

# INTERACTION POINT

February 3, 2006

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## Celebrating Black History Month

By Vivian Lee



Einstein on Race and Racism

Fred Jerome and Rodger Taylor

Thursday, February 16  
Noon - 1:00 p.m.  
Panofsky Auditorium

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## SSRL Stores Hydrogen in Move Toward Hydrogen Vehicles

By Heather Rock Woods



Imagine this: your fuel gauge is hovering near

## DOE Science Bowl at SLAC on Saturday, February 11

LAST CALL FOR VOLUNTEERS!



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## Probing Stardust

By Erik Vance

A BayPac consortium composed of SLAC, UC Berkeley and LLNL scientists will be among the first to examine pristine comet particles.

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empty. You stop at the nearest store, turn in your empty hydrogen cartridge, buy a full one and pop it into your car. Presto, you are on your hydrogen-powered way again, emitting just the faintest traces of water out the tailpipe.

[See whole story...](#)



“The sample return capsule is in spectacularly good shape,” SSRL physicist Sean Brennan said. “There will be hundreds of particles that can be analyzed.”

[See whole story...](#)

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## Director's Corner

By Jonathan Dorfan

### Our Collective Commitment Revisited

As we enter a new calendar year, I wish to reiterate my very strong commitment as Director to provide a workplace free of injuries and accidents, a workplace that is environmentally protective. I do so in accordance with the principles of the Integrated Safety and Environmental Management System (ISEMS). As I said in my All Hands talk last August, my goal is to provide an environment such that none of you get hurt working at SLAC. But I can't prevent all injuries alone in my role as Director. Each one of us *individually* has pledged to take personal ownership for our safety and the safety of our coworkers. Likewise we are committed to the protection of the environment.

As I also said in my All Hands talk, I cannot stress enough that the bottom line is clear; *safety begins and ends with our individual behaviors*. Injuries and accidents are almost always preventable if we, as individuals, remain vigilant and follow the ISMS core functions:

- define the scope and plan the work
- assess the hazards of the work
- develop controls for the hazards
- perform the work with the planned controls
- provide feedback for lessons learned analysis at completion.

You may remember that I stressed in my All Hands talk that we should not be slaves to injury statistics, but rather strive to eliminate injuries. I continue to believe that strongly. At the same time, I also stressed that statistics are very helpful to measure our collective performance and can be a guide to emerging vulnerabilities. Accordingly, I bring you these updates as feedback for preventing further injuries.

The goals for FY05 Total Recordable Cases (TRC) and Days Away Restricted or Transferred (DART) were no more than 17 and 8 cases respectively. The actual FY05 performance was within the goals, namely



Jonathan Dorfan, Director  
(Photo by Diana Rogers)

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we had 11 TRCs and 8 DARTs. You are to be congratulated on meeting the goals. By way of 'lessons learned', we analyzed last year's 11 TRC occurrences and 45 first aid occurrences, and found that almost all these occurrences could have been prevented if more appropriate choices had been made by the individual(s) doing the work.

This year's TRC and DART goals are more stringent, namely '14 and 6'. To date we have already reached 5 TRC and 3 DART and 15 first aid occurrences; again almost all of these occurrences were preventable with modified choices.

Let me thank you for reading this column and for your continued partnership towards the goal of eliminating injuries to you, our irreplaceable staff and loyal users.

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## LCLS Safety Walk Through



*Laboratory Director Jonathan Dorfan conducted a safety walk through of the LCLS project facilities accompanied by John Galayda (LCLS). Pictured above (right to left) are David Saenz (LCLS), Gary Meadows (XL Construction), Michael Scharfenstein (LCLS), Jonathan Dorfan (DO) and Javier Sevilla (LCLS).*

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## SLAC Space Probe: Probing Stardust

By Erik Vance



Researchers (shown left to right) Sean Brennan (MRUS), Konstantin Ignatyev (MRUS), Hope Ishii (LLNL) and Katharina Luening (MRUS).

(Photo by Diana Rogers)

own in the form of meteorites. But, according to Brennan, meteorites are "cooked fairly well on their way in," burning up almost all elements besides iron and nickel. Brennan expects to see more volatile elements such as sulfur, selenium and phosphorus in the Stardust sample because the probe shielded these elements on their way through the earth's abrasive atmosphere.

