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Los Alamos
NATIONAL LABORATORY
Ideas That Change the World

NewsLetter

Week of Sept. 29, 2003 Vol. 4, No. 20

2002 Distinguished Performance Awards

The Laboratory has selected its 2002 Distinguished Performance Award winners. The annual award, which recognizes individuals and small and large teams for job performance above and beyond what is normally expected, includes seven individuals, 10 small teams and seven large teams.

Individuals or small teams who receive Distinguished Performance awards must have made an outstanding and unique contribution that had a positive impact on the Laboratory's programmatic efforts or status in the scientific community, required unusual creativity or dedication of the individual or team and resulted from a level of performance substantially beyond what normally would be expected.

Large teams must have performed scientific, engineering, technical, administrative and/or management activities at a level far above normal job assignments; completed a project that brought distinction to the Laboratory by resolving a problem that has broad impact and/or resulted in the Lab becoming the recognized expert in the field; worked on a project that involved original and innovative thinking, approaches and results; and exhibited (by each member of the team) an exemplary level of skill, teamwork and dedication well beyond normal expectations that resulted in the successful completion of the project.

Each recipient of the Distinguished Performance Award receives a plaque and a pin. In addition, each winner of an individual award receives $1,000, and each member of a winning small team receives $500.

Debra Graves

Gregory Kaduchak

INDIVIDUALS

Debra Graves, SNS-DO

The Spallation Neutron Source (SNS) project is a $1.44-billion, six-lab collaboration to design, build and operate the next-generation accelerator-based neutron source at Oak Ridge National Laboratory. Los Alamos' five-year commitment is to design and deliver the linear accelerator and the radio-frequency power, including controls.

Debra Graves of SNS accepted a change of station to Oak Ridge, initially to oversee the shipping, receipt and management of Los Alamos equipment. Oak Ridge quickly recognized her skills and persuaded her to accept the same role for all six SNS partner labs. At the SNS Receiving and Testing Storage Facility, where she also serves as building manager, Graves led the effort to establish an online receiving and tracking system that has allowed her to track more than $250 million in major equipment transactions.

Graves has performed her assignment with accuracy, high energy, superb interpersonal skills and firm knowledge of federal acquisition regulations, Department of Energy orders and Los Alamos and Oak Ridge policies. Her colleagues call her efficiency "phenomenal." She is an exemplary ambassador for the Laboratory.

Gregory Kaduchak, MST-11

Answering the need for new counterterrorism technology after Sept. 11, 2001, Gregory Kaduchak of Electronic and Electrochemical Materials and Devices (MST-11) developed new defenses against chemical and biological warfare agents.

Kaduchak created a noninvasive chemical-agent sensor by expanding on a previously developed swept-frequency acoustic interferometer. Calling on his detailed understanding of the acoustic physics of detection processes, he developed a much more efficient transducer design and significantly improved the analytical algorithms. He then worked with an industrial partner to assist in the production of a field-deployable version of the instrument.

He also delivered a greatly improved acoustic concentrator that concentrates bio-agent particles, such as

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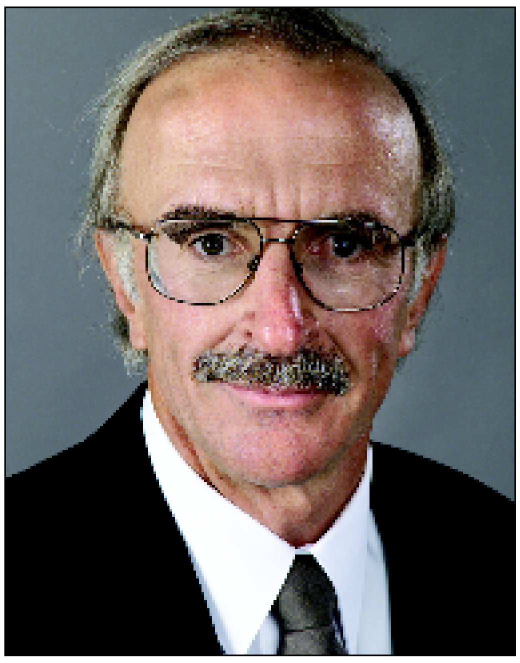
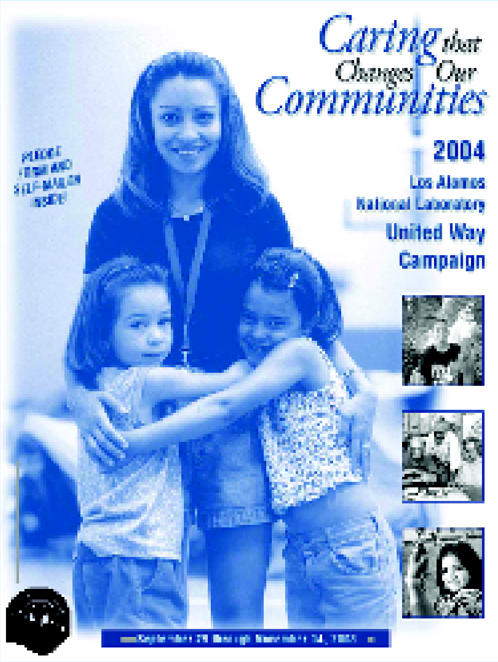
Peter Lopez



Brian McVey



2004 United Way campaign

The Laboratory's United Way 2004 giving campaign, "Caring that Changes our Communities," began Sept. 29 and continues through Nov. 14.

Laboratory Director G. Peter Nanos said, "The United Way campaign is an excellent way to support important community needs. I ask you to please consider making a contribution to one of Los Alamos' and Northern New Mexico's most rewarding programs."

