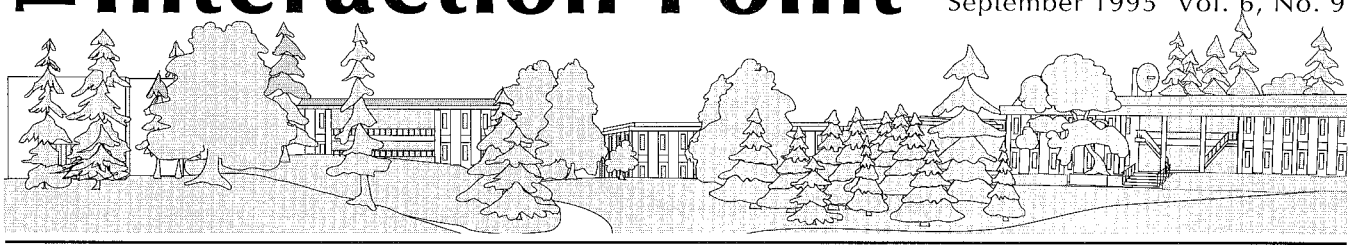
The Interaction Point

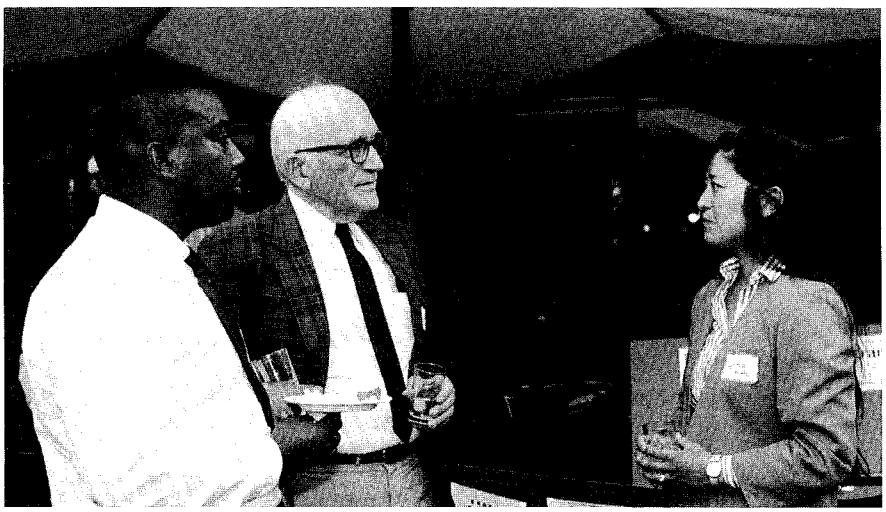
Events and Happenings
in the SLAC Community
September 1995 Vol. 6, No. 9



SUCCESS STORY: 25+ YEARS OF SSP

John Ashton

At the awards ceremony and dinner Mrs. Alberta Coleman, wife of the late Dr. Coleman, presents the first annual Ernest Coleman Award for Scholarship and Citizenship to Christopher Jackson.



Stanford Visual Arts—Steve Gladfelter

Phillip Carswell, a former student with the SSP, talks with Professor Sid Drell and fellow former student Carina Chiang.

by Karen McClenahan

WHEN THE SUMMER Science Program (SSP) was conceived in 1970, the founders never dreamed that it would attain the recognition and success that it has today. In August, more than 40 former SSP students returned to SLAC for a day to celebrate 25+ years of the SSP. The program provides opportunities for students traditionally under-represented in the sciences—minorities, women and the financially disadvantaged. For nine summer weeks, the students live on the Stanford Campus while they participate in hands-on research at SLAC and attend lectures and tours. Students and scientists form mentoring relationships that may last lifetimes. In this way the students are introduced to concepts that they might not otherwise encounter and the science community benefits from an enlarged and enthusiastic pool of future scientists.

