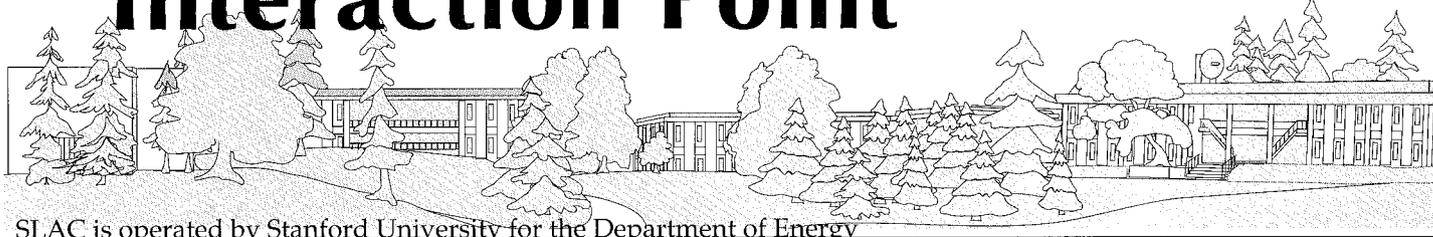


The Interaction Point

Events and Happenings
in the SLAC Community
March 2000, Vol. 11 No. 2



SLAC is operated by Stanford University for the Department of Energy

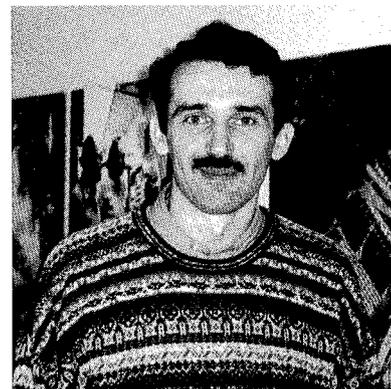
Tide and Atmosphere Move Linac Tunnel Daily

DURING THE HOLIDAY BREAK, while most SLAC staff members were off on vacations around the world, some folks were here working on important research for the future. Among those who stayed close to home was Andrei Seryi, a staff physicist working on the Next Linear Collider.

"We really need to know many more things about the future NLC tunnel, so what better than to study our present tunnel," said Seryi. His project during the holiday period was to determine the amount of relative motion of different parts of the tunnel from day to day. His results show that there are major influences on tunnel stability from two primary sources: tidal motion and atmospheric pressure.

Seryi has his Ph.D. in accelerator and beam physics from the Institute of Nuclear Physics in Novosibirsk, Russia. His thesis topic dealt with problems of the final focus in linear colliders. Because the beams are very small, motion of the beam lines can cause them to miss each other, so studying tunnel stability is another important adjunct to Seryi's previous work.

Since arriving at SLAC in October of last year, Seryi has occupied his time with an investigation of ground motion and with analyzing the performance of final focus systems for the NLC.

