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Director's Corner



By Jonathan Dorfan

As the year comes to a close, and we look forward to taking full advantage of the annual

Laboratory closure, please accept my and my family's warm seasonal greetings. However you celebrate the year's end, may it be joyful and may it herald a healthy, happy and successful 2006 for you and your loved ones.

[See whole story...](#)

Hunting the Penguin During BABAR's Long Run

By Heather Rock Woods

BABARians are hot on the trail of penguins.



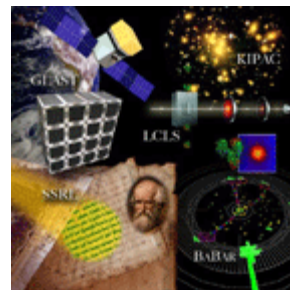
The BABAR

collaboration is hunting for signs of new physics—perhaps supersymmetry, or perhaps the Higgs particle—in 'penguin modes,' rare channels of decay from B mesons to other particles.

Holiday e-Card

This year the printed holiday card is replaced by an e-card.

Brave new world!



You can find it on-line:

<https://www-internal.slac.stanford.edu/do/ecard/bin/default.asp>

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Czech Named Ashley Fellow for 2005

By Pauline Wethington

Sandra Czech (HR) won the 2005 Alonzo W. Ashley Career Development Fellowship. This will enable her to finish her degree at San Jose State University, where she is majoring in Linguistics with a minor in Physics.

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ABOUT TIP

Director's Corner

By *Jonathan Dorfman*

As the year comes to a close, and we look forward to taking full advantage of the annual Laboratory closure, please accept my and my family's warm seasonal greetings. However you celebrate the year's end, may it be joyful and may it herald a healthy, happy and successful 2006 for you and your loved ones.

As you know well, SLAC is an important and highly valued part of Stanford University. We all work for a great University, one of the leading research and educational institutions in the world. The SLAC Director is appointed by the University President, and reports to both the President (for all management and fiduciary matters) and to the Provost (for academic matters). The University maintains oversight of SLAC in many ways, but possibly the most important mechanism is that of the SLAC Policy Committee (SPC), or what until recently was called the Science Policy Committee. At the urging of the President Hennessy's Blue Ribbon Panel on SLAC, commissioned in the wake of the October 2004 accident, and consistent with the reality that the SPC has for a rather long time covered not just science policy but all aspects of management, the name has been changed. This will not in any way reduce the scientific content of the SPC meetings, but will formally acknowledge the critical importance of ensuring sound management of the science. The SPC meets for two days typically in the first week of May and December and has fourteen members. The Committee is currently chaired by Professor Jim Siegrist of Lawrence Berkeley National Lab. and University of California at Berkeley. Jim did his thesis on the Mark I detector as a SLAC graduate student.



Jonathan Dorfman, Director
(Photo by Diana Rogers)

We recently concluded the December 2005 SPC meeting. I reviewed for the SPC what a very challenging past 13 months it has been for every one of us. We were faced with the recovery from a major accident in October 2004 which necessitated a long period of operational downtime. All facilities had to prepare for and pass a safety validation review. Our 2005 budget did not meet expectations and we had to endure the agony of laying off valued co-workers. We have had many reviews whose outcome was critical to our future success. We had a once in 46-year freak power outage that left us without power for three days. We have gone through the first major reorganization of the Laboratory since its inception. When the SPC were here in May 2005, we were just beginning to "get back on our feet". Six months later it's a very different story. Tough though it has been, I was able to say with much conviction and pride that we had come through this difficult period, and SLAC, as always, is conducting a broad and highly successful research program. I concluded my talk by pointing out that this was only made possible due to the extraordinary quality, dedication and determination of SLAC's staff.

Change and adversity are always difficult; but look where we stand now. We received full funding for the LCLS project for 2006 and construction has already started. The B Factory reached record performance, breaking the magic 10^{34} cm⁻¹ sec⁻¹ luminosity barrier, more than three times its design. SSRL has been performing superbly. GLAST has completed the assembly of the Large Area Telescope. The linear collider group has repositioned itself outstandingly after the linac technology decision

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and is leading the world through the Global Design Effort process. The Kavli Institute is growing in leaps and bounds and the building is nearly finished. We have established the Ultrafast Science Center and have hired a world- leading scientist as its first Director. The FFTB and the NLCTA facilities are in full operations. *This Laboratory is back to full and safe performance.*

For two days we presented SLAC activities to the SPC and I was delighted by the closing statement of the Committee Chair, Jim Siegrist: "SLAC has faced many and varied challenges in 2005 and the SPC would like to congratulate the SLAC staff on their resilience, and their commitment to the goals of the laboratory."

