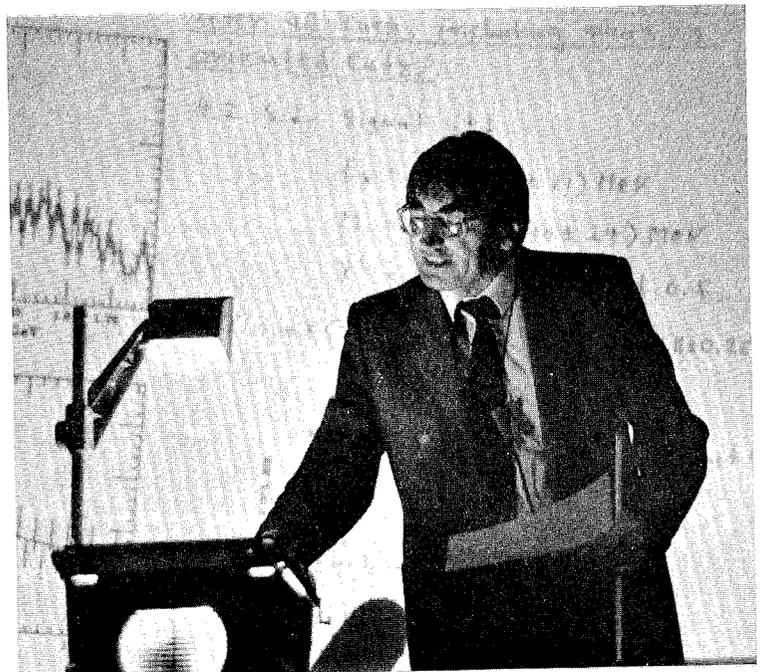
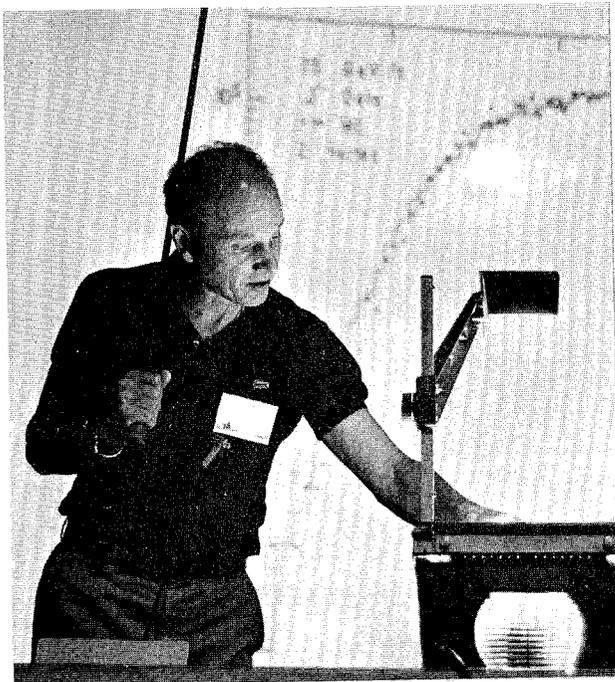
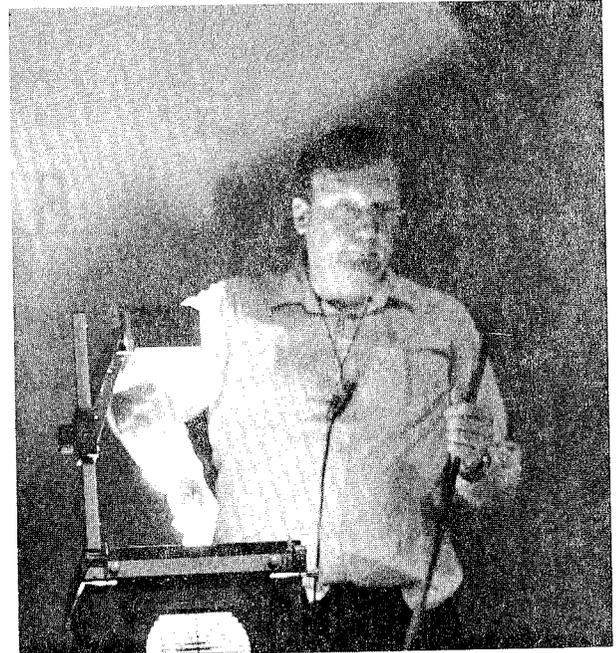
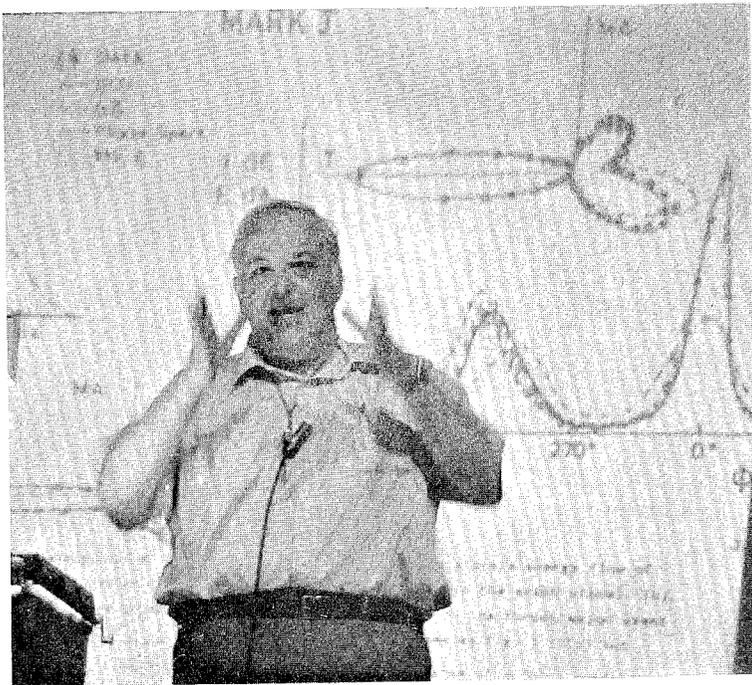