Employees can designate specific United Way agencies they want to support with their donation. University of California employees with CRYPTOCards can make donations by going to *unitedway.lanl.gov* online. Lab workers also can pledge to United Way through payroll deduction. Or they can write a check to United Way, attach the check to the pledge card and return it to Mail Stop P232.

Lab divisions and groups are encouraged to organize their own events to support the fundraising effort. Frequently asked questions and fundraising guidelines are available on the Community Relations Office Web page online.

For more information, questions or comments on the Lab's 2004 United Way campaign, write to *unitedway@lanl.gov* by e-mail, call 5-4400 or go to the United Way Web sites at *www.losalamos.com/unitedway/* or *www.uwsfc.org* online.

Los Alamos NewsLetter

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Los Alamos National Laboratory is operated by the University of California for the National Nuclear Security Administration (NNSA) of the U.S. Department of Energy and works in partnership with NNSA's Sandia and Lawrence Livermore national laboratories to support NNSA in its mission.

Los Alamos enhances global security by ensuring safety and confidence in the U.S. nuclear stockpile, developing technologies to reduce threats from weapons of mass destruction and improving the environmental and nuclear materials legacy of the Cold War. Los Alamos' capabilities assist the nation in addressing energy, environment, infrastructure and biological security problems.

NNSA
National Nuclear Security Administration

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Salary Increase Authorization for 2004 fiscal year set

In a recent master management memo, Richard Marquez, associate director of administration, noted the planned merit and promotional increases for fiscal year 2004.

The annual Salary Increase Authorization (SIA) is the amount of the Laboratory's operating budget that can be used for salary increases. The SIA is not an extra fund, but an authorization to spend an approved amount on salary increases. The Department of Energy has authorized an additional 0.5 percent of payroll for promotional increases during the year.

The table below shows what has been distributed to deputy directors and associate directors for salary increases. Depending on their reserve and allocation requirements, divisions will receive smaller allocations. Once allocations have been made to divisions, managers are responsible for ensuring that individuals within a peer group with similar job content and performance are paid consistent with each other. Depending on the issues in a given peer group, the amount available to recognize individual contribution may vary significantly. Therefore, employees should not expect that the size of the directorate-level distributions translate to an average increase for each individual.

Series	Planned Merit Increase Percent	Promotional Increase Percent
Technical Staff Member	3.2 percent	.5 percent
Technician	3.7 percent	.5 percent
Administrative Exempt	4.5 percent	.5 percent
Administrative Nonexempt	3.9 percent	.5 percent

SIA is only one factor in determining FY04 salaries. Because many factors must be considered in determining salaries, employees should not interpret the SIA percentages as guaranteed or even approximate individual increase amounts. When making salary decisions, managers must consider job performance and job content, the employee's current salary and its position within the salary range, overall relative contribution scores and salaries of other employees in the peer group, changes in peer group membership, alignment issues within a peer group, market premiums for specific jobs or skills and so on.

The small raises reflect the generally softer job market and higher unemployment rates according to the World at Work, Mercer and Conference Board surveys. With the increase for FY04, the Laboratory still is above the average salary budget reported nationwide.

This year, holdbacks will be established institutionally to address issues outlined by the Welch Study.

To read the complete memo, see master-management memo 1758/ADs 1928: FY 04 Salary Increase Authorization Allocation (pdf) (9/10/03) or link to it from the Sept. 12 online Daily Newsbulletin at *http://www.lanl.gov/orgs/pa/newsbulletin/2003/09/12/*.

September service anniversaries

40 years
Charles Lehman Jr., NMT-2

35 years
Richard Browning, ESA-WR
Ronald Krantz, NIS-17

30 years
Kenneth Apt, NIS-7
Donald Burton, X-4
Linda Davis, PM-1
James Dyson, NIS-6
Horace Gasca, ESA-WMM
John Jarmer, LANSCE-7
Robert Malone, CCS-2
Ruben Manzanares, MST-7
Joe Martinez, EES-2
Albert Migliori, MST-NHMFL
David Montoya, ESA-WMM
Patrick Rodriguez, P-22
Charles Snell, X-1

25 years
Deborah Bennett, NMT-11
Charles Bonner, NMT-4
Michael Geelan, LANSCE-12
Rayenell Goldman, IM-1
Paul Lewis, LANSCE-12
Jerry Lugo, NMT-15
Richard Martin, T-12
James McAtee III, HSR-DO
Luis Roybal, CCN-4
Leonard Salazar, CFO-2
W. Robert Scarlett, P-21
E. Katherine Valdez, IM-1
Jackie Vigil, RRES-CH
Michael Webb, TRO
Thomas Wehner, D-3
Douglas Weiss, D-3
Mark Wilke, P-23

20 years
Peter Adams, X-2
Frances Archuleta, NMT-DO
Cathy Blossom, NMT-DO
Fredric Bolton, S-10
Michael Boor, NMT-3
Donald Chavez, NMT-5
Marc Clay, PS-7
D. Wayne Cooke, MST-8
Joseph Cortez, NMT-5
James Cruz, IM-1
J. Wiley Davidson, CHS
Kirk Ellard, PM-DS
Steven Greene, P-DO
Leigh House, EES-11
Michael Hundley, MST-10
Keith Jacobson, RRES-MAQ
Roger Johnston, C-ADI
Richard Light, CCN-7
Lucille Maestas, X-8
Catherine Majerus, HR-S
Linda Meincke, B-5
Carter Munson, P-24
Russell Powers, FWO-WFM
Paul Rivera, SUP-3
Laurel Roberts, IM-8
Katherine Salgado, CER-20
Francis Sena, DX-1
Erika Spallitta, IM-5
L. Jerilyn Thornton, PM-18
Turner Trapp, NMT-DO

