SLAC Reorganizes for Major Science Discovery

By Neil Calder

Director Jonathan Dorfan recently announced a complete reorganization of the structure and senior management of the Laboratory. The new organizational structure is built around four new Directorates—Photon Science, Particle and Particle Astrophysics, Linac Coherent Light Source (LCLS) Construction and Operations. Two of the new Directorates—Photon Science and Particle and Particle Astrophysics—encompass SLAC's current major research directions.

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See whole story...

BABAR Probes Rare B Quark Coupling

By Heather Rock Woods

In the world of elementary particles, beauty couples preferentially to charm. BABAR studies these common ‘charm’ decays, where B mesons containing a b quark (for beauty, or bottom) decay to charm mesons containing a charm quark.

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See whole story...

Inside In The Dark

By Nina Adelman Stolar

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The Payroll Must Go On!

By Ron Barrett

What do you do when you have ~10,000 square feet of computers with no electrical power, lighting or cooling and the payroll is due in one day?

Add to that scenario : the fact that the whole site is down
outside to see how wide spread the problem was and find out what had happened.

The SLAC community was very cooperative and responsive during this genuine emergency. Staff were dispatched to survey the site and began hooking up generators where there were critical needs to keep systems alive. According to Frank O'Neill (RD) “The CEF group really took a major role in securing the facility.”

See whole story...

The Stanford Linear Accelerator Center is managed by Stanford University for the US Department of Energy

Last update Monday June 13, 2005 by Topher White
Inside In The Dark

By Nina Adelman Stolar

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The SLAC community was very cooperative and responsive during this genuine emergency. Staff were dispatched to survey the site and began hooking up generators where there were critical needs to keep systems alive. According to Frank O'Neill (RD) “The CEF group really took a major role in securing the facility.”

O'Neill said, “We identified a number of critical areas and systematically went through the whole site.” The CEF department took great care to work safely and efficiently to provide temporary power where needed. When the decision was made to clear the site mid-day, there was no time estimate for regaining power.

Safety walk throughs had to be done building by building to be sure equipment and facilities were secure before people could reenter. The security officers were of great assistance, going through each office as buildings were cleared. According to Simon Ovrahim (SEC), “On Saturday, we had four security officers on shift and from 10:00 a.m. to 6:00 p.m. we opened every office as buildings were cleared. We turned off coffee pots, heaters and the like.”

David Burke (TD) was stationed in MCC, holding meetings in the mornings, assuring that critical operations people were on site to bring the Laboratory back on line gracefully.

People really came together in this crisis. They waited to see how long it might be--standing outside, watching to see if it would begin to rain. Once PG&E surveyed the damage and provided an estimate on repairs, the decision...
was made to release the staff. Seemingly insignificant things can become problems in this situation. A simple problem like a leaky fridge pooling water in a hallway is magnified when it is too dark to see barricades. Some staff members put flashlights in or near restrooms, with one fellow bringing battery-powered lanterns from his car.

Ziba Mahdavi (BLS) handed out the SLAC telephone hotline number to everyone she could reach. The messages were recorded by Lee Lyon (HR), who said “We exercised the hotline, updating the message when firm information was available.” People could call in from anywhere to check the status, know when to expect the next update and to ask what was up with the paychecks.

Many people worked throughout the power outage and the subsequent days to assure your work place was ready for your return. As the weekend came to a close, the SLAC hotline gave the word: Everyone, come back to work Monday morning.

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Last update Thursday August 04, 2005 by Topher White
The Payroll Must Go On!

By Ron Barrett

What do you do when you have ~10,000 square feet of computers with no electrical power, lighting or cooling and the payroll is due in one day?

Add to that scenario the fact that the whole site is down with an estimated up time after the deadline has passed. Well, that is exactly the scenario we had at the Lab on Wednesday, May 18.

The Solution

Decide how many systems you actually need to get the payroll run and sent to the banks. Then, call in electrical planning to figure out how to safely bring in enough temporary generator power to make the systems work.

If you received your paycheck on time following the surprise power outage at SLAC, you can thank the electricians and the planners for their dedicated efforts.

Following an evaluation of safety and electrical needs, 13 electricians and other essential professionals worked many long hours into the night on Wednesday to safely restore electrical power via generators, temporary transformers and distribution cables to payroll dependent services.

Electrician Team:
Fikret Alisic (CEF)
Richard Altieri (CEF)
Richard Boushey (CEF)
Francisco Castillo (CEF)
Brad Catania (CEF)
Raymond Cuadrado (CEF)

SLAC electricians convert 480v from diesel generator to 120/208v to be used for power in Building 50 to bring network and servers back temporarily. Shown left to right: Brandon Mai, Fikrit Alisic, Francisco Castillo, Ricardo Delgado, George Quilon and Richard Altieri.