All families go through tough times and strong families come through them. The SLAC family has demonstrated its strength in 2005. 2006 will be a great year!

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Hunting the Penguin During BABAR's Long Run

By Heather Rock Woods

BABARians are hot on the trail of penguins.

The BABAR collaboration is hunting for signs of new physics—perhaps supersymmetry, or perhaps the Higgs particle—in ‘penguin modes,’ rare channels of decay from B mesons to other particles.

They hope to catch their quarry with their physics net. This is a set of data so huge that the current 15-month run will double the amount of data collected by the BABAR experiment during all previous runs from 1999 to 2004.

“There have been intriguing hints for new physics in penguin modes, which makes this a hot topic,” said BABAR Spokesman David MacFarlane.

The search for new physics among penguin modes and other rare decay channels is one of many research goals for the international collaboration during the current run. It will take the vast amount of new data that the PEP-II accelerator is providing, and BABAR is recording, to be sensitive to tiny effects involved as well as to attain the statistical significance needed to possibly resolve whether new physics effects are taking place.

The current run started mid-April 2005, paused briefly from mid-October to mid-November to re-certify accelerator safety systems and upgrade PEP-II vacuum chambers, and will continue through July 31, 2006. BABAR also took advantage of the down time to install new drift chamber electronics that will allow full exploitation of the increasing luminosity delivered by PEP-II. In addition, the experiment is benefiting from upgrades to one-third of the muon identification detector.

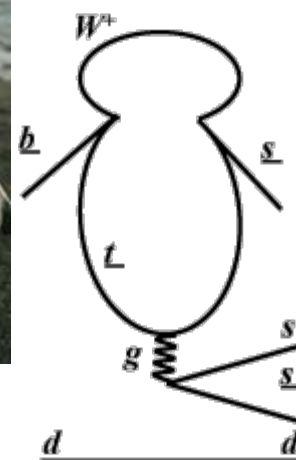
The PEP-II accelerator produces B mesons and their anti-particle, B-bar mesons. Both decay into other particles through the weak force, but the matter and antimatter particles decay at different rates because of an asymmetry in the behavior of the weak force (it violates charge-parity symmetry).

According to the Standard Model of known physics, this asymmetry in matter and antimatter decays should remain the same whether decays occur in a particular set of penguin channels or in the more common ‘charmonium’ modes. The data to date, however, indicates that in some of those penguin decays, there seems to be far less asymmetry than seen in the charmonium modes of decay. If this holds up, it means some kind of new physics is showing up in these rare decays—thanks to quantum loops.

A quantum loop means particles of any mass can instantly materialize, and then



(Photo courtesy of www.galenfrysinger.com)



NOT THIS PENGUIN.....THIS ONE!

This Feynman diagram represents a loop process in one of the penguin decay modes under study at BABAR, drawn to resemble a penguin.

(Image courtesy of David MacFarlane/Riccardo Faccini)

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disappear, during the decay process. Quantum loops dominate penguin modes, but not charmonium modes. The brief-lived virtual particles are usually W bosons, which mediate the weak force. But other particles with similar behavior could enter the loop, including a charged Higgs particle, which physicists still ardently seek, or a neutralino, one of the proposed supersymmetry particles. This makes decays involving loops very sensitive to new physics at high masses. If the new particles participate in penguin decays, they would alter the expected asymmetry between matter and antimatter decays.

"Each individual penguin mode might have a different contribution from new physics," said Riccardo Faccini, BABAR Physics Analysis coordinator.

Indeed, recent papers on two new types of penguin decays showed that one follows standard model physics and the other suggests that non-standard physics might be influencing the decays. B-factory physicists are also looking for new physics in other rare decays with loops, such as tau and charm particle decays.

BABAR experimenters hope to have a much better understanding by the end of this run. The current average of all penguin channels shows about three-sigma effect for new physics, still below the five-sigma signal usually needed to claim a discovery. Even if these hints aren't confirmed, the measurements made by BABAR and by Belle, the B-factory in Japan, will constrain where new physics could be found. The constraints will ultimately help experiments at the Large Hadron Collider currently being built at CERN interpret any discoveries made by directly producing new physics particles.