SLAC BEAM LINE

A useful scientist is neither philosopher nor poet but believes instead that it is preferable to have an instant of approximate fact than an eternity of precise illusion. — Ralph Estling

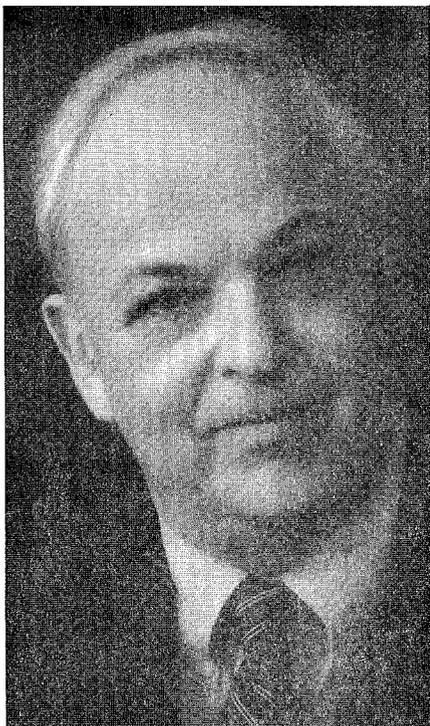
Volume 15, Number 9

September 1984



SLAC SUMMER INSTITUTE, AUGUST 1984

RICHTER INAUGURATION IN NOVEMBER



Burton Richter, who became SLAC's Director on September 1, will be formally inaugurated by Stanford University President Donald Kennedy in ceremonies on November 14. The date coincides with the tenth anniversary of the discovery of the ψ particle at *SPEAR*. That experiment sparked a new direction in subatomic physics and confirmed the colliding beam technique as the most powerful experimental tool for exploring matter at high energies. The period is sometimes called the 'November Revolution.'

The 1976 Nobel Prize was awarded jointly to Richter and to Professor Samuel C.C. Ting, who simultaneously discovered the particle in a different kind of experiment at Brookhaven.

A symposium in the morning reviewing the physics flowing from those discoveries will include talks by Deputy Director Sidney Drell, Nobel Laureate Samuel C.C. Ting, *SLC* Project Director John Rees, Roy Schwitters, James D. Bjorken, and David Hitlin.

