon

SLAC Noon Lecture
Auditorium

April 24

BaBar Electronics
Workshop