15 years
Audrey Archuleta, LANSCE-4
Johnny Collins, X-4
Bruce Cottrell, LC-IP
Thomas Farish, D-2
Kyran Kemper, CCN-DO
Ricky Lopez, HSR-5
Linda Lowe, ESA-MPO
Carl Necker Jr., MST-6
Donald Olivas, CCN-7
Lloyd Schempp, ESA-WMM
Josef Schillig, MST-NHMFL
Louis Schulte, NMT-2
Jeane Strub, STB-RL

10 years
James Coons, ESA-WMM
Daryl Grunau, CCN-7
Brian Kendrick, T-12
Patricia Leonard, RRES-QAT
Rodolfo Martinez, B-3
Guy McNamara, X-3
Deesh Narang, NMT-14
John Nolan, B-2
Wayne Pickard, CIO-PO
Todd Pozzi, IM-DO
Barbara Sinkule, NIS-7
John Tapia, SUP-2
David Wayne, NMT-15
Paula Whitehead, HSR-5

5 years
Loretta Atencio, ADO
Stephen Barnard, DX-5
Kurt Beckman, FWO-MSE
Danny Branch, CER-DO
Charles Brownrigg, OEO
Deanna Capelli, DX-1
David Decroix, D-5
Michele Decroix, ESA-GTS
Abel Delarosa HSR-12
Wu-Chun Feng, CCS-1
Matthew Filer, FWO-WFM
Larkin Garcia, FWO-WFM
Donald Gonzales, CCN-4
Angelina Gurule-Sanchez, LANSCE-1
J. Steven Hansen, NIS-5
George Hansrote, PM-DS
Steven Harbour, NIS-10
Jeffrey Heikoop, EES-6
John Isaacson, RRES-ECO
Kris Kwiatkowski, P-23
Donald Landry, PM-DS
Peter Lindahl, RRES-QAT
Lisa Lloyd, CFO-3
Darryl Lovato, NMT-16
David Lyons, CER-1
Kathleen Maestas, LANSCE-7
Robin Markham, HSR-4
Percy Martinez, P-21
Kimberlyn Mousseau, IM-DO
Vincent Mousseau, T-3
Jose Ortega, DX-1
Douglas Patrick, NIS-4
Gilbert Romero, ESA-WMM
David Salazar, LC-IP
Adam Scott, NIS-10
Morag Smith, NIS-5
Gregg Sullivan, DX-2
Kathleen Taylor, DX-4
Mark Taylor, CCS-2
David Thompson, C-ADI
Stephen Tobin, NIS-5
Tony Valerio, SUP-2
James West, NIS-5

Safety improvement: Taking the next steps

Make a commitment to be accountable for safety.

- Engage in the five-step process for all work.
- Look out for your fellow workers as well as yourself
- Follow the rules or get them changed.

anthrax spores. The concentrator can vastly improve the sensitivity of any particle-based bio-detector. Kaduchak's design makes possible portable bio-detection systems with no moving parts and low battery-power requirements.

Kaduchak's instruments have been called "revolutionary" by the Los Alamos Center for Homeland Security and have been applauded by the Defense Threat Reduction Agency. Kaduchak is the winner of the FBI Director's Award for earlier work.

2002 Distinguished Performance Awards

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Peter Lopez, NMT-5

As head of the Assembly Engineering Team, one of many teams serving the W88 Pit Manufacturing and Certification program, Peter Lopez of Weapons Component Technology (NMT-5) played a unique role in meeting a congressional mandate to recreate the pit production technology that was lost in 1992 when work stopped at Rocky Flats.

Lopez built a multidisciplinary team of 24 and then drew upon his extensive background in plutonium metallurgy and materials processing to lead this crew in developing a reliable pit manufacturing system of 22 interconnected processes. The work involved the difficult chore of converting and updating aging plutonium-processing equipment and required team members to multitask to maintain a 24-hour build schedule.

In April, Los Alamos brought in its first certifiable pit ahead of a very aggressive schedule — an achievement recognized at the highest levels of the National Nuclear Security Administration.

Lopez's exceptional dedication, leadership skills and scientific creativity reflect honor and dignity on the Lab's nuclear weapons program. His team's completion of a complex assembly system was critical to the restoration of U.S. pit manufacturing capability.

Brian McVey, X-8

Detection and identification of chemical plumes provides valuable intelligence about the activities of possible proliferators of weapons of mass destruction. Rapid battlefield analysis of chemical clouds can protect soldiers in combat. The tool serving these needs is a long-wave infrared imaging system known as hyperspectral imaging.

Although the remote-sensing instrumentation for this work is quite advanced, users have found it difficult to efficiently sort through the collected, highly complex data to extract weak chemical signatures. Brian McVey of Computational Science Methods (X-8) has eased this task by organizing multivariate signal-processing algorithms into a coherent package called the Hyperspectral Image Processor (HIP). HIP performs end-to-end analysis and mitigates interfering scene "clutter." It has become the industry standard tool, and many analysts in the intelligence community have adopted it because of its versatility and ease of use.

McVey's work has made Los Alamos the leader in chemical spectral imaging. As a result, intelligence-community funding to the Lab for this work has quadrupled in the last two years.

Tammy Milligan

Tammy Milligan, BUS-DO

Tammy Milligan, formerly of the Business Operations (BUS) Division, became the Chemistry (C) Division's business team leader shortly after three reorganizations had drastically changed the division's makeup.

The division had complex financial issues, but Milligan quickly began putting matters in order. She developed an analysis and reporting procedure to assure all groups would receive timely financial data and helped the division pursue funding for facility upgrades, new strategic hires, fire recovery and construction projects. She used her skill of explaining complicated financial subjects to train new group leaders in the nuances of Lab financial systems. In addition, she provided them with customized tools to support their financial duties.

