

NewsLetter

Week of January 1, 2007

Vol. 8, No. 1

Fellows' Prize Winners recognized

by Krista D. Wilde

Laboratory scientists Cheryl Kuske, Tim Germann, and Andy Erickson are the 2006 Fellows Prize winners. They will be honored for outstanding research and leadership at the 2006 Fellows' Prize colloquium at 3 p.m. Tuesday, January 9, in the Physics Building Auditorium at TA-3.

The winners of the Fellows' Prize for Outstanding Research, Kuske of Molecular Microbiology and Immunology (B-1) and Germann of Applied Science and Methods Development (X-1-SMMP), will each discuss their research at the colloquium. Erickson of International Technology (ADTR-IT), who received the Fellows' Prize for Leadership, also will be honored at the colloquium.

Kuske was recognized for her work in the areas of environmental microbiology and biothreat reduction. She will discuss recent advances in the ability to detect microorganisms and to determine the diversity and composition of microorganisms in the environment. Her talk will use examples relevant to climate change and biothreat reduction, and will include information about the discovery of novel microbial groups. This discovery has reshaped scientists' understanding of the diversity, abundance, and identities of microorganisms in the environment, explained Kuske.

Germann's research in material physics and simulations of pandemics is part of the reason the Fellows recognized him with this award. He will discuss large-scale particle-based simulations, which he uses to study the behavior of materials and public health. A material's response to impulsive loading is determined by large numbers of atoms interacting in the material. Similarly, a pandemic can spread due to a series of human interactions. Germann's talk covers the simulations he used to study the shock compression and release dynamics of single crystal and nanocrystalline metals along with a discussion of simulations used to assess strategies to mitigate the effects of an influenza pandemic, said Germann.

Erickson received the Fellows' Prize for Leadership because of his outstanding technical success, enthusiasm, and leadership in the international technology area.

Kuske earned her doctorate from the University of California, Davis and has worked at the Lab since 1990. Germann joined the Lab in 1997 after earning his doctorate in chemical physics from Harvard University in 1995. Erickson, a Los Alamos native, received his master's degree in electrical engineering from the University of Strathclyde in Scotland in 1988 and has worked for the Lab for thirteen years.

The Fellows' Prize for Research honors individuals who perform outstanding research at the Lab and published within the past 10 years, and the Fellows' Prize for Leadership commends individuals who exhibit outstanding scientific and engineering leadership.



Tim Germann



Cheryl Kuske



Andy Erickson

Photos by Mike O'Keefe, Records Management, Media Services, and Operations



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Carbon monoxide poisoning prevention

Carbon monoxide is a colorless and practically odorless gas. It is poisonous to people and animals because it displaces oxygen in the blood. The gas is produced by the incomplete burning of solid, liquid, and gaseous fuels. Appliances fueled with natural gas, liquefied petroleum, oil, kerosene, coal, or wood may produce carbon monoxide.

According to the Consumer Product Safety Commission, every year more than 200 people in the United States die from carbon monoxide produced by fuel-burning appliances. Several thousand go to hospital emergency rooms each year for treatment for carbon monoxide poisoning.

The following tips can help prevent carbon monoxide poisoning:

- Install CO detectors/alarms in the home. Make sure it meets the requirements of the most recent Underwriters Laboratory Standard 2034.
- Make sure appliances are installed according to manufacturer's instructions and local building codes.
- Have the heating system (including chimneys and vents) inspected and serviced annually.
- Only burn charcoal outdoors, never inside a home, garage, vehicle, or tent.
- Always make sure to turn off any gas-powered engine inside an attached garage or basement. Even if the garage door is open, a person still can be affected or killed by CO.
- Do not use gas appliances, such as ranges or ovens, for heating the home.
- If using a fuel-burning appliance for approved indoor uses (such as a heater), make sure it is vented to the outdoors following manufacturer's instructions.
- Open flues when using fireplaces.
- Choose properly sized wood-burning stoves that are certified to meet Environmental Protection Agency emission standards.
- Have a trained professional inspect, clean, and tune-up the central heating system

Director updates work force; reflects on successes and needed improvements

by Hildi T. Kelsey

Laboratory Director Mike Anastasio gave employees his assessment of the last six months at Los Alamos during an all-employee meeting in the National Security Sciences Building Auditorium.

Anastasio began with a safety message. He encouraged employees to take an extra moment to look around their workspaces before they leave for the holidays.

He also discussed the budget, mentioning that the last Congress passed a continuing resolution for appropriation of the vast majority of funding for the Laboratory that will "keep us going until mid-February." He noted that the new congressional leadership plans to pass another continuing resolution for the rest of the year.

In addition, Anastasio stated that he is "working internal budget issues and disconnects" and will know more about it in the new year. He stressed "there are no plans for a RIF [reduction in force], and no plans to have a plan for a RIF."

He lauded Lab accomplishments, but noted some areas of frustration.

"From June 1 to now, I have mixed emotions," he said. "I am very impressed with what we accomplished — thank you for all your hard work. I am pleased and impressed with your efforts, but at the same time I am frustrated, frustrated with what we have left to do."