The SLAC team will focus on inorganic minerals. On Earth, these minerals have cycled through so many natural processes that they look vastly different than they would have at the beginning of the solar system. Wild 2 offers a special opportunity to sample a relatively unaltered comet because it existed on

Very early on Sunday, January 15, a NASA space craft thumped down onto the Utah desert. The Stardust probe had traveled halfway across the solar system to catch material from the tail of the comet Wild 2.

Soon, some of those particles will make a much shorter journey to California. When they arrive, a BayPac consortium composed of SLAC, UC Berkeley and LLNL scientists will be among the first to examine pristine comet particles.

"The sample return capsule is in spectacularly good shape," SSRL physicist Sean Brennan said. "There will be hundreds of particles that can be analyzed."

One of the main goals of the probe is to collect the raw elements that created the solar system about four billion years ago. These elements occasionally make it to earth on their

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the edges of our solar system for billions of years before approaching the sun for the first time just 35 years ago. Relatively uncontaminated by processes within the solar system, Wild 2 most resembles the primordial components of the sun and its planets.



*This photo shows particles traveling through Aerogel. By exposing the Aerogel to x-rays at*

Brennan and the BayPac team are part of an international preliminary examination collaboration examining a subset of the 130 Aerogel tiles that collected particles from the comet's tail. Aerogel is an ultra-light material able to catch dust particles like sponge cake in a sandstorm. However, while granules in a sandstorm whip around at 60 to 100 miles per hour, the comet dust hit the Aerogel at about six kilometers per second (approximately 14,000 miles per hour).

Brennan and research partners Konstantin Ignatyev, Hope Ishii and Katharina Luening will expose the Aerogel to x-rays from SSRL. By comparing the wavelength of incoming rays to those exiting the sample, the researchers will identify the elements in Wild 2's tail.

SSRL will have two chances to examine the comet dust with the synchrotron before the end of the year. Brennan and his team will also identify the most interesting samples and pass these along to LLNL, where researchers will slice off slivers 30 nanometers thick to analyze in their transmission electron microscope.

"All reports are that it is an extremely successful mission with years of research ahead of us. Very exciting," Brennan said.

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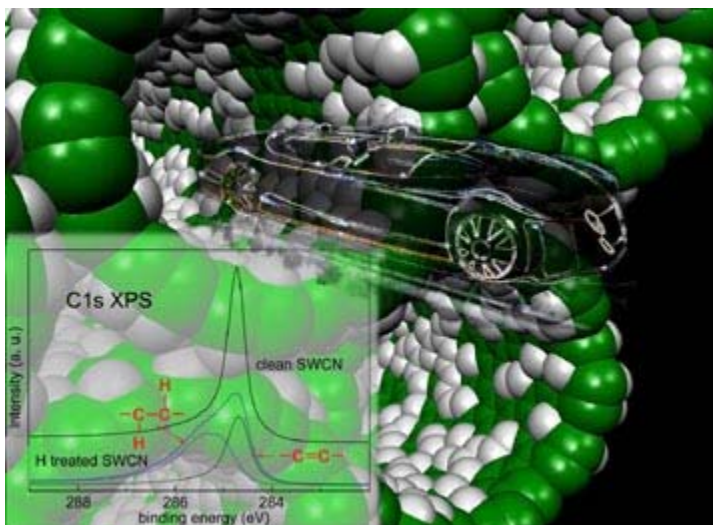
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## SSRL Stores Hydrogen in Move Toward Hydrogen Vehicles

By Heather Rock Woods



(Photo courtesy of Anton Nikitin)

efficiently and compactly.

The basic idea of fuel cells is to strip the electron from a hydrogen atom and then drive the electron across a membrane to generate an electrical current which can power your car. In their attempt to store hydrogen, the researchers bombarded a film of carbon nanotubes with a hydrogen beam. Then they studied the film with different x-ray spectroscopy techniques to see if any hydrogen atoms had formed chemical bonds with the carbon. To their delight, they found that about 65 percent of the carbon atoms had bonded to hydrogen atoms.

"It was a surprise that we could get so many carbon-hydrogen bonds. It gives us hope it can be used

Imagine this: your fuel gauge is hovering near empty. You stop at the nearest store, turn in your empty hydrogen cartridge, buy a full one and pop it into your car. Presto, you are on your hydrogen-powered way again, emitting just the faintest traces of water out the tailpipe.