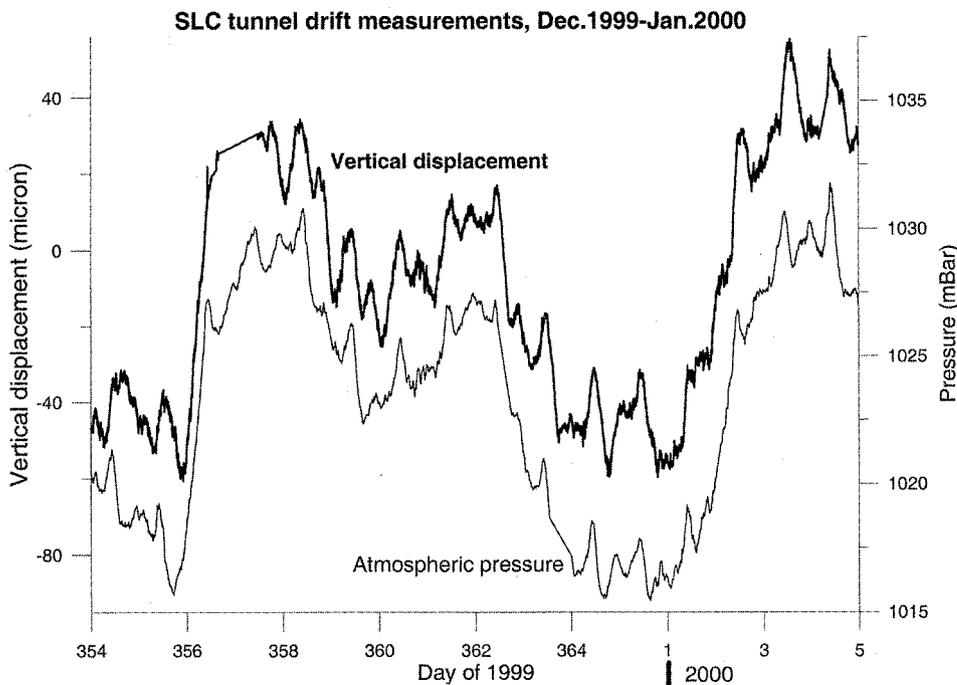


Andrei Seryi

Cut and Cover

When it comes to the Next Linear Collider, one of the major considerations is the kind of tunnel to be built. Two options generally present themselves: the cut and cover technique used for the SLAC linac; or boring a hole into bedrock, which was the method chosen for the Superconducting Supercollider in Texas. The 2-mile long SLAC linac tunnel with its laser alignment system is a unique location for studying long term relative transverse motion over long distances. In the past, Chris Adolphsen of the NLC group and others have measured the "fast" ground motion in the SLAC tunnels (covering a frequency range from 0.01 to 100 Hz).

Gordon Bowden of the ARDA group also performed some measurements of the position stability for periods, from several minutes to a day,



(Continued on Page 3)

Director's Corner



by Jonathan Dorfan

I mentioned to you in a previous article that I think we can do better at communicating within the Laboratory, with our neighbors and with decision makers in Washington, DC.

To assess where we are, what we are doing well, and areas where we can improve, I have set up a Task Force on Communications.

Patricia Kreitz, head of Technical Information Services, and Richard Blankenbecler, former head of the Theory Group, have agreed to serve as the co-chairs of the task force. They will work with three subgroups, each dealing with somewhat different topics: line communications, internal communications, and outreach. The sub-group coordinators are Roger Erickson from the Accelerator Division, Nan Phinney from the Next Linear Collider group, and Helen Quinn from the Theory group, respectively. Each sub-group will comprise about seven people. The membership of the task force will be drawn broadly from all sectors of the Laboratory. If you are called on by one of the subcommittee chairs, I hope that you will agree to serve.

I look forward to receiving the report of the Task Force by July 2000.

Draft Charge to the Task Force on Communications:

"The SLAC Communications Task Force has been established as a one-time, in-depth process for seeking improvements in all aspects of communications at SLAC. The Task Force will be steered by two co-chairpersons, reporting to the Director.

Since communications encompass a range of activities, the task force will be divided into three sub-groups described below. Each sub-group will have a coordinator to drive its sub-agenda; the coordinators will report to the co-chairs. The issues facing the sub-groups will have considerable overlap and it will be imperative that the co-chairs facilitate opportunities for cross-fertilization and discussion. The Task Force is strongly encouraged to seek the opinions of a wide range of the SLAC staff as background to its work. In some areas, it may be useful to learn what is done at other DOE Laboratories.

Draft Charge (Continued)

The output of the Task Force will be a report summarizing its findings and highlighting its recommendations. The Task Force should aim at completing this report by the end of July 2000, but is encouraged to share with the Directorate recommendations which the Laboratory could implement on a shorter time scale.

Sub-group A will focus on communications associated with the daily workings of the Laboratory, namely all aspects of communications vertically and horizontally within the Laboratory's line management structure. Information and ownership are empowering at all levels of an organization; how do we make this maxim a truism at SLAC? This sub-group should examine, but not be limited to, the following areas:

- How information flows in the existing organizational structures
- How information flows up and down the line
- Opportunities for ownership and empowerment at all levels of the organization
- Is the evaluation and communication of performance done in an optimal way?
- What actions would provide more direct contact for the staff with the Director and the Associate Directors?

Sub-group B will focus on how we communicate information to our staff which is not directly related to the performance of their jobs. Are the present vehicles we use in this regard (Interaction Point, Quick News, Bulletins, All Hands talks from the Director) adequate/ideal? How can we improve the technical knowledge base of our staff, particularly the non-technical staff, so that they can better understand both the scientific program and the goals of the laboratory?

Sub-group C will focus on all kinds of outreach, including education, community relations, local and national press, political communications such as with DOE and Congress, User relations and the broader physics and scientifically literate communities. The sub-group will recommend what SLAC's top priorities ought to be and how SLAC can best direct resources to support these priorities.