Penguin decays are elusive prey. Out of 400 million events, BABAR has measured only several hundred of them. Fortunately, the hunters are getting smarter.

"We have developed quite refined tools," Faccini said. "The doubling of the data set is really important because of the much improved sensitivity. We have a very good silicon vertex tracker to measure these different modes and in recent years we've been learning how to squeeze every last bit out of it. We also have refined our background-fighting abilities."

The PEP-II team is also on their side, delivering a record luminosity of just over $1 \times 10^{34} / \text{cm}^2 / \text{s}$ in the last few days before the mid-run downtime in October. The accelerator team has plans for a further 20 percent improvement in luminosity before next summer. They also expect an almost doubling of luminosity after they install major improvements in the fall of 2006.

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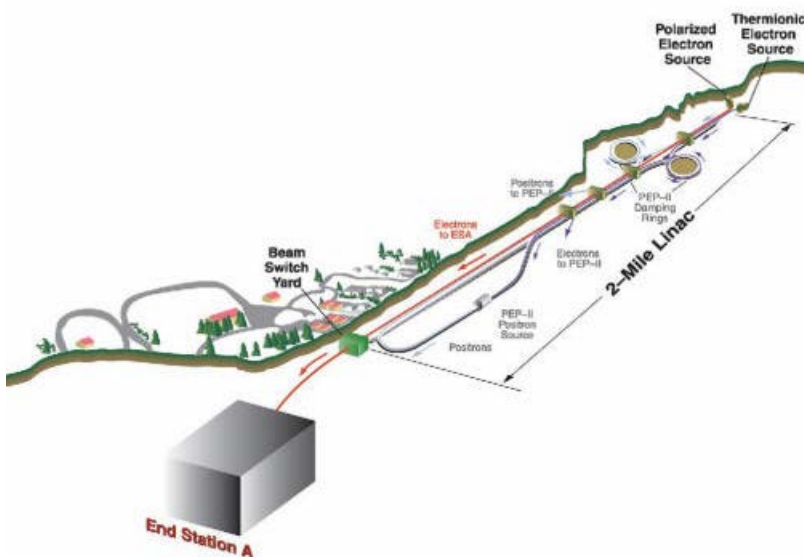
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E-158 Makes AIP Top Stories for 2005

Congratulations to our E-158 collaborators! The AIP Bulletin of Physics News top physics stories for 2005 included the E-158 experiment at SLAC. These results were cited as the best measurement yet of the weak nuclear force.



For more information, see: <http://www-project.slac.stanford.edu/e158/>

For other top physics stories for 2005, see: <http://www.aip.org/pnu/2005/split/757-1.html>

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Czech Named Ashley Fellow for 2005

By Pauline Wethington

Sandra Czech (HR) won the 2005 Alonzo W. Ashley Career Development Fellowship. This will enable her to finish her degree at San Jose State University, where she is majoring in Linguistics with a minor in Physics.

Under the mentorship of Kwok Ko (ACD), Czech will work in the Advanced Computation Department. This will help her gain greater knowledge of and experience in the scientific research at the Laboratory.

Czech will be working with Pauline Wethington (COM/HR) to recruit Hispanic physics students, adding to the diversity of applicants for the Science Undergraduate Laboratory Internships (SULI) Program. In September 2005, Czech attended the national conference of the Society for Advancement of Chicanos and Native Americans in Science (SACNAS) in Denver, Colorado. She had the opportunity to speak to students and their professors about the SULI Program and to encourage many of them to apply for the summer 2006 program.



(Photo courtesy of HR)

For the past five years Czech has worked in Human Resources as a Records Assistant. The fellowship has given Czech the chance to explore areas she had only dreamt of and because of time and the limited hours in day would not have had the opportunity to do what she is doing now.

Thanks to the Ashley Fellowship, her dream has become reality.

For more information, see: <http://www-group.slac.stanford.edu/hr/er/fellowship/2004/ashley.html>

ASHLEY FELLOWS	
2005:	Sandra Czech (HR)
2004:	Arturo Alarcon (LCLS)
2003:	Lesley Wolf (TIS)
2002:	Pauline Wethington (COM/HR)
2001:	Nicholas Arias (ILC)

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The Evolution of the SLAC Web

In May 2005, the SLAC website went through an evolution to reflect the [change in the organization of the lab](#) and a [new look and feel](#) to encourage a consistent user experience.