Researchers at SSRL and Stanford have taken a step closer to this futuristic vision by adding hydrogen to tiny cylinders made entirely out of carbon. Carbon nanotubes, 50,000 times narrower than a human hair, have excited the imaginations of scientists hoping to make nano-electronics. Recent experiments at SSRL and the Advanced Light Source in Berkeley have shown that the tubes are also a promising material for storing hydrogen safely,



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as a material for storing hydrogen," said Anders Nilsson (RES).

Single-walled carbon nanotubes are essentially a one-atom-thick layer of carbon rolled into a tube. All the carbon atoms are on the surface, allowing easy access for bonding. The carbon atoms have double bonds with each other. The incoming hydrogen breaks the double bonds, allowing a hydrogen to attach to a carbon while the carbon atoms renew their grip on each other with single bonds. The carbon nanotubes offer safe storage because the hydrogen atoms are bonded to other atoms, rather than freely floating as a potentially explosive gas.

The researchers estimated that five percent of the total weight of the hydrogenated nanotubes came from the hydrogen atoms, and they are already working to boost that number. For its FreedomCAR program, the DOE has set the goal of developing a material that can hold six percent of the total weight in hydrogen by the year 2010. Because hydrogen is the lightest element, the storage material also needs to be light to hold a high percentage of hydrogen by weight, and carbon is light.

In addition to upping the weight percent of hydrogen, researchers also need to overcome challenges in releasing the stored hydrogen so it can be used in a fuel cell. Currently, the hydrogen-carbon bonds break above 600 °C, but two cycles of hydrogenating the carbon nanotubes and then breaking the hydrogen-carbon bonds appears to cause defects in the tubes. Ideally, the hydrogen would be released at 50 to 100 °C. Adding metal catalysts and adjusting the radius of the tubes are potential solutions.

This was the first experiment conducted on the new SPEAR3 beamline 5-1. The work was supported by the Global Climate Energy Project as well as the DOE.

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## Drell Wins Achievement Award



*Persis Drell (PPA) is the recipient of the Wellesley College Alumnae Achievement Award for 2006. Wellesley's Alumnae Association recognizes alumnae who have brought honor and distinction to themselves and to Wellesley through their outstanding accomplishments. Drell will travel to Wellesley in February to receive the award.*

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## Tuttle Joins Communications Group

*By Nina Adelman Stolar*

The newest member in the office of communications, Kelen Tuttle, arrived at SLAC last December. She will manage the SLAC Today website, write for various publications at the Lab and generally assist the communications office. In the next few months, she will help re-launch SLAC Today as a daily on-line newsletter, complete with articles, weekly columns and information for everyone at SLAC.

"It's a challenge to create a publication that comes out so often yet is still relevant and useful," she said. "but I'm confident of our success and excited about the possibilities."

The new format will build from the success of publications like Fermilab Today and Today at Berkeley Lab. By combining lab-wide announcements and events with human interest stories and descriptions of science from around the Lab, Tuttle hopes to increase the sense of community at SLAC.

Tuttle recently earned a masters degree in science journalism from Boston University and holds a bachelors degree in English and physics/astronomy from Carleton College in Minnesota. She once thought she wanted to be an astrophysicist, but after sitting in front of a computer monitor for three months straight, analyzing data from a telescope 800 miles away, she decided that research wasn't for her. She now enjoys delving into research projects just long enough to learn the details and intricacies of the science, and to explain it to others in SLAC publications.

"It has been fabulous to sit down to lunch with Nobel Prize winners," Tuttle said. "I have been very impressed by the people who work at SLAC—especially with their friendliness."



*Kelen Tuttle (COM)  
(Photo by Juhi Yajnik)*

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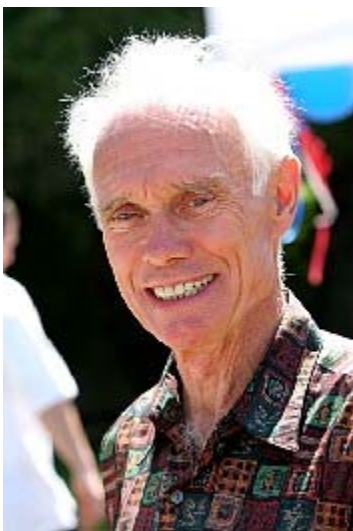
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## Walz Wins DOE ES&H Award



*Congratulations to Dieter Walz (CEF) on winning the DOE SC 2005 Pollution Prevention and Environmental Stewardship Award, a well deserved recognition for one of his many contributions to the Lab. The award recognizes Walz's outstanding contribution through reuse of over 430 tons of concrete and iron in building new experimental facilities. The award ceremony will take place in May.*

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## Address Changes Should be Reported to HR

Have you received your W-2 form? If you have had a recent address change, please be sure to contact the HR Records department to update your address in order to ensure proper forwarding of 2005 W-2's.