Among the Lab's accomplishments he listed was the Los Alamos-Sandia team's submission of the design of a reliable replacement warhead for submarine-launched ballistic missiles. He said that the Lab can expect the outcome of the competition with Lawrence Livermore for the contract to be announced early in 2007. "I think this team did a great job," he said.

Anastasio stated that a second competition was going on as well — the competition for the country's future direction with its nuclear deterrent. He outlined the debate about two approaches: the Cold War deterrent designed in the 1970s versus going down a different, futuristic path — "using the knowledge and capability we developed to move us toward the future, reduce number of weapons in the stockpile, and build security in a world where terrorism is a much bigger concern." He said that the Nuclear Weapons Council decided to go down this new path.

"To me that is a great success and represents the impact this national laboratory should have," he said.

Anastasio went on to list several other accomplishments, such as

- The second access accelerator at DARHT achieved four pulses.
- The Cibola Flight Experiment satellite is moving closer to launch.
- The National High Magnetic Field Laboratory's Pulsed Field Facility at Los Alamos achieved a 100-tesla magnetic field.
- The Lab developed advance technology with universities and industries deployed to convert biomass into bioethanol, converting ethanol from cellulose.
- Lab leadership and employees gathered continued support for science through Grand Challenges workshop.



Mike Anastasio

'If we can come together and work together, we can do great things for the country.'

He said he also was impressed by Laboratory Directed Research and Development efforts, the direct involvement of employees and first-line supervisors on in response to safety and security incidents over the last six months, the direct impact of deployed security offices, and the 60 percent increase in the number of technology transfer agreements.

The director commended the nine scientists who were selected as American Physical Society fellows, the newest Institute of Electrical and Electronics Engineers fellow, and three new American Association for the Advancement of Science fellows. He also congratulated Ricardo Schwarz for being accepted into the National Academy of Engineering.

Further, the director said he was pleased with the feedback he has been getting on the commitment of Laboratory to the community. For instance, Lab employees raised \$727,000 in pledges and donations (matched by Los Alamos National Security, LLC, for a total of \$1.45 million) for United Way and \$450,000 for the Los Alamos employees' scholarship fund, which is managed by the Laboratory Foundation. The Laboratory also plans to contribute \$550,000 to the Regional Development Corporation for economic development activities.

Although he was excited about such progress, Anastasio was also critical of unresolved problems at the Laboratory, especially in the area of security.

"Everything we do is amplified. This Lab is important to the country, and they know it," said Anastasio. "There are some outside the Lab that question our ability to meet the high standards that they have. It is important that we think about it in this context and demonstrate to critics that we are worthy of the trust the country wants to place in us."

He said we have a special relationship with the country — "one action by one person can put this institution in the public eye." Anastasio emphasized that "we are a community and we have a shared fate. What one of us does, can impact all of the Lab." But, he said this also gives the Lab an opportunity. "If we can come together and work together, we can do great things for the country," he said.

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Los Alamos National Laboratory NewsLetter

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Editor:
Jacqueline Paris-Chitanvis, 5-7779

Associate editor:
Steve Sandoval, 5-9206

Production editor:
Denise Bjarke, 7-3565

Graphic designer:
Edwin Vigil, 5-9205

Los Alamos National Laboratory is a multidisciplinary research institution engaged in strategic science on behalf of national security. The Laboratory is operated by a team composed of Bechtel National, the University of California, BWX Technologies and Washington Group International for the Department of Energy's National Nuclear Security Administration.

Los Alamos enhances national security by ensuring the safety and reliability of the U.S. nuclear stockpile, developing technologies to reduce threats from weapons of mass destruction, and solving problems related to energy, environment, infrastructure, health and global security concerns.



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Director updates ...

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Specifically, he expressed concern about the "sloppy cybersecurity" still being found at the Lab, which he suggested is caused by confusion and inconsistency across the Lab. "If I want you to do better, I owe it you to be able to tell you what better is," he said.

To that end, the Lab has developed a new cybersecurity organization that will "bring policy and implementation all together in one place."

The new organization, he said, will consist of four elements:

- policy and planning;
- technical support (cyber specialists and the addition of a senior ISSO working at the associate director level in every directorate that has classified activities);
- a certification and accreditation organization reporting to the director; and
- a means to clarify what's expected of employees.

In parallel, he said, Lab management is developing a long-term strategy of "where we are trying to go as an institution."

Expanded substance abuse policy

Citing the Laboratory's special relationship with the nation and to prove that Lab personnel are worthy of the trust this country has placed in them, Anastasio said the Lab will expand its substance abuse policy to include testing for the use of illegal drugs.

The expanded program includes

1. Pre-employment screening — all employees who will work for the Lab on a regular basis, including contractors
2. Random testing of Laboratory employees
3. Testing in response to reasonable suspicion of illegal drug use
4. Testing after serious incidents and accident.

The new policy is available at <http://policy.lanl.gov/pods/home.nsf/Pages/DAPP6WMQDL> > <http://policy.lanl.gov/pods/home.nsf/Pages/DAPP-6WMQDL> online.

