

LOS ALAMOS NATIONAL LABORATORY  
**CURRENTS**

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**May 2008**

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*Queen of SHEBA*

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*CINT visualization*

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*Remedying information security deficiencies*

## Here's to a successful summer internship

May marks the beginning of the Laboratory's annual influx of summer student interns. This is an exciting period, especially for the students, mentors, and members of the Student Programs team in the Science and Technology Base Programs Office (STBO). Students come to Los Alamos from all over the world to cultivate job skills related to their academic majors and to help out in both technical and administrative support organizations. For the next few months, the Lab and the Los Alamos community will look and feel just a little bit more like a college town with more than 1,000 students added to our census.

Formal rites of orientation and training dominate the first week of a student's internship. Among the various encounters orchestrated at this time, probably none is more important than the initial meeting between the student and his or her designated mentor(s). Mentors commit a very significant amount of their time and assume a profound responsibility to ensure a positive result from the student's internship experience at the Laboratory.

The positive results of successful student internships take various forms. While acquiring new skills that directly complement their academic studies, student interns make very significant contributions to the technical and administrative workload throughout the Laboratory. Between 2002 and 2007, 42 percent of all technical staff members and 30 percent of the technicians hired had served at the Lab in a student intern or postdoc capacity. In the 2007 fiscal year, former interns and postdocs represented 59 percent of technical staff members and 71 percent of technicians hired by the Laboratory.

Of course, the ultimate measure of a successful internship is harder to quantify. Did the student learn something valuable? Did he or she return home or to the campus safe and healthy? It is with these goals in mind that on behalf of the STBO Education and Postdocs Program Office and the entire Laboratory, I warmly welcome all students arriving for the summer 2008 student internship season!

**—Scott Robbins, Science & Technology Base Programs Office—  
Education and Postdoc Office**



Scott Robbins

Dixon Wolf

*About the cover: Torsten Staab, Chemical Diagnostics and Engineering team leader, makes an up-close observation of a bird whose data could be entered into his hand-held avian surveillance tool. The tool transforms field-data-acquisition from pencil and paper to digital. See Page 4 for story. Photo by LeRoy N. Sanchez*

### **Doorn receives DOE outstanding mentor award**

Stephen Doorn of Advanced Diagnostics and Energy Systems recently was honored as a recipient of the Department of Energy Office of Science Outstanding Mentor Award. The award recognizes mentors for students participating in the DOE Office of Science Scientific Undergraduate Laboratory Internship program. In addition to the award from DOE, Doorn also will mentor a SULI student intern this summer.

### **Durakiewicz elected to Synchrotron Radiation Center user committee**

Tomasz Durakiewicz of Condensed Matter and Thermal Physics was elected to serve on the User Advisory Committee at the Synchrotron Radiation Center in Stoughton, Wisconsin. The center is a National Science Foundation-funded national user facility run by the University of Wisconsin-Madison. As a member of the Committee, Durakiewicz will provide input to center management regarding operations of the light source and the science portfolio of the facility.

### **Brandt elected vice president of AIHA**

Michael Brandt of Operations was elected vice president of the American Industrial Hygiene Association. Brandt has served as a member of the AIHA Board of Directors since 2001 and has been a member of AIHA since 1979. AIHA is one of the largest international associations serving the needs of occupational and environmental health professionals practicing industrial hygiene in industry, government, labor, academic institutions, and independent organizations.