The Task Force is asked to consider options for an organizational structure that can oversee areas B and C in a coherent way. Where would such a structure fit into the present organization? What kind of administrative and professional support is needed for such a structure? The Task Force is also asked to consider the value of staff volunteers and retirees to enhance the internal and external outreach programs."

Tunnel Stability (Continued)

in November 1995. Repeating these measurements over much longer periods of time fills in a missing gap in the data. "By cross correlating the measured data with other parameters such as the atmospheric pressure, we can determine which factors are partly responsible for tunnel motion," says Seryi.

Just before the shutdown, with the support of the alignment group, new equipment such as the photodetector and the data acquisition system were installed, the laser target was moved in and data taking began.

Tidal Motion

Measurements have shown several unexpected facts. One is that the observed motion has very clear daily and half-daily periods. Detailed analysis confirmed that this motion is indeed tidal, motion which is produced by gravitational attraction of the Moon and Sun on the Earth.

Why are we so surprised by this conclusion? Because the amplitude of the observed tidal motion is surprisingly large, approximately 10 microns, about a hundred times more than expected. This anomaly is explained by the fact that SLAC is located close to the Pacific coast. When the ocean tides change the water level at the shore, this water produces additional pressure which increases the deformation of the nearby earth. This phenomenon is called ocean loading and has been known by geophysicists for more than 30 years.

This is perhaps only the second observation of the impact of tidal motions on an accelerator. Scientists at CERN's electron-positron collider (LEP) noticed tiny changes of the beam energy and, with the help of SLAC's Gerry Fischer (now deceased), were able to correlate these with the phase of the moon. The change in energy was caused by the change in the LEP circumference as the earth is periodically stretched by tidal forces. This stretching is a "first order effect" which is more easily observed because its amplitude is much larger, a few millimeters on the LEP circumference of about 27 kilometers. The transverse

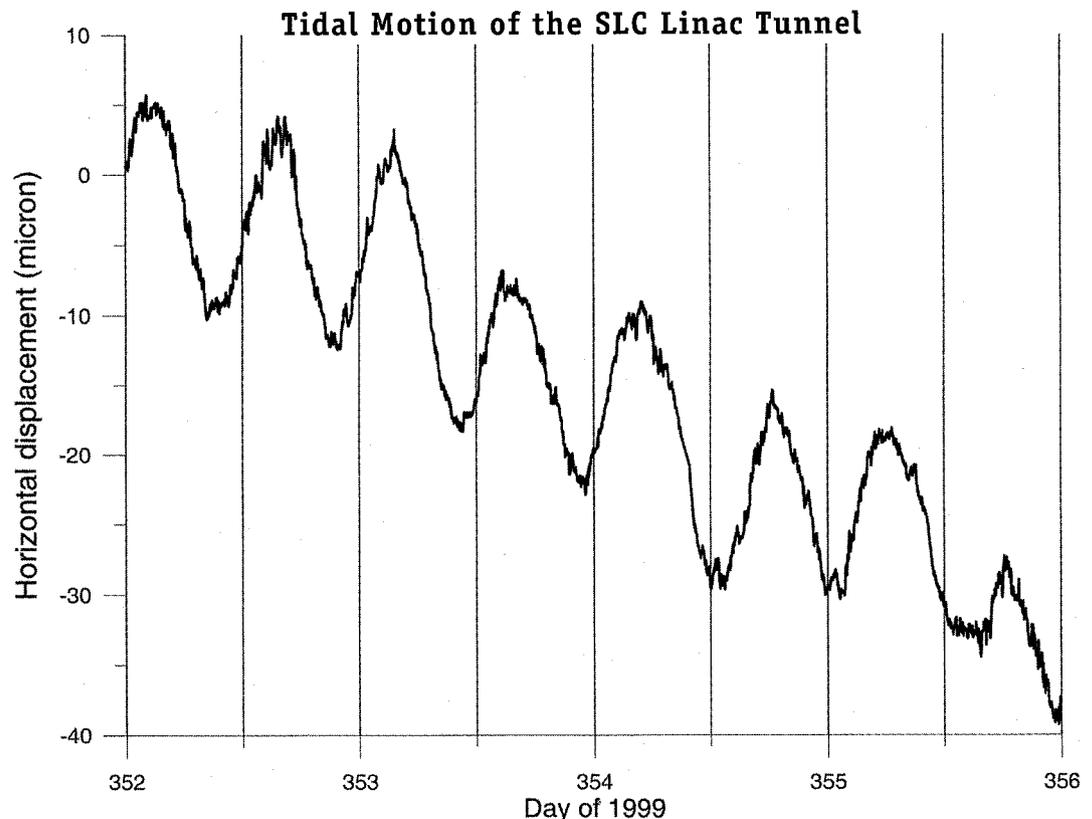
tidal deformation that we observe at SLAC is a "second order effect" which is much smaller, and would therefore be nearly undetectable if not enhanced by ocean loading.