A general talk on the significance of this physics by *SLAC* theorist Frederick Gilman will be given for the *SLAC* staff in the afternoon on the green, followed by remarks from W.K.H. Panofsky and from a representative of the Department of Energy. After his inauguration by Donald Kennedy, Burton Richter will give a formal address. The ceremonies will conclude with a reception.

NEW TECHNICAL DIVISION DIRECTOR

Dr. Kaye Lathrop has been appointed Associate Director, Technical Division. He will assume this post in October. This position of Director of the Technical Division had been held by Burton Richter, now the Director of the laboratory. The post was held by Dick Neal from the founding of the laboratory until Neal's retirement in 1982.

Dr. Lathrop has had extensive experience in scientific research and laboratory management at the Los Alamos National Laboratory, of which he has been Associate Director for Engineering Sciences since 1979. He had earlier been Division Leader of the Computer Science and Services Division, Alternate Division Leader of the Energy Division, Associate Division Leader in the Reactor Division, and Assistant Division Leader of the Theoretical Division.

He received his Bachelor's degree from West Point in 1955 and served for three years in the US Army Corps of Engineers. He then obtained a Ph.D degree in mechanical engineering with a physics minor from Caltech and joined the Los Alamos staff.

Dr. Lathrop has received several scientific awards including the E.O. Lawrence Memorial Award in 1976 and the American Nuclear Society Exceptional Performance Award in 1980. He is a member of both the

American Nuclear Society and the American Physical Society and has a distinguished list of published papers on topics ranging from neutron transport theory to computer studies.

In his memorandum to the staff announcing the appointment, W.K.H. Panofsky noted, "We have high expectations that Dr. Lathrop will be of the greatest assistance to *SLAC* in discharging our increasing responsibilities. He will introduce some new approaches to *SLAC* born from his work outside high-energy physics, while continuing our traditional missions in that field."



Cover

SLAC SUMMER INSTITUTE, 1984

The cover photo shows four of the 31 speakers at the SLAC Summer Institute. Clockwise from top left: SLAC Director Burt Richter; Carlo Rubbia, Harvard; Bogdan Niczyporuk, Cracow Institute; James Cronin, Chicago. These speakers illustrated the breadth of topics in the two-week school. (Photos by Joe Faust.)

The Summer Institute is now a tradition in high-energy physics. It is intended to bring to young physicists and students the background of current high-energy physics as well as the most recent results.

The theme for this year's school, The Sixth Quark, was chosen early in the year in recognition of the intense experimental search then going on for this 'top' quark. A few weeks before the beginning of the summer institute, evidence for top was found at CERN, and Carlo Rubbia discussed it at the school.

Completely unexpected was the announcement of a new, unknown particle by the Crystal Ball, now in Germany. This work was presented at the school by Bogdan Niczyporuk. (see box at right).

The final day of the Institute was part of the Pief-Fest, in which several physicists discussed the many topics in which retiring SLAC Director W.K.H. Panofsky has an interest. Burt Richter discussed the great wealth of experimental discoveries which have come from electron-positron storage rings. Other speakers covered scattering experiments, science policy, and issues of disarmament.

James Cronin discussed the elegant work in very rare decays of the K mesons. This work, first begun 20 years ago, shows the violation of a basic symmetry in physics involving handedness and the similarity of particles to their antiparticles. Theories trace this small effect, called CP-violation, to the third generation of quarks and leptons, the generation which includes the top quark. Cronin shared the 1980 Nobel Prize with his colleague, Val Fitch, for this work.