Additional information on the substance abuse policy will be provided to employees following the winter break. A 30-day comment period will enable employees to provide input on the proposed new policy. Anastasio added that a comment period will be established for all significant policy changes.

"We are not yet the great national security laboratory that I want us to be. We need to work together as a community — it takes us all to make this happen. We are not there yet, but I am confident that we can be," he said.



For Laboratory closures, delays or early dismissal information, call UPDATE at 667-6622 or 1-877-723-4101 (toll free).



Employees' generosity helps less fortunate

Some of the hundreds of gifts purchased by Los Alamos Neutron Science Center and other Laboratory employees for underprivileged children in Northern New Mexico were gathered at the LANSCE Division Office. For the ninth year, LANSCE sponsored its 100 Special Children giving initiative. Gifts include toys, children clothes, and shoes. The gifts were distributed to children in Española, Santa Fe, Taos, and other Northern New Mexico communities. Sandra Valdez, Records Management, Media Services, and Operations



December service anniversaries

35 years

Carl Ekdahl Jr., HX-6
Beraldo Montoya, RP-1
Betty Perkins, X-DO
Douglas Reilly, N-1
Robert Stewart, CTN-5

30 years

Ezekiel Aragon, W-3
Theresa Cdebaca, ER-FP
Fermin Garcia, MST-6
John Langford, WT-1
Felix Martinez, ISR-6
Matthew Martinez, RP-1
Dennis Naranjo, WT-8
Archie Nixon, PMT-2
James Stelzer, AOT-ABS
Janice Wills, IST-APPS3

25 years

James Freyer, B-3
Glenn Magelssen, X-2-PC
Shirley Montoya, ISR-3
Theresa Romero, CFO-SYS
Maurice Sheppard, X-4

20 years

Miles Corrie, MSS-WFM
Maria Lujan, DHS
Fred Moya, OS-PT
Ronnie Quintana, CFO-2
Gene Sacoman, HPC-3
Nancy Sauer, INST-OFF
Gerald Seitz, HX-3

15 years

Stephanie Cisneros, CFO-3
Andrew Hime, P-23
Bennie Martinez, EES-6
Mark Padilla, ASM-PUR

Sharon Trujillo, TT-DO

10 years

Lisa Colletti, C-AAC
Robert Greene, X-3-SVCG
Marissa Herrera, HPC-2
John Hopkins, IRM-CAS
David Ireland, WI-8
Jaqueline Kiplinger, MPA-10
Steve Lamoreaux, P-23
Joseph Latino, ISR-1
David Mercer, IAT-3
Dana Netz, HX-6
Gilbert Ratliff, HR-S
John Scott, X-2-N2
Dane Spearing, PMT-4
Amy Urbatsch, CFO-3
Douglas Weaver, EES-7
Wesley Wilburn, P-25
Cathy Wilson, EES-2
Christopher Worley, C-AAC

5 years

Jose Archuleta, WCM-1
Sidney Barnes, SEC-SA5
Helen Boorman, STBPO-RL
Amanda Casteel, MST-6
Elizabeth Crespin, CMR-DO
Rene Cusumano, N-1
Kraig Deike, CMR-OPS
Donald English, W-11
Nathanael Farnham, WT-9
Timothy Ferris, MSS-CMRFO
Janette Frigo, ISR-3
William Gillison, SEC-PPS1
Martin Gomez, WCM-1
John Gonzales, WCM-1
Paul Graham, ISR-3
Han Htoon, C-PCS

Beth Jagnow, PP-MFG
Barbara Jordan, DHS
Anil Kamat, SB-PF
Charles Kelsey, LANSCE-LC
James Langford, PMT-DO
Deborah Leishman, D-6
Sean Liming, CTN-3
Fred Lopez, PMT-5
Derwin Martinez, AOT-IC
Mark Martinez, RP-1
Cathy Martinez, PMT-2
Ross McDonald, MPA-NHMFL
Michael McKinney, IST-APPS1
Charles Montoya, PMT-4
Ruth Morgart, MST-6
James O'Hara, AOT-MDE
Patrick Opsahl, W-6
Craig Othmer, LC-BL
Tim Pence, AOT-OPS
Larry Peppers, PMT-1
Kevin Rainey, HX-3
Joseph Reynolds, MST-16
Jeanette Rivera, OM-MS
Gilbert Romero, WCM-1
Jose Salazar, SEC-PPS1
Fritzgerald Sandoval, PMT-5
Bonita Sato, WCM-3
Paul Smith, PM-DO
William Sole, W-9
Arthur Trujillo Jr., CFO-2
Linda Tytler, ER-ISO
Elissa Vigil, T-CNLS
Kenneth Vigil, RP-1
Robin Vitek, IST-IS12
Denise Walker, FME-DES
Todd Wehner, WT-4
Maura Wilhelm, C-CSE
Bruce Wilkinson, W-7
Jinsuo Zhang, D-5

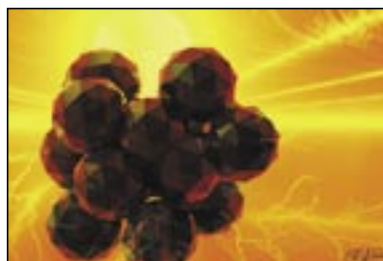
The year 2006 brought unprecedented change to the Laboratory, as a new management-and-operating contractor was named for only the second time since the Laboratory's inception. Los Alamos National Security, LLC, took over management of the Laboratory in June, and despite a few distractions stemming from

the transition, the Laboratory reveled in outstanding technical achievements and scientific breakthroughs. It also took pride in honors bestowed on co-workers and colleagues, welcomed distinguished visitors, dedicated facilities, and more.