Because the SSP actually began in 1970, this reunion was called the 25+ Years Celebration. The afternoon began with a brief tour of SLAC's newest projects, followed by a panel discussion featuring past students and program directors. The panel reviewed the past and focused on the question, "Where should the program go from here?" The panelists' comments showed the audience how the SSP had helped shape the lives

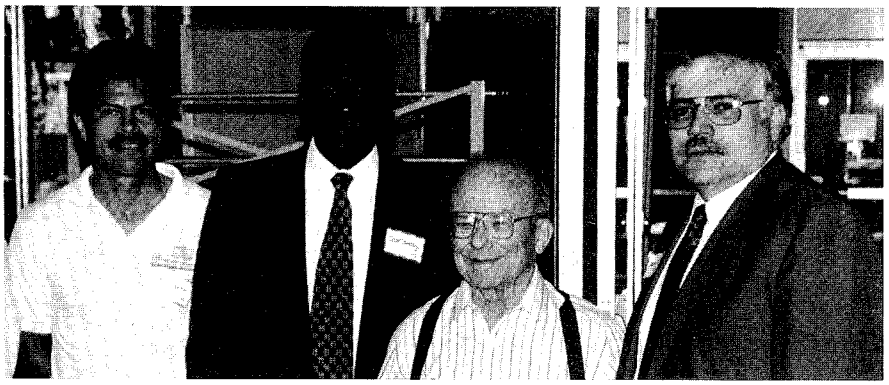
*See **SSP,** page 2*

SSP *Continued from page 1*

of past participants. The discussions revealed that many went on to careers in high-energy physics or other scientific fields, several became doctors, one became a priest, and another is currently working as a special agent for the FBI. In addition, recent surveys show that of the 500 students who have spent their summers here, 43 have obtained their PhD's in physics and 13 are medical doctors.

The reunion also allowed the former students to remember their experiences together. A 1970 program participant, David Ruiz (now a manager at Apple Computer), remembered that SLAC housed the students in a monastery for two weeks at the beginning of the summer. The bedrooms in the monastery were called cells and the beds were only about five feet long.

The SSP currently sponsors approximately 20 students each year who have had little or no exposure to science and engineering outside their university coursework. By the end of the summer, students have learned to solve problems, gained self-confidence, and made a contribution to the lab. Stephen McGuire, a student in 1970, said, "the students are faced with problems and challenged to come up with solutions—that put me in touch with the excitement of discovery." McGuire is now an associate professor of nuclear science and engineering at Cornell University. One constant mentioned by the panelists was that the SSP was a positive force in their lives, allowing them great personal growth and intellectual stimulation.



Stanford Visual Arts—Steve Gladfelter

Members of the SSP from 1970 had a chance to talk with SLAC's Director Emeritus Pief Panofsky. Shown above (left to right) are Paul Calderon, Dave Shelby, Pief Panofsky, and David Ruiz.

On a more serious note, Mary James (a former program student and director, currently an associate professor of physics at Reed College) said, "The strong institutional commitment that the laboratory management has made to this program really counts." Vicente Llamas, the program director for 14 years (now a professor of physics at New Mexico Highlands University), praised the dedication of SLAC employees saying, "Over time, the advisors changed dramatically in contributing and responding to the developing capacities of the students. Out of similar programs nationwide, the SLAC program is my favorite due to the warm support we received."

At the awards ceremony and dinner for past and current SSP students and the current supervisors, Professor Sid Drell described the inspiration for the program, "In a time of civil rights causes, we [the Directors] asked what the Lab could do to open wider the doors to the American Dream," and thus the SSP began. Professor Drell stressed the critical role of science and technology in the current decade and in the future. Citing wars and environmental pollution as current challenges, he asked, "when facing the challenges of today and the future can we afford not to include all our talented people from all segments of society that have something to contribute?"

After dinner the first annual Ernest Coleman Award for Scholarship and Citizenship was

See **SSP,** *page 3*

Stanford Visual Arts—Steve Gladfelter

A panel discussion featured past students and program directors. Shown above, left to right, are Carlos Figueroa, Al Green, Mary James, Stephen McGuire, and Vicente Llamas.

From **SSP,** page 2

presented to Christopher Jackson, a physics major from California State University at Sacramento. The Coleman Award is given to a student who displays the qualities valued by one of the past directors, Dr. Ernest Coleman, who died in 1990. Mrs. Alberta Coleman, presenting the award honoring her late husband, said, "This evening has been a stepping stone for everyone present to broaden our lives and prepare for the future." Mrs. Coleman encouraged the audience, "...to take hold of life, run forward with it and do the best you can."

This reunion of the SSP after more than twenty-five years was a testimony to the positive and long-lasting influence the program has had on the lives of both the students and SLAC employees. All SLAC employees can take great pride in the program and look forward to participating in future achievements.