(Photo by Ron Barrett)
Once the power was restored for these machines additional staff members worked through the night to bring the services on-line and run the payroll system. The payroll system finished running at about 1:30 a.m. and data was sent out at 8:30 a.m. on Thursday morning before the deadline.

The folks working directly with payroll software were Ernest Denys and Jeanne Pierre. A very thorough understanding of the network and everything else by Gary Burhmaster made it possible for the systems to talk together. Commitment to getting it done and creative solutions were supplied by John Weisskopf.

From Friday night through Sunday most computer systems were brought back to life by staff working long hours, carefully documenting and fixing the requisite hardware.

SCS staff included—but was not limited to—the following people:

**Computer Services:**
Neal Adams (SCS)
Yemi Adesanya (SCS)
Karl Amrhein (SCS)
Ron Barrett (SCS)
John Bartelt (SCS)
Jon Bergman (SCS)
Chuck Boeheim (SCS)
Matt Campbell (SCS)
Bob Cowles (SCS)
Renata Dart (SCS)
Teresa Downey (SCS)
Shirley Gruber (SCS)
Mike Hogaboom (SCS)
Ricardo Kau (SCS)
Randy Melen (SCS)
Len Moss (SCS)
Ian MacGregor (SCS)
Richard Mount (SCS)
George Maclin (SCS)
Lance Nakata (SCS)
Sean Roberts (SCS)
Bill Weeks (SCS)
Lois White (SCS)
Wei Yang (SCS)

**Bonus Quiz**

Question: Can you guess how many total systems on the second floor in Building 50 were restored following the payroll system?

Answer: 3,211 servers
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Laboratory Mission

“Our mission is to make discoveries in photon science and particle and particle astrophysics and to operate a safe laboratory that employs and trains the best and brightest,” said Dorfan. “The new management structure adapts SLAC’s outstanding resources to that mission and gives us renewed strength to complete it.” All changes are effective immediately and the reorganization is expected to increase our scientific user base.

“SLAC is a laboratory with a remarkable future, one that represents a transition from its historic role in high energy...
physics to new frontiers of comparable scientific impact,” said Raymond Orbach, director of the DOE Office of Science. “The combination of SPEAR3 and the LCLS gives SLAC the promise of world leadership in photon science. I am pleased to see this promise reflected in the new organizational structure. SLAC’s particle and particle astrophysics programs are also poised to make discoveries both in accelerator and non-accelerator physics research. It is an exciting time for SLAC, and for the entire scientific community.”

Photon Science Across Disciplines

As director of the Photon Science Directorate, Keith Hodgson has responsibility for SSRL, the science and instrument program for the LCLS (the world’s first X-ray free electron laser) and the new Ultrafast Science Center.

“Photon science is the most rapidly expanding element in the changing balance of scientific foci at SLAC,” Hodgson said. “Three central and interconnected elements—synchrotron-based research using SPEAR3, development and research using the LCLS and four interdisciplinary, science-based initiatives—create a coherent program that, for about 3,000 users, will produce outstanding photon science that cuts across many disciplines. By 2010, no single laboratory in the world will have an equal ability to investigate both the ultra-fast and the ultra-small.”

Poised for Discovery

Persis Drell, director of the Particle and Particle Astrophysics Directorate, oversees the B Factory, the ILC effort, accelerator research and non-accelerator particle physics programs including KIPAC initiatives and the GLAST project.

“This is an incredibly exciting time for the field of particle physics,” said Drell. “With the B Factory program, GLAST and new near-term initiatives being developed at the Lab, SLAC is poised to make discoveries about the fundamental nature of our universe. Furthermore, we are doing the essential R&D, especially in accelerator research, that will enable the future discoveries of the field.”

Construction of the $379 million LCLS, a key element in the future of accelerator-based science at SLAC, started this fiscal year. A significant part of the laboratory’s resources and manpower are being devoted to building LCLS, with completion of the project scheduled for 2009. Commissioning will begin in 2008 and first science experiments are planned for 2009. John Galayda serves as director of the LCLS Construction Directorate.

Operational Support and Management Changes

To reinforce SLAC’s administrative and operational efficiency and to stress the importance of strong and effective line management, a new position of chief operating officer has been created, filled by John Cornuelle as director of the Operations Directorate. This fourth Directorate has broad responsibilities for operational support and R&D efforts central to the science Directorates. These include environmental safety and health, scientific computing and computing services, mechanical and electrical support departments, business services, central facilities and maintenance.