The vast majority of employees ended the year much as they began it, dedicated to doing the

best job possible on behalf of the nation. With a new year before us that no doubt will be filled with its share of challenges and accomplishments, it is important to recall high points of the year that was. On the following pages is a summary of some of the Lab's technical and scientific accomplishments, awards, visitors, and events during 2006.

Technical accomplishments



Tiny crystals promise big benefits for solar technologies

Laboratory scientists have discovered that a phenomenon called carrier multiplication, in which semiconductor nanocrystals respond

to photons by producing multiple electrons, is applicable to a broader array of materials than previously thought. The discovery increases the potential for the use of nanocrystals as solar cell materials to produce higher electrical outputs than current solar cells.

The little beam that could: Laser-driven ion beams offer multiple uses

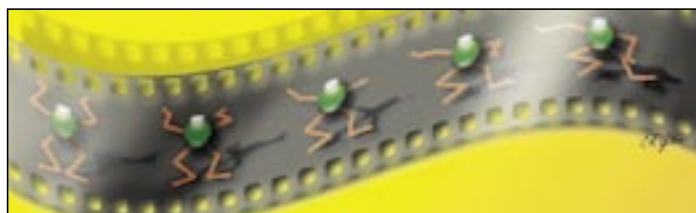
Scientists at the Laboratory, in collaboration with researchers from the University of Nevada, Reno; Ludwig-Maximilian-University in Germany; and the Max-Planck-Institute for Quantum Optics in Germany, developed a new method for using a laser beam to accelerate ions. The novel method may enable important advances in compact ion accelerators, medical physics and inertial confinement fusion.



The laser driver of the Trident Laser Facility at Los Alamos.

New gallium nitride film method beats the heat

A team of Laboratory scientists developed a method for growing crystalline gallium nitride films at lower temperatures than industry standards. By eliminating the higher temperatures and harsh, reactive environments that currently limit the types of materials used as substrates, the discovery could greatly increase the use of crystalline gallium nitride films in optical-electronic devices, like blue LEDs and laser diodes, high-density optical data storage devices, flat panel displays and solid state lighting.

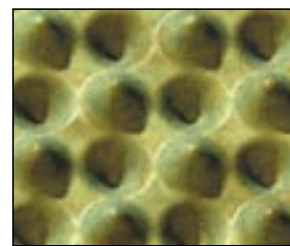


Attosecond pump-probe proposed to explore the dance of electrons

Electrons in atoms move in a choreographed motion on a time scale of attoseconds (one quintillionth, or one billionth of a billionth of a second). To observe this ultrafast motion, Los Alamos physicists have theoretically demonstrated an attosecond pump-probe technique that captures the steps in this intricate dance by ionizing the atom at selected times. Development of the proposed technique might someday allow scientists to actually see into a world of electron motion.

Research reveals hidden magnetism in superconductivity

While studying a compound made of the elements cerium-rhodium-indium, researchers at the Laboratory and the University of Illinois at Urbana-Champaign discovered that a magnetic state can coexist with superconductivity in a specific temperature and pressure range. The discovery is a step toward a deeper understanding of how nature is organized in regimes ranging from the fabric of the cosmos to the most fundamental components of elementary particles.



Scientists observe solitary vibrations in uranium

Los Alamos scientists, working with collaborators from around the world, recently observed experimental evidence of solitary vibrations (solitons) in a solid. First

observed as localized waves on the surface of water more than a century ago, the concept of solitons in solids was only theorized as possible two decades ago. The results of their discovery of random localized vibrations in a 3-D solid will add new knowledge to the field of solid-state physics and could have implications for other areas of science and technology.

Avian flu modeled on supercomputer, explores vaccine isolation options for thwarting a pandemic

Using supercomputers to respond to a potential national health emergency, scientists have developed a simulation model that makes stark predictions about the possible future course of an avian influenza pandemic, given today's environment of world-wide connectivity.



Laboratory anthrax relatives non-friendly but non-lethal

A Laboratory team working as part of the Department of Energy's Joint Genome Institute explored the genomes of non-lethal bacteria closely related to the cause of anthrax, *Bacillus anthracis*. A paper in the *Journal of Bacteriology* describes the genomic sequencing and comparative analysis of *Bacillus thuringiensis* 97-27 and *Bacillus cereus* E33L.

Los Alamos Joint Genome Institute finishes landmark genome

Los Alamos researchers on the Department of Energy's Joint Genome Institute team finished the 50th microbial genome since they began "finishing" in 2003. Fifty of the 100 genomes completed by the Joint Genome Institute were finished at Los Alamos. The 50th genome, finished in July, was the microorganism *Polaramonas naphthalenivorans*. It is known for its ability to degrade naphthalene, a carcinogen commonly found at DOE's energy production sites.