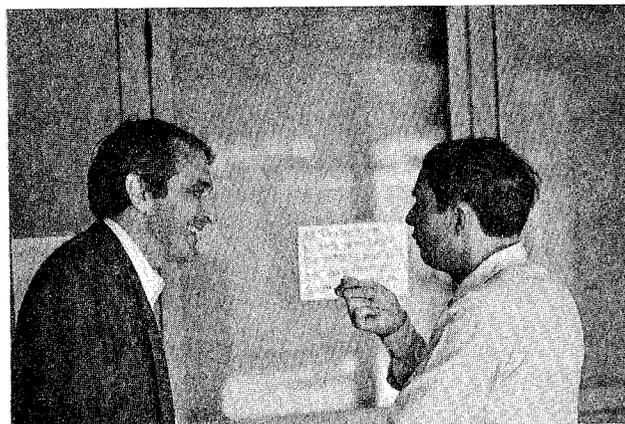
FORTTRAN FORUM, OCTOBER 17

Fortran, that venerable computing language, is keeping up with the times. A national committee is proposing changes in the language that, for example, will help deal with current and future 'supercomputer' programming. Since this such a widely used language, the committee has been holding meetings across the country to explain its ideas and get suggestions. SLAC is acting as host for the bay area meeting, scheduled for Wednesday, 17 October, from 1:00 pm to 5:00 pm in the SLAC auditorium. All Fortran users in the bay area are invited. For further information, call Len Moss, x3370, or Myrna Valdez, x2841.

ZETA — THE CRYSTAL BALL'S NEW PARTICLE

This summer the Crystal Ball Collaboration announced the evidence for a new and unexpected particle, which they have named ζ , or 'zeta.' The work was performed by an international team of 78 physicists at the German laboratory DESY using the Crystal Ball detector built here and first used at SPEAR.

The particle does not seem to be made of the known quark building blocks in the usual fashion. Some suggest that it is related to the Higgs mechanism, a feature of present theories which generates the mass of all other particles. But some of the properties of the new particle do not fit those explanations. The discovery will be reviewed in more detail in a future *Beam Line*.



SLAC's Elliott Bloom (left) chats with Michel Davier at the Summer Institute. Bloom is co-spokesman for the Crystal Ball experiment with Hans Bienlein of DESY.

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SLAC Beam Line, x2979, Mail Bin 94

Editorial Staff: Bill Ash, Dorothy Edminster, Bob Gex, Janet Sauter, Herb Weidner.
 Photography: Joe Faust.
 Graphic Arts: Walter Zawojski.
 Illustrations: Publications Department.

Stanford University operates SLAC under contract with the US Department of Energy.

STUDY OF HIGH LUMINOSITY PHYSICS

The *SLAC-LBL* Users Organization and *SLAC* are sponsoring a study of the new physics which would be available at *PEP* if the machine were modified to give significantly higher intensity. Technically known as an increase in luminosity, the change would increase the number of interesting collisions, or events, produced in a run. Many of the interesting processes at *PEP* occur infrequently and the increased rate should help bring them forward. The study, entitled "Workshop on e^+e^- Physics at High Luminosities," will be held at *SLAC* November 30 and December 1.

The technique brings the magnetic quadrupoles closer to the detectors, producing an effect much like that of using a stronger lens to focus, and brighten, a light beam. One step in this process, called a mini-beta insertion, has already been taken at *PEP*. Moving still closer (micro-beta) requires bigger changes in the machine and also affects the experiments, which would have to accommodate magnets very close to the detectors.

The program for the study includes *B* physics, jets & *QCD*, flavor tagging, two-photon physics, new physics, machine development, precision vertex detectors, particle identification, calorimetry, and rare processes. The organizing committee consists of J. Weiss (Chairman), Argonne; R. Panvini, Vanderbilt; J. Matthews, Johns Hopkins; R. Taylor, *SLAC*; P. Oddone, *LBL*; M. Peskin, *SLAC*; M. Derrick, Argonne; H. Paar, *NIKHEF*; and D. Koltick, Purdue. Further information is available from J. Weiss at *SLAC* Mail Bin 94.

SERA NEEDS YOUR HELP

Emergencies happen without warning. They can affect anyone regardless of prior planning. They strike, often at the least opportune times, and can leave even the most prudent person devastated. The shock of enduring a personal tragedy can drain the resolve as well as the finances.

This is the reason for the *SLAC* Emergency Relief Association, *SERA*. We exist for the sole purpose of insuring that our fellow workers can continue through trying times. We provide both financial and human assistance when and where it is needed most. Our over fifteen-year record speaks for itself. We have helped many of your fellow workers to overcome obstacles when there was no one else who would.