### **Lab's Nanotechnology Center honored by DOE**

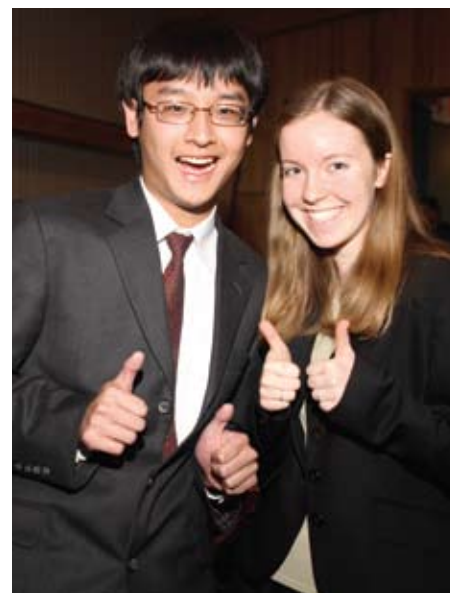
The Los Alamos and Sandia national laboratories Center for Integrated Nanotechnologies (CINT) was honored recently by Department of Energy Secretary Samuel Bodman for effective management of construction and instrumentation projects at CINT's Gateway to Los Alamos facility and Albuquerque's Core facility.

According to award documentation, the integrated LANL-SNL project team credited extensive communication and planning for the team's ability to respond to unanticipated challenges arising during the construction period, such as the Laboratorywide "Stand Down," a continuing resolution affecting the federal budget, and escalating costs for materials and labor.

The Gateway to Los Alamos facility and the Core facility were formally completed in April 2007 at a cost of \$75 million, although basic operations were able to start in 2006. Both facilities comprise more than 130,000 square feet of space. The Lab's CINT is located at Technical Area 3 and includes laboratories to house cutting-edge technologies, such as ultrafast spectroscopy, self-assembly, physical synthesis, scanning probes, pulsed laser deposition, and a visualization theater.



Los Alamos's Center for Integrated Nanotechnologies



Tony Huang and Erika DeBenedictis

### **Albuquerque duo wins Supercomputing Challenge**

Budding scientists from Albuquerque, Erika DeBenedictis of St. Pius X High School and Tony Huang of La Cueva High School, captured the top prize at the 2008 New Mexico Supercomputing Challenge award ceremony hosted by the Laboratory.

The team's project, "An Analysis of Direct Simulation Monte Carlo and Its Application to Simulating Supersonic Shockwaves," modeled a spacecraft's reentry into the atmosphere. Each student on the winning team earned \$1,000. Their teacher received a projection system.

DeBenedictis is a two-time top-prize winner in the Challenge; she teamed with two Albuquerque students in last year's competition on a project also involving space flight.

To read a Laboratory news release, go to [http://int.lanl.gov/news/index.php/fuseaction/home.story/story\\_id/13172](http://int.lanl.gov/news/index.php/fuseaction/home.story/story_id/13172).



Torsten Staab downloads information from his avian surveillance tool onto a laptop computer. The tool also enables the user to track physical samples and to capture epidemiological data in the form of videos, photos, text, and voice recordings. These devices will track bird flu outbreaks across the globe this spring.

## Bird in the hand

### *tool streamlines acquisition of avian flu field-data*

While Laboratory researcher Torsten Staab's inventions help fulfill his aspiration of making a positive impact on society, many of them also can be described as "way cool." Among these is his new hand-held avian surveillance tool, a first-of-its-kind device that dons the colors of UCLA, its sponsor.

The Chemical Diagnostics and Engineering team leader's latest technology takes field-data-acquisition practices beyond pencil and paper to digital heights, putting field surveillance for avian flu at the touch of a screen. Researchers working in the field now can electronically enter data, such as a bird's weight, sex, and species. They also can track geographic locations, take pictures of the animal, sample barcodes, and record voice notes.

The device is a specialized version of the full-feature forensic sampling device recently requested for an episode of *CSI: NY*, a forensic-based police show on TV. Though smaller, it too features a touch screen with graphical user interface, digital camera, GPS,

microphone, memory card slot, and wireless Bluetooth and WiFi communications. The new, smaller devices are being used to track bird flu outbreaks in places such as Alaska, California, Russia, Japan, Vietnam, Mongolia, Canada, Ecuador, and parts of Africa.

"By improving field-data-acquisition practices, enabling and accelerating all-digital information sharing across organizational boundaries, I hope that this little device will help researchers and health-care officials around the world detect and track outbreaks and migration patterns of potentially harmful pathogens, such as H5N1, much faster and more easily," Staab said.