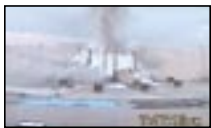
Scientists predict pulsar starquakes

Scientists have discovered how to predict earthquake-like events in pulsars, the dense remains of exploded stars. These are violent episodes that likely crack a pulsar's dense crust and momentarily increase its spin rate.



DARHT conducts successful W76 hydrotest

The W76 Life Extension Program reached another major milestone with a successful hydrotest at the Laboratory's Dual Axis Radiographic Hydrotest (DARHT) facility. The hydrodynamic experiment was designed to perform two essential tasks: provide an engineering certification of manufacturing design and



assembly techniques in support of the W76 LEP, and harvest physics data to further inform the Laboratory's baseline predictive models — to apply the principles of Quantifying Margins and Uncertainties in the W76 LEP path forward. Hydrotest 3624 was one of a series of hydrotests in support of the W76 LEP.



Underground Radio™ revolutionizes subterranean emergency rescue capabilities

A Laboratory developed technology may soon help save lives of people trapped in underground accidents.

The Laboratory signed licensing agreements with Vital Alert Technologies Inc. for Los Alamos' Underground Radio™, a technology that will provide Through-The-Earth Communication™, (two-way voice and text) for first responders, rescue and security teams, underground miners, and the public in critical emergency situations around the world.

UNICORN subcritical experiment a success

A joint Laboratory/ Nevada Test Site team successfully fired the UNICORN subcritical test at the Nevada Test Site. Before placement underground, the UNICORN device is configured in a tower-like "rack" similar in construction to those used before 1993 for full nuclear yield testing at the Nevada Test Site. The UNICORN test recorded a 100 percent data return from its array of diagnostic sensors, also part of the "rack" assembly.



UNICORN device configured in a tower-like "rack"

Less expensive fuel cell may be possible

Laboratory scientists developed a new class of hydrogen fuel-cell catalysts that exhibit promising activity and stability. The catalysts are made of low-cost nonprecious metals entrapped in something called a heteroatomic-polymer structure, instead of platinum materials typically used in fuel cells.

Bringing in the 'Bee Team'

Initially, the concept seems too incredible to be possible — train a common honeybee to physically respond to the distinctive smell of specific explosives, then develop a method for measuring or observing that response in order to use the bee's reaction to the smell of explosives as a natural explosives detector. As incredible as it may seem, Laboratory scientists recently created such a detector under the Stealthy Insect Sensor Project.



Harnessed bees ready to be trained

Seeing the unseen universe

New research gives cosmological surveys aimed at understanding dark energy and dark matter a boost. Lab scientists have developed a new method for incorporating astronomical observational data into computer simulations, which promises to be a significant advance in enabling future cosmological surveys.



Dwight Rickel of Los Alamos' National High Magnetic Field Laboratory's Pulsed Field Facility checks the 100 Tesla Multi-shot Magnet.

Powerful magnet expected to attract new users

Scientists from around the globe will soon be drawn to Los Alamos to the National High Magnetic Field Laboratory's Pulsed Field Facility and its recently commissioned 100 Tesla Multi-shot Magnet. At 100 tesla, the new magnet's field is two million times stronger than Earth's magnetic field. This powerful magnetic field source will help scientists open up new frontiers for materials research, such as the basic electronic energy balance in electronic materials. What they find could help produce the next generation computers, sensors, and much more.

Unzipping the molecule of life

The most fundamental biological processes of life occur when the genetic code contained in DNA molecules is converted into the structures and functions of a cell, or is replicated in cell division. For this process to occur, the long strands of nucleotide polymers, called polynucleotides, that make up DNA must separate, or unzip, to allow enzymes to bond with them. While this unzipping has yet to be directly observed, Laboratory scientists have recently created a model that mimics the process. The model could be a valuable tool in understanding the unseen unzipping process.



Visitors



Eleanor S. Towns was the featured speaker for the Laboratory's annual Martin Luther King Jr. observance.

Sen. Pete Domenici, R-N.M.



Ambassador Roald Naess, left, of the Ministry of Foreign Affairs for Norway and Ambassador Richard Ekwall, right, director of the Ministry of Foreign Affairs for Sweden meets with Senior Fellow Terry Hawkins.

Internationally recognized forensic scientist Joseph Almog



J. Robert Oppenheimer's secretary, Priscilla Duffield, gave Laboratory employees a rare insider's perspective of the Manhattan Project during a Heritage Lecture series talk.

Former staff member turned astronaut John Phillips



Actor and writer George Takei, left, known to legions of Star Trek fans as Capt. Hikaru Sulu, the helmsman of the U.S.S. Enterprise

Ohkay Owingeh Pueblo Gov. Joe Garcia



U.S. Rep. Terry Everett, R-Alabama, left, and Rep. Silvestre Reyes, D-Texas

Motivational speaker Derius Swinton



Toshihiro Nikai, Japanese Minister of economy, trade and industry, navigates the Lab's fuel-cell powered cart through a hallway.