Necessary & Sufficient

OFFICIALS AT SLAC recently initiated a process to identify the regulatory requirements and standards that are necessary and sufficient to ensure safety and health and to protect the environment. Through this process the Department of Energy (DOE) and SLAC hope to eliminate those environmental, safety, and health policies and requirements that are redundant and unnecessarily burdensome. These new requirements and standards will meet or exceed all applicable federal, state and local laws and regulations.

"SLAC will identify the standards needed to protect the employees' health and safety, and at the same time meet all statutory requirements," said Mary Ross, head of program planning at SLAC's Environmental Safety & Health Division.

The project is part of the DOE's ongoing effort to improve business practices at the different national laboratories by replacing the present system of DOE orders and special requirements with simpler, more cost-effective standards that are tailored to each individual laboratory.

To accomplish this SLAC will follow the guidance provided by the DOE for the Necessary and Sufficient Closure Process and make use of the experiences and lessons learned during the pilot program conducted by Fermi National Accelerator Laboratory earlier this year.

To aid in developing these new standards SLAC has sought the public's views and comments. SLAC is especially interested in comments on the environmental, safety, and health hazards associated with the operations at SLAC.

The process of developing the new standards has begun and should be completed by early October.

—Jon Rosell

Seismic safety survey brings fixes

THE FIRST PHASE of a campus-wide seismic survey, which took a representative sample of a dozen SLAC buildings, found that most of those buildings conform to the updated state seismic code. However, the survey highlighted potential problems with three of the buildings: the fire station, a section of the auditorium breezeway, and Building 280 (the Physics & Engineering Building). The most serious problem was detected in Building 280, where the stairways and upper landings in the breezeways between modules A and B, and B and C were found to have a flawed anchoring system. In a sizable earthquake the stairs could collapse. Because of this, the middle (B) module was evacuated. The employees working in module B were relocated or sent home until September 25, when repairs were completed. Otherwise, the modules that make up Building 280, while not in complete compliance with the recently enacted changes to the California Building Code, are safe for occupation.

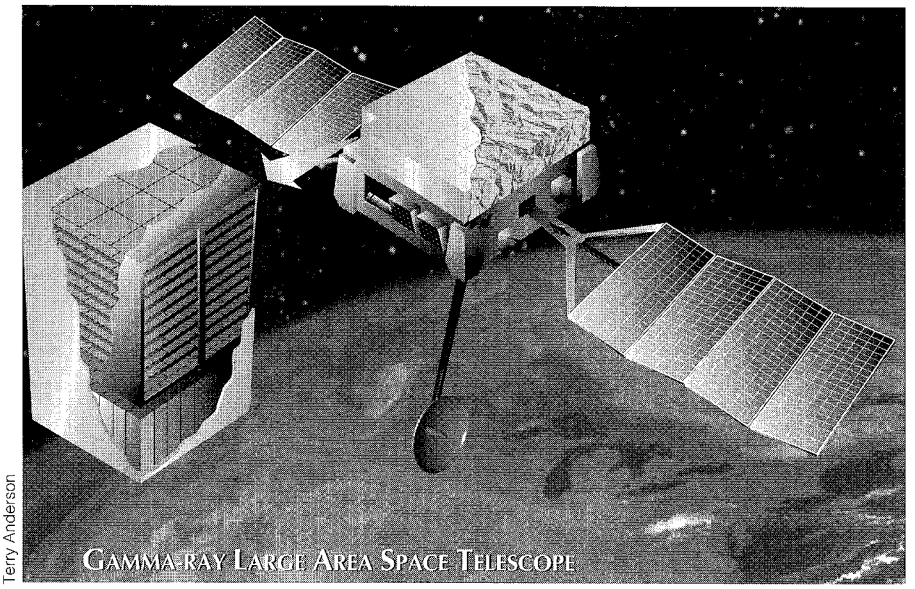
Other areas that were highlighted by the recent SLAC-initiated survey, which is intended to help SLAC meet the new California Standards, are the fire station and the junction between the auditorium and the breezeway in front of the SLAC auditorium. The doors of the fire station could become jammed in the event of an earthquake; they will be kept open until they can be replaced. Although it survived the Loma Prieta Earthquake, a section of the breezeway connecting to the auditorium may also be vulnerable according to the new code. The lobby has been closed off, and users of the auditorium will have to enter through the lower doors across from the security guard building at the main gate while this is being further investigated and remedied. The auditorium lobby is expected to be repaired by early October. The seismic survey will continue until all SLAC buildings have been reviewed.