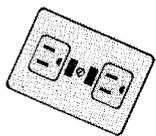
Implications for the NLC

Are these tidal deformations dangerous for the future linear collider? "Not really," says Seryi. "This tidal motion is slow, very predictable and has quite a long wavelength, all of which make it quite harmless." But the measurements gave us another unexpected observation that may have much more impact on tunnel construction and the future collider site. "We found a strong correlation with atmospheric pressure, especially in the vertical plane," said Seryi. The variation of the ground materials and the contour of the landscape along the tunnel appear to be responsible for this effect.

In tidal deformation, the wavelength of the deformation is approximately equal to the length of the accelerator. However, the landscape, and thus the effect of atmospheric pressure variations, can vary on much shorter length scales.

"The linac can cope more easily with misalignments which have a long wavelength," says Seryi, "and it is less tolerant of misalignments with a short wavelength."





Talk, Walk & Clean = Something for Everyone



IT'S A NEW ERA, and SEDAC (the Safety & Environmental Discussions Assistance Committee) is excitedly planning TWC 2000, this year's Safety and Environmental standdown. TWC 2000 will take a different approach from past events. The TWC 2000 standdown will take place on Friday, April 14, from 8:00am to 10:00am. In addition, a TWC Team Leaders' Orientation is scheduled for Monday, March 27, from 1:30pm to 2:30pm in the Auditorium.

As in previous years, operations will cease during the standdown, and the accelerator and critical processes in other areas will go into an appropriate stand-by condition. This year, the various teams will have a choice of three methods of action, as outlined in Director Dorfan's All Hands memo. The methods are:

- Talk (T): similar to the past safety and environmental discussions, teams will generate two documented safety and environmental concerns and proposed actions; or

- Walk (W): small teams will use a checklist and walk to determine possible hazards in work areas, buildings or outdoor areas predefined by the teams; or,

- Clean (C): teams will perform a two-hour housekeeping effort in an indoor or outdoor area predefined by the teams.



Teams will choose one of the above action methods to address one or more of the Safety and Environmental Focus Topics, for example:



- Discussions of strains and sprains, slips, trips and falls; hazardous materials and hazardous waste handling; ergonomics; or a discussion topic selected by the team.

- Inspections of building and outdoor areas for earthquake readiness, electrical

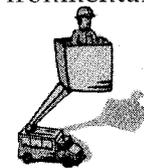
and fire safety, abandoned materials, safe management of chemicals, hazardous waste, or compressed gases, storm water contaminants, protection of storm drains, and spill readiness.

- Clean ups to improve safety, workspace utilization, the environment, facility appearance, or increase productivity in the work areas. Clean ups can include organizing for recycling, gathering potentially leaking or overdue hazardous material/waste containers, and eliminating potential sources of storm water contamination around storm drains.

Talk teams are encouraged to come up with new ideas. Walk teams will have their efforts credited as one of the required building manager walkthroughs if the entire building is inspected. Clean teams are encouraged to take "before & after" photos for publication in a future Interaction Point!

A web site has been developed to help provide more information about TWC 2000: <http://www.slac.stanford.edu/esh/standdown/standdown.html>.

We are hoping for continued success in this program. In previous years, Safety & Environmental Discussions have influenced a number of corrective actions such as improved pathways, lighting and stairways; improved traffic patterns and safety; improved subcontractor safety; improved electrical safety and increased emphasis on environmental compliance and stewardship.



If you have questions, please contact SEDAC Division Representatives: Janice Dabney, Technical Division, Frank O'Neill, Research Division, Ian Evans, SSRL, Gail Gudahl, Business Services Division, and Richard Cellamare and Ellen Moore, ES&H Division.