Department of Energy Secretary Samuel Bodman



Department of Energy Deputy Secretary Clay Sell



Former Laboratory Director Harold Agnew

Operations



Laboratory breaks ground on new CMRR building

Sen. Pete Domenici, R-N.M., center, used an American flag to signal to a backhoe operator to begin breaking ground for the Lab's new Radiological Laboratory Utility Office, phase one of the planned Chemistry and Metallurgy Research Replacement (CMRR) project. Also shown are left to right, Joel Leeman of the Principal Associate Director for Nuclear Weapons Program (PADNWP) Office, Tim Nelson of CMRR, Tom D'Agostino, deputy administrator for defense programs with the National Nuclear Security Administration, then Laboratory Director Bob Kuckuck, Steve Penson of the Austin Corp., the general contractor for phase one and Don Cobb, acting deputy Laboratory director.



Power plant equipment moved into place

Two cranes lift a 100-ton generator onto anchor bolts on a concrete foundation at the power plant east of Diamond Drive at Technical Area 3. A 50-ton turbine also was moved power plant. The new equipment will provide emergency power to the Laboratory.

Volatile organic removed from former Lab disposal site

An estimated one-fifth of a subsurface solvent-vapor plume was cleaned by the Environmental Corrective Actions Project (EP-CAP) during the course of studying soil vapor extraction as a potential method for cleaning up Material Disposal Area L. This waste disposal area operated from the early 1960s until 1985 at Technical Area 54. William Stewart, an environmental engineer with Apogen Technologies, gathers data from the soil vapor extraction apparatus.



Laboratory dedicates CINT facility

U.S. Senators Pete Domenici, R-N.M., and Jeff Bingaman, D-N.M., joined Laboratory Director Mike Anastasio, center, in cutting the ribbon at Los Alamos' Center for Integrated Nanotechnologies Monday at Technical Area 3. The 36,500-square-foot facility will house Lab scientists, post-doctoral researchers, technical support staff, and visiting researchers. The Los Alamos facility, along with a CINT building at Sandia National Laboratories, is part of a Department



of Energy Office of Science effort to invest in the emerging field of nanoscience. At far left are Toni Taylor, associate director of CINT, and Clay Sell, Department of Energy deputy secretary, Far right is Al Romig, vice president of Sandia labs.

Relocating TA-18's critical assembly machines

The phrase "end of an era" tends to be widely used when a sports legend passes on, but lately it's been the term of choice for activities at Technical Area 18, the Los Alamos Critical Experiments Facility. In a challenging series of moves this fall, four critical assembly machines that formed the nation's last general-purpose, critical-mass laboratory were decontaminated, disassembled, and dispatched to storage at Technical Area 35. Jim Dyson of Advanced Nuclear Technology guides hoisting of the uranium reflector from the Flat Top criticality machine in preparation for the machine's move from Technical Area 18.

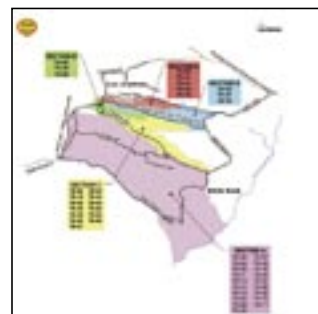


Diamond-Jemez intersection changes

Laboratory employees and contractors who work in Technical Area 3 saw many changes in the Diamond Drive-East Jemez Road (truck route) intersection during the year as part of the Security Perimeter Project. New access requirements are scheduled to go into effect early this month when the Security Perimeter begins full operation in and around Technical Area 3.

Lab celebrates 63 years of service to the nation

In May, the Laboratory celebrated the University of California's 63 years of service to the nation through its management of the Laboratory. "Celebrating an Era with Pride and Honor" included Laboratory workers, subcontract personnel, retirees and their families and friends for a day of exhibits, entertainment, food, and fun. The highlight of the celebration was the dedication of the new National Security Sciences Building at Technical Area 3, which included a ribbon-cutting ceremony, self-guided tours of the facility, and the unveiling in the NSSB courtyard of a commemorative piece from the Pentagon building that was attacked on Sept. 11, 2001. On June 1, Los Alamos National Security, LLC, assumed the management and operations of the Laboratory.



Laboratory has new site-wide evacuation plan

Laboratory officials rolled out an institutional, site-wide evacuation plan designed to maximize efficiency in getting people off the site in case of an emergency. It will be incorporated with individual building emergency plans to help ensure the safety of Lab personnel in the event of an emergency. The plan establishes specific evacuation routes and pre-evacuation steps, or triggers, in order to ensure the orderly and safe movement of people during an emergency. Incidents such as fire, flood, earthquakes, hazardous materials spills, or accidents could require site-wide evacuation.

Awards



Tantalum metal mold, one of three projects selected Best-in-Class

Laboratory receives five Pollution Prevention awards

The Laboratory received three Pollution Prevention Best-in-Class awards and two Pollution Prevention Environmental Stewardship awards from the National Nuclear Security Administration.