Staab is unassuming and matter-of-fact about his transformational technologies, but Tony Beugelsdijk of Chemical Diagnostics and Engineering describes him as a systematic thinker who "does what he sets out to do very well, on budget, and on time."

Staab and his teammates—Craig Blackhart, lead software engineer, and David Geb,

mechanical engineering student from UCLA—with manufacturing support from ESG Engineering, recently finished building 150 of the handheld, field-ruggedized, surveillance devices for the California Office of Homeland Security. The work was done through a Work for Others Agreement between UCLA's School of Public Health and the Laboratory.

In the coming months, UCLA and other collaborators at the University of California, Davis, University of Alaska at Fairbanks, Wildlife Conservation Society, U.S. Geological Survey, and Canadian Wildlife Service will deploy the devices at bird-banding stations in 38 states in the United States and across Canada, Asia, and Central and South America.

"The World Health Organization and National Institutes of Health also have expressed a keen interest in our new gadget. Other potential, future application areas include wildfire fighting, environmental sampling and monitoring, and wildlife biology," Staab said.

Beyond its intended purpose, Staab confides that users can do other things with the handheld device, including play MP3s, watch movies, play games, send e-mails, browse the Web, or simply use it as a cell phone, while waiting for the birds to land in their fly nets.

"Most bird-banding stations are staffed by students and volunteers who most likely would be very interested in the device's unadvertised entertainment features," Staab said. "To keep them focused, we have hidden these non-work-related device features."

Improvements to the device already are in the works. Staab and his team are looking at adding speaker-independent, software-based voice recognition to speed data entry even more. This, however, is technically challenging, because the device is designed to be used outside under virtually any weather condition, he explained.

In close collaboration with his colleagues from Systems Engineering and Integration, Staab's team has developed a slightly modified version of these new surveillance devices, which will be deployed in a large-scale Department of Homeland Security-sponsored BioWatch field exercise this spring.

The first in his family to go to college, Staab continues to put his doctorate in computer science to work in ways he hopes will improve people's quality of life.

One of his near-term goals is to develop—in close collaboration with Hong Cai and Jian Song, both of the Bioscience Division—an affordable, DNA-based home diagnostics test kit for presymptomatic detection of a wide variety of diseases, such as influenza, Alzheimer's, and cancer.

"This type of DNA-based test is the Holy Grail of clinical testing," said Beugelsdijk. "This is right in Torsten's domain."

—Mig Owens

Ron Morgan, left, and Andrea Romero of the Laboratory's HAZMAT team use the gun-shaped version of the surveillance tool to take photos and record locations.



Photos by LeRoy N. Sanchez

## Focal Point

# Queen of SHEBA

*researcher revamps unique  
criticality equipment*

One-of-a-kind is a reasonable way to describe Charlene Cappiello, the smiling face behind the newly refurbished critical assembly equipment that's transitioning from Technical Area 18 to a new home at the Nevada Test Site. Then again, each of the remarkable machines on which Cappiello has worked also could be described that way. The experimental nuclear reactors on which she's based her career have allowed generations of scientists to more closely, yet safely, peer into some of the deepest secrets of nuclear materials.

Cappiello graduated from the University of Colorado in 1974 with a bachelor's degree in engineering and worked as a systems engineer on the Fast Flux Test Facility experimental reactor in Hanford, Washington, until 1980. She then came to Los Alamos as a design engineer, working on equipment from a gadgeteer's dreams: small portable reactors, tritium-handling equipment, experimental oil shale retorts, accelerators, fusion energy machines, and nuclear radiation detection systems—except that here at a national laboratory, those are simply tools of the job.

She retired in June 2005, returning as a contractor on this special project to move the machines to the Critical Experiments Facility at the Nevada Test Site.

