GLAST Milestone: Integration and Testing of Engineering Models

By Larry Wise and Anna Gosline

The Large Area Telescope (LAT) project, a key component of GLAST, recently sailed through its first phase of testing with great success. Conducted at SLAC in conjunction with NASA, this milestone brings physicists one step closer to uncovering the mysteries of the gamma ray sky. The project is an exciting new horizon for particle physics that could lead to discoveries of cosmic proportions.

“The LAT detector will be the world’s most sensitive and massive space-based gamma ray telescope when it is launched in 2006,” said LAT principal investigator Peter Michelson (Stanford University).

The energy range of the LAT will be unparalleled—from 10 MeV to over 100 GeV—and much more sensitive at detecting and discriminating high energy gamma rays than any other instrument in space. This superior range and sensitivity will allow scientists to answer previously unimaginable questions.

“GLAST science topics include study of the most powerful accelerators in the universe, active galactic nuclei, as well as the potential discovery of the elusive nature of Dark Matter,” said Steven Kahn (KIPAC).

Before it can take to the sky, SLAC researchers have to prove that it will work seamlessly in the laboratory. Testing Detector Prototype

“Early identification of problems is crucial in the overall process of building a working instrument into space,” said Tune Kamae (AG). “Unlike traditional accelerator based experiments, GLAST will be totally inaccessible for repair after launch. This imposes extremely rigorous standards for the integration and test phase for the detector.”

Under the management of Elliott Bloom (EK), the LAT Integration and Test (I&T) Subsystem team successfully assembled and tested a small prototype of the LAT detector. According to Elliott, “The testing went beautifully and we are excited by the results. The whole team worked really well together and achieved a great deal.”

These hardware tests focused on two components of the LAT detector: the silicon strip tracker and the cesium iodide calorimeter. The tracker, from Instituto Nazionale di Fisica Nucleare (INFN, Italy), measures the trajectory and ultimately the source of celestial gamma-rays. The calorimeter, from the Naval Research Laboratory in Washington, D.C., measures the energy of gamma rays. These two components were combined to create an integrated detector, working together to decipher fingerprints of gamma rays.

Tucked away in a 6,000 square foot clean room, the LAT team tested the integrated detector with cosmic ray muons as well as gamma rays. The LAT was the world’s most sensitive and massive space-based gamma ray telescope when it was launched in 2006.

Phinney Receives 2003 Marshall D. O’Neill Award

By Anna Gosline

Nan Phinney (NLC) was recently honored by Stanford University with the 2003 Marshall D. O’Neill Award. This award honors exceptional Stanford employees who have made enduring contributions to the university’s research enterprise—and Phinney certainly fits the bill.

Award Recipient Nan Phinney (NLC)

For more than 22 years Phinney has worked as the Deputy Leader of NLC Accelerator Physics, an international collaboration to build the next generation linear collider based on SLAC technology. Her experience with SLAC has given her unparalleled insight into the design of this project as she continues to work for the future of linear accelerators and particle physics.

SLAC Scenarios Committee to Hold Town Meeting

To discuss preliminary findings.

Tuesday, November 25
2:30-5:00 p.m.
in Panofsky Auditorium
Breezeway.

For more information, see: http://www-project.slac.stanford.edu/ic/local/scenario

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LCLS: Faster with Foil

By Anna Gosline

Before it’s even built, SLAC physicists had already started making the x-ray pulse shorter. “The shorter the pulse, the better we can observe phenomena that occur at shorter lengths,” said Max Bøggild, EK physicist. “In 1999, we set the standard for the x-ray pulse length when we produced a 200 femtosecond pulse,” said Max.

SLAC physicists had steadily pushed the x-ray pulse length down to 230 femtoseconds; the design standard is 230 femtoseconds; without the foil insert, the x-ray pulse length would be 450 femtoseconds. Without the foil, the x-ray pulse length would be 450 femtoseconds.

