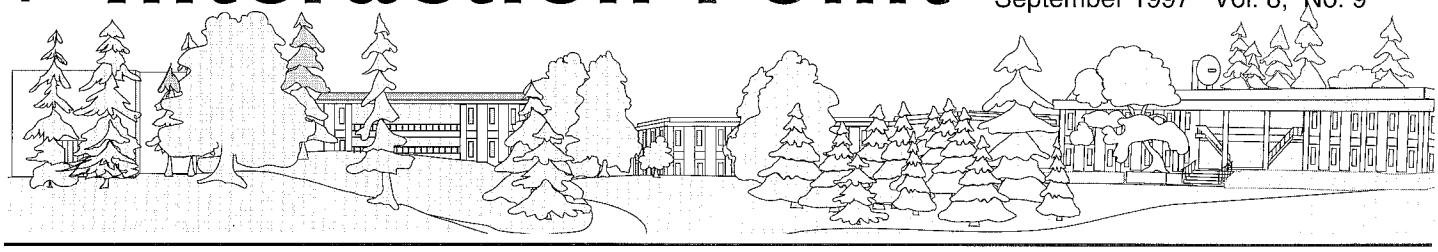
The Interaction Point

Events and Happenings
In the SLAC Community
September 1997 Vol. 8, No. 9



# Lab Strategic Plans Outlined

HOW ARE WE DOING? Where are we going? How can we improve? Those were the basic questions of DOE officials who visited SLAC last month for the On-Site Review. Every two years SLAC has an opportunity to lay out our long-term plans to the DOE for their comment.

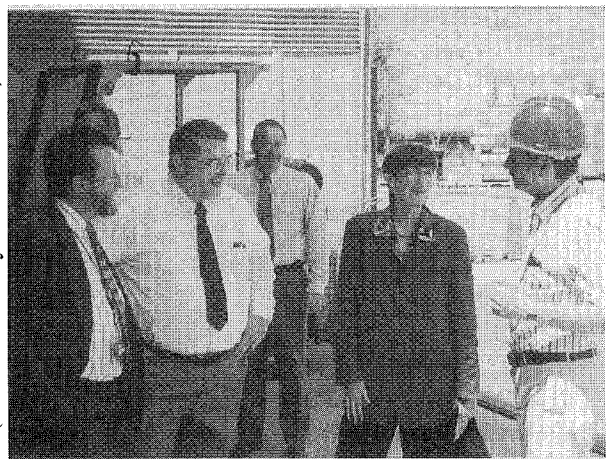
SLAC Director Burton Richter began the meeting with a summary of strategic issues such as the need for budget increases, the continuous improvement of health and safety, and the renovation of our aging infrastructure.

Martha Krebs, Director of DOE's Office of Energy Research (DOE-ER) praised SLAC and Richter's leadership in the area of safety, citing specifically the site-wide safety stand downs which started two years ago. "This lab is a model for others in terms of involving the entire staff and being proactive in safety issues," commented Krebs.

Krebs and her staff were briefed on future directions of high energy physics and synchrotron radiation. "I've been getting the word from others that SSRL is an outstanding program in respect to user satisfaction and service," said Krebs. She expressed her interest and scientific support of new projects such as the NLC, and GLAST and SPEAR 3, but reminded us of the budget restrictions ahead.

*Summer interns met with DOE officials to discuss the importance of research opportunities for undergraduates. (l to r) Top row: Antoinette Joseph (DOE), Helen Quinn (SLAC), Cicely Mitchell, Jaimme York, Carlos Figueroa (director of the summer intern program), Erich Caulfield, and Sam Rodriguez (DOE). Bottom Row (l to r) Ivonne Mosquera, Garth White, Martha Krebs (DOE), and Christi Flacco.*

(Photos Courtesy of P.A. Moore)



*DOE officials toured IR2 as part of their visit. (l to r) John Muhlestein from the DOE Site Office, John O'Fallon, Steve Buswell and Martha Krebs from DOE-ER chat with Dave Hitlin, spokesman for the BaBar collaboration.*

Education was also high on the agenda. "This is an area where Secretary Peña has strong interest and preferences," said Krebs. As part of her orientation to SLAC education programs, Krebs had lunch with a group of students from the Summer Internships in Science and Engineering (SISE) program.