Her skills, said Nuclear Nonproliferation Division Leader Nancy Jo Nicholas, are unique, part of what allowed TA-18's criticality team to provide a remarkable science service to the nation. Understanding nuclear cross sections, remotely reconstructing nuclear industry accidents, establishing safety guidelines for research and industry, training first responders—all



Sandra Valdez

have been part of the job for the critical assembly teams.

While working at TA-18, Cappiello became the principal investigator for the liquid solution reactor, SHEBA. She conducted many first-of-a-kind experiments on uranium fluoride solutions on the machine.

“Unfortunately, my favorite machine is SHEBA, which is the one that is not going [to the Critical Experiments Facility at the Nevada Test Site]. Of the four that are going, I like Godiva, our pulse reactor, the best.”

For more information, see the *LANL News-Letter* story at <http://int.lanl.gov/news/newsletter/120406.pdf>, “Relocating TA-18’s Critical Assembly Machines.”

—Nancy Ambrosiano

Charlene Cappiello does some final tidying of the Planet critical assembly machine before it is shipped to the Critical Experiments Facility at the Nevada Test Site.

From left to right, Students' Association executive members Pawan Rastogi, Thomas Lockard, and Katie Wurden visit with Terry Wallace, principal associate director for Science, Technology, and Engineering.



Richard Robinson

## More than a job *a rewarding experience*

Each summer and throughout the year, more than 1,000 young adults from high school, college, and graduate school come to the Laboratory to gain work experience, explore their field of study, apply knowledge they've learned in school, and advance their careers.

Among this group are five individuals who serve on the Students' Association executive committee.

"I got involved primarily because I want to help students have a rewarding experience," said Pawan Rastogi of Inorganic Isotope and Actinide Chemistry, treasurer of the Students' Association.

"I see the association as a networking opportunity, a chance for students to connect, discover what the Lab is all about, and a means for creating social events and other opportunities for students," said David Seigel of Technology Transfer and chair of the Association.

"I grew up in Los Alamos, so I know what it is like to be here," said Katie Wurden of the Water Stewardship Program and Association vice-chair. "I have become the unofficial liaison, helping new students adjust and enjoy their experience in Los Alamos and at the Lab. I see the social aspect as being very important, the opportunity to network and meet."

Networking opportunities sponsored by the Students' Association include the annual student picnic, informal luncheons with Laboratory senior managers, Lab tours, and other after-hours social events.

"We bring important student issues to the administration, with the hope of finding viable solutions," said Thomas Lockard of Plasma Physics and Association vice-chair.

"One way we have done this is with a few informal lunches, which have given students an opportunity to interact with Lab leadership," adds Seigel.

Tours and workshops also are arranged to help students build their future careers and expose them to a variety of disciplines.

"We strongly encourage students to join the association or volunteer to help with events," Seigel said.