Since the old SLAC detailed and highlighted home pages no longer reflect this organizational change and new pages exist that were designed to replace the old pages, all of the following web pages:

- [SLAC Detailed Page: For staff, users, and collaborators](#)
- [SLAC Highlighted Page: For staff, Users, and Collaborators](#)
 - [Research Program](#)
 - [Scientific Information](#)
 - [Working at SLAC](#)
 - [Organization](#)

will be removed on December 30, 2005 and these pages will automatically redirect to the new [For Staff](#) page.

If your web browser has any of these pages set as your default page, you might want to change your default page now. To change your default home page in your web browser:

- Internet Explorer - Go to the page you want to be your home page. Then go to Tools, Internet Options, General, click on "Use Current" and click "OK".
- Firefox - Go to the page you want to be your home page. Then go to Tools, Options, General, click on "Use Current Page", and click "OK".

NOTE: If you are working on a Windows machine and you are unable to change your default home page, you should contact your desktop administrator. Some Windows computers have a program (Spy Sweeper) that has not been correctly uninstalled and prevents users from changing their default page.

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Stanford Linear Accelerator Center, Menlo Park, CA
Operated by [Stanford University](#) for the [U.S. Dept. of Energy](#)

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New Look for ES&H

By Larissa Williams

In the coming year, ES&H will release a new Environment, Safety and Health website design. The new website will include:

- A design integrating the SLAC home page look and feel
- A new scheme organizing content by topics
- Integration of the ES&H Manual chapters into the web pages

The ES&H Knowledge Management Department has been working to reorganize ES&H content to better meet your needs. The site has undergone major revisions: navigation has shifted, colors have changed and sections have a new format with easy-to-use fly-out menus and internal tab links.

In developing the new website, we spent several months interviewing customers and conducting design tests. Copies of our project plan, interviews and results from the tests are [on-line](#).

When the new website is launched, it will incorporate our most visited pages and all new manual chapters. Due to the amount of information on the site, we will be continuing to migrate existing content to the new design over the coming months.

Once the new site is launched we invite your comments and questions. You can contact the [ES&H website coordinator](#).

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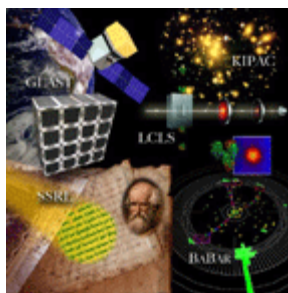
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Holiday e-cards

This year the printed holiday card is replaced by an e-card.

Brave new world!



Please use it abundantly
and inform all your colleagues of its existence.

You can find it [on-line](#).

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Counterfeit Parts and Circuit Breakers

By Robin Wendt

Counterfeit and suspected counterfeit parts are a problem because they frequently do not meet the standards of the genuine part they imitate and, as a consequence, may be a safety hazard and cause damage to equipment. Please refer to [Bulletin 9C, Counterfeit Parts](#).

To avoid this risk, those in the SLAC community who obtain bolts, fasteners and circuit breakers are recommended to do so through SLAC Stores. SLAC Stores orders only from reliable vendors and verifies the items are not counterfeit, thus assuring the safety of the end-user. We recognize that not all procurements of bolts, fasteners and electric circuit breakers are made through Stores, though we encourage you do so for such items.

Those who procure these items directly from vendors may run a higher risk of obtaining counterfeits and need to be vigilant.

For information about SLAC Stores, contact Tom Murphy (Ext. 3584, smurf@slac.Stanford.edu) or see the [Stores](#) website.

If you have concerns over authenticity of items obtained outside of SLAC Stores, contact the following:

Bolts and fasteners—Butch Byers, head, Chemical and General Safety Department, ES&H Division (Ext. 9603, bbyers@slac.stanford.edu)

Electric circuit breakers—Perry Anthony, SLAC electrical safety officer (Ext. 4354, anthony@slac.stanford.edu)

Please note that all ES&H bulletins, including Bulletin 9C are being rescinded; guidance from them that remains current is being incorporated into ES&H Manual chapters or other policy/requirement documents.