Community outreach is also an area of interest to the Department of Energy. P.A. Moore outlined a few of the Lab's community activities, and stated the importance of SLAC staff as ambassadors to their communities.

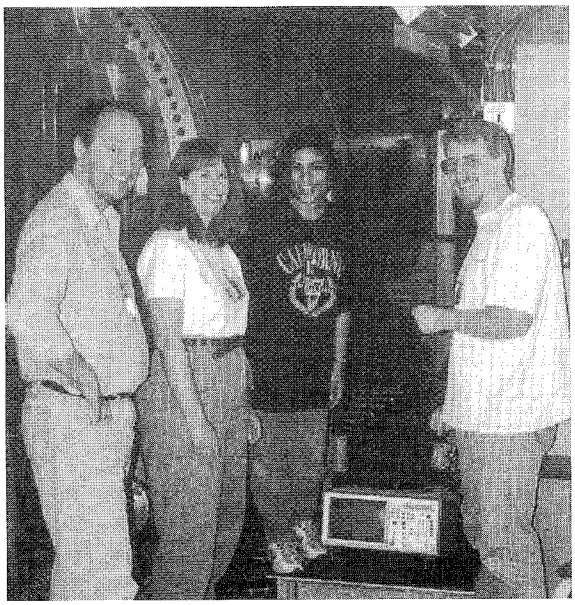
# Virtual Visitor Center

AS ANYONE WHO HAS been to the auditorium or cafeteria in the last year knows, SLAC now has a walk-in Visitors Center. What they may not realize is that a Web version–the Virtual Visitors Center (VVC)–is also in the works. Designed to be accessed from SLAC's homepage, it hopes to reach a target audience from high schoolers on up.

That is why Tom Woosnam, science department chair at Crystal Springs Uplands School in Hillsborough, spent five weeks of his summer working in the opulent, air conditioned (when the door was open) surroundings of Building 28, otherwise known as "The Maze."

Woosnam was one of six high school teachers at SLAC participating in internships sponsored by the Department of Energy. His task was to produce Web pages for the VVC linked to the posters displayed in the Visitors Center. Basing his work on material already written by Helen Quinn, he found himself ranging widely across many areas of physics. Not only was there the challenge of writing pieces on accelerators, detectors, experiments, SSRL, theory and cosmic rays, there was also a need to decide the levels at which to write them. With guidance and suggestions from Quinn, Woosnam has structured the material in three basic layers of complexity to appeal to various audiences. Math has been kept to a minimum and pictures are plentiful.

No deadline has been set for the VVC to be fully online, but Woosnam's work this summer will help bring the date forward and contribute to educating SLAC's world-wide audience.



*Perry Anthony (r) gives a tour of End Station A to teachers Tom Woosnam (l), Carol Johnston (c) and graduate student Rupinder Kaur.*

# Teacher Report Card

THIS SUMMER I HELPED set up a data acquisition system for SLAC's Health Physics department in a test beam experiment scheduled for the fall of 1997. This experiment will measure the neutron energy spectra generated by interaction of high energy electrons on thick targets.

When I return to school in the fall, I will implement a new program involving extensive use of computers in the science classroom, ranging from use of the internet to data collection for laboratory activities. Although the programs that I will use at school are different from those that I used at SLAC, the confidence gained from working on computer systems will be a great asset.

One topic in my sophomore math curriculum is logic. My increased knowledge of electronics, computers and programming has given me many ideas for updating my presentations on this topic. More knowledge of binary numbers will also be helpful in my math classes for the sections on logic and exponents.

The most useful part of this summer's experience comes from the opportunity to meet and speak with many different people among the scientific community. I feel privileged to have worked with two exceptional mentors, Perry Anthony and David Fryberger.