“I have also asked Hodgson and Drell to act as deputy laboratory directors,” said Dorfan. “I will rely on their
experience, expertise, and strength in the scientific areas that they represent. Together with the Chief Operating Officer and LCLS director, we have built a strong management team.”

The new SLAC management team will share a co-located set of offices in the SLAC Director’s Office Suite in Building 40 to encourage the integration of the laboratory’s photon science, particle and particle astrophysics, and operations programs.

Nearly all individual groups and units will remain the same but will be remapped onto the new organizational structure. Maintaining the key work units in this manner will ensure a smooth transition.

**Bright Future**

Stanford provost John Etchemendy welcomed the changes. “The laboratory has distinguished itself by sensing the most compelling new science and has quickly positioned itself to be a leader in the world research community in photon science and particle and particle astrophysics,” Etchemendy said. “We look forward to strengthening the university’s support for SLAC, especially in the fields of ultrafast science, particle astrophysics and computing. SLAC has a glorious past, but the future looks even brighter.”

For more information, please see the Director’s Office Web site: [http://www-group.slac.stanford.edu/do/](http://www-group.slac.stanford.edu/do/)

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Last update Friday June 03, 2005 by Topher White
In the world of elementary particles, beauty couples preferentially to charm. \textit{BaBar} studies these common ‘charm’ decays, where B mesons containing a b quark (b for beauty, or bottom) decay to charm mesons containing a charm quark.

However, enterprising experimentalists have been intrigued by the less favored couplings between b quarks and non-charm quarks because they are less understood and not fully predictable. Physicists expect that exploring charmless decays will provide new insight into the world of quarks bound in states of matter.

Stanford graduate student Amanda Weinstein (now at UCLA), Jochen Dingfelder, Mike Kelsey and Vera Lüth (all EC) have sifted through 83 million \textit{BaBar} events looking for those where B mesons decay to a pi meson (an up (u) quark plus an anti-down quark) and to a pair of leptons—an electron or muon plus an undetectable neutrino. Such decays are called ‘semi-leptonic’ because the products include leptons and a meson.

"Experimentally, the challenge is two-fold," said Lüth. "First, the neutrino cannot be detected, thus its presence has to be inferred from the fact that a sizable fraction of the B meson energy and momentum appears to be lost. This is a direct application of Einstein’s famous expression, \(E=mc^2\). Second, charmless decays make up only 0.2 percent of all the semi-leptonic B decays, and thus one has to look very hard to find them!"

\textbf{BaBar Data Analysis—Form Factors Function Set}

\begin{itemize}
  \item Preliminary \textit{BaBar} measurement of the decay rate as function of \(q^2\), the invariant mass squared of the lepton-neutrino system, for \(B\)-meson decays to a lepton, a neutrino and a pi meson. The measured distribution (data points) is compared to the predictions of various form-factor calculations (histograms).
\end{itemize}

(IMAGE COURTESY OF JOCHEN C. DINGFELDER)
The BaBar group found more than 500 of the rare decays among the very common decays to a charm meson and a lepton pair. Because the leptons are simple in nature and well understood, they can serve as a probe of the properties of the very heavy B meson and its transition to the very light pi meson (about 37 times lighter).

“We use the part we understand—the weak decay to the electron and neutrino—to examine the part we don’t understand,” Dingfelder said.

One thing that makes this study complicated is the fact that the quarks are not free and detectable because the strong force binds quarks inside the mesons. Thus scientists have to infer the quark properties from the observed meson, and this requires theoretical models or calculations that are notoriously difficult.

“We can summarize the aspect of the problem which is the least understood—the part of the decay involving the strong force and bound quarks—in terms of a set of functions known as form factors,” said Weinstein.

“There are various predictions for form factors, ranging from models to sophisticated calculations, and their predictions vary a lot,” said Lüth. “We want to disentangle this puzzle.”

**PEP-II Luminosity Helps Nail Down Vub**

“Thanks to PEP-II’s generous luminosity, for the first time we have enough data to measure the form factor for this particular decay, which describes how the quarks in the initial B meson turn into a u quark in the pi meson,” said Dingfelder.

It turns out that the model experimenters have relied on for many years now appears to be the least likely, while the data agree well with two calculations released last year that required huge computer farms to solve highly sophisticated mathematical approximations.

A precise understanding of the form factor contributes to a way of nailing down ‘Vub,’ the coupling strength between b and u quarks. Vub determines the probability that a B meson will decay into a pi meson. Its precise measurement will also test physicists’ understanding of the observed asymmetry between matter and anti-matter in B meson decays.