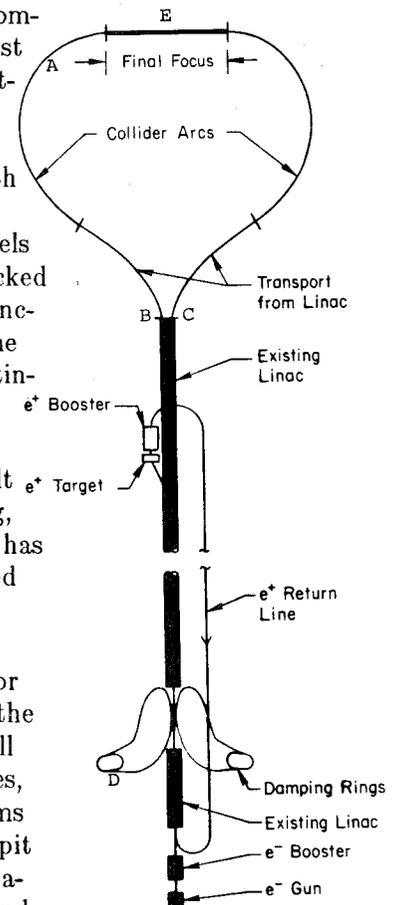
Now we are asking for your help that we may continue to offer this invaluable service to all those, members and non-members alike, who belong to the *SLAC*

PROGRESS ON THE COLLIDER

The tunnel for the *SLAC* Linear Collider was 90% complete in September with just 860 feet of of the 9000-foot-arc remaining (near point A in the figure). The two junctions of the tunnel with the linac (points B and C) are complete and the tunnels have been temporarily blocked about 200 feet from the junction so the linac can resume operations while work continues in the tunnel.

At the other end of the machine (point D) the vault for the north damping ring, which will store positrons, has been completed and covered over.

Bids have been received for beginning another major civil construction project, the experimental hall. This hall (point E) will contain offices, lab space, and control rooms above ground with a deep pit for two experiments and maneuvering space underground.



community. For as little as one dollar per month you can insure that *SERA* will be able to operate in the future. Please fill out and return the pledge card form today. We need your help today. You may need our help tomorrow.

—Brian Waugh

SERA CONTRIBUTION	
<input type="checkbox"/> My check is enclosed.	_____ (Signature)
I would like to donate \$ _____ to SERA.	_____ (Please print name)
<input type="checkbox"/> I authorize payroll deductions of \$ _____ per month to SERA, to continue until further notice.	_____ (Date)
	_____ (Employee number)
TAX DEDUCTIBLE	mail to BIN 70

RALPH AND RANDY NELSON

The following was abstracted from the "People in the News" column of the September 4, 1984, issue of *PC Magazine*.

When Ralph Nelson set out to solve his problem of keeping track of magazine articles about the *IBM PC*, he didn't realize so many other *PC* owners were in the same deluge.

It took Ralph's 18-year-old son, Randy, however, to realize the marketing potential of what his father so painstakingly created. A physicist at the Stanford Linear Accelerator Center, Ralph originally bought a *PC* both to work at home and to access the mainframe computers at Stanford.

Then the frustration started. "I was hooked on the *PC*," says Nelson, whose computing experience goes back two decades. "But I just couldn't keep up with reading all of the articles, let alone remember where I read what."

Using *PC-FILE III* (the popular, user-supported database management program) Nelson created a database of magazine articles, letters, and news features about *IBM Personal Computers*. Nelson's simple and to-the-point structuring of the database proved the key to success of his ultimate product, *LETUS A-B-C*. Each article's listing includes a brief abstract. Searching for articles can be done by key word, subject, title or author — even month. What Nelson created is an overlay to be used with *PC-FILE III*.

Randy Nelson didn't have to talk too much to convince his father to market *LETUS A-B-C*. Together they are now learning about marketing, business, people, and each other. Not that there were problems with their relationship to begin with, but this business has brought them much closer. "We're having a lot of fun with something that only Randy and I believed in to begin with," Ralph says proudly.