Reorganization had brought Analytical Chemistry (NMT-1) to C Division, making it Actinide Analytical Chemistry (C-AAC). Milligan concentrated on easing that transition and also helped effect a change in actinide analysis funding from a "per sample" to a "block funding" basis — a more logical and stable method.

Although Milligan has moved on to another assignment, her commitment to excellence left a lasting impression on the financial health of C Division.

Tomas Proffen

Thomas Proffen, LANSCE-12

The Lujan Neutron Scattering Center's (LANSCE-12) Neutron Powder Diffractometer was one of the world's oldest (built in the 1980s) and yet most-respected pulsed neutron-scattering instruments. Beginning in 2001, Thomas Proffen guided a $1.1-million upgrade that made it even better.

Proffen and his team dismantled the house-size instrument and completely rebuilt it, increasing the detector coverage by a factor of five. The first beam entered the upgraded instrument in September 2002, and by late October the diffractometer was already taking data of extraordinarily high resolution. It is now the first instrument of its kind designed specifically for pair distribution function analysis — a way of characterizing local atomic structure — and at the same time, it is the best powder diffractometer in the United States for crystallographic analysis.

This upgrade, a collaboration with five universities, was the first major instrumentation project at Los Alamos to receive National Science Foundation funding. Proffen's guidance yielded such a high level of success that NSF is now considering a second Lab project.

Christopher Webster

Christopher Webster, ADSR

For many years, the Jemez Mountains site called Fenton Hill was home to the Hot Dry Rock program for geothermal energy research. Hot Dry Rock formally ended in 1994 with inadequate funding left for cleanup and with some hope that the program might be restarted. A 12,600-foot-deep well and a 1-million-gallon water pond remained, along with buildings and many tons of equipment. Over time, weather took its toll, the infrastructure deteriorated and rodents moved in, all of which posed potentially hazardous conditions. In addition, an obligation existed to return the site, which the Lab does not own, to clean condition. In late 2001 the decision was made to begin cleanup.

Christopher Webster of the Strategic Research Directorate (ADSR) organized the Fenton Hill Site Working Group to remediate the site. He obtained the needed additional funds (about $400,000) and led the working group through completion of the extensive reclamation project in less than a year and for far less money than was originally estimated.

Webster's efforts have made Fenton Hill a clean, safe, productive and environmentally responsible site and have preserved it for ongoing astrophysics projects.

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SMALL TEAMS

Accelerated Aging of Plutonium Team

As part of the Enhanced Surveillance Campaign to determine the lifetime of stockpile pits, this team was asked to help increase our understanding of plutonium aging beyond the oldest known limits.

Members of the team needed to prepare, test and examine nuclear weapons materials whose aging was accelerated to the equivalent of 60 years or beyond. They first had to replicate the old Rocky Flats casting, rolling and machining capability, miniaturize it to fit in two gloveboxes in TA-55's Plutonium Facility, get DOE approval for its use with plutonium-238 and demonstrate that they could produce materials that met Rocky Flats specifications in several important properties.

No one had ever done such work with rapidly aging material (excessively "hot" and therefore difficult to handle), so team members faced daunting technical, engineering and institutional issues. Still, they successfully replicated the Rocky Flats process on the very first attempt and produced a material matching all key parameters of the predominant pit type in the U.S. stockpile.

This team includes **Franz Freibert**, **David Dooley**, **Richard Ronquillo**, **Chris Trujillo** and **Claudette Trujillo** of Process and Engineering (NMT-16) and **J. David Olivas** of Nuclear Materials Science (NMT-10).

Accelerated Aging of Plutonium Team

DynEx Vessels Design and Fabrication Team

The DynEx experiment planned for DARHT is an essential element in the Lab's ability to certify weapons performance without nuclear testing. The experiment's use of both high explosives and special nuclear material requires its confinement in vessels that can withstand internal blast loads and resultant overpressure.

Although such vessels are routinely used — at the Lab; in conventional defense applications; and in the oil, gas, and chemical industries — no formal standards have existed for them. Team members developed the design approaches for such vessels and worked with the Pressure Vessel Research Council and the American Society of Mechanical Engineers, which led to the establishment of a standards-based approach for vessel design, fabrication and testing.

The team's work passed intensive review by a blue ribbon panel of national experts and by staff and members of the Defense Nuclear Facility Safety Board, paving the way for an experiment that serves the Lab's mission. Furthermore, the standards established will now be incorporated into the national ASME Boiler and Pressure Vessel Code for use nationwide.

Members of this team are **Christopher Romero**, **Darrell Bultman** and **Thomas Duffey** of Test Engineering (DX-5); **Kelly Bingham** of Welding Technology Services (SSP-PADO) and **Edward Rodriguez** of Weapon Repsonse (ESA-WR).

DynEx Vessels Design and Fabrication Team

Jayenne Implicit Monte Carlo (IMC) Project Team

This team designed, developed and delivered new high-quality radiation-transport software that allows personnel in the Advanced Simulation and Computing (ASCI) program to perform state-of-the-art physics simulations.

Using object-oriented programming, the team built a simulation capability in software packages that support two types of parallelisms — one in which an entire mesh is replicated on each processor and one in which the mesh is split among all processors. No other ASCI code has both parallel capabilities. In addition, the Jayenne IMC software is well suited to the ASCI Q machine, so users are getting shorter times-to-solution than ever before.

Users of nonlinear physics codes are accustomed to finding many bugs in new software packages. However, the Jayenne IMC software is of such high quality that more than 1 million computer hours have revealed only one bug, affecting only one user.

Designers using this team's software are now simulating greater spans of physical systems than ever before and are consistently matching experimental results, some of which they could not match before. This team is leading the way toward predictive capability.