In addition, two others gave me useful insights regarding science, scientists, and science education. Max Dresden, a retired professor of physics and an authority on the history of science, shared many wonderful stories about the people who shaped modern physics. Amanda Weinstein, a graduate student in physics and daughter of a SLAC theorist, revealed insights on what it takes to be successful today in this field. My summer at SLAC has given me stories to inspire my students and enthusiasm to return to teaching.

*--Carol Johnston*

## WELCOME GUESTS AND NEW EMPLOYEES

The following people joined SLAC through mid-August: **Edward Anashkin**, BBR; **Mehdi Benkebil**, EC; **Vladimir Blinov**, BBR; **Frank Close**, THP; **Robert Cowles**, SCS; **Igor Gaponenko**, BBR; **Ryoichi Kajikawa**, EA; **Ellen Kissel**, EC; **Frank Krauss**, BBR; **Lata Mafi**, PUR; **Takayuki Matsumoto**, EK; **Rolf Merte**, ARDB; **Michiko Miyamoto**, THP; **Dellilah Sabba**, ES&H; **Joerg Stelzer**, BBR; **Eva Silverstein**, THP; **Situ Sun**, AD; **Julia Thom**, EA.

# Gun Test Facility Begins Operation

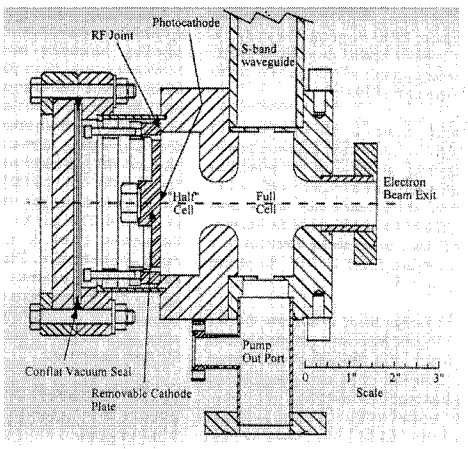
LATE IN THE NIGHT of July 19, 1997 a new accelerator began operation at SLAC–the Gun Test Facility (GTF) located in the shielded vault of the SSRL injector linac. Graduate students Mike Hernandez and David Reis along with SSRL's John Schmerge and Herman Winick were joyous at witnessing the first glimmer of light produced by a 5 MeV electron beam on a phosphor screen.

Begun about 3 years ago, the gun test is a research project aimed at developing the high-brightness electron source that will be needed for future linac-based X-ray free-electron lasers (FELs) such as SLAC's proposed Linac Coherent Light Source (LCLS). The Light Source requires brighter electron beams than the current SLC, which generates its bright electron and positron beams in the damping rings.

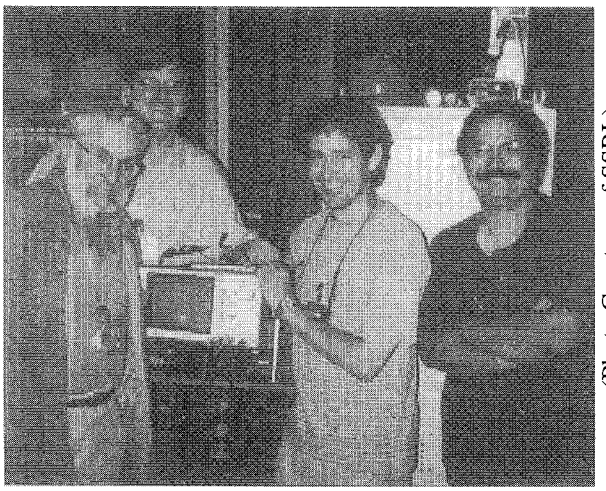
The most promising technology for the electron source for the LCLS is a type of photocathode radio-frequency gun, pioneered at Los Alamos National Laboratory in the 1980's as part of the SDI program nicknamed Star Wars.

In such a gun electrons are generated by light shining on a metal or semiconductor cathode by the so-called photoelectric effect, rather than by boiling off electrons by applying heat to the cathode surface as is done in a TV tube. The gun now used for the SLC program is also a photocathode gun, using polarized laser light to generate polarized electrons by the photoelectric effect on a gallium arsenide cathode.