Contact: Claudia Ransom, Ext. 2366, or Martha Reed, Ext. 4112

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## Payroll Information

### New W-4 Needed to Claim Withholding Exemption

If you had filed 'EXEMPT' from Federal and or State withholding for 2005, that exemption expires on February 15. IRS requires that you fill out and submit a new W-4 if you are still claiming 'EXEMPT'. If Payroll does not receive the 2006 completed W-4 form on or before February 16, your tax withholding will be based as if you are claiming Single with zero exemption effective on February 16.

W-4 forms are available in the Payroll Office (A&E, Bldg. 41, Rm. 216) and on-line at: <http://www.irs.gov/pub/irs-pdf/fw4.pdf>

### Final Notice: Form 8233 for 2006 - Tax Treaty

If you are claiming Tax Treaty, you must complete form 8233 for each tax year. Please submit the completed 8233 Form 2006 to Payroll immediately.

Forms are available from Claudia Ransom at the Records Department in HR (A&E, Bldg. 41, Rm. 236). If you fail to submit form 8233 on the specified date, federal tax will be deducted from your salary.

Contact: Ellen Remerata, Payroll, Ext. 5194, [ellen@slac.stanford.edu](mailto:ellen@slac.stanford.edu)

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## Travel Expense Report Submission Deadlines

As stated in the Stanford Administrative Guide 36.7 ([Travel Expense Policy](#)) dated December 15, 2005: Expenses submitted more than 60 days after completion of travel, or incurring the expense, will be reported as additional income to the individual, in accordance with Internal Revenue Service regulations.

### Action Required

- If you have business trips that occurred over 60 days ago but you have not submitted your expense reports, please submit them ASAP but no later than February 28. SLAC is providing a one-time grace period to allow travelers to submit their travel expenses that are over 60 days without the expenses being reported as additional income.
- According to SLAC guidelines, expense reports should be submitted within 20 days of return from a business trip. Additionally, Stanford policy requires that travel expenses charged to the department American Express card be submitted within 3 days of return from the business trip.
- Beginning March 1, expense reports that are received by the Travel Reimbursement Office after 60 calendar days upon return of business travel will be reported as additional income.

Contact: Alison Twombly, Travel Reimbursement, Ext. 4346, [atwombly@slac.stanford.edu](mailto:atwombly@slac.stanford.edu)

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## Bulletin 06-3 from the Stanford Benefits Department

Starting in February, the Stanford Benefits Department will hold a monthly presentation for employees who would like information on retiree benefits. The one-hour meetings are primarily directed to those considering retirement in the near future, although anyone can attend. Employees who are planning to retire should definitely attend no later than two to three months before their expected retirement date.

In addition to general information important to those planning to retire, attendees will learn what they need to do to determine benefit eligibility, health care options and how to request distributions from their retirement savings, including the Tax Deferred Annuity (TDA), the Stanford Contributory Retirement Plan (SCRCP) and the Stanford Retirement Annuity Plan (SRAP).

These meetings are a prerequisite to an individual meeting with a benefits staff member about retirement benefits.

### Meeting Dates for 2006:

February 24  
 March 24  
 April 28  
 May 26  
 June 30  
 July 28  
 August 25  
 September 29  
 October 27  
*No meeting in November*  
 December 1

All meetings will be held from 12:30 to 1:30 p.m. at 651 Serra Street in the Amy Blue Conference Room on the Stanford campus. Dates and times can also be found on the BenefitSU web site under BenefitSU News—Events Calendar.

For more information, see: <http://benefitsu.stanford.edu>



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## Invest for Your Retirement


Representatives from Fidelity, TIAA-CREF and Vanguard will be holding free individual counseling sessions at SLAC throughout the year. Appointments will be in the ACD Conference Room (A&E, Bldg. 41, Rm. 130A).