The Jayenne IMC team is **Todd Urbatsch** and **Thomas Evans** of Transport Methods (CCS-4).

Jayenne IMC Team

LANSCE User Office

LANSCE annually welcomes several hundred experimenters from academia, national laboratories, government agencies and industry in a user program that has increased as much as 142 percent in some experimental areas since 2001. The LANSCE User Office, with a core of only three people, provides exemplary service to the many national and international users in spite of rapid program growth.

This team administers the proposal review process and then schedules and coordinates most aspects of user activity, including communications, travel, orientation and facility access. It coordinates training to get experimenters to work quickly, assists with shipments of specialized equipment, works on user facility agreements for proprietary industrial users, collects a variety of statistical information and has even chauffeured people through apartment searches and juggled the needs of those who have missed Badge Office hours or training.

LANSCE User Office

Because LANSCE is the only national user facility accommodating both classified and unclassified experiments, institutional requirements are particularly complex. That most users — and LANSCE technical staff — are unaware of the difficulties is a testament to the skill and dedication of the User Office staff.

Staff members are **Sandy Chance**, **Evan Sanchez** and **Rebecca Garcia** of Communication and User Coordination (LANSCE-4).

Nitric Acid Recycle Team

TA-55's Plutonium Facility has been the source of an extremely problematic waste stream: nitric acid contaminated with plutonium. For 20 years this stream has been processed in an evaporator and the resultant distilled liquid sent to the Radioactive Liquid Waste Treatment Facility. There the acid was neutralized, the remaining actinides were precipitated out, and the treated effluents were discharged through an industrial outfall.

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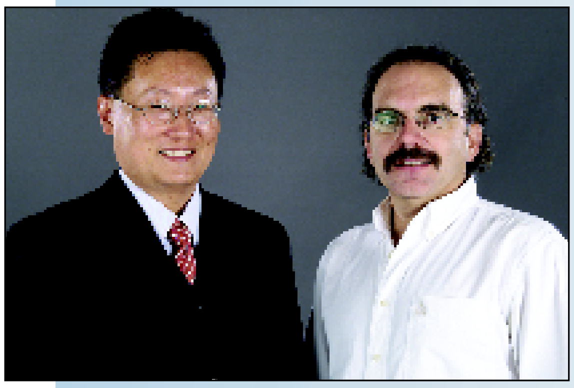
This team developed the Nitric Acid Recovery System, which recycles nitric acid for further use, shrinking the waste stream by 95 percent and reducing the Plutonium Facility's overall nitric acid consumption.

Creating NARS required miniaturizing distillation columns that commonly are100 feet high and developing novel safe startup and shutdown techniques. The finished system can be operated only one week a month and still can produce enough nitric acid for all user needs.

The NARS team, winner of the 2002 White House "Closing the Circle" award for environmental stewardship, has greatly enhanced the Lab's ability to continue or even increase plutonium operations in the future.

Team members are **Don Mullins**, **Ronald Chavez**, **Benjie Martinez**, **Wayne Smyth** and **Aquilino Valdez** of Actinide Process Chemistry (NMT-2).

Nitric Acid Recycle Team



Portable Digital X-Ray (PoDiX) Team

Portable Digital X-Ray (PoDiX) Team

The Department of Defense needed a small, lightweight radiographic system to inspect packages suspected of being weapons of mass destruction, radiological dispersal devices or other dangerous items. For such counterterrorism work, responders would need the mobility to get to a target and the speed to forestall a detonation. Failure would be devastating.

Members of this team developed a small, field-portable X-ray detector that provides near-real-time, high-quality digital radiographic images. They had the device ready in 18 months for less than $1.4 million. To accomplish the task so quickly, they modified and adapted commercially available parts to create the miniaturized system and produced a design that not only provides the capabilities requested but that also enhances safety for the user by relying on very low radiation sources.

Currently being evaluated by DoD, this instrument has attracted the attention of the Department of Homeland Security, the FBI and DOE's Office of Emergency Response. DOE has described the ingenuity and innovation of its design as truly remarkable.

Members of this team are **Brent Park** of Stockpile Complex Modeling and Analysis (D-2) and **Gaetano Arnone** of Advanced Nuclear Technology (NIS-6).

Radiological Triage Team

Radiation detectors are being used in increasing numbers to screen suspicious packages. Should a nuclear threat be uncovered, expert teams such as the Nuclear Emergency Support Team are ready to respond. But nonthreatening radiological materials can trigger false alarms, resulting in a waste of assets needed only for extreme emergencies.

This team organized in 2002 to provide near-real-time assessment of suspect items. Members are on year-round, 24-hour-a-day call to rapidly analyze nuclear and radiological data. In addition, they are testing commercial isotope detectors in an effort to help vendors develop more-reliable products.

Between January and December of 2002, team members defused numerous potentially volatile situations. As a result, the team has become crucial to the nation's overall Nuclear Emergency Response program and integral to the support of government agencies responsible for national security. The team is a strong support for the Lab's nuclear threat reduction mission.

The Radiological Triage Team includes experts from Los Alamos, Lawrence Livermore, and Sandia national laboratories. The Los Alamos team members honored are **David Mercer** of Safeguards Science and Technology (NIS-5) and **John Blackadar**, **John Bounds**, **William Casson**, **Richard Morgado** and **Mohini Rawool-Sullivan** of Advanced Nuclear Technology (NIS-6).