In the type of gun being developed for the Light Source, an intense burst of ultraviolet laser light striking a millimeter-sized spot on the photocathode produces about two billion electrons within 5-10 trillionths of a second. With so many electrons packed so closely together in space and time their mutual repulsion (remember: like charges repel one another) results in a spreading out of the beam; thus a loss of concentration or brightness.




*A cross section of the BNL/SLAC/UCLA 1.6 cell symmetrized cavity gun is shown.*



(Photo Courtesy of SSRL)

*(l-r) Herman Winick, John Schmerge, David Reis (University of Rochester), and Mike Hernandez.*

To reduce the time during which this beam spreading can take place the photocathode is placed in a high-gradient (up to about 150 MeV/m) accelerating field which boosts the emitted electrons to nearly the speed of light in a distance of about 10 centimeters. This acceleration is done in a structure similar to that used in the SLAC linac. The residual spreading is further reduced, or compensated, by refocusing the beam emerging from the gun structure using a solenoid magnet.

A collaboration among SLAC, Brookhaven National Laboratory and the University of California at Los Angeles has designed and fabricated an rf gun aimed at meeting the demanding requirements for the LCLS. Dennis Palmer, a graduate student of Roger Miller, played a major role in the design and initial testing of the first copy of this gun at Brookhaven as part of his Stanford Ph.D. thesis.

*(continued Page 4, Column 1)*

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# Gun Test Facility Begins Operation

*(continued)*

A second copy, with some modifications made by Jim Weaver, has now been installed on the GTF for more detailed characterization. A critical component of the GTF is the laser which drives the gun with 5-10 picosecond long bursts of ultraviolet laser light with a peak power of about 10 megawatts.

The laser system for the GTF was designed, constructed, and is now being commissioned by University of Rochester graduate student David Reis under the supervision of Professor David Meyerhofer. It makes use of part of the laser system developed by the Rochester group for SLAC experiment E144 at the Final Focus Test Beam. The GTF diagnostics were designed, built and are now being commissioned by Mike Hernandez. Collaborators at Argonne National Laboratory have also made contributions to the GTF. John Schmerge provided broad technical coordination for all aspects of the GTF project.

Generating these very high brightness electron beams, and preserving their brightness during transport, acceleration, and compression, are major areas of R&D for future facilities for both the synchrotron radiation and high energy physics user communities, the two constituencies which SLAC serves. Thus SLAC, with its strong accelerator physics capabilities and unique experience with the SLC, is the ideal place to pursue this R&D.

Many at SLAC contributed to the design and construction of the GTF, particularly Mike Nalls, Sam Park, Gary Woodcock, and Dian Yeremian, plus many others in the machine shops, radiation physics group, SPEAR operations group, and the SSRL Mechanical Services and Electronics groups.

We also owe many thanks to the staff of the Business Service Division, particularly Purchasing, for their excellent service throughout this project.

*--Herman Winick*

## Work Safe, Work Smart

Since 5/12/97 SLAC has had only two Worker's Compensation claims involving days away from work. Sharon Haynes, Worker's Compensation Coordinator, reported that the incidents occurred on 7/28/97 and 8/7/97. The number of calendar days between the 5/12/97 claim and 7/28/97 claim is 77 days. This beats our previous record of 67 calendar days between claims and establishes a new record for SLAC.

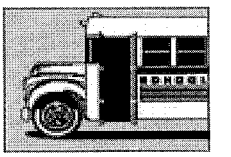
# On the Trail of the Transistor

MICHAEL RIORDAN HAS RECENTLY published another book for general readers on the history of science. Co-authored with Lillian Hoddeson of the University of Illinois, *Crystal Fire: The Birth of the Information Age* (W.W. Norton & Co.) is the definitive story of the transistor, including the development of related semiconductor technology, which together spawned the microchip and now form the foundation of Silicon Valley.