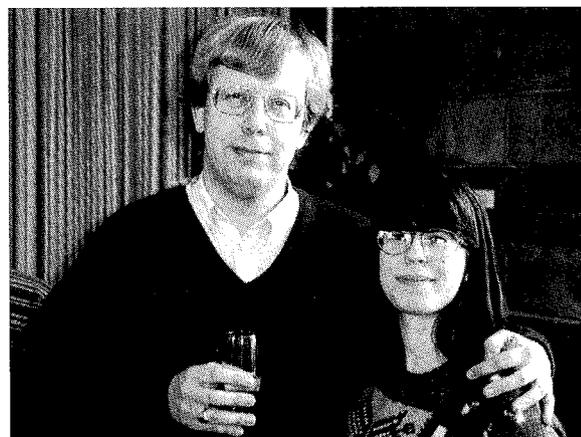
—Rich Cellamare

Ten Year Service Awards



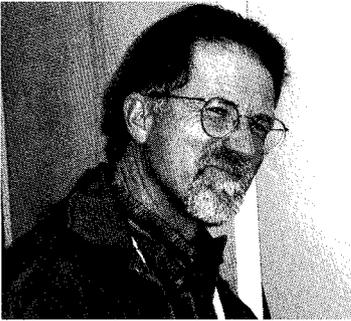
Rene Donaldson found the sun in the Cafeteria too bright, or she was incognito to get her award, seen here with Lowell Klaisner.

THE TEN YEAR SERVICE Awards ceremony was held February 4 in the Cafeteria to honor the 99 employees who had achieved a milestone of working 10 years at SLAC. See the SLAC web announcement page to get a complete list of 10-year honorees.



Pleased as punch, Willy Langeveld shared the ceremony of his ten year award with doctoral student Alyssa Prinz.

Surplus Equipment Brings Smiles to Students



"YOU SEE THAT OLD monitor there?" Alan Conrad (pictured at left), Salvage and Warehouse Supervisor, pointed to a 13-inch monitor sitting on a pile of electronics. "They even take that sort of thing and turn it into something useful."

Conrad, who has been at SLAC for ten years, says that donation of surplus equipment to schools is one of the more rewarding aspects of his job. "Look at these thank you notes from the kids," he says, pulling out a stack of papers. They are printed notes from elementary school kids, complete with misspellings and hand drawn pictures (see below).

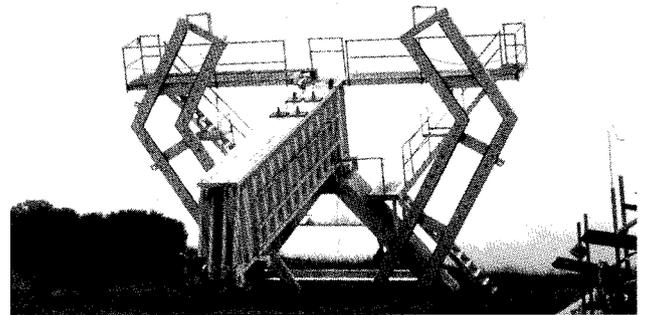
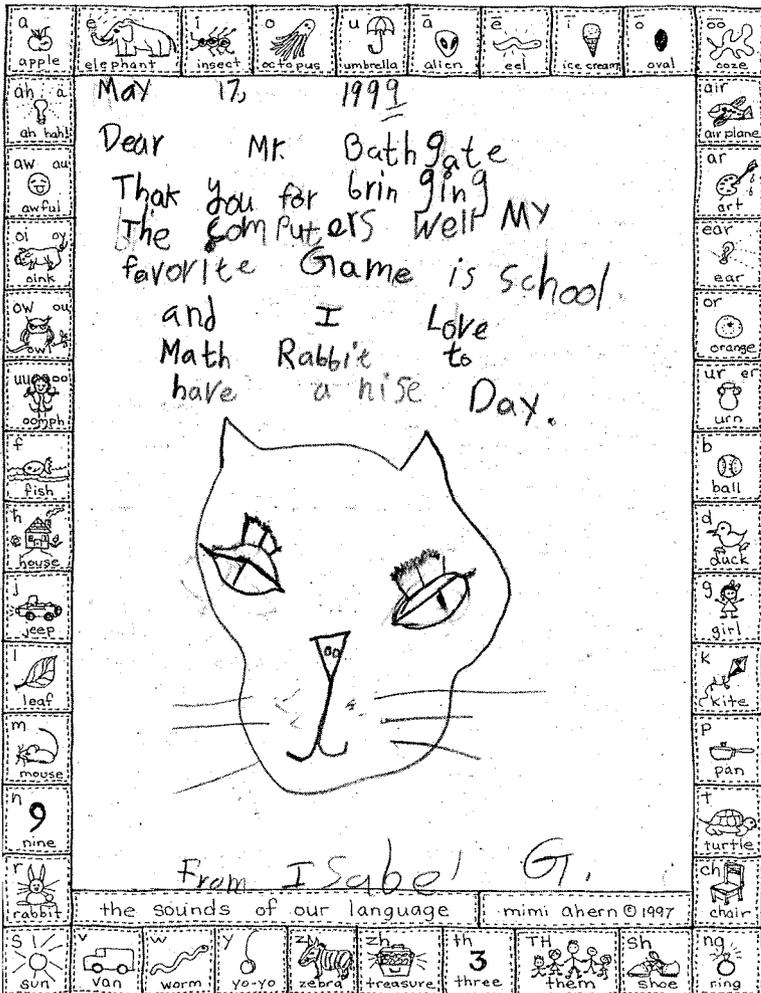
Jim Bathgate is a parent volunteer who is working with SLAC to get equipment for the La Honda/Pescadero Elementary Schools. According to Bathgate, Pescadero School is developing a program in which those students who don't have a computer at home can