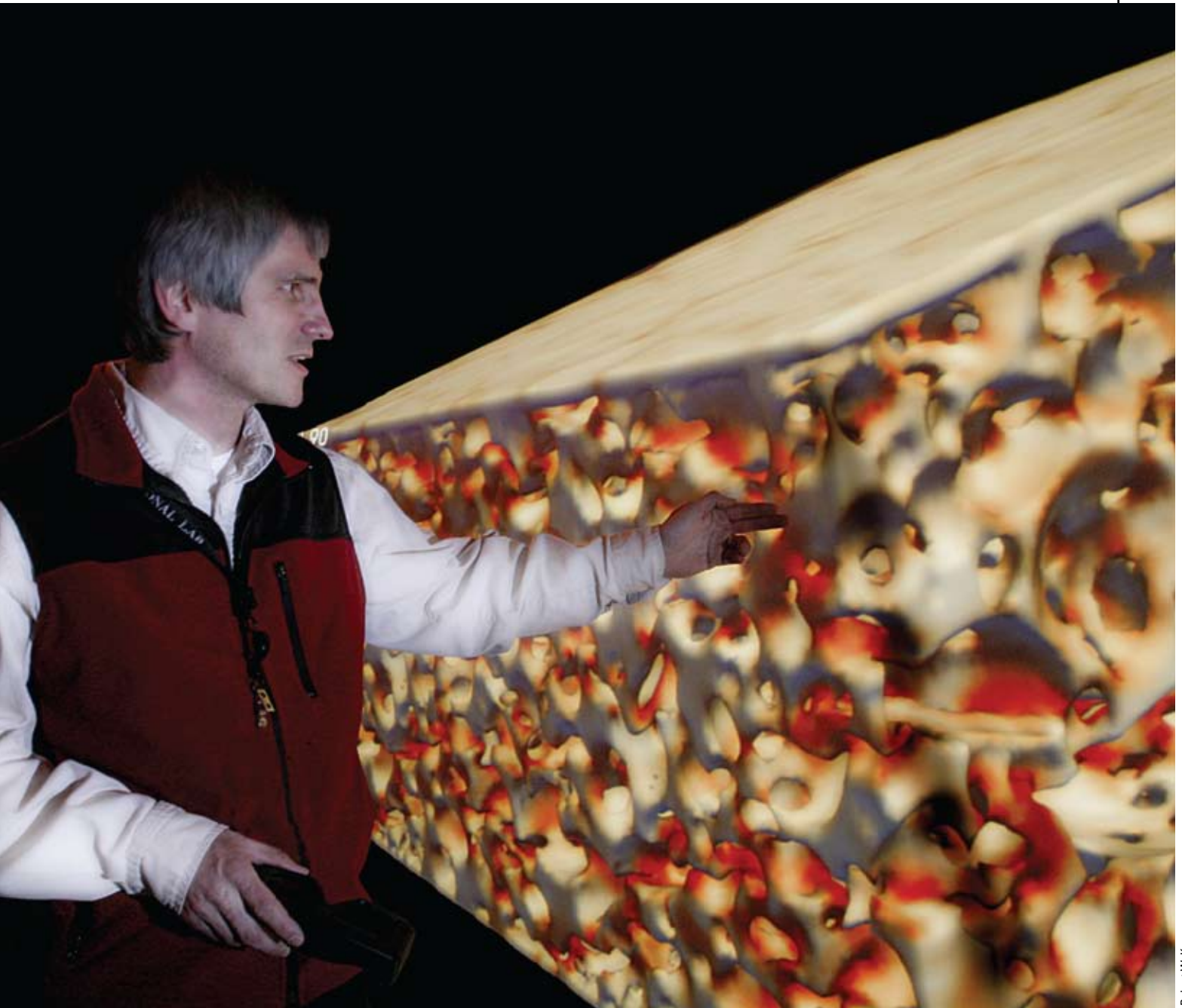
"As the executive committee, we are not a hierarchy. We simply serve as a resource for students and as a tool to help them," said Rastogi.

"The more the merrier; everyone is welcome and encouraged to get involved," said Wurden.

To volunteer with the Students' Association or for more information, go to <http://sa.lanl.gov/> or e-mail [saexec@lanl.gov](mailto:saexec@lanl.gov).

—Ed Vigil

# CINT visualization



Robert W. Kramer

In the Center for Integrated Nanotechnologies stereo visualization lab, Matthias Graf of Condensed Matter and Statistical Physics explains the elastic and structural properties of a compressed foam pad simulation by Scott Bardenhagen of Explosives and Organic Materials. The red color indicates regions of high stress of foam. This work was partly supported through a Laboratory Directed Research and Development Exploratory

Research project. CINT, which was recently honored by the Department of Energy (see Page 3), is a national user facility that provides scientists with a unique research environment that combines nanoscale materials science and biosciences capabilities and expertise under one roof, surrounded by supporting resources accessible to CINT users.