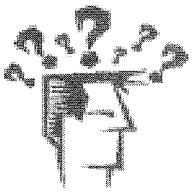
The central figures in the book are physicists John Bardeen, Walter Brattain and William Shockley, who shared the 1956 Nobel prize for their breakthrough. Shockley went on to found Shockley Semiconductor Laboratory on San Antonio Road in Mountain View–the first semiconductor company in the Valley, which led to many other, much more successful companies. In his review of the book in *Nature*, former National Academy President Frederick Seitz writes, "The authors have left no stone unturned in making their work an enduring classic...The test is rich in anecdote, presenting the reader with colourful views of many of the secondary as well as the primary figures involved."

Riordan will be speaking about the origins of Silicon Valley and signing copies of *Crystal Fire* at Printers Inc. in Palo Alto on Thursday evening, September 18, at 8 p.m. This date marks the 50th anniversary of a crucial event in the birth of the Valley–the invention of the transistor. The book lends lively details to events that preceded and followed this discovery.

# Now Running!



THE MENLO MARGUERITE COMMUTER shuttle is now serving the Menlo Park Train Station, Santa Cruz Avenue, Sand Hill Road businesses and SLAC. The new service went into operation on July 1. They are offering some travel incentive kits to entice you into using public transportation. Contact Bernie Lighthouse at x2358 for schedules and passes for free fares on CalTrain and other public transportation. For travelers coming from the North, this saves you one stop and a fare zone increase. Save the air and save some money! Ride the Marguerite!



# Inquiring Minds Want to Know: SLAC Survey Issues

LAST MONTH'S COMMUNICATION SURVEY in the Interaction Point brought out some interesting comments. Here's a sample of thoughts from our workmates and the Editor's response:

*"Why is the all-hands email restricted?"*

Many people complain that they get too much email, so all-hands email is restricted to items that are newsworthy, of an urgent or timely nature, and have site-wide implications.

*"It would be nice if people returned phone calls."*

Sometimes we forget to program our voice mail to let people know we are away from the office. Other times we are really busy and forget. We can all do better in this respect.

*"Allow people to take classes even during the day to round off their job skills and let them make up the time - don't make it contingent on the supervisor alone!"*

If you and your supervisor are not in agreement over classes during work hours, contact Bernie Lighthouse (non-bargaining unit) or Al Ashley (bargaining unit) for advice.

*"An itemized list of safety concerns from the SLAC-wide safety meetings was supposed to be posted on the web, with the disposition of each item. Did this ever happen? I have the feeling nothing was done about many of the problems."*

This list is posted on the ES&H webpages. Look for "Programs" and click on Safety and Environmental Discussions. There is a list of action items and the status of each item. If you don't have access to the Web, ask your group administrative associate, your safety discussion leader or a member of the SEDAC committee (Gail Gudahl, Darren Marsh, Ian Evans, Frank O'Neill, Janice Dabney or Jack Hahn).

*--P.A. Moore*

# Community Outreach at DOE Labs

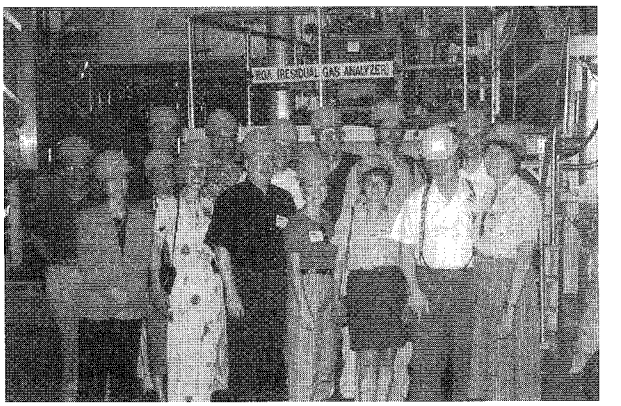
"IT'S IMPORTANT THAT WE communicate Lab activities to the public and that public perceptions and attitudes be communicated back to the Lab," said Robert Goldston, Director of Princeton Plasma Physics Lab, in his opening remarks at the Energy Research Communications Council. The group, composed of public information officers of DOE-ER facilities, met recently in Princeton to discuss strategies for improving community relations.