borrow one. Pescadero is a largely agricultural community with a lower socio economic level, so many families don't have computers at home.

Conrad was able to scrounge up about 29 monitors, 16 CPUs, and miscellaneous spare parts such as hard disks, cables and keyboards. "We have to get rid of this stuff, so we either sell it for scrap, or in this case, we donate it to a good cause," says Conrad. If there are other parent volunteers out there who want to check out the SLAC Warehouse, Conrad is more than willing to show them around and help get useful supplies into our public schools. He can be reached at x2329.

Donations are freely available to public schools, but not private or religious schools. All items are as is and must be picked up from the site. People interested in surplus items should download the donation forms on the education page of the Web <http://www.slac.stanford.edu/gen/edu/education.html>.

Parent Jim Bathgate is pretty happy with his surplus items. "The budget constraints don't leave much room for computer equipment, but thanks to SLAC, we can still provide computer exposure to these kids," says Bathgate.



Part of SLAC's outdoor sculpture garden on the PEP ring road.

Work Safe, Work Smart

An injury involving days away from work was reported on 1/24/00 according to Sharon Haynes, Workers' Compensation Coordinator. The number of calendar days between then and this update of 2/17/99 is 24 days. SLAC's record number of days between claims remains at 150 days.

Will the Author Please Step Forward?

BACK IN THE GOOD old days, an individual, or maybe several, would work on a scientific experiment and obtain results out of a small lab. We recall that Hewlett and Packard started in a garage, and that early computer enthusiasts calling themselves the "Home Brew Club" met at SLAC.

However, an experiment like BaBar, which contains about 500 people from 10 nations, creates a dilemma when it comes to publishing papers and determining the contribution of individual authors. In Europe, the collaborations in the Large Hadron Collider (LHC) present a similar challenge. In anticipation of results from these large collaborations, the *CERN Courier* published a list of recommendations regarding publishing papers from large groups.

The first is the creation of a new class of publications to be called "scientific notes." According to the *Courier*, "these notes will be part of the official results of the experiment," and they will include results as well as interesting methodologies. Scientific notes will need to be approved by the collaboration spokesperson, pass peer review, and go into the public domain.

Another recommendation is that the name of the collaboration and all participating institutions will be listed, with a reference to the full author list that would only appear in print only periodically. This process eliminates the need to list each person's name each time, but still recognizes the institutions involved.

For the details on these recommendations and others, readers are referred to the *CERN Courier* of November, 1999 which is available in the SLAC library and at other places around the site.

Emergency Hotline

Remember this number: 1-877-477-SLAC.

As part of the Lab's on-going preparation in case of a major disaster such as an earthquake, this emergency phone line is now available.

On any ordinary day, if you called 1-877-447-SLAC (7522), you would get a recorded message saying that everything is fine and there is no emergency information. However, if a flood, fire or earthquake were to hit, the phone message would be changed to provide you with as much information as possible.

The Emergency Preparedness Committee meets periodically to refine the Lab's response to emergencies and sometimes conducts practice drills. For questions, contact Lee Lyon x2283.

Can Scientists Thrive with Paperless Publishing?

THE SLAC HIGH ENERGY Physics (HEP) library has been comprehensively cataloguing the HEP literature since 1974.