The researchers presented their results, the most precise to date, at the Moriond Conference in Italy and the CKM Workshop in San Diego, both held in March. Several BaBar groups are now busy updating and improving the measurement of Vub and the form factors using the three-fold increase in data gathered through 2004. Significant progress depends on close collaboration with theorists. The competition, the Belle experiment in Japan, is likewise aiming to do better.
SLAC Legends: The Rock

By Katherine Bellevin

What is the rock sitting outside of the A&E building? An asteroid? A geode?

Many theories abound, but the true saga of ‘The Rock’ began over 20 years ago. In 1980 it was unearthed in an excavation site at the West End of the Klystron Gallery. The rock is almost perfectly round rock and weighs about 800 pounds.

Ed Keyser (retired), who discovered the rock, initially thought he had found the world’s largest geode. “We pictured the rock split in two and containing all the beautiful crystals that one finds in geodes,” he said. But after drilling a hole into the rock to see what might be in the center, he found only solid sand stone all the way through.

After being moved several times and twice slated for demolition, the rock was transferred to it’s current location.

“I am happy the rock provided some joy to those who were around when it was placed,” said retired SLAC-er Ed Keyser. “It is also a pleasure to know that many tales of how the rock came to be in its present location have been invented and told and retold.”

For the rest of Ed’s story, see: http://www.slac.stanford.edu/gen/pubinfo/therock.html
ES&H Safety Tip of the Week: Make the Most of Your JHAM

Job hazard analysis and mitigation (JHAM) is a technique we use to make our workplace—and ourselves—safer. It is a cornerstone of the SLAC approach to integrated safety management.

Remember, it is not an evaluation of your performance but of the job itself. Job hazard analysis lets us look objectively and systematically at what we do to identify any possible hazards in the way a job is performed so we can make changes and do the job with less risk of accidents or injuries. In our JHAM process we scope the work, identify the hazards and develop the hazard controls. Then we perform the work within the controls. When possible it is good to look at the final job and consider how it might be improved (be done more safely) next time, communicating improvement ideas to the supervisor and work team.

We use routine JHAMS in evaluating and authorizing the work that we regularly do in the workplace. If we are faced with work that is not on our routine JHAM we must work with our supervisor to create a non-routine JHAM.

Only when both you and your supervisor have signed the non-routine JHAM are you authorized to conduct this work. All routine JHAMS are reviewed and re-signed annually to ensure they capture changes and control the routine hazards of our jobs.

Job hazard analysis also offers us a way to look at everything we do with new eyes. That is why it is important to develop the habit of going through the mental checklist of scoping the work, identifying the hazards and...
identifying the hazard controls prior to performing the task.

Always remember to perform the work within the controls, then assess the work and communicate improvements. When you continually ask, “What can go wrong here?” you make it less likely anything will go wrong.

For more information call the Safety Service Desk (Ext. 4554).

For more information, see: https://www-internal.slac.stanford.edu/esh/SLACsafety/jham/

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Last update Thursday June 02, 2005 by Topher White
2005 Employee Recognition Awards

By Carmella Huser

SLAC honored 34 people, who were nominated and selected by their peers for the 2005 Employee Recognition Awards, at a May 17 luncheon at the Stanford Faculty Club. They were:


Employee Recognition Awards are given to members of the SLAC community who consistently promote a positive, respectful and harmonious work environment. This prestigious award recognizes good citizenship and the impact that the awardees have in making SLAC a better place to work. In a message to awardees, Lab Director, Jonathan Dorfan, said: “I can’t think of a more important honor than to be recognized by people who work around you, recognized for the support you bring to them, the encouragement you bring to them, the fact that you make them feel that this place is the wonderful workplace that it is.”

The 34 awardees were chosen from almost 200 nominations that were received by the selection committee. In addition to being honored at the luncheon, the awardees received a coveted “Globie” statuette, a letter of commendation for their personnel file, a certificate, and the honor of being pictured on SLAC’s Wall of Fame in the Administration and Engineering Building.
SLAC proudly salutes this year’s awardees and thanks them for their contribution to SLAC’s Respectful Workplace.