—Jon Rosell

GLAST receives NASA Grant

by Eric Harpell

SILICON STRIP TECHNOLOGY may reach new heights, now that NASA has funded a mission concept study for the Gamma Large Array Space Telescope (GLAST). If successful, the study will persuade NASA's Office of Space Sciences to give the international and interdisciplinary GLAST effort a green light for launch early next century. Ultimately, astrophysicists hope that GLAST will be launched from a Delta rocket into low-earth orbit, where it will cover the gamma-ray spectrum between 20 MeV and 1 TeV with up to 100 times the data per solid angle of sky as its most sensitive predecessor. Once in space, GLAST is expected to provide glimpses of high-energy phenomena dating back to the origins of the observable universe, as well as exotic "local" objects within our own galaxy.



Terry Anderson

The mission concept study, proposed by an international team headed by Professor Peter Michelson of the Stanford Physics department and Hansen Experimental Physics Laboratory, has only recently been approved by NASA. However, work on GLAST in SLAC's Group K has been under way for the past three years. Personnel currently working on GLAST at SLAC include: Dr. Bill Atwood, the principal originator of the instrument concept proposed for the GLAST mission; Professor Elliott Bloom, the Group K leader; Dr. Gary Godfrey, John Broeder, and Stanford graduate students Mike Chen, Daniel Engovatov, Alex Luebke, and Ganyane Shabad. At SLAC, testing is under way of silicon strip detectors, low-power VLSI readout circuitry, and structural elements needed to assemble GLAST. In addition, a full detector simulation has been completed.

Many hurdles remain, however, before GLAST sees "first light" in the gamma-ray sky. Although the silicon strip detectors were developed in HEP labs and funded by the DOE (especially for the SSC), they have never been used in a space-based, high-energy gamma-ray experiment. Unlike previous orbiting gamma-ray detectors, which use gas-filled "spark chambers," GLAST represents a tremendous innovation in space efficiency, packing the volume of a satellite almost entirely with 49 "towers" containing about 70 square meters of silicon strip detectors. This gain in efficiency is not without cost, however. Weighing in at three tons and with a price tag of approximately two hundred million dollars, GLAST will require the development of unprecedented solutions for a space-based, high-energy physics laboratory.

Presently, the EGRET experiment on board the Compton Gamma-Ray Observatory is revealing brief but tantalizing glimpses of the gamma-ray sky. Its discoveries include active galactic nuclei (AGNs)—powerful sources of gamma radiation, the cores of which may contain super-massive black holes and which display variability of fifty percent or more within a few days. Also discovered are mysterious bursts of multi-GeV emission that do not appear to correspond to known celestial objects, but seem instead to be associated with gamma-ray bursts that occur at lower energies. EGRET has the disadvantage of a limited field of view, however, and cannot provide the continuous coverage that variable object studies require. Operational since 1991, EGRET's days are numbered, as the gas in its spark chambers has a limited lifetime.

Compared to EGRET, GLAST will have a much wider acceptance, enabling it to provide essentially continuous coverage of AGNs and other variable objects. It is anticipated that GLAST will detect about 100 high-energy gamma-ray bursts per year. With a second-level trigger rate of about ten events per second, GLAST's onboard system will download nearly 1 gigabyte per day of data to Earth. Screening of background events eliminates most unnecessary telemetry. This puts GLAST in good company with current-generation particle physics experiments.

When launched, GLAST will allow astronomers to study and refine their models of AGNs, in addition to better-known objects

*See **GLAST,** continued on p. 5*

Staying on Top: The 1995 SLAC Summer Institute

TWO HUNDRED and twenty-four participants from 13 different countries representing 88 institutions joined us for the SLAC Summer Institute from July 10–21. The Institute's central theme for this year, "The Top Quark and the Electroweak Interaction," proved to be a very "hot" topic, following the discovery of the top quark earlier in the year. The agenda of lectures, discussion sessions, outings, and dinners gave attendees the chance to escape their offices or cubicles for some lively learning, interchange of ideas, and socializing.