"Our SPIRES-HEP database now indexes over 400,000 research articles, with almost 50% linked to fulltext electronic versions," says database manager Heath O'Connell. "The size of this database has made it popular worldwide among physicists. Louise Addis, SLAC's former librarian, was quick to recognize the usefulness of the Web for this purpose. The web interface to SPIRES made searching the database so much easier that it's now hard to imagine life without it."

With this database and the development of the Los Alamos Lab's E-print archives in 1991, the HEP community pioneered the trend to "paperless publishing" and the trend to paperless access. Says O'Connell, "In other words, what we would now call a virtual library."

There are now major implications resulting from the virtual library on the way scientists conduct their research and on traditional paper-based publishing.

To allow authors to "thrive," the SPIRES-HEP collaboration has been ensuring that as much information as possible is included with each bibliographic entry for a paper. Known as metadata, this information can include tables of the experimental data that researchers can easily use to perform their own analyses, as well as detailed descriptions of the experiment, citation tracking, and online reviews of articles.

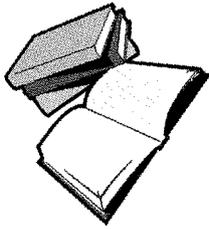
"We are especially lucky in that the HEP community is so willing to help us with this metadata, both in terms of additional information and quality control," says O'Connell.

How are we doing? O'Connell says that SLAC scientists are paving the way in electronic communication. With major international collaborations like BaBar, which numbers over 500 people from 10 countries, finding new and improved ways of sharing information has never been more important. "This lab is certainly not only thriving but setting the pace for other fields of science," says O'Connell.

O'Connell presented his findings in February at the annual meeting of the American Association for the Advancement of Science held in Washington, D.C.

—Heath B. O'Connell





SLAC Library Open House

THE SURE SIGN OF a successful SLAC event: people, even grad students(!), were still there long after the food was gone. On Thursday January 13, 2000 the SLAC Library held its first Open House. This event specifically honored SLAC book authors. Many people from the SLAC community attended to view the display of books by SLAC authors arranged by decade from the 60s to the year 2000. Since the Open House, the SLAC Library staff have received many suggestions as to which authors have not been identified yet. A comprehensive list is evolving as Library staff learn of more authors that have previously been wrapped in mystery. If you know of any, please email moss@slac.stanford.edu. A new list will be put on the web.

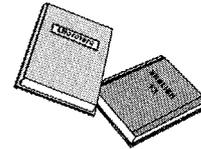
Brief remarks were made by Jonathan Dorfan, Director of SLAC, and Pat Kreitz, Director of Technical Information Services. Dorfan remarked on the productivity and creativity of SLAC's many authors,

stressing how valuable it is that SLAC authors take the extra time to document what they do. He observed that the Lab and the University benefit through the contributions SLAC authors make to the intellectual community. Dorfan also spoke positively about the success of the Open House as an event which helps support his idea of SLAC as a community.

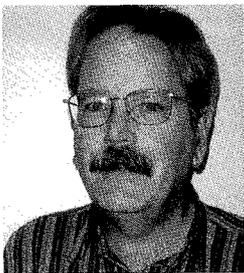
Kreitz thanked the many people involved with the remodel, including special thanks to David Leith for his critical support. Many attendees commented positively on the rearrangement of space that has resulted in more shelf space for books, more user-friendly services at the library entrance and more users' quiet working space, including private study carrels with DHCP access to the network for laptops.

The Open House was so successful that the library hopes to make it a new tradition. They promise there will be more cookies next time.

-Molly Moss



Site Engineering & Maintenance Department



JUST THINK. ALL YOUR requests for site maintenance go to a single extension, 8901. That's one of the advantages of the new department merger called Site Engineering and Maintenance. The centralized service desk is the visible combination of responsibilities of the former Facilities office and the

Plant Engineering Department except for beam related problems. "Continue to send your beam operations problems directly to MCC and CATER," says Burl Skaggs (pictured above), head of the new SE&M group.

The service desk will take your requests, find out who you are, and find the right person within SE&M to solve your problem. "Keep in mind that the service desk people won't have in-depth knowledge of the entire site," says Skaggs. The details of your repair job should be worked out between you and the appropriate technical people who receive your request.

The good news is that when you have a request, you no longer have to keep track of a long list of people to call. The new system also avoids the frustration of being handed off to several different individuals and having to explain yourself over and over again.