# Today's students, tomorrow's researchers

*Lab takes science to local communities*

## *Expanding Your Horizons*

More than 120 junior-high and high-school girls learned firsthand about science, engineering, and math at the annual Expanding Your Horizons conference co-sponsored by the Laboratory. In the top right photo, Laboratory staff member Emily Schultz-Fellenz of Environmental Geology and Spatial Analysis gives advice about building a sturdy bridge to Katrina Thrlow, left, of New Mexico Academy for Math and Sciences and Felisha Lopez of Penasco Middle School.

Bottom right: Ariel Castaneda, right, and Chanell Martinez, both of Pojoaque Middle School, examine their bridge at the Expanding Your Horizons conference. Weights in the center of the bridge create the buckling effect; the exercise tests how much weight their bridge can hold.



## *Science at San Ildefonso*

Kyle Benavidez, top left, uses a soldering gun to make a robot during a robotics workshop at San Ildefonso Pueblo. The Tribal Relations team in the Government Affairs Office partners with the Laboratory Foundation and Northern New Mexico College to sponsor the Pueblo Education Outreach program.

Parent volunteer Sophie Calabaza of the National Nuclear Security Administration's Los Alamos Site Office, bottom left, helps fourth-grade student Alix Luarkie attach his rocket to a makeshift launchpad during a rocketry workshop. Students learn the basics of aerodynamics, weight and balance, propulsion, and basic geometry in the rocketry workshop.



Photos by Sandra Valdez

## LOS ALAMOS REPORT

### **Get weekly Lab news**

The latest edition of the *Los Alamos Report*, which offers weekly news from the Laboratory, is available at <http://lareport.blogspot.com/>. To receive the e-mail version of the *Los Alamos Report*, send an e-mail to [listmanager@lanl.gov](mailto:listmanager@lanl.gov) with the command "subscribe losalamosreport" in the body of the e-mail.

### **Packages in a security area**

Immediately open any package that comes into a security area. Make sure it contains no listening, recording, or transmitting devices, other controlled or prohibited articles, or accountable items. If the package cannot be opened immediately and does not appear to contain classified information, store it outside the limited area.

### **New federal security badge reminder**

Do not contact the Badge Office to enroll for the new federal security badge or to find out the status of your new badge. To ensure efficiency, workers eligible for the new badge will be contacted by e-mail regarding the enrollment and badge pickup processes. For more information, go to <http://int.lanl.gov/security/newbadge/>.

### **Credit hours to change for undergraduate students**

Beginning this fall, all undergraduate students employed at the Laboratory will be required to be enrolled as full-time students—a minimum of 12 credit hours—in

their respective college or university during the school year. Currently, undergraduate students are required to take a minimum of nine credit hours. Increasing the minimum number of course credits required for eligibility will help students avoid situations in which they may fail to complete their degree within the time allotted, explained Scott Robbins of the Education and Post-doc Office. For more information, go to <http://int.lanl.gov/education/>.

### **Recycle, reuse, and reduce waste**

Every year, Americans throw away 10 times their own weight in garbage and enough paper to build a wall 12 feet high, stretching from New York City to Los Angeles. Go to [http://lanl.gov/recycle/docs/080402\\_envirogram.pdf](http://lanl.gov/recycle/docs/080402_envirogram.pdf) for ways to recycle, reuse, and reduce waste.

## RESEARCH LIBRARY

### **Document searching made easier at Research Library**

Finding internal and external documents is faster and more efficient, thanks to two new search tools available at the Research Library: Los Alamos Authors and OPPIE.

The Los Alamos Authors search tool is for locating Laboratory unclassified publications and documents that previously were stored in the former Classification group database. The earliest Laboratory records date back to 1943; the repository includes data for records through this year.

OPPIE will be the library's primary search tool when it debuts this week. OPPIE also will have

"perpetual beta" capability to add new services while retiring outdated features. OPPIE replaces the Search-Plus search tool now in use.

### **May service anniversaries**

Find the May service anniversaries online at <http://www.lanl.gov/news/newsbulletin/anniversaries>.