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Medical Care during Holiday Shutdown

The SLAC Medical Department is closed during the holiday shutdown. If you have a work-related non-emergency illness or injury, you may seek treatment from one of the following healthcare providers:

- Sequoia Hospital Occupational Health Services (open 8:00 a.m.–6:00 p.m.) 633 Veterans Blvd., Redwood City (650) 364-1565
- Sequoia Hospital Occupational Health Services (open 8:00 a.m.–5:30 p.m.) 454 Forest Avenue, Palo Alto (650) 566-0288
- Stanford Hospital Emergency Room (open 24-hours) 300 Pasteur Drive, Stanford (650) 723-5111
- Your personal physician provided you have completed the Physician Pre-Designation form.

Notify the SLAC Medical Department (Ext. 2281 or mggherman@slac.stanford.edu). Leave a message noting:

- Your name
- Nature of the injury
- Time and date of the occurrence
- Name of clinic or hospital where you received treatment

When the Medical Department opens for business on January 3, 2006, you will be sent an SU-17 to complete.

If issues arise regarding a workers' compensation claim, contact Martha Deacon, Zurich claims examiner, at (415) 538-7402.

Contact: Sharon Haynes, Workers' Compensation Administrator, Human Resources Department, Ext. 4533, shaynes@slac.stanford.edu

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Security Tips for the Holidays from SCCS Computer Security Group

As we all are getting ready to enjoy our Holiday break, lets take a few minutes to talk about safe computing. Below, you'll find some 'best practices' and how to make sure your current and new computers and computer equipment don't spoil your Holidays.

- Keep your computer fully patched, no matter what the operating system is. Windows gets all the publicity, but all operating systems and software may have flaws. Know how to get the updates for your computer and software and pay attention to update reminders when you receive them.
- Use a firewall. If you have XP SP2, then use the firewall that comes with it. Otherwise make sure you have either a software or hardware firewall to protect your home computer.
- Have anti-virus software installed and regularly update. Don't open any e-mail attachments unless you are expecting the file. Sometimes the virus files get through to us before the anti-virus software can detect them.
- Have anti-spyware/anti-adware software installed and update it regularly if it isn't done automatically. Using more than one anti-spyware/anti-adware is a good idea because it will give you a better chance of catching more of the spyware, or preventing it from ever getting onto your computer. Remember that none of the products are capable of catching everything.
- Is it an e-mail or is it a phish? It's a phishing e-mail! It is trivial to fake an e-mail to make it look like it is coming from your bank, your work, your family. Even if the sender e-mail address is one you know, it doesn't mean that is really who it came from. Don't click on web links in e-mails unless you are absolutely sure of their validity.
- The same goes for e-cards. You wouldn't know who they are really from, but they want you to click a link to read them! Don't agree to run ActiveX and don't download ANY files to your computer.
- If you get a new Windows computer, make sure you've got XP SP2 installed with the firewall enabled BEFORE connecting to the Internet.
- If you get a new PDA, you should set a password on it to prevent unauthorized access.
- If you get a home wireless network system, use your router instruction manual to look for the four items we've included below (they might be in the 'advanced' section of the manual):
 - Set up the WEP password. It should be at least 10 chars long and include letters and numbers.
 - Change the router's default password, using the same criteria as mentioned above for the password.
 - Change the default SSID.
 - Enable MAC filtering and only authorize specific computers to connect to your router.

Contact: Teresa Downey, SCCS, Ext. 2903, teresa.downey@slac.stanford.edu

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Tax Treaty 8233 Form for 2006

If you are claiming Tax Treaty you must complete form 8233 for each tax year.

Please submit to Payroll a completed 8233 Form 2006 on or before December 21, if possible.

Forms are available in the Records Department in Human Resources (A&E Bldg. 41, Rm. 236). If you fail to submit the form, federal tax will be deducted from your salary until the completed form is received.

You will also need to fill out a new W-4 for 2006. This form is available in the Payroll Office or on-line at: <http://www-group.slac.stanford.edu/travel/PAYROLL/W-4>

Contact: Claudia Ransom, Ext. 2366

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Address Changes Should be Reported to HR

If you have had a recent address change, please be sure to contact the HR Records department no later than January 6, 2006 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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The Interaction Point will be published next on January 20, 2006.

Happy Holidays from the TIP Staff!

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Welcome New Employees!