Sam Rodriquez, assistant to Martha Krebs in Energy Research, briefed the group with news from Headquarters. "We want to be able to communicate the good news, but we have to know the bad news as well."

Caron Chess, a consultant in risk communication from Rutgers University sponsored by Berkeley Lab, cautioned participants to attend to the needs of the local community. "Trust is hard to build and easy to destroy. There is no quick fix for rebuilding trust, it has to be a change in lab culture," said Chess. This message was reinforced by Marge Lynch, public affairs manager at Brookhaven.

Public affairs officers commented on activities at their local sites, what works and what doesn't, and building lab involvement in the community. Participants observed that education programs, public tours, and shared activities with the community are important components of outreach efforts. Focus groups and surveys are methods to test the perceptions of neighbors.

SLAC participants at the meeting were P.A. Moore, Assistant to the Director for Public Affairs, and Nina Stolar, Manager of the Public Affairs Office.



*Public affairs officers of DOE labs gather in front of the Tokomak at Princeton Plama Physics Lab.*

# Cybrarians Among Us?

*Cybrarians at SLAC include (l to r): Ann Redfield, Sally Zapata, and Georgia Row.*

AN ARTICLE IN THE August, 1997 issue of *Wired* magazine asserts that librarians are fighting off extinction in the information age, by re-naming their professional schools and shifting the schools' curricula to emphasize managing information in electronic formats.

While the move into cyberspace may be a new one for library schools, some of the first-generation SLAC librarians were the avant-garde of "cybrarians." SLAC's library joined with the library at DESY in 1974 to start the High-Energy Physics (HEP) database. In 1982, SLAC's library was the first on the Stanford Campus to move to an online catalog. Although one of the key people from that first generation of SLAC librarians, Bob Gex, has recently retired, the SLAC library continues this pioneering effort to electronically organize information useful to HEP researchers.

Information available through the Internet and the World Wide Web, as we all know, has become an almost overwhelming flood in recent years. The work the SLAC library has done in channeling this flood for patrons has resulted in a steadily increasing use of our databases: the HEP database is now experiencing 250,000 external hits per month. Although it will be a bit of a struggle to fill Bob Gex's well-worn shoes, he can take comfort in the fact that he and the other pioneering cybrarians have established a firm track on which the current SLAC library staff can continue to run.

**DID YOU KNOW?**

According to a recent Operating Safety Committee memo, there have been 284 traffic citations issued by SLAC security officials during the period from October 1, 1996 through June 30, 1997.

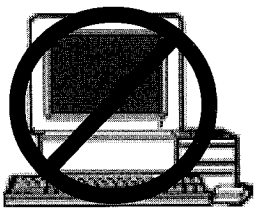
# Personnel Handbook Available

"I DON'T KNOW IF you are the right person to ask..."

Have you ever prefaced your call to the Personnel Department with these words? Finally, there is a comprehensive guide to who does what in Personnel. No more guessing or making a few errant stabs until you get the responsible person to respond to your questions.

Prepared as the basis for the Personnel Web page, the Handbook is available for those who don't have ready access to a computer, or who don't want to wait for the online version. The Handbook contains tips to utilize Personnel services more effectively, and an index to look up specific subject matters. It's only a snapshot in time and will not be maintained like the Web page, but you can obtain your copy by calling Barbara Johnson, x2354.

# "Spamming" Blocked



SLAC BLOCKS EMAIL FROM any domain which delivers Unsolicited Commercial Email (spam) to SLAC, and which has not delivered any legitimate email to SLAC during the previous 30 days. Once a domain has been blocked, any attempts to delivery mail to SLAC will be terminated and an appropriate error message will be generated for the sending domain postmaster and user (if valid).

This action became necessary due to the increasing volume of unwanted email coming into SLAC. The emails are often offensive to SLAC users, they can interfere with legitimate work, and delivery of such messages via SLAC computers constitutes abuse of Govermnent property.

For more information on the volume of spams being seen, the error messages that may be seen by a user sending email through a "spamming domain" and how to find out more, see: http://www.slac.stanford.edu/comp/net/email/email.html#spam.