### **Be aware of pedestrians**

Before making a right turn on a red light, stop and check for vehicle and pedestrian traffic in all directions. There have been several near misses because drivers are not watching for pedestrians in crosswalks before turning right on a red light. Vehicles should always yield to pedestrians in crosswalks.



### **In Memoriam**

- Lola Frances Hodson, 84, died February 28
- Quentin Appert, 70, died March 19
- Rudy Herrera, 57, died March 22
- Maurice "Mac" McCloskey, 89, died April 2
- Shirley Dussart, 71, died April 5

 *Implement a cyber security system that reduces risk while providing exemplary service and productivity*

## Remediating information security deficiencies

### *Lab on track with corrective actions*

The Laboratory recently met a major Department of Energy security compliance order action by successfully implementing new information security policies.

Issued last July by Energy Secretary Samuel Bodman, the compliance order directed the Laboratory to implement a number of corrective actions to remedy deficiencies in its physical and information security programs.

“With this milestone, the Lab has completed 13 of the 14 actions required in the order,” said Carolyn Zerkle of the Director’s Office, head of the Security Compliance Order Project.

The Laboratory’s new information-security policies provide employees with guidance in a number of areas, including personal electronic devices in the workplace, wireless computing, marking information systems, media, contingency planning, disaster recovery, and risk management.

These actions represent a fundamental change in the way the Lab approaches the management of risk in information security, noted Tom Harper, the Laboratory’s chief information officer.

“Brett Wahlin, the Lab’s chief cyber security officer, and I are working closely with Carolyn Zerkle to ensure that the information security actions will be sustainable over the long term and are based on Integrated Safeguards and Security Management principles,” said Harper.

The Laboratory continues working to meet its last compliance order milestone—LANL information systems must be accredited by DOE and NNSA by the end of the year, including all the unclassified systems, which must be done by September 30. The immediate challenge for accreditation of unclassified systems is to identify all systems and their owners and then apply a new systematic and streamlined approach to creating security plans, explained Zerkle.

“Reaccreditation of classified systems is progressing well and must be completed by December 12, 2008,” she said.

“This effort is truly a Labwide issue,” added Harper. “We are collectively working very hard to establish compliance with federal orders with minimal impact to our programs.”





Richard Robinson

Vanessa De La Cruz, right, of the Government Affairs Office discusses some enhancements to a database with Dave Moir of IST Control, Inventory, and Configuration Applications.

## Libraries at your fingertips

Ever had to manually look for a long-lost memo, a policy, report, or invoice? Then you know firsthand how time consuming these searches can be. Fortunately for most Laboratory employees, such labor-intensive efforts are a thing of the past.

Finding documents and information on the job is a lot easier now, thanks to information technology and professionals like Dave Moir of IST Control, Inventory, and Configuration Applications and his colleagues in the Information Systems and Technology Division. They create the interface, hooks, links, and paths to the data that are critical to running

an organization as large and diverse as Los Alamos.

“My colleagues and I put together and support document management libraries around the Laboratory,” said Moir. “This includes developing forms and library structures using off-the-shelf software that we customize to meet the needs of the customer.”

Moir’s work includes calendar development, document storage, and task control. He and his colleagues also create groupware that helps organizations improve their productivity and better manage their data assets.

Success comes in collaborating with customers to meet their needs, noted Moir. “Probably the most important thing we do is communicate with our customers, and because of that, I believe the most important part of my job is keeping people happy,” said Moir.

Chances are most employees have seen the work that Moir and his peers produce. For example, the Laboratory’s Policy Page, recently judged a DOE complex best practice, was developed by Moir’s team in IST Division.

As with any other library or repository of information, new things always are being added while others that no longer are relevant or applicable are removed. It’s a job that keeps Moir and his coworkers busy doing what they do best: helping customers.

“We are a service organization, and the things that keep us in business are the work we do for others,” said Moir. “The highlight of my time at the Lab has been working with those customers and the relationships that have grown out of that collaboration. After seven years, I still get a rush when something works.”

—Ed Vigil

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