<b>Fidelity</b>	<b>Vanguard</b>	<b>TIAA-CREF</b>
February 7	February 8	February 22
March 7	March 8	March 22
April 11	April 4	April 25
May 9	May 3	May 18
June 6	June 20	June 21
July 12	July 7	July 19
August 8	August 9	August 23
September 12	September 13	September 20
October 17	October 11	October 18
November 7	November 8	November 14
December 5	December 6	December 13

Please contact the investment company directly to set up an appointment.

**Fidelity:** (800) 642-7131 

**TIAA-CREF:** (800) 842-2007  or [www.tiaa-cref.org/moc](http://www.tiaa-cref.org/moc)

**Vanguard:** (800) 662-0106 , Ext. 14500 or [www.meetvanguard.com](http://www.meetvanguard.com)

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## The SLAC Emergency Hotline Number:

**1-877-447-SLAC (7522)**

Please make a note of the SLAC Emergency Hotline number. In the event of an emergency, the most current information about SLAC will be a single phone call away.

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## MILESTONES

### Awards

Drell, Persis (PPA) Wellesley College Alumnae Achievement Award for 2006

Walz, Dieter (CEF) 2005 DOE Award for Pollution Prevention and Environmental Stewardship, announced January 24, 2006

### Service Awards

#### 5 Years

Asiri, Fred (NLC), 2/1  
 Delgado, Salvador (CEF), 2/5  
 Sandoval, Thomas (CEF), 2/12

#### 10 Years

Chang, Charlotte (PPA), 2/12  
 Nguyen, Phillip (PCD), 2/1

#### 15 Years

Calloway, David (ACO), 2/1  
 Craddock, Wesley (CEF), 2/4  
 McDunn, Ruth (TIS), 2/7

#### 25 Years

Dudley, Kris (MFD), 2/2  
 Petree, Mark (AD), 2/9

### Retired

Prescott, Charles (EA), 11/30/05

### Deceased

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Crumpler, Jeanne Elisabeth (formerly HR), passed away on January 4, 2006.

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/>

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Last update Tuesday January 31, 2006 by [TIP](#)

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## DOE Science Bowl at SLAC on Saturday, February 11

### LAST CALL FOR VOLUNTEERS!



**DOE SCIENCE BOWL 2006 REGIONALS**  
**STANFORD LINEAR ACCELERATOR CENTER**

*(Image by Terry Anderson)*

#### WHO?

You—your support is needed!

#### WHAT?

Regional science competition for local high school teams

#### WHEN?

Saturday, February 11

#### WHERE?

Panofsky Auditorium

#### WHY?

Science Bowl is dedicated to encouraging young people passionate about science—they are our future!

Don't delay—get involved and help us host a fantastic event!

Volunteer by contacting Melinda Lee (COM),  
 Ext. 8547, [mtlee@slac.stanford.edu](mailto:mtlee@slac.stanford.edu)

For more event information please see:  
<http://www2.slac.stanford.edu/scibowl>

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## Celebrating Black History Month



### Einstein on Race and Racism

Fred Jerome and Rodger Taylor

Thursday, February 16

Noon - 1:00 p.m.

Panofsky Auditorium

*By Vivian Lee*

In celebration of Black History Month, the Affirmative Action Office is pleased to extend an invitation to the SLAC community to join us at a special event. Co-authors Fred Jerome and Rodger Taylor will give a presentation on the new book, *Einstein on Race and Racism*. The book reveals neglected aspects of Einstein as a passionate humanitarian, socialist, internationalist and outspoken critic of racism.

This hour-long event will begin promptly at Noon in Panofsky Auditorium and is an opportunity not to be missed. Immediately following the presentation, the authors will be available for book signing. This book, as well as others by the authors, can be purchased prior to the event at the Stanford Bookstore or through Amazon.com. Please bring your books with you to the event, as no books will be sold on site.