The new employee orientation held on December 1 included (left to right): Steve Tether (PPA), Elaine Beidatsch (HR), Mark Brito (SCCS), Ralph Kerwin (ESH), Martha Reed (HR), Alfred Vicerat (CPE), Philip Seward (CPE), Stephanie Weitzenkamp (TIS), Craig Burkhardt (CPE), Lauren Barbieri (HR) and Brian Lam (CPE).

(Photo by Diana Rogers)

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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

Amin, Mustafa (KIPAC), 2005 recipient of the Kirkpatrick Award

Service Awards

5 Years

Novokhatski, Alexander (AD), 12/18

10 Years

MacKenzie, Cameron (MFD), 12/16

Deceased

Gray, Bob (I&C), age 59, passed away on December 9, 2005.

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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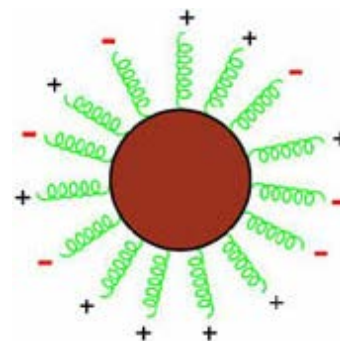
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SLAC COLLOQUIUM SERIES PRESENTS

Twistor Spinoffs for Collider Physics

Lance Dixon
SLAC

Monday, December 19, 4:15 p.m.
Panofsky Auditorium



Do you find the adding up of Feynman diagrams tedious? Hidden symmetries found in the sums of diagrams suggest there is a better way to predict the results of particle collisions. In the past two years, spin-offs of a new theory, known as the Twistor String Theory, have led to the development of efficient alternatives to Feynman diagrams which can be useful for work at the Tevatron, the LHC and for future research at the International Linear Collider. Come see what this 'twistor' is all about!

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SLAC Holiday Party: Tuesday, December 20

By Linda DuShane White

The SLAC Holiday Party with a 'Home for the Holidays' theme will be held on Tuesday, December 20, from 11:30 a.m. to 1:30 p.m. Plan to have a lot of fun!

The festivities are free to the SLAC community and to retirees and will include a holiday meal prepared by Jeff Machado Catering. In addition to luscious traditional fare, he will feature dessert tarts, cranberry holiday punch and warm apple cider.

Musical entertainment will be provided by the Leonard Webb Quartet, and the movies Rudolph the Red Nosed Reindeer and How the Grinch Stole Christmas will be shown in the Panofsky Auditorium. Raffle tickets for prize drawings will be handed out at the party. The drawing will be in the tent behind the Linear Café after the movies.

This year, for the first time, there is a Gingerbread 'Structure' Competition. We can't wait to see all the creative constructions! They will be on display along with raffle prizes. If your group wants to enter the Gingerbread Structure contest, be sure to register by December 16, see: <http://www-project.slac.stanford.edu/holidayparty/2005/competition.asp>

As part of the SLAC Sharing Campaign, food for the Second Harvest Food Drive can be placed in barrels at SLAC until Wednesday, December 21.

For more information, see: <http://www-project.slac.stanford.edu/holidayparty/>



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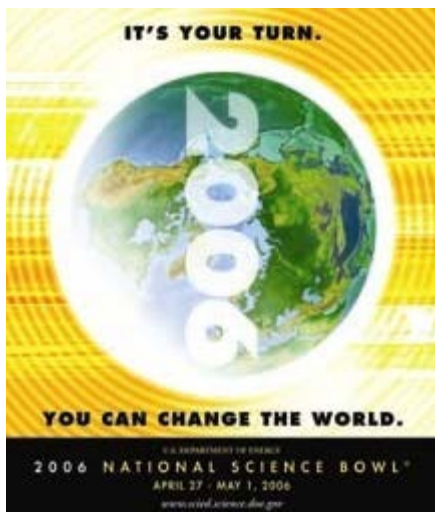
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DOE Regional Science Bowl at SLAC

WE NEED YOUR HELP!



(Image courtesy of DOE)

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

WHO?

You—Your support is needed!

WHAT?

Regional science bowl for local high school teams

WHEN?

Saturday, February 11, 2006

WHERE?

Panofsky Auditorium

WHY?

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

Don't delay— get involved and help us host a fantastic 2006 event!

For more event information, please see:

<http://www2.slac.stanford.edu/scibowl/>

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The Interaction Point

Editorial Team

Neil Calder
Nina Adelman Stolar
Vickey Flynn
Ziba Mahdavi

Writers

Melinda Lee
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, 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/>