Laboratory employees win 32 Society for Technical Communication awards

Laboratory publications from Communication Arts and Services (IM-1) and the Los Alamos Neutron Science Center (LANSCE) received 32 awards in the 2005-2006 Society for Technical Communication's Southwest Regional Publications, Art and Online competitions, including Best of Show in the publications competition.

Lab scientist named 2006 Asian American Engineer of the Year

Los Alamos scientist Ning Li of Condensed Matter and Thermal Physics (MST-10) has been named the 2006 Asian American Engineer of the Year by the Chinese Institute of Engineers-USA.



Ning li



National Security Sciences Building receives prestigious award

The National Security Sciences Building earned first

place in the category of "Design Build" as part of Southwest Contractor magazine's "Best of 2005" competition.

Van de Sompel receives LACASIS award

Herbert Van de Sompel of the Research Library (STB-RL) received the Los Angeles Chapter of the American Society for Information Science and Technology Award in recognition of his significant contributions in library automation, standards and interoperability.



Herbert Van de Sompel



Lab's Zurek recognized for contributions to quantum theory

Laboratory Fellow Wojciech Zurek of the Theoretical (T) Division is the recipient of the Alexander von Humboldt Research Award in recognition of his contributions to foundations and applications of quantum theory.

Wojciech Zurek

Hur receives 2006 Outstanding Young Researcher Award

Namjung Hur of Condensed Matter and Thermal Physics (MST-10) received the 2006 Outstanding Young Researcher Award by the Association of Korean Physicists in America.



Namjung Hur

Rasmussen a World Technology Network fellow

Steen Rasmussen of Hydrology, Geochemistry and Geology (EES-6) has been named a World Technology Network fellow in the biotechnology sector. Rasmussen is the first Los Alamos scientist to become a WTN fellow.



Steen Rasmussen



Keith Boyer



Stirling Colgate

Boyer, Colgate awarded the 2006 Los Alamos Medal

Laboratory technical staff members Keith Boyer and Senior

Laboratory Fellow Stirling Colgate, are recipients of the 2006 Los Alamos Medal. The Los Alamos Medal is the highest honor and most prestigious award the Laboratory can bestow upon an individual or small group.

Three receive Postdoctoral Distinguished Performance Award

David Chavez of Materials Dynamics (DX-2), Richard Schaller of Physical Chemistry and Applied Spectroscopy (C-PCS), and Lin Shao of Structure/Property Relations (MST-8) are the recipients of the annual Postdoctoral Distinguished Performance Awards.

Lab's Williams receives Emerald Honors award

Rube Williams of Nuclear Design and Risk Analysis (D-5), a nuclear engineer currently on entrepreneurial leave from the Laboratory, won the 2006 Emerald Honors Minorities in Research Science Award in the Community Service and Educational Leadership categories.



Rube Williams



Scott Havemann



Dennis Roybal

Havemann, Roybal earn DOE small-business awards

Scott Havemann and Dennis Roybal

received Department of Energy/National Nuclear Security Administration awards for their efforts in small-business development and advocacy.

Laboratory captures five 2006 R&D 100 Awards

Nontoxic explosives, a computer visualization tool, charged-particle optics code, nanofabrication process, and computer-language compiler earned the Laboratory five 2006 R&D 100 awards. These latest awards presented by R&D Magazine bring the Laboratory's total to 103 since 1978.



Kevin Sanbonmatsu

Los Alamos researcher receives 2005 Presidential Early Career Award for Scientists and Engineers

Kevin Sanbonmatsu was one of fifty-six researchers given 2005 Presidential Early Career Awards for Scientists and Engineers, the nation's highest honor for professionals at the outset of their independent research careers.

CRADAS, MOUs



D.V. Rao, center, then Decision Applications Division leader, Steve Fernandez of Energy and Infrastructure Analysis and Randy Erickson, right, D Division deputy leader, sign a memorandum of understanding with Louisiana State University.

Los Alamos/LSU Hurricane Center join forces

Understanding hurricanes and their effects is a specialty for Louisiana State University's Hurricane Center, and now they will have an additional set of tools and scientific expertise with which to work. A memorandum of understanding will team members of the Lab's Decision Applications (D) Division with LSU Hurricane Center staff to join forces against the worst storms nature can offer. Other memorandums of understanding signed during the year include

- Chevron to work jointly on a project to improve oil recovery from low permeability formations, including from oil shale, oil sands, and heavy oil extraction;
- Japan's New Energy and Industrial Technology Development Organization and the National Institute of Advanced Industrial Science and Technology to collaborate on the development of fuel cells and hydrogen technologies; and
- New Mexico state government to formalize and strengthen a collaborative effort to bring the national laboratories' technology and expertise to small businesses across the state.



Duncan McBranch, right, Technology Transfer Division leader, along with Robert Hemphill and Mark Wasilko, left, of AES Corp., sign paperwork formalizing a Cooperative Research and Development Agreement.

Cooperative Research and Development Agreements

• The Lab's EnergyFit™ technology was licensed to AES, a global energy company, which will commercialize the technology. EnergyFit™ is a system software layer that constantly tunes computer processors for optimal performance by adjusting CPU speed to reduce heat and electrical costs while maintaining performance.