Director Lance Dixon says of this year's Summer Institute, "We were fortunate, after choosing this year's topic, that Fermilab came along and discovered the top quark after all! We were also fortunate to have an excellent set of speakers at the school this year. The interplay between the speakers covering production of top quarks at hadron and e^+e^- colliders—Pekka Sinervo, Keisuke Fujii, and Hans Kuhn—went particularly well, I thought. The afternoon discussion sessions were well-attended and quite lively."

Martha Krebs, the Director of the Office of Energy Research, attended one of the Summer Institute social hours. Krebs was at SLAC to perform a periodic DOE on-site institutional review of our goals and direction for the next five years.

Coordinator Lilian DePorcel has posted in the lobby of the Central Lab Harvey Lynch's extraordinary black-and-white photographs that capture the essence of the 1995 Summer Institute. Please stop by and take a look.

—Jennifer Chan

GLAST, *continued from p. 4*

such as the Crab Nebula. They will also focus on the sixty unidentified objects already found by EGRET.

Many of these unidentified sources are in our Galaxy, and are hard to identify due to large error regions and too many candidate objects. Also, some may be due to flaws in the background model used to subtract the contribution of gammas made by cosmic rays hitting galactic gas. Currently, astronomers can only speculate on the nature of these sources. Candidates include objects within the Milky Way (such as black holes), pulsars with no radio component (such as the long-sought Genminga), and Wolf Rayet stars. Most of the objects located outside the galactic plane are probably AGNs that are not previously known from optical or radio surveys.

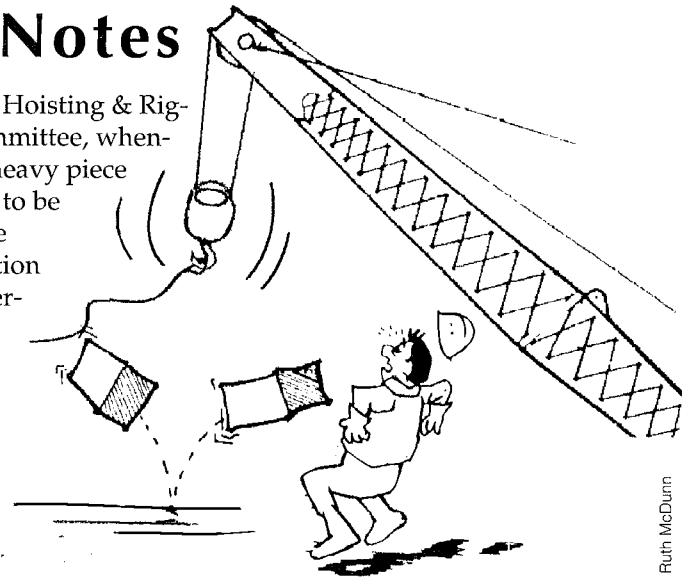
GLAST will also be used to probe the diffuse emission caused by the interaction of cosmic rays with the interstellar medium. Because various parts of this interaction can be modeled, the gamma-ray silicon-strip telescope spectrum of cosmic rays can be compared to theoretical spectra to better understand the mechanism of diffuse emission.

Of special interest to high-energy physicists and astrophysicists are gamma-ray bursts that come from virtually all directions in space. Although collisions between neutron stars in our own galaxy might account for some of the bursts, the majority show no tendency to lie in the galactic plane. Professor Lynn Cominsky of Sonoma State University, a part-time member of Group K and a member of the GLAST collaboration, explains that "such isotropy may imply cosmological origins for the source of these immense explosions." Studies indicating cosmological time-dilation effects for the lower luminosity events also supports the theory that these bursts are located to the very edge of the observable universe. Associating these bursts with known lower-energy sources (i.e., x-ray, uv, optical, or radio) has proven to be difficult. To date, said Cominsky "about 1400 such bursts have been detected—about one per day." Surprisingly, however, "not one has been identified with a lower-energy counterpart." Locating optical counterparts may be possible with data from GLAST. "At least," said Cominsky, "we can tell optical astronomers where to point their telescopes."

While GLAST will be a state-of-the-art gamma-ray monitor, its silicon-strip arrays will actually detect electron-positron pairs created when gamma rays are "converted" within lead sheets sandwiched between the silicon strips. The resulting "shower" of charged particles then passes through successive layers of silicon strips, providing information about the energy and direction of the incoming gamma ray. Extra-terrestrial gamma rays can be distinguished from cosmic rays, reflected gamma rays, and orbital radiation by the characteristic pattern of "hits" in the detector, and by the energy deposited in a CsI calorimeter. Extensive modeling of the GLAST pair conversion process and the definition of the optimum instrument parameters has been carried out at SLAC.

