

Sandia creates Kevlar gauntlets to protect arms of soldiers riding atop military vehicles in combat

Recommendations for bulletproof protective gear sent back from Iraq

By Michael Padilla

Sandia researchers have created gauntlets that will aid in saving arms of military personnel riding atop Humvees and other military vehicles during combat.

The shoulder-length Sandia Gauntlets are made of layers of heavy Kevlar — reinforced material used in bulletproof vests and tires — with carbon-composite forearm and upper arm protective inserts.

The heat-protection characteristics of the Kevlar layers mitigate the thermal effects of warhead blasts on tissue, while the combination of carbon-composite and Kevlar diminish both blunt trauma effects and penetration or shredding effects of warhead shrapnel on both tissue and bone, says Jack Jones (6955), project lead and Sandia physical security specialist.

“If the Sandia Gauntlets can protect just one soldier, sailor, airman, or Marine from losing an arm, then the effort put forth will be well worth it,” says Jack. “This project is very important to our service members and allies who are in harm’s way fighting in Iraq and Afghanistan.”

Jack and Jim Purvis (6955), with the assistance of Larry Whinery and Richard Brazfield (both 2111) from the Sandia Parachute Lab,

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ARMS PROTECTION — KAFB Airman Garrett Martin displays the Sandia Gauntlet atop a Humvee.

(Photo by Randy Montoya)

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Canine explosive detection teams to be deployed at Sandia/New Mexico

By Bill Murphy

On July 19, Sandia’s Protective Force organization will begin deployment in New Mexico of professional explosive detection canine services, says ProForce Operations Support Dept. 4211 Deputy Manager Mike Schaller. The services are being contracted through NetGain Corp. and its joint venture partner K-9 Search-on-Site. The companies already provide canine services at Y-12 and Los Alamos National Laboratory and for Department of Homeland Security screening operations at several airports around the country.

Mike, Sandia’s contract oversight manager for the canine project, says the deployment is a response to security audits that cited a need for more explosive detection capability at the Labs.

While the two canine teams — the dogs and their handlers — will arrive on site on July 19, Mike says their first couple of weeks here will be to allow them to become familiar with Sandia’s specific requirements and to allow Labs security police

officers to become familiar with the teams’ methods. Assuming the familiarization process goes well (and there is no reason to assume it won’t), the canine teams will begin operational deployment about the first of August.

The contract, which initially calls for two teams of one dog and one handler, runs through February 2005. Sandia’s protective force will deploy these resources at random locations throughout the site for the duration of the contract period, Mike says.

What they do — and don’t

Mike says the canines, which are trained to detect a multitude of explosives, will meet rigorous and specific performance test criteria and certification requirements before performing duties at the Labs. Each team will be professionally trained by certified professionals to ensure reliability. And Mike emphasizes that the dog teams deployed at the Labs

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ANALYZE THIS — A promotional photo from the K-9 Search on Site Web page shows a dog and its handler inspecting a car for explosives. Two K-9 teams will be deployed at Sandia beginning July 19.

Employees, teams receive recognition

During the 2004 Sandia Employee Recognition Night, 65 individuals and 57 teams were honored for



exceptional achievements. The program carries on a tradition that since 1994 has honored Sandians for outstanding service rendered to the Labs and the nation. Read about the winning teams and see pictures of the individual recipients on pages 6 through 10.

NanoSummit explores nanotechnology for energy, security needs

Researchers attend one-day D.C. event to meet major players

By Neal Singer

A wider view of the coming importance of nanotechnology and its place in expanding energy resources and security capabilities was presented by researchers, administrators, and policymakers in a one-day DOE “NanoSummit” session on June 24 in Washington, D.C. Non-DOE researchers from industry and universities found admission valuable enough that they paid to go. Approximately 350 people attended.

Poster displays described the five DOE Office of Science nanoresearch centers — including the joint Sandia/Los Alamos one (CINT, see *Lab News*, June 11) — and some of the experiments already in progress under their aegis.

“I have an application in for a project to the Center for Integrated Nanotechnology in Albuquerque to work on an idea we have in [nano] materials,” said Rafael Aviles, manager of the central analytical support group of Rohm and Haas Company in Spring House, Pa. “This is an opportunity to meet the people involved.”

Indeed, he met Labs Director and Sandia

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5 Hydrology remains an important aspect of WIPP monitoring

▶12 Through United Way Sandians help make Rachel’s Courtyard a reality

What's what

Some really interesting things turn up in the most unusual places. Like graffiti with a "today" twist that appeared recently on the wall of the men's restroom in one Sandia facility.