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**GLAST LCLS**
(continued from page 1)
the Crystal Ball Detector in 1978. Huge samples of data were collected in shifts around the clock and on weekends. Technicians Reggie Rogers and Jeff Tice (both REG) got their first taste of the rigors of space hardware manufacturing as they worked elbow-to-elbow with fellow aerospace veteran Mark Molini (REG). Rogers commented, "The manufacturing process for flight hardware is really impressive in the level of care and detail in documentation of the process. We've really got our work cut out for us for the next couple of years."

**Accelerated Pace**
Despite the recent frenzy of the I&T Subsystem, LAT Project Manager Lowell Klaizner (GLAST) expects the pace will accelerate as the research and more components of the LAT are integrated into the full detector. ‘‘The entire facility will be a beehive of activity when integration of the LAT is in full swing starting in the summer of 2004,'’ Klaizner said.

Positive results at this early stage in development are promising for the overall success of the completed LAT. The testing of the integrated engineering models is a crucial first step towards manufacturing the entire LAT detector, which will be two orders of magnitude more complex. The hard work and dedication of the LAT team gives every indication that SLAC will rise to the challenge of space.

**Rigging Group Moves to EFD**
By John Weisend
On October 1, the SLAC Rigging Group transferred from Site Engineering and Maintenance (SEM) to the Experimental Facilities Department (EFD). The Rigging group will continue to provide site-wide rigging support and assist with other EFD activities as appropriate.

**San Francisquito Creek Council: 10 Years and Running**
By Judy Fulton
Nestled in the foothills, SLAC is situated in an area that still has many of the characteristics of the Spanish explorer Portola must have seen as he traveled down San Francisquito Creek to his first view of the San Francisco Bay. Meandering along the southern perimeter of SLAC (see map) on its way to the Bay, the Creek is one of the few remaining habitats for steelhead fish in the Bay Area, and many consider it to be a regional treasure. The San Francisquito Creek Watershed Council coordinates stewardship of the Creek and its surrounding land. October marks the tenth anniversary of the Council.

**Why the Council Exists**
The San Francisquito Watershed encompasses an area of approximately 45 square miles, from the Santa Cruz Mountains to San Francisco Bay. The San Francisquito Creek starts at Seacliff Dam and flows through multiple jurisdictions, separating two counties. It is regulated by multiple local, state and federal agencies. Because of the many stakeholders with various viewpoints, the Creek Watershed Council was created to better coordinate protection of the Creek and its watershed.

**The Council’s Mission**
The Council works to preserve and enhance the Creek as a community resource. Representatives of local public agencies, local governments, community organizations, and individuals from the community make up the Steering Committee. They come together on a voluntary basis to discuss creek-related concerns and to collaborate on creek and watershed stewardship projects.

**Compensation Services Basics**
By Sandra Czach
Compensation Services consists of two experts, Karen Lawrence (head) and Carol Bechtel, who have been working in the compensation field for over 15 years each. One of their many functions is to “establish and maintain appropriate salaries for staff at SLAC—a moving target.”

**SLAC’s Human Resources department is comprised of five sub-groups, each with their own specialty. One of these is Compensation Services. The world of compensation can be mind-boggling—what is the process, where do you begin and who do you talk to? Compensation Services consists of two experts, Karen Lawrence (head) and Carol Bechtel, who have been working in the compensation field for over 15 years each. One of their many functions is to “establish and maintain appropriate salaries for staff at SLAC—a moving target.”**

**Calculated Concerns**
The LCLS is a delicate and sensitive machine, and researchers were concerned the proposed electron scatter could ruin the light source completely. Physicists didn’t even know if X-rays could be produced at all. It was possible until Zhirong Huang (ARDA) demonstrated it with computer calculations. Using the foil can also introduce a wakefield, a nuisance effect created by electrons as they travel through the foil. Karl Riordan (ARDA), Genady Shapoval (ARDA) and Holger Schlarb (DESY) studied this potential problem and revealed that it would not interfere with x-ray production. Finally, Dieter Walz (EFD) showed that the foil itself could withstand continual electron bombardment.

Using the foil also costs a lot. Paring down the effective electron bunch means that less x-rays are produced. Though the decreased intensity it will be a limiting factor for any planned experiment, researchers working on LCLS design are continually searching for ways to shorten pulse length while maintaining the full intensity.