Although the mission concept study for GLAST has been approved, GLAST's future in space is far from certain. SLAC beam tests of part of a GLAST tower are planned for next spring. This prototype will consist of a 12-plane, silicon-strip pair conversion tracker with a transversely segmented CsI calorimeter and a novel type of scintillator-veto system. Together with scientists from SLAC and Stanford's HEPL, scientists from the Naval Research Laboratory, the University of Washington, the University of Chicago, the University of California at Santa Cruz, Germany, Italy and Japan are also members of the GLAST collaboration and are participating in preparations for the beam test and in the mission concept study.

Hoisting & Rigging Notes



SEVERAL GROUPS ON SITE load and unload equipment from various vendor trucks. Sometimes, when the load is large, special care must be taken to be sure the load is balanced to prevent accidents. For example, on August 9, 1995, a $40,000 metal-clad switch gear weighing 3,800 pounds was rotated and dropped while it was being unloaded from a delivery truck. Fortunately no one was injured in this accident. The extent of the damage is unknown at this time.

This accident, while unfortunate, does serve as a reminder to us all that when a load is being lifted and/or transported, the load eccentricity (center of gravity) becomes a major factor. It is important to remember that not all loads are uniformly distributed on the pallets at all times and that not all loads are balanced.

This makes it difficult to know the best method for loading, unloading, lifting, or moving equipment. Not all of us are specialists when it comes to moving equipment. The answer to the problem? Ask a specialist when unsure about a load. The specialists in the field of hoisting and rigging are the Plant Engineering Department (PED) Rigging Group.

According to Zorb Vassilian, the Chair of the Hoisting & Rigging Safety Committee, whenever a large or heavy piece of equipment is to be unloaded, or the weight distribution of a load is uncertain, the requestor or the PED Rigging Group may be called for assistance. In this case, the unit was top heavy. The installation of lifting eye bolts on top of the switch gear might have prevented the accident.

Another resolution to the problem would require the cooperation of the requestor and Purchasing. For example, if the requestor knows in advance that the item being bought will need the assistance of the riggers to unload, he/she can inform Purchasing at the time the request is made. Purchasing can then request that the vendor inform them of the arrival time and date. Once the date and time of delivery is known, the riggers can have time to schedule their work load.

For the future safety of all of us at SLAC, everyone must comply with the Hoisting & Rigging safety rules and standards. The Hoisting & Rigging Safety Committee has the responsibility for carrying out the SLAC safety policy for hoisting and rigging.

PED and the committee are currently developing SLAC's Hoisting & Rigging Training Program. A draft of the new Hoisting and Rigging Manual is under way. The manual is designed to meet SLAC's specific hoisting and rigging needs. The Hoisting & Rigging Safety Committee, the PED, and ES&H are available to help each group leader and department head implement the Hoisting & Rigging Safety Policy.

—Gene Holden

Lab Trek—The Next Generation

THE PUBLIC AFFAIRS OFFICE is pleased to announce that following the successful pilot program for staff tours this summer (see article on p. 8), we are continuing to offer staff tours, modeled after our special tours for VIP visitors, on a monthly basis. The exact stops will vary as operations in the experimental area permit; however, highlights include the Klystron Gallery, the SLD detector at the Collider Experimental Hall and the PEP-II facility.

The SLAC tour-guide orientation will cover the physical site as well as some history of the laboratory facilities. Following a short talk, the bus will transport the group to many areas of the lab where technical hosts will explain the equipment and describe current research efforts. You are requested to wear flat, comfortable shoes and are welcome to bring your camera.

To sign up for one of these special tours, please call the Public Affairs Office (ext. 2204) and ask to sign up for the Staff Tour.