Having a one-stop repair reporting system reduces the overall effort to dispatch, monitor and resolve problems. Guess what? This is also the first time that repair requests are being documented. The service desk is an independent group that is tracking and reporting all requests, making people accountable for their promises and providing the data to improve our overall effectiveness.

Skaggs says that soon people will be able to submit and track service desk requests directly on the web in addition to using the telephone.

The other significant responsibility of the service group is the updating and maintenance of several site-wide databases, documents and drawings. The first data to be reviewed will be the building location and building manager data. SE&M will be developing a current baseline of the known data, update the site database, and then publish the changes. Once he or she is appointed, SLAC's new space manager will be the point of contact for approving and notifying SE&M about database changes.

"I really appreciate the suggestions and comments on this new group, and I hope that people will continue to provide feedback. That's the main way we'll be able to improve our service," says Skaggs.



The SLAC web is indexed using the InfoSeek search engine. The engine works its way through our site daily, but it takes about a month to make it through the entire SLAC web site. Whether you are using the "Quick Website Search" box on the detailed home page or the search page (www.slac.stanford.edu/slac/www/search/searchslac.html), the following are a couple of tips that could make your search efforts a bit more effective.

Upper and lower case: If you use **upper case**, the search will be limited to upper case. That is, the search will look for an exact match. If you use **lower case**, the search will include all cases – upper, lower, and mixed case. A search for *technical publications* will yield a different result than *Technical Publications*.

Quotes around phrases: If you enter a phrase without quotes around it, the search tool will look for pages with any of the words in it. If you **put quotes around** all or part of a phrase, the tool looks for the words within the quotes exactly as shown. So, a search using *technical publications*, "*technical publications*," and "*Technical Publications*" yield entirely different results.

Use Meta tags: If you are a web author, you can greatly increase the visibility of your pages by using Meta tags. The most common tag types are for "description" and "keywords." These tags do not appear on the page, except in the source, and are placed within the <head> tag. The **syntax** is <meta name="description" content="enter a description of the web page between the quotes."> or <meta name="keywords" content="keyword, keyword phrase, keyword2">.

–Ruth McDunn

Dear Janice:

I've Got This Safety Problem



"ARE YOU THE DEAR Abby of SLAC?" Recently someone who saw my photo in the Interaction Point teased me. Hmmmm, I thought. I am always looking for column ideas.

Let's see what could happen.

"Dear Janice: I bought a new ergonomic chair for my administrative support person, but

he'd rather hunch over the keyboard, slumped in an old government model chair. What shall I do?"

Or maybe this one:

"Dear Janice: How do I lift something really heavy if I'm the only one around? Sometimes I feel so alone."

Truth be told, SLAC abounds with "Dear Abby's." We mend the rips in the fabric of your safety world. And there are lots of us, not just me, even though I happen to write this column. Each of the people on the following lists can help: the ES&H Resource List (<http://www.slac.stanford.edu/esh/resource.pdf>), the members of the SLAC citizen committees, Operating Safety Committee (OSC), and the Local Safety Committee (<http://www.slac.stanford.edu/esh/committees/committee.html>), and division or department safety coordinators (<http://www.slac.stanford.edu/esh/reference/safecoor.html>), just to name a few.

Abby must feel good every time she helps someone. So do we. There's no better feeling than to know we're

SLAC Milestones

DECEASED

Beal, Charles, former SLAC medical doctor, age 77, 1/30/00

Copenhagen, Ken, former SLAC mechanical engineer, age 79, 1/23/00

RETIRED

Barnett, Mark, SCS, 2/14/00

Campana-Dufresne, Ree, RD, 2/29/00

Do you have a milestone you would like published in TIP? Email tip@slac.stanford.edu to have it included.

making our lives safer and more healthy. We also might have learned something in the process.

Here's an example. As the OSC chair, I received a note about a bicyclist seen on site wearing radio earphones over both ears while riding. Our Manager of Laboratory Safeguards & Security verified that this was a DMV violation and his staff would issue warnings. In addition, a safety engineer in Safety Health & Assurance Department said he'd include the mention in a future ES&H Update on bicycle safety. And our QuickNews Editor highlighted the issue effectively in her 2/4/00 publication.

Love-lorn? We might not be able to help. Safety-lorn? You've got our number. No one should ever feel clueless in their cubicle. So next time you have an environmental, safety or health concern, take up your mouse. Connect with your "advice columnist." Safety menders are ready and waiting!

–Janice Dabney