Please e-mail [vlee@slac.stanford.edu](mailto:vlee@slac.stanford.edu) for ticketed priority seating. For more information, visit <http://www-group.slac.stanford.edu/aao/newsandinfo/>

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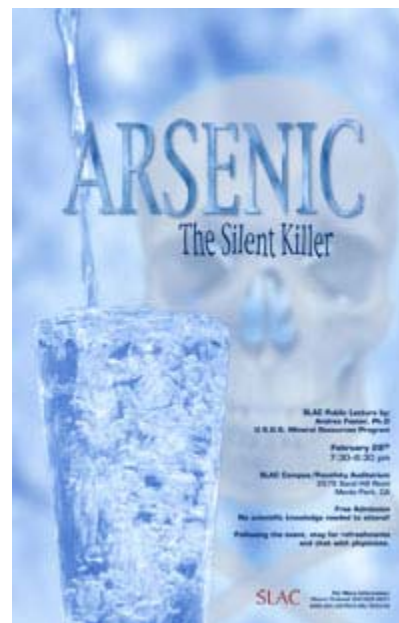
Next talk in the SLAC Public Lecture Series:

## Arsenic: The Silent Killer

**Andrea Foster, USGS**

Tuesday, February 28, 7:30 p.m.  
Panofsky Auditorium

Free Admission; no reservations necessary.  
Please bring photo ID.



(Image by Terry Anderson)

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Andrea Foster, SSRL user and scientist with the Mineral Resources Program at the U.S. Geological Survey, uses x-rays to determine the forms of potentially toxic elements in environmentally-important matrices such as water, sediments, plants and microorganisms. Foster will discuss her research on arsenic, which is called the silent killer because when dissolved in water, it is colorless, odorless and tasteless. Consumption of relatively small doses of this element in its most toxic forms can cause rapid and violent death. Arsenic is a well-known poison and has been used since ancient times. Less well known is the fact that much lower doses of the element, consumed over years, can lead to a variety of skin and internal cancers that can also be fatal. Currently, what has been called the largest mass poisoning in history is occurring in Bangladesh, where most people are by necessity drinking ground water that is contaminated with arsenic far in excess of the maximum amounts determined to be safe by the World Health Organization. This presentation will review the long and complicated history with arsenic, describe how x-rays have helped explain the high yet spatially variable arsenic concentrations in Bangladesh, discuss the ways in which land use in Bangladesh may be exacerbating the problem, and summarize the impact of this silent killer on drinking water systems worldwide.

For more information, see:

[http://www2.slac.stanford.edu/lectures/info\\_2006/2006\\_02\\_28.htm](http://www2.slac.stanford.edu/lectures/info_2006/2006_02_28.htm)

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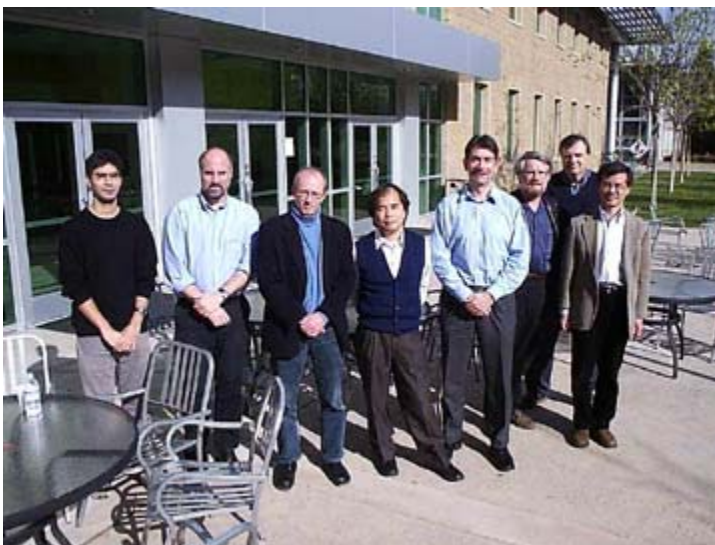
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## Experimental Program Advisory Committee Meeting



*In late January, physicists from laboratories in Asia, Europe and the U.S. convened at SLAC to evaluate proposals for particle physics and particle astrophysics experiments at the Lab. The Experimental Program Advisory Committee (EPAC) reviewed reports on E164X, ILC Beam Instrumentation, LCD, GLAST and BABAR as well as proposals for SABER, ATLAS and LSST.*

*For more information see: <http://www.slac.stanford.edu/grp/rd/epac/>*

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## About Us:

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### Editorial Team

Neil Calder  
Nina Adelman Stolar  
Vickee Flynn  
Ziba Mahdavi

### Writers

Melinda Lee  
Kelen Tuttle  
Erik Vance  
Linda DuShane White  
Heather Rock Woods

### Photography

Diana Rogers

### Distribution

Tineke Graafland

### Layout & Graphics

Agnieszka Egan

### On-line Edition

Nina Stolar

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