The Radiological Triage Team

Russian Fissile-Material Storage Facility Thermal Program Team

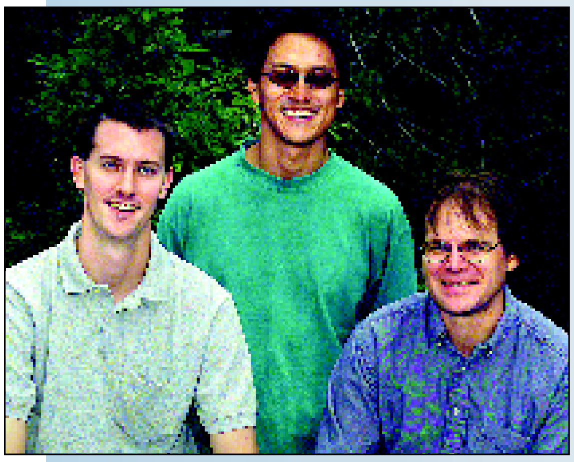
The Russian Fissile-Material Storage Facility that is nearing completion in Mayak, Russia, will secure weapons-grade fissile material against theft. However, early thermal-loading estimates indicated that only 33 percent of the facility could safely hold plutonium. A second storage wing might be needed, and American money — about $250 million — would pay for its construction.

To realistically gauge the existing facility's thermal environment, members of this team conceived, negotiated and guided the technical execution of full-scale physical tests in the United States and Russia. Test results were then incorporated into computational models, verified through benchmarking exercises and integrated into system-performance models. The work established a sound technical basis for tripling the facility's plutonium-storage capacity, thus eliminating the need for more construction.

By demonstrating the RFMSF's sufficiency for storing all of Russia's foreseeable excess plutonium, team members supported the Defense Threat Reduction Agency's Cooperative Threat Reduction goal of making this a safer world. They also have provided the United States with expanded expertise to address related storage issues in this country.

Team members are **Pratap Sadasivan**, **Thad Knight** and **Robert Steinke** of Nuclear Design and Risk Analysis (D-5) and **Brent Faulkner**, **Donald Quintana** and **Raymond Romero** of Applied Engineering Technologies (ESA-AET).

Russian Fissile Material Storage Facility Thermal Program Team



Supercomputing in Small Spaces Team

Supercomputing in Small Spaces Team

Supercomputers always have been computational prima donnas — huge facility-filling collections of hardware that are fast enough and powerful enough for national defense problems but too expensive and temperamental for many business applications. The Supercomputing in Small Spaces Team has changed all that by developing the world's most-efficient supercomputer: Green Destiny.

Although Green Destiny operates at supercomputer speed, each of its clustered

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240 processors uses 6 to 8 times less power than usual, and the entire compilation occupies just 6 square feet. Such efficiency in the terms of metrics related to performance versus power and space usage leads to an annual savings of up to $400,000 in the total cost of ownership. In addition, Green Destiny operates reliably without special housing, cooling, filtration or humidification.

This new type of supercomputer has drawn national and international attention at conferences and through stories on CNN and in The New York Times, HPCwire, CIO magazine and Computer World. Green Destiny was a winner in this year's R&D 100 Award competition.

Members of this team are **Wu-chun Feng** and **Eric Weigle** of the Advanced Computing Laboratory (CCS-1) and **Michael Warren** of Theoretical Astrophysics (T-6).

Supernova Modeling Team

A supernova, the death of a massive star, is one of the most violent natural phenomena, an explosion briefly outshining 100 billion stars. To understand a supernova, astrophysicists have long tried to model the event. A one-dimensional simulation was done in 1966, but two-dimensional codes proved inadequate for a satisfactory multidimensional simulation.

Members of this team created a new three-dimensional code and put it through multiple runs at the National Energy Research Supercomputer Center in Oakland, beginning in spring 2002. One run took more than a month and required constant monitoring. By the end of 2002, the team had become the first group ever to model the complete evolution of a supernova in three dimensions.

This milestone, one of the Lab's most visible scientific successes in 2002, was heralded at a press conference at the American Astronomical Society and was featured in high-profile, online publications such as Scientific American and HPCwire. It reaffirms Los Alamos as a premier center for supernova research and contributes substantively to the Laboratory's standing in the international scientific community.

Team members are **Christopher Fryer** and **Michael Warren** of Theoretical Astrophysics (T-6).

Supernova Modeling Team

Advanced Simulation and Computing Q Team

ARM Tropical Western Pacific Team

LANSCE Lujan Target Replacement Team

LARGE TEAMS

Advanced Simulation and Computing Q Team

The Q machine is the nation's largest supercomputer. Operating at 20 trillion operations per second, it is the equivalent of 20,000 personal computers working together. Its timely installation was necessary for the Laboratory to complete new nuclear weapons simulations, which are crucial to credibly applying Advanced Simulation and Computing (ASCI) program efforts to national stockpile objectives.

Despite complex technical challenges, the ASCI Q Team brought the Q machine online in less than six months, well ahead of schedule and established an effective, stable environment for the milestone calculations of the Shavano project. The team also provided networking, archival storage, software environment and consulting operations and programming support. Without the team's support, the milestone effort would have failed. In addition, during the installation the team made more than 4 million processor hours available to six unclassified science simulations — several are the largest ever attempted. The results of the simulations exceeded all expectations and led to new insights of dynamic processes in many fields. The team heroically provided 24-hour support seven days a week to both projects.

The team's overwhelming success brings distinction to the Laboratory and keeps us in the forefront of high-performance computing.

ARM Tropical Western Pacific Team

The Tropical Western Pacific Team is part of the DOE Atmospheric Radiation Measurement program, which is dedicated to understanding and predicting global climate. The goal of the ARM program is improving predictive capabilities using an infrastructure of several permanent climate-monitoring sites that supply continuous data to support model development. One of these sites is the Los Alamos-directed Tropical Western Pacific Site.

The team, an international collaboration of scientists and technicians, developed, installed and operated a state-of-the-art atmospheric radiation and cloud station in Darwin, Australia. The station rapidly produced the best research-grade radiation and cloud data set ever available from the deep tropics, collected from the center of the El Niño phenomenon.