The lead offering in that edition of the *Porcelain Press*, placed above the urinal, urged people to be "mindful" of their surroundings and what they are doing as a way to avoid accidents, injuries, and other unpleasanties. The piece featured a thumbnail of a movie poster from *City Slickers* and an allusion to some philosophical advice from the character played by Jack Palance to the character played by Billy Crystal.

I had, and offer, no critical opinions or judgment about the relevance of the advice and no comment about the comment — except the medium. We're all adults here, right? And in the process of growing up and going to school and traveling, we've all seen the scribbles and scrawlings offering pithy observations from the stunted world of the scribblers and scrawlers on the walls and stalls of public restrooms.

Well, maybe the commentators were fastidious, or maybe they were just being "today" without thinking, but their comments were registered legibly on stickies and arranged neatly alongside the *Porcelain Press* piece. No defacers of the wall there. Of course, maybe their ballpoint pens wouldn't write on the glazed surface of the tile, but let's give 'em the benefit of the doubt.

"Great idea!" one observer said. "I think I'll stick a pad of stickies and a pen on a string up there so other people will write."

That would probably work at Sandia. Wonder if a bunch of fifth-graders would record their thoughts on stickies, rather than in broad-tipped, permanent markers on the steel stall walls? Nah. . .

Oh, and when photographer Randy Montoya went into the men's room with a camera to snap the photo above, curiosity got the best of decorum and a mixed-gender group, told the facilities were empty, followed him to see exactly what was so interesting in a restroom. As they chattered and giggled, a voice inquired politely from a stall at the back, "How many women are in here?"

And quickly there were none.

By the way, in case you didn't remember, after then-septuagenarian Jack Palance finished his speech accepting his first Oscar for his performance in that movie, he dropped to the stage floor and did a quick three or four one-handed pushups.

Now, *that* was impressive!

— Howard Kercheval (844-7842, MS 0165, hckerch@sandia.gov)



Management promotions

New Mexico

Brian Leen, from PMLS, R&D Procurement Dept. 10251, to Manager, Manufacturing and Production Purchasing Dept. 10252.

Brian joined Sandia in April 2002, as a member of the Procurement organization. Since November 2002, he was co-located with his technical customers in Tech Area 4, supporting Organizations 15000,



BRIAN LEEN

2300, and 2600. Brian was a buyer in the R&D Procurement Department when he was promoted.

Before coming to Sandia, he worked for seven years at Philips Semiconductors, where he was a buyer and later a material manager. Brian served in the Air Force for 25 years, retiring as a colonel in 1994. His final position in the Air Force was as the

Director of Contracts for what was then called Phillips Laboratory, now the Air Force Weapons Lab.

Brian has a BA in business administration (transportation) from the University of Washington/Seattle, an MS in logistics management from the Air Force Institute of Technology, Wright-Patterson AFB, and is a Certified Professional in contract management through the National Contract Management Association.

Arthur Shanks from PMTS to Manager, High Consequence Assessment and Technology Dept. 4117.

Before joining the Labs in June 1995, Arthur worked for three years as contractor in Sandia's Health Physics Department supporting Radiation Protection Program development. His work since joining the Labs has been in radioactive waste management as the Waste Characterization project leader, responsible for ensuring that all waste accepted into the Radioactive and Mixed Waste Facility



ARTHUR SHANKS

was properly characterized from both the radiological and hazardous waste standpoint and was able to be shipped for disposal. In that role, he also helped plan the operations at the facility to ensure effective use of the contract staff supporting the operation.

In October 2000, Arthur was selected to enter the Weapon Intern Program. He graduated in October 2002; as part of this program, with the addition of some additional graduate classes, he achieved his second master's degree in engineering mechanics. During the intern program, he worked for a short period in the Weapon Reliability Department.

Following the intern program, Art worked for a short period in the W76 and W88 Weapon Systems Engineering Department, helping to complete a fratricide assessment of the W76, among other smaller projects. In December 2002, he transferred to the High Consequence Assessment and Technology Department as the project leader for both the Sandia Joint Technical Operation Team and the Consequence Management Program. He led those projects until his recent promotion.

Art has a BS in physics and MS in nuclear engineering, both from the University of New Mexico and an MS in engineering mechanics from the New Mexico Institute of Mining and Technology.

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LOCKHEED MARTIN

Take Note

Retiring and not seen in *Lab News* pictures: **Nat Youngblood** (10258), 21 years; and **Hugh Whitehurst** (6861), 20 years.

Retiree deaths

Wilbur Leroy Drake (age 85) April 26
Ronald D. Snidow (73) April 28
Donna R. Foor (93) April 29
Merrill O. Murphy (82) April 29

Sympathy

To Evelyn Moore (10852) and Jim Moore (10848) on the death of her father and his father-in-law, Marvin Romero, June 9.