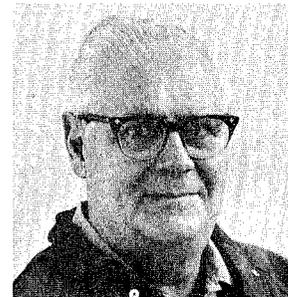
Though this *PC* success is somewhat new to Ralph, he has established his own identity in his profession as radiation/health physicist. He has written books and dozens of articles, and he enjoys a position he has held at Stanford since 1964. "It's the best of all worlds," says Ralph. "All of this and I'm now working with my son, too."

Randy Nelson, who graduated in June from Gunn High School, plans to pursue a career in computer science. A year ago he didn't know much at all about computers and wasn't too interested in what his father was doing with the *IBM PC*. However, since their involvement with *LETUS A-B-C*, Randy has studied *BASIC* at Foothill Junior College (while still in high school). And at the rate Randy is going he just might be teaching a class before too long — on how to market software.

BOB RODDICK RETIRES

Robert Roddick, a native San Franciscan, joined *SLAC* on October 5, 1970, bringing us his many years of experience as a tool-and-die maker.

His career began in 1937 with the Atlas Heating Company of San Francisco where he worked until 1949. Later that year, he joined Dalmo Victor in Belmont. He continued there until 1970 when he decided to come to *SLAC*.



His experience was a great asset to *SLAC*. His contributions were many. Bob demonstrated his capabilities by developing special tooling and fixtures. He was also an excellent instructor and innovator in the Machinist Apprenticeship Training Program. For the past several years Bob was the *MFS Quality Control* inspector. In this position, his extensive technical knowledge was fully utilized.

Bob made many friends during his 14 years at *SLAC*. He will certainly be missed by all who knew him.

We wish him all the best in the future.

—H. Zaiss/J. Wehner



A CHARGED UP POSITRON SOURCE This cheerful crew shown celebrating at a well-known local watering place is the Positron Source, a team of *SLAC* people and friends who won First Place in the D Division of the Menlo Park Recreation Department's 1984 Summer Co-Ed Softball League. Back row:(left to right) Nizam Sundaita, Jeannie Jones, Felix Cobian, Mary James, Rick Hall and kids. Middle row: Tim Jones, Eileen Cassidy, Terry McCaffrey, Gene Holden. Front Row: Joyce Marshall, Dan Goode, Rayford Beecher.

SLAC FAMILY DAY 1984

An estimated 2500-3000 staff and family attended the 1984 SLAC FAMILY DAY held Saturday, August 4th. The huge crowd consumed about 3000 steaks, 220 gallons of soft drinks, 15 kegs of beer and 20 cases of champagne, not to mention numerous burgers, beans, salad, bread and ice cream. Thirsty SLACers and family members polished off the soda and beer about 30 minutes before Family Day ended.

Bernie Lighthouse, the organizer, extends thanks to everyone involved in making Family Day a success.

Events of the day included games for the kids, a coed softball tournament, volleyball, computer tours and games, site tours, foot races, train rides, live music, a dunk tank and much more. Some of these events are captured in the following collection of photographs.