With the continued ingenuity of SLAC, new roles and support from DOE, LCLS will be an internationally unparalleled light source, giving scientists a look at the magic of matter at previously unimaginable scales.
Employee Training Assessment: Why and How
By Anthony Jean-Baptiste

Proper training helps ensure worker safety. If people know how to do their jobs safely, accidents are less likely to occur, which is to everyone’s benefit.

It’s the Law and Common Sense
SLAC is required by federal, state and local laws to certify that all employees receive safety training appropriate to their daily work. To demonstrate compliance, we must record who has taken which training courses.

There are a few questions asked may be: “Was the person trained to do that work task?” No one should be in the workplace without training. To demonstrate this, consider this example: someone in your work area is injured in a preventable accident. One of the first questions asked might be, “Was the person trained to do that work task?” No one should be in the position of working without proper training.

ETA: Here to Serve
To identify and track training, the ES&H training group developed a tool called the Employee Training Assessment (ETA).

The ETA enables supervisors and ES&H coordinators to assess which training courses apply to which employees. A web-based database tracks whether an employee has completed an assigned course. Each employee’s ETA must be updated annually.

Chae Sheet for Updates
If you are responsible for creating or updating an employee’s ETA, you need to do two things:
1. The list of required courses for the employee. The employee’s supervisor or ES&H coordinator is responsible for providing this. They can use one of three forms:
   • The Non-Hazard Worker ETA Planning Form: http://www.slac.stanford.edu/esr/traaining/eta/PlanNonHaz.pdf
   • The Industrial/Radiological Worker ETA Planning Form: http://www.slac.stanford.edu/esr/traaining/eta/PlanIndRad.pdf

2. Permission to Update the ETA. If you need computer permission to update the ETA, please contact Training Coordinator Rod Hiemstra (Ext. 3860).

Once you have the list and permission, you are ready to update the web-based database. Follow these simple steps:
1. Go to the ETA’s main page at http://www.slac.stanford.edu/esh/traaining/eta
2. Click on the last item in the left-hand navigation menu, “ETA Database” (see details below).
3. Select criteria to search for a specific individual or group of individuals by department. For example, you can view all individuals in HR by selecting the “OCC/Human Resources” option in the “Department” box.
4. Click the “Submit” button.
5. You will see all the individuals that fit the criteria selected in step three.
6. If there are no changes to an individual’s ETA, simply check the box under the “ETA No Chng” column.
7. If there are changes to an individual’s ETA, click on the employee’s “Key number”.
8. You will see the individual’s ETA with the assigned courses in the first section and all available courses listed beneath.
9. Make any necessary changes, and then click the “Send Changes” button at the bottom of the page.

More of SLAC’s History Now Available On-Line
By Jean Marie Delen

The SLAC History Web site, maintained by the Archives and History Office, has recently been expanded to include the various SLAC histories that have been written to date with links to those available electronically. If you have trouble remembering a URL, you can enjoy the new history list by typing the term “SLAC history” in the search box at the top of the new SLAC History Web site, and selecting the first link in your search result.

History that are now available on-line include Stanford Historical Society feature articles from Sandblower and Tit “Draher and Deeper Journey into the Atom” (1986), Fler Panafsky’s “Big Physics and Small Physics at Stanford” (1990) and Bob Moulton’s “Physics, Power and Politics—Fear and Loathing on the Electron Trail: An Eyewitness Account of the Campaign for Congressional Approval of the Stanford Linear Accelerator Center, 1959-1963” (2001). The site also gathers articles that were previously available into one location. These include Doug DePuy’s 1986 report on SLAC, “An Informal History of SLAC,” a three part series from the early 1980’s by Ed Clinehart, Fler Panafsky and Burton Richter; Richard Rees’ "Colliding Beam Storage Rings." Fascinating facts are good to know, but better to share. Both the guides and the subjects can enjoy the ‘pre-win’ aspect of it all.

The Public Affairs Office (PAO) runs tours of SLAC most days. The general tour gives an introduction to the Lab and then we usually take them from the Visitor Center to the Klystron Gallery, through the research yard and to the SLD detector. Anyone can guide tours and it’s always a fun experience! I’m a graduate student working with the BaBar collaboration, but I’ve found that people from all corners of SLAC give tours. Each tour of gives our own spin and highlights our own interests. It’s like giving a tour of our home and everyone just loves what we did with the rooms.