If you have further questions, contact the SLAC Postmaster, Teresa Downey, either via email (postmaster@slac.stanford.edu) or phone (x2903).

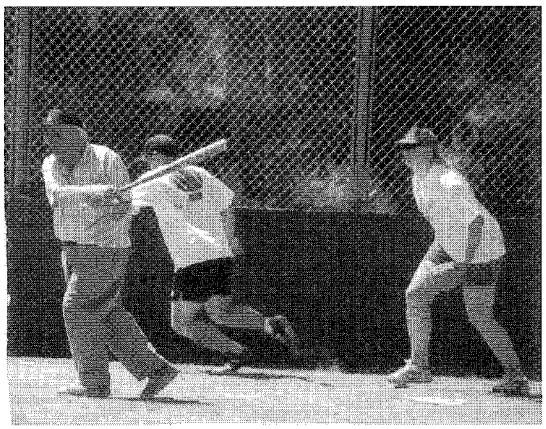
*--Richard Mount*

# Clash of the Titans

THE THEORY AND EXPERIMENTAL SOFTBALL teams clashed at La Entrada Field on the last Saturday in July. When the dust settled on the sun-baked field, the bleached scoreboard displayed the conclusion of this year's championship game: Theory 12, Experiment 9. The Theory victory was the fifth in the last nine years.

The winning Theory strategy this year was: score early, score often. Timely hitting by Scott "Mr. Casual" Thomas, Howie "The Hustler" Haber and Lance "Captain America" Dixon allowed Theory to take an early lead in the second inning. Theory bats exploded again in the fourth and fifth innings with run scoring hits to power Theory to a 12-5 lead.

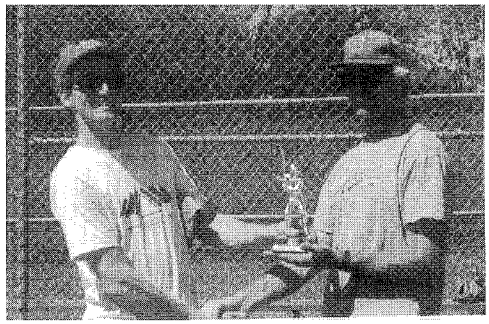
From the sixth inning on, the Experiment pitching tandem of Burton "Big Daddy" Richter and Dick "Zany" Zdarko slammed the door shut on the Theory scoring machine. Experiment then mounted a ferocious hitting assault of their own, scoring runs by Ron Cassel, Greg Mitchell, Dave Reyna and Trevor Lanting in the bottom of the sixth, tightening the game to 12-9.



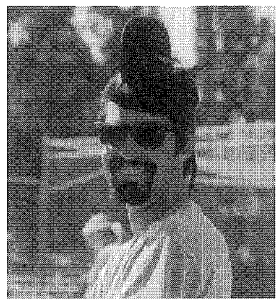
*Burton Richter, Experiment Pitcher, at bat with Sharon Brodsky, Theory Catcher, and Chris Chaput as a pinch runner late in the game.*

(Photos courtesy of Nina Stolar)

*Theory Team Roster (l-r): Scott Thomas, Sharon Brodsky, Tobias Hurth, Howie Haber, Bj Bjorken (pitcher), Gerhard Buchalla, Michael Melles (standing); Alex Kagan, Mascot Daisy, Shaouly Bar-Shalom, Mihir Worah, Yuval Grossman, Lance Dixon (Captain), Amber the Wonder Dog, Walt Stolar (front row).*



*Team Captains Lance Dixon (Theory) and Mike Woods (Experiment) exchange the Game Trophy and Theory gets bragging rights for the year ahead.*



*David Reyna encourages Experiment with his rally cap.*

The final three innings were a nail biting defensive struggle as pennant waving fans cheered wildly for both sides. Although Experiment pounded the ball with authority time and time again, Theory made fielding gems and cut runners down with deadly accurate throws.