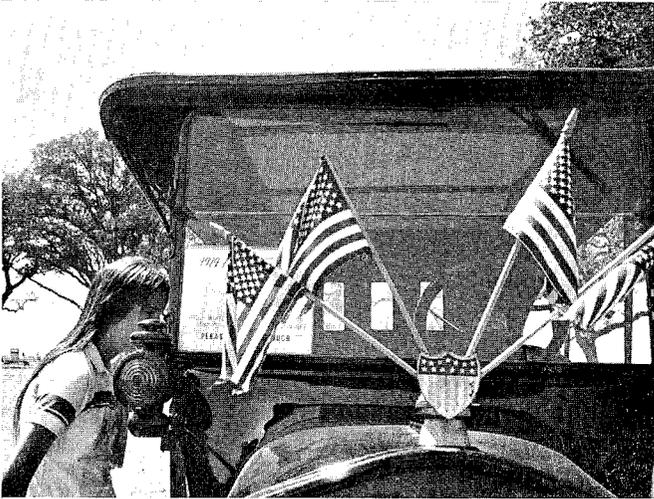
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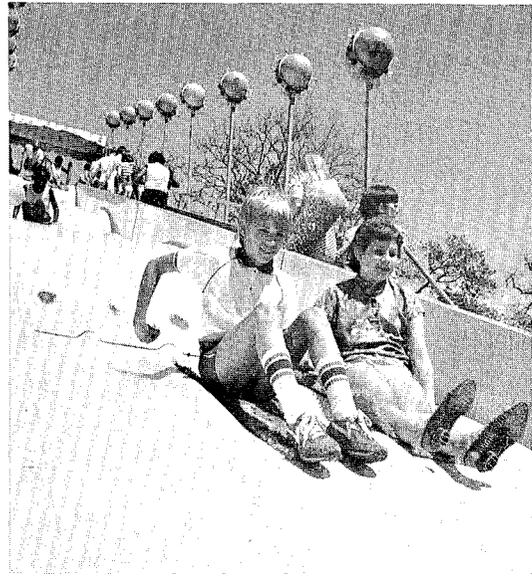
What could be more fun than the challenge of computer games? The computers are not up to making the startling background, however. That came from the hand of Walter Zawojki.



Don't be alarmed, just the Fire Station demonstrating new equipment.



Antique vehicles on display for the crowd's enjoyment.



Working off all that food on the 150 ft. slide.



Still smiling after the 1500th balloon.

THEODORE OLIVER EVANS RETIRES

Ted Evans began his career at Stanford in the fall of 1953. During the ensuing 30-plus years, Ted worked in Hansen Labs' technical glass shop, fabricating special glass shapes; as an assistant to Dr. Sonkin, one of the linear accelerator pioneers; as a tube fabrication technician in SLAC's Klystron Department; as a klystron operations technician working in the accelerator gallery; and for the last nine years as a klystron test technician on the swing shift in the test lab.

While Ted has certainly contributed his share to the world of high-energy physics, he will probably be remembered by his fellow workers for his endless supply of puns, one-liners, and limericks, his love of history, particularly that of the US Civil War, and his unfailing good humor.

So, Ted is leaving the buzzing klystrons, oscilloscopes, vacuum equipment and reams of data to pursue a quieter life delving deeper into the records of the past and maintaining a philatelic hobby.

We wish him well but we will miss him.

-Ted Johnston





1984 SUMMER SCIENCE STUDENTS

The above picture of this year's Summer Science Students caught all 17 of them in a rare moment away from the lab, the classroom, the library or the computer terminal. Dr. Joseph Tenn, the Director, who did such an excellent job running the program is back row left. He is followed by Tracey Hampton, Sergey

Troyanovsky, Achilles Speliotopoulos, Rick Trujillo, Cornelius Williams, Michael Athanas. Middle row: Kathryn Ellis, Elizabeth Baker, Ming Ng, Pamela Hatcher, Hieu Hong. Front row: Remegio Molo, Lou Sanchez-Chopitea, Claire Lyu, Sheila Motomatsu, Jill Goldberg, Patrick Hamer.

MALAPROP CORNER

The following are from a collection made by John Ehrman of malaprops heard, written, or otherwise committed at SLAC.

We must try to emerge our viewpoints.
 We're caught on the horns of our own petard.
 Let me ask a point-blunt question.
 There's not an iota of difference, for the most part.
 It's a pain in some aspects.
 It seems to be an insurmountable opportunity.
 For various and assundry reasons.
 For all intensive purposes,
 Let me refurbish your memories.
 I flew it by ear.
 He condenses a 5-minute speech into 20 minutes.

SLAC FOOTRACE

The annual footrace up and down the Klystron Gallery will be held on Thursday November 29, at noon. The total distance is 3.8 miles or 6 km. Winners in various categories will receive prizes and their names will be engraved on the perpetual trophy. All finishers will receive ribbons. SLAC Race tee-shirts will be sold at cost and refreshments will be available.

Spectators are heartily invited. The Race Committee could also use help in planning and organizing the event. Call Pat Decker x2833 to volunteer.

NOMINATION FOR BEST TECHNICAL HEADLINE

Jitter debugging two laser experiments

(Review of Scientific Instruments, March 1982.)