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Last update Friday June 03, 2005 by Topher White
New SLAC Directory Offers More Features

By Ziba Mahdavi and Katherine Bellevin

A new SLAC Directory is currently being tested and will soon be released. This new directory has many enhancements, including listings for:

- alternate contact information, such as cell phones, pagers
- SLAC cell phones
- easy to navigate organization charts
- home institution (for SLAC Users)

Control Your Own Contact Information

People who are in the SLAC Directory can now add alternate contact information to their listings. This is important for the User community, as well as anyone who has multiple phone numbers, email addresses, cell phones or pagers. In order to edit your own information, you must be logged in using your SLAC Windows account/password. Those without a SLAC Windows account should contact their ATOM for assistance with this function.

This project is a joint effort of the Business Services, Computing and Communications groups. We’ve gained valuable input from staff around the lab -- including ATOMS, Admins, User support and others.

Try It Out!

We’d like your comments and suggestions. Try out the beta version at: http://www-public.slac.stanford.edu/phonebook/search.html and let us know if you have any problems, suggestions or comments. Send comments to directory-admin@slac.stanford.edu. The new directory is also available from every directory listing page. We hope to launch the new directory in mid-June.

Please note that the new organizational changes at the division level may not be yet reflected in the organizational chart, so please check that you are listed with the correct department and supervisor, but you do not need to send in corrections for which division you belong to.
Find a Phone Number When the Web Site is Down

Did you know that you can dial 650-926-8777 and get any staff member’s phone number by spelling out the last name (and sometimes part of the first name)? This service is also available via the main SLAC line (926-3300, choose option ‘2’).

Print the Phone Book

From the phone book advanced search page (http://www-public.slac.stanford.edu/phonebook/search.html), use the “Printing the Phone Directory” link. The data is refreshed nightly.

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Last update Tuesday November 29, 2005 by Topher White
Dugan Selected as North American Regional GDE Director

By Kurt Riesselmann
Reprinted from Fermilab Today

Recently, GDE Director Barry Barish announced the appointment of Gerald Dugan, professor of physics at Cornell University, as the regional director of the ILC Global Design Effort for North America.

While details are still being worked out, Dugan has accepted the appointment. The announcement was made at a meeting of the High Energy Physics Advisory Panel (HEPAP) in Washington, DC. Dugan is the second GDE regional director to be named, following the appointment of Fumihiko Takasaki (KEK) as regional director for Asia.

Dugan has worked on numerous collider projects and programs, and he currently serves as one of convenors of the ILC working group on sources, damping rings and bunch compressors for the linear collider.

As regional GDE director, Dugan will oversee and coordinate the ILC R&D efforts of the four lead laboratories in Canada and the United States, where funding is provided by the Department of Energy and the National Science Foundation.
Welcome New Employees!

The new employee orientation held on March 3 included (left to right): Yves Acremann (ESRD), Andreas Scherz (ESRD), Selina Li (EE), Gerald Rooney (PUR), Yvette Ladd (BSD), Ernesto Prudencio (ACD) and Vivian Lee (AA).

(Photo by Diana Rogers)
MILESTONES

Service Awards

5 years
Aranda, Allyson (ESRD), 6/12
Folger, Josephine (CEF), 6/1
Macias, David (EP), 6/1
Straumann, Till (ASD), 6/1
Weismann, James (CEF), 6/1

15 years
MacGregor, Ian (SCS), 6/1
Pushor, Robert (MET), 6/1
Yeremian, Anahid (ARDA), 6/1

20 years
Hart, Paul (ESD), 6/3
Russell, James J. (SLD), 6/1
Larsen, Denise (MFD), 6/3

25 years
Conley, Robert (REG), 6/15
Staudenmaier, Paul (CEF), 6/3

To submit a Milestone, see: http://www.slac.stanford.edu/pubs/tip/milestoneindex.html

See Awards and Honors at: http://www.slac.stanford.edu/slac/award/
Stanford Commencement Tours of SLAC
Saturday, June 11

As part of the Stanford University Community, help us host the families and friends of Stanford Commencement for tours of the Lab.

To join us as SLAC Ambassadors to the Community, please contact Nina Stolar (Ext. 2282, nina@slac.stanford.edu).
Register Now for SSI!

The 2005 SLAC Summer Institute (SSI) will be held from July 25 through August 5. The theme for this year’s institute is “Gravity in the Quantum World and the Cosmos.” Registration is now open.

For more information, see: http://www-conf.slac.stanford.edu/ssi/2005/
The Interaction Point

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The Interaction Point is published twice monthly every first and third Friday. Submissions are due the second and fourth Tuesdays of each month.

Send submissions to tip@slac.stanford.edu, or mail to TIP Editor, MS 58, Stanford Linear Accelerator Center, 2575 Sand Hill Road, Menlo Park, CA 94025.

TIP is available online at: http://www2.slac.stanford.edu/tip/