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2002 Distinguished Performance Awards

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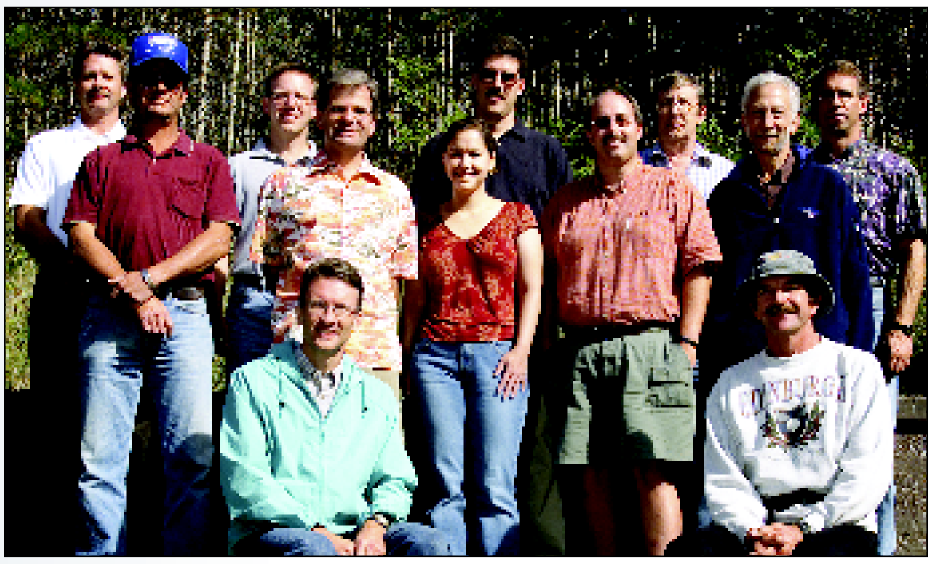
In addition, the team supported the continued operation and significant improvement of two other remote stations in Papua New Guinea and the Republic of Nauru and developed improved maintenance operations for all three stations. Through original and innovative approaches and an exemplary level of dedication and teamwork, the team accomplished all of this without increased funding.

LANSCE Lujan Target Replacement Team

The Lujan Target Replacement Team successfully averted a crisis by replacing the target-moderator-reflector system at the Los Alamos Neutron Science Center (LANSCE). The TMRS, used in generating neutrons for the Lujan Neutron Scattering Center, failed twice early in 2001 during the beam delivery period. As a result, the beam current was reduced, limiting the magnitude of experiments and severely threatening the Laboratory's ability to meet commitments to Lujan Center users.

An interdisciplinary team was assembled to evaluate, redesign, fabricate, assemble, test and replace the TMRS before the 2002 run. The new system had to eliminate the possibility of failure yet deliver equivalent performance and fit the footprint of the old system. Quick and accurate resolution of these issues required tenacity and innovative thinking from team members, who worked under great pressure. With exemplary teamwork, they delivered on schedule the new TMRS, which allows beam delivery comparable to the best spallation sources in the world.

The 2002 user program set records for the average proton current and the total neutron production from the new system. In addition, the lessons learned from the experience led to design changes for the spallation neutron source under construction in Oak Ridge, Tenn.



Los Alamos Mars Odyssey Team

Los Alamos Mars Odyssey Team

In early 2002, NASA announced that the Mars Odyssey spacecraft had discovered large amounts of hydrogen in the form of water ice beneath the surface of Mars. The Los Alamos Mars Odyssey Team played a major role in that discovery, one of the decade's most important in planetary physics.

The Odyssey mission is to map the chemical elements and minerals of the planet's surface with a suite of instruments that includes a neutron spectrometer designed and built at Los Alamos. Analyzing the flood of detailed neutron spectrometer data with their own complex computer codes, team members provided results that were critical in identifying the hydrogen-rich layer buried just beneath the surface in the polar regions. The data led to the interpretation that this layer contained much more ice than expected. The data also showed greater hydrogen content in mid latitudes than was earlier thought to exist.

This team's dedication and expertise in nuclear, planetary and space physics led to major scientific discoveries that brought international recognition to the Laboratory. The team also contributed to the Laboratory's national security mission by developing advanced detection technologies and by demonstrating expertise in remote sensing of nuclear radiation.

Palm Power Project Team

Palm Power Project Team

The next-generation soldier will need power for electronics used in the field. Because existing batteries are too heavy and short lived, the Defense Advanced Research Projects Agency , through its Palm Power project, is seeking portable power for military use.

This team developed a direct methanol fuel cell stack that meets the stringent technical specifications of power, size, weight, and lifetime. Team members collaborated with Ball Aerospace, a defense contractor, to integrate the DMFC stack into a complete system that approaches the physical profile of existing U.S. Army-issue batteries.

The impending Iraq war prompted DARPA to push for prototypes on an accelerated schedule, so team members worked evenings and weekends to finish the job. In spite of the pressure, they found creative solutions to numerous scientific and engineering challenges. Army agencies are currently evaluating prototype units, and the DMFC stack is tentatively designated as the baseline power system for the U.S. Army's Objective Force Warrior program.

Because of this team's work, the Lab can now compete for defense and threat-reduction power projects across the government. Production of DMFC stacks also will advance the emerging domestic fuel cell industry.

Shavano Code Project Team

Shavano Code Project Team

The success of the Stockpile Stewardship program depends on high-quality primary simulation codes that can rapidly add new physics models. By meeting a December 2002 ASCI milestone, this team demonstrated the Lab's ability to develop that capability.