• Gasoline, diesel, and turbine engines could soon burn cleaner or be more fuel efficient through the application of Plasma Assisted Combustion, a technology originated and developed at the Laboratory. The Laboratory entered into an agreement with PerriQuest Defense Research Enterprises, LLC, to advance the technology for commercial refinement and implementation

• Ultra-strong CNT fibers made of lightweight carbon nanotubes could prove to be some of the strongest materials on Earth. The fibers are 100 times stronger than steel (pound for pound for the same weight), tougher than diamonds, and roughly one-ten-thousandth of a human hair in diameter. Los Alamos has licensed this carbon nanotube technology to Seattle-based CNT Technologies Inc.

Outreach

A brainy subject

Webelo Cub Scout Pack 28 members from St. Francis Cathedral School in Santa Fe look at a human brain while visiting the Laboratory's Bradbury Science Museum. Science educator Liz Martineau discussed the human brain with the youngsters.



Lab employees reach out to pueblo educators

Ron Wieneke of the Nuclear Materials Technology (NMT) Division Office holds a completed solar racer robotic as he talks to teachers about what students will learn in robotics workshops at various pueblo schools.

Northern New Mexico girls discover science at Expanding Your Horizons workshop

A student tests the spatter of 'blood' in the "Blood Drops Tell Tales" student workshop, where they discover how forensic scientists can use blood residue left at a scene of a crime. The workshop was held as part of the Expanding Your Horizons conference for young women co-sponsored by the Laboratory.



Lab sponsors volunteers training for pueblo education outreach

Jeff Carmichael, seated right, of Solid Waste Regulatory Compliance (ENV-SWRC) reads instructions to volunteers at a rocket-building training activity at San Ildefonso Pueblo. The workshops bring science concepts into the classroom.

Women's History Month student artists recognized

Alix Morgan, left, of Chamisa Elementary School in White Rock receives a certificate from Leisa Davenhall of Chemical Sciences and Engineering (C-CSE) at a presentation at Mesa Public Library. Morgan and Katie Lofton designed a poster as part of the Lab's Women's History Month poster contest, sponsored by the Women's Diversity Working Group, Office of Equal Opportunity and Diversity (HR-OEOD) and the Diversity Affirmative Action Board.



Learning is fun for students

Matt Briggs, left, of Hydrodynamics (DX-3) and Chris Tomkins of Neutron Science and Technology (P-23) explain fluid instability using water to youngsters and their families during the Bradbury Science Museum's annual Science Circus. The Science Circus outreach program encourages families to discover science through hands-on experiments.

Supercomputing Challenge

A pair of budding mathematicians from Albuquerque Manzano High School captured the top prize during the New Mexico Supercomputing Challenge held at the Laboratory. Kristin Cordwell and Chen Zhao's project, "Finding Inverses in Finite Fields," earned the students a \$1,000 U.S. Savings Bond.



Los Alamos Employees' scholarship fund awards scholarships

Los Alamos High School senior Alayna Rodriguez received the four-year, \$5,000-a-year platinum scholarship from the Los Alamos Employees' Scholarship Fund. The fund is administered through the Los Alamos National Laboratory Foundation. In addition, Dylan Allegretti of Santa Fe Preparatory School, Jose Castellano of Pojoaque High School, Antonia Clifford of St. Michael's High School and Trevor Martin of Taos High School will receive four-year gold scholarships for \$2,500 a year.



Bradbury Science Museum hosts Human Body Road Show

A youngster holds part of the brain stem from a model of the human brain at the Bradbury Science Museum. The "Human Body Road Show," a hands-on traveling exhibit developed by the Pacific Science Center and hosted by Los Alamos' Bradbury Science Museum, visited communities throughout Northern New Mexico last summer.

Students learn about science at summer program

Students gathered around Laboratory scientists Julianna Fessenden-Rahn and Thom Rahn to look at a core sample at Santa Clara Pueblo. The Tribal Relations team in the Government Affairs Office (CGA-GAO) sponsors the Summer Environmental Science Institute at several nearby pueblos.



Labs take science to the schools

June Dukowicz, center, of the Bradbury Science Museum, looks on as Los Alamos Middle School students separate hydrogen from water during a science outreach visit to the school. Through electrolysis, students were able to break down water into hydrogen and oxygen and use the hydrogen in a fuel cell to power a small fan. Science educators from the National Renewable Energy Laboratory in Golden, Colorado, brought their science outreach program to Northern New Mexico and visited Pojoaque and Los Alamos middle schools. Bradbury Science Museum, part of the Community Programs Office, arranged the local school visits.

Jemez Pueblo students get taste of science

Richard Schrader of River Source consultants walks in the Jemez Creek with students from Jemez Pueblo-area middle and high schools. The students used their feet to learn about the composition of the river bottom, such as the shapes and sizes of rocks, stones, and sand. More than 125 students took part in the workshop. The lesson was part of the environmental institute science outreach workshop at Jemez Pueblo. The Laboratory Foundation provided a grant to the pueblo for the workshop. Jemez Pueblo is one of four accord pueblos.



Los Alamos National Laboratory file photos