—Nina Adelman

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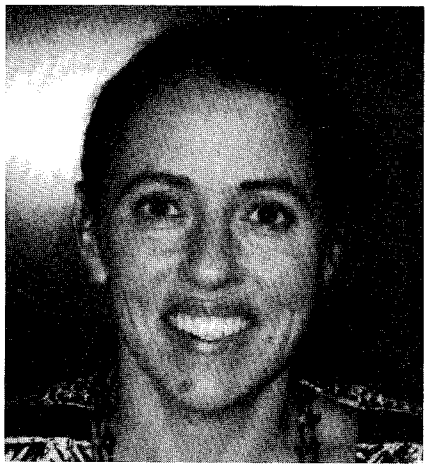
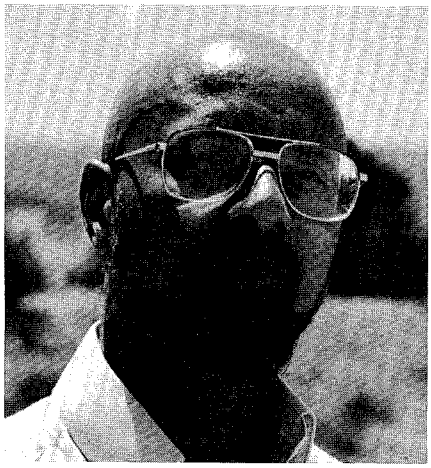
Henniss, Tilghman promoted



Kathryn Henniss



Anthony Tilghman

KATHRYN HENNISS assumed the role of department head in the Technical Publications Department as of July 1. Kathryn worked in the SLAC Documentation Office for two years before being selected as manager of Technical Publications, replacing Rene Donaldson, who had been in the position for the past two years. (Rene will continue at SLAC, returning full-time to the position of *Beam Line* editor.) Before working at SLAC, Kathryn worked in the field of scholarly and technical publishing at the Center for the Study of Language and Information at Stanford, and for Stanford University Press.

ANTHONY TILGHMAN became the new MPS group leader earlier this year. Anthony started at SLAC 26 years ago as a participant in the Skills Training Program. At the time Bill Pierce (Controls) was an instructor, teaching basic electronics and math courses. When Anthony graduated from that program he went right to work for Bill in the liquid-hydrogen target-control systems. Over the years Anthony has been a bench technician in the Research Division, a coordinator in the vacuum collimator, and later was responsible for the protection ion chambers systems for SLC and for the wire scanners for the controls systems

Welcome Guests and New Employees

Henry Atiles, Mechanical Design; Vinod K. Bharadwaj, Accelerator; Sheron Briscoe, Experimental Group C; Juanito Buhain, Power Conversion; Andreas K. Freund, SSRL; Ronald Johnson, Controls; Yoshitomo Kamiura, SSRL; Karen Lingel, Experimental Group E; Jeff Maggard, SSRL; Jennifer Masek, Technical Information Services; Darrell Pennington, Document Control; Engelbert Quack, Theory; Robert Richards, Mechanical Design; Hillary Russak, Waste Management; Franck Sabatie, Experimental Group A; Steffen Solyga, Accelerator Theory and Special Projects; Michael Sullivan, Pep-II *B* Factory.

On the air: Channel 51

THE STANFORD COMMUNITY will go on the air September 27 when the Stanford Channel, Channel 51, comes up on the local cable network. The programming will feature Stanford sports, science, arts, humanities, lectures, and special events. The program will start off small; as it grows, programming will be traded with other university television systems.

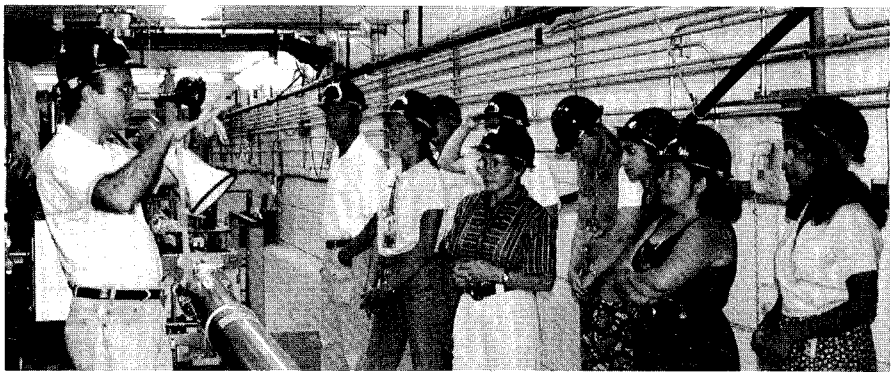
Programming this fall will run from 7 PM to 10 PM, and be repeated from 11 PM to 2 AM and from 2 PM to 5 PM. Program listing may be found in the *Campus Report, Palo Alto Weekly, San Jose Mercury News,* and on Cable Co-op's televised TV Guide on Channel 21. Between regular broadcasting time the channel will run programming information, Stanford job openings, and sports scores.