An important Appendix F measure in the UC contract, the milestone included showing major progress in developing simulation capability, demonstrating new physics models, establishing a preliminary implosion baseline for the W-88 primary, and completing important three-dimensional (3-D) implosion calculations. Team members incorporated many computational and physical innovations and solved a decades-long problem of numerical analysis. Their work allows substantially improved studies of 3-D geometrical features in weapons systems.

The team's efforts required significant sacrifice. Most members worked 50 to 60 hours a week for more than four months, including weekends and Christmas vacation. However, they maintained professional

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Tritium Systems Test Assembly Facility Stabilization Project Team

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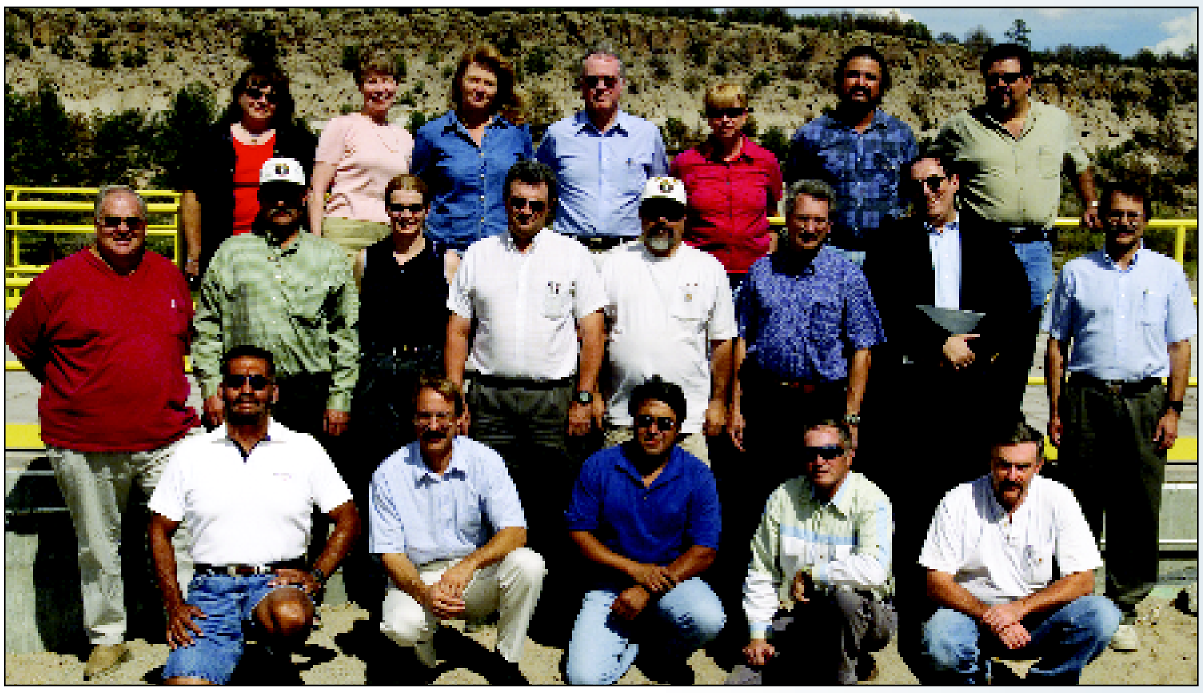
working relations in spite of the pressure. The new capability they have demonstrated has already proven useful to the weapons design community, proving that the Shavano Code project will play an important role in certification during the coming years.

Tritium Systems Test Assembly Facility Stabilization Project Team

Twenty years of successful programmatic efforts ended at the Tritium Systems Test Assembly (TSTA) facility in 2000. This team brought TSTA to a safe and stable end state for transition to DOE Environmental Management. Over 15 months, team members safely removed more than 50 grams of tritium and packaged and shipped more than 45,000 pounds of tritium-contaminated waste to Technical Area-54.

The team disassembled the facility's experimental equipment and extensive supporting tritium-handling infrastructure while continuing to meet Category 2 Nuclear Facility requirements. Many of the facility's systems were dormant and minimally documented, but team members restarted them to characterize and remove the tritium residue. In one case, an experimental glovebox containing both tritium and beryllium contamination had to be removed through a temporary hole cut in an outside wall.

The difficult stabilization project was completed on schedule and within budget. Its success brings the Lab one major step closer to its long-term goal of consolidating all tritium activities at Technical Area 16. The lessons learned along the way will be valuable in future stabilization activities here and across the DOE complex.



Watusi Experiment Team — Los Alamos members

Watusi Experiment Team

United States security depends on the ability to detect and verify seismic and infrasound events for ground-based monitoring of nuclear explosions, with emphasis on distinguishing between naturally occurring and man-made events. The Watusi experiment involved a 38,000-pound explosive shot (TNT equivalent) that successfully tested new sensor technology, exercised current sensor technology and provided data that will lead to refined intelligence about proliferation of weapons of mass destruction and to the advent of an early warning system for seismic disasters.

The success of the experiment demonstrated exceptional teamwork and close cooperation among the national laboratories and government agencies. The massive technical, logistical and administrative challenges overcome by the Watusi Experiment Team in preparing the shot included creating an explosive that was remotely generated, resolving critical safety issues, developing special instruments and integrating project management and operations to encompass the large number of interagency team members, all with specialized skills.

Thanks to the Watusi Experiment Team, the successful completion of the shot, with its experimental array, has brought credit to the Laboratory as a supplier of innovative ideas and capabilities, while contributing to the nation's nuclear test readiness.

Watusi Experiment Team — Nevada Test Site members

Editor's note: For a complete listing of large team members, see the Sept. 4 Daily Newsbulletin at http://www.lanl.gov/orgs/pa/newsbulletin/2003/09/04/text02.shtml online.

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