For those unfamiliar with the tradition, each "spring" Theory and Experiment vie for supremacy on the softball field. Begun in the 1950s as a Faculty vs. Students game on the Stanford campus, Sidney "Lefty" Drell and Burton "Big Daddy" Richter have carried this tradition into its fourth decade. This year's celebration was held at Chez Lance.

The Experiment team consisted of: Ron Cassel, Chris Chaput, Glen Crawford, Jim Johnson, Paul King, Trevor Lanting, Greg Mitchell, Paul Raines, David Reyna, Burton Richter, Terry Toole, Mike Woods (Captain), Dick Zdarko.

*--Nina Stolar*

| **SCORE:** | | | | | | | | | | **RUNS** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Inning** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | |
| Theory | 1 | 2 | 0 | 5 | 4 | 0 | 0 | 0 | 0 | **12** |
| Experiment | 0 | 1 | 1 | 2 | 1 | 4 | 0 | 0 | 0 | **9** |

# Summer Institute Program Honors Dr. David Leith

(Photos Courtesy of Rainer Pitthan)

*David Leith displays his commemorative plaque while SLAC Director Burton Richter looks on.*

*Doreen Leith was also honored at the ceremony for her years of support.*

AFTER 25 YEARS OF guidance, David Leith is stepping back from his involvement with the Summer Institute. Leith was honored at the end of this year's program by his colleagues. "BJ" Bjorken and Sid Drell, instrumental in starting SSI with David, gave their recollections of the school.

Lance Dixon represented the more recent period in the Institute history, and letters of congratulation were sent by Gary Feldman, Fred Gilman, and Anne Warren...all have been important in the course of the Institute.

# Soapbox Derby

*ATTENTION RACING FANS:*

*"Start your engines."* Whoops. Let's try again.

*"Will those who are pushing the gravity-powered vehicles, please take your places at the starting line?"*

SUNDAY, SEPTEMBER 21st, IS THE DAY of the Sand Hill Challenge, a soap box derby to benefit programs to educate teens about the dangers of drinking and driving. Organized by Jamis McNiven of Buck's Restaurant in Woodside, the event is gathering momentum and the sponsor list is growing.

The race will begin at the Addison Wesley entrance on Sand Hill Road and end just past the SLAC main gate. Sand Hill will be closed to traffic during the race, so if you are on duty that day, watch for signs about alternate gates.

SLACers will be active participants and volunteers are needed in several areas. Those interested in helping with the vehicle can contact Lowell Klaisner (x2726). If you wish to be involved with the finish line team, Pat Wurster is the contact at x3507. For the SLAC Open House afterward, contact Nina Stolar (x2282).

# FactinOs

***Ombuds Office Move***

SLAC/Stanford Ombudsperson Ellen Waxman has a new location on the second floor in the Central Lab, Room R269. Her phone number remains the same at x3826.

***415 Where are You?***

After all the brouhaha about area codes changing, we find that over 75% of our pagers will remain on the 415 area code! Steps are taking place to remedy this situation.

***Internal Communications Survey***

We hear you! The surveys are rolling in! We are tabulating data as fast as we can and the results will be published in the October TIP. Tech Division turned in the most surveys, with Research Division following closely behind. We need to hear more from the rest of you–come on, BSD, ES&H, SSRL, and PEP-II and "other"! Be counted! Send in those surveys! It's a green sheet in last month's newsletter (or contact Vickee Flynn, x4208, for a copy). We will extend the deadline until September 15 to allow you a bit more time to get in your survey.

***Budget Still in the Works***

The House and the Senate budgets for FY98 don't agree. When this happens, the budget goes to a conference committee to resolve the differences. That committee will meet in mid-September and we hope to have a final budget by then. More news as it happens.

***PEP-II Tours***

The noon tours of the PEP-II ring will begin in mid-October and continue for six consecutive Wednesdays. To reserve your place on this walking tour, call or email Teri Peterson (x4463, or terip@slac.stanford.edu).

***Need a Word?***

Can't find a dictionary or thesaurus? Here's a reason to keep that Web Browser open! Merriam-Webster has a web page, with both a dictionary and a thesaurus. Try them at: http://www.m-w.com.