At noon a one-hour special will be run over the SUNet Academic cable network on campus so that Stanford employees who live outside of the local cable network area can view some of the highlights of the regular programming.

Stanford sports programs will feature football, men's and women's basketball and volleyball.

—Jon Rosell

Employee tours prove popular



Technical host Jose Martinez of EB/SLD addresses staff visitors (left to right) Rod Hiemstra (ES&H), Maureen McNear (SHA), Luda Cantor (FAC), Karen Campbell (PER), Raj Mann (SHA), Sandra Cajal (SHA), and Teresa Cervantes (PER).

OVER 150 Business Services Division (BSD) and other SLAC staff took advantage of site tours requested by Jerry Jobe during July and August. The tours were set up in response to BSD staff input as part of the Continuous Quality Improvement program. Nina Adelman Stolar, Public Affairs, set up seven site tours covering many areas of SLAC not typically accessible to the public. The tours began with an orientation talk by graduate students and other volunteers including John Coller, Jose Martinez, and Eric Weiss, SLD; and David Reyna, ESA. Following the orientation, staff were transported by bus to the Klystron Gallery and South Damping Ring, End Station A, SPEAR/SSRL, SLD, and *B* Factory/IR-12. At each stop, technical hosts enthusiastically described current research efforts in process at the various labs and explained and demonstrated equipment necessary to run research experiments. Technical hosts included Henry Bellamy, Sean Brennan, Katherine Cantwell, Graham George, Mike Rowan, and Hiro Tsuruta, SSRL; Jonathan Dorfan, Tom Elioff, and Al Mixon, PEP-II; Keith Jobe and Marc Ross, SLA; and Joe Perl and John Venuti, SLD.

The tours provided staff with an opportunity to meet people they work with every day and to see first-hand a portion of the equipment they process through purchasing, accounting, and receiving. Many veteran BSD staff had never seen the damping rings, the detector, or the large magnets used to guide the beam. Teresa Cervantes, Personnel, commented "I didn't know all that was out there." The tours also provided the technical hosts with an opportunity to get to know BSD staff they may have talked to on the telephone, but had never met. One host stated, "I didn't know what BSD stood for until now." Communication is a two-way street.

The site tours were opened to non-BSD staff as well and were very well received. Staff from the Environment, Safety, and Health Division, the Technical Division, the Library, and other areas joined BSD staff on the last tours. Janice Dabney, Technical Division, stated "the tour was excellent and well worth the time spent." Nina Adelman Stolar indicates the staff site tours could become a permanent offering of the Public Affairs Office in the future. Contact Nina (ext. 2282 or e-mail **nina@slac**) for additional information.

— *Sharon Minton*

EVENT CALENDAR: April 1994

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 additions or changes by calling ext. 2204 or sending e-mail to **nina@slac**.

October 7
Annual Reviews Editorial Mtg.
V. Luth

October 9–10
BaBar Technical Board
(TBA)

October 11 7:00 PM
IICS EDSIG Meeting
Auditorium

October 12–13
SSRL Annual Users Meeting
Auditorium

October 12–14
BaBar Tech. Review Committee
(TBA)

October 16–20
SLD Week
(TBA)

October 17
SLUO Executive Committee
(TBA)

October 23, 7:00 PM
OS/2 Users Meeting
Auditorium

October 27–28
SPC Meeting

October 28
LBL Open House
LBL

November 1–3
SU Alumni Association Course
Auditorium

November 3 7:00 PM
ZONTA Int'l Meeting
Auditorium

November 3–4
BaBar Int'l Finance Committee
(TBA)

November 7–8
BaBar Executive Board
(TBA)

November 9–11
BaBar Technical Board
(TBA)

November 13–17
SLD Week
(TBA)

November 14–16
DOE BaBar Review
V. Luth, T. Boysen

November 14, 7:00 PM
IICS Meeting
Auditorium

November 27, 7:00 PM
OS/2 Users Meeting
Auditorium

November 28
BaBar Joint Exec./Tech. Board
(TBA)