At the end of the tour, guests always say “Thank You.” I feel good knowing that I’ve been able to share the marvels of science and may even inspire a new young scientist. To learn about becoming a SLAC Tour Guide—or to host your own group of visitors—contact Emily Bell (PAO) in advance (Ext. 2620, emily.ball@slac.stanford.edu).

A Day in the Life of a Tour Guide
By Adam Edwards

It’s a sunny California afternoon and I’m giving a tour of our beautiful site. General public tours are usually the most exciting to do; I like the random mix of people—and questions—that I encounter on these tours.

“So, what would happen if, say, I put my hand in the beam?” a visitor asks. She’d probably get a nice hole in it, but that would never happen here. It’s very important that our standards don’t collide with anything but themselves; that’s why all the air is removed from the beam pipe.

There are those who wonder, “Why isn’t anybody ever working wherever we go?” Others are curious about how things work. “Thanks, I’ve always wondered what...”

Many bring their own stories to share: “I was reading my paper this morning after breakfast and saw a remembering reading in the year papers ago about this place opening. What year was that?”

Each tour has its own flavor, but inevitably eyes light up as the tour progresses and I tell each group about the work we do.

“Is that the accelerator then?” queries another curious visitor. “Well, that’s part of it. The actual beam is about 25 feet below ground. But to power the beam we use 240 klystrons. See the machines over there with the red cylinders? They are lined up above this beam in the middle shed which is, in fact, the longest building in the world. It’s about 10 feet longer than Hong Kong’s airport terminal!”

Sharing Spirit with Others
We can look forward to the Festival of Joy as a time when together we can celebrate our own good fortune and share it with others as well.

Shared lies the season when together we can celebrate our own good fortune and share it with others as well.

Sharing the joys of the season by giving them to others is a beautiful and spirit-filled way to honor the season of Thanksgiving. Make special efforts to include your family and friends in your plans.

Sharing Campaign Drives:
12/1 - 12/18:
Second Harvest Food Drive
12/1 - 12/11:
Family Giving Tree Wish Drive

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POLICIES AND PROCEDURES UPDATE

Departments on Annual Property Control Honor Roll Announced

The DOE has announced a new banking contract for SLAC. Starting December 1, SLAC-generated checks will be coming from the Union Bank of California. This does not affect the process by which you receive your checks, nor does it affect the direct deposit process for paychecks. If you need to cash a SLAC-paid check, you can either visit your own bank or stop by any of the Union Bank branches in California, Oregon, or Washington. The closest Union Bank branch to SLAC is at 716 Santa Cruz Avenue in Menlo Park.

Upcoming Events

**Friday, Nov. 21, 12:30 p.m.**
SLAC Orange Room, NOTE ROOM!
SLAC STANFORD JOINT HIGH-ENERGY ASTRO THEORY SEMINAR
Wayna He, Stanford U.
"Thermal Radiation from the Atmosphere of Magnetic Neutron Stars"

**Friday, Nov. 21, 2:00 p.m.**
SLAC Orange Room, NOTE TIME!
SLAC ACCELERATOR SEMINAR
Ferdinand Wilke, DESY
"Synchro-Beamtron Resonances in the HERA Lepton Ring"

**Monday, Nov. 24, 4:15 p.m.**
SLAC, Panofsky Auditorium (Refreshments: 3:45)
SLAC DEPARTMENTAL colloquium
David Montague/Harvey Lynch, SLAC
"Boost Phase Inception"

**Tuesday, Nov. 25, 12:30 p.m.**
SLAC Orange Room
SLAC EXPERIMENTAL SEMINAR
Hanna Mahlke-Krueger, Cornell U.
"Different Upsilon Resonances + Quarkonium Production <GO>"

**Tuesday, Nov. 25, 2:30-5:00 p.m.**
SLAC, Panofsky Auditorium
SLAC SCENARIOS STUDY TOWN MEETING
Various speakers, followed by open discussion.
"Vistas for the Future of SLAC -"