Lab News, Sandia Technology, 2004 calendar, Daily News win PRSA New Mexico chapter Cumbre Awards for excellence

Cumbre Awards, presented annually by the New Mexico Chapter of the Public Relations Society of America (PRSA) to recognize excellence in the field, went to four Labs publications during a recent ceremony.

Gold Awards went to the *Sandia Lab News*; *Sandia Technology*, a quarterly news/feature magazine that focuses on the Labs' R&D efforts; and the 2004 R&D/Community Outreach calendar.

The electronic *Sandia Daily News* took home a Silver Award.

Nominations, judged by the Portland, Ore., chapter of the PRSA, were required to define each publication's general objectives, identify publics, theme, budget, research used to guide each publication, and the process used to determine each publication's success at meeting predefined goals.

Gauntlets

(Continued from page 1)

designed and fabricated the gauntlets. The carbon-composite inserts were fabricated by a local small business specializing in composites.

From idea to product

The initial concept for the Sandia Gauntlets was conceived by Jim during an overseas trip in mid-October 2003 after reading an article about a soldier who lost his arms during the Iraq war.

Soon after, the technical requirements of the idea were discussed with several other Sandia experts. The Parachute Lab was contacted concerning the availability of Kevlar material at Sandia and the ability and the use of the parachute lab personnel to construct a prototype.

By early November the basic concept and several design options had been engineered in detail. During the third week of November, a refined prototype was designed. Jack said several prototypes were constructed and functionally tested with military personnel in a mission environment. Steven Todd and Brandon Ahrens (both 5915) conducted an explosive test of the prototype.

In December, several sets of the Sandia Gauntlets were given to the 1-82 FA, 1st Cavalry Division out of Ft. Hood, Texas; 515th Corp Support Battalion, 720th Transportation Company; and the US Air Force 355 Logistics Readiness Squadron/CCDE. The gauntlets were then shipped to forces in Iraq for recommendations.



GAUNTLET USE — Airman Ryan Jones demonstrates how the Sandia Gauntlet is used. (Photo by Randy Montoya)

Recommendations from the field

The Sandia Gauntlets were well received in Iraq, says Jack. Recommendations for modifications to the gauntlets were sent back and improvements to the prototypes have been made.

Sandia criteria were for a one-size-fits-all design with blunt trauma protection for the hand, wrist, and elbow, as well as heat and blast protection. The primary recommendations from the field tests include straps to hold the gauntlets in place, and modifications to the forearm armor to increase flexibility and maneuverability.

Members of the US Army and Air Force have requested that the Sandia Gauntlets be attached in the rear (left and right sleeve) with a quick release buckle. This allows the service members to shed the gauntlets after an initial attack if they have to fight in a dismounted role, says Jack.

Other suggestions included adding a neoprene sleeve inside the forearm to allow for a more secure fit and placing a thumb-hole in the composite to ensure the Sandia Gauntlet rotates and moves with the lower arm. In addition, the military personnel would prefer to cut the composite back from the knuckles to the wrist, says Jack.

"This would allow the wearer more dexterity when using the Sandia Gauntlets for loading and charging a weapon system, driving, or acting as an assistant driver," says Jack.

Several military units have inquired about the gauntlets and would like to know when they will be available for full use, says Jack.

"US Army doctors report a large increase in the numbers of personnel who are losing their arms above the elbow," says Jack. "Prior to the



JIM PURVIS (6955) adjusts the Sandia Gauntlet on KAFB Airman Garrett Martin. (Photo by Randy Montoya)

use of Kevlar armored vests, these personnel usually died. Now they are surviving, but their arms are too mangled to repair due to burns and shrapnel penetration damage. The Sandia Gauntlet is a solution to the problem."

Jack says as far as he knows until now there has not been anyone working to develop a system to protect US service members and allies while riding exposed in cupolas and losing limbs from blast effects (spall-heat and shrapnel) from IEDs (Improvised Explosive Devices) and rocket propelled grenades.

Labs-wide support

The Sandia Gauntlets have received tremendous support from various departments including President C. Paul Robison, says Jack. Funds for the project came from Lockheed Martin and several Sandia centers.

The next step in the project, Jack says, is to identify a company outside of Sandia to produce the gauntlets for the military.

"The project is moving ahead quickly and timely," he says. "We are grateful to all who have supported this project."

Canine

(Continued from page 1)

will be used only for explosive detection.

"All they do is sniff for explosives," Mike says. "These particular dogs aren't trained for any other functions."

In fact, that requirement is specifically a condition of this contract agreement, Mike says.

Mike says the canine services will augment existing explosive detection capabilities that are already deployed at several gates around the Labs. Those capabilities, however, are so-called fixed post systems — where they're installed is where they stay. The canines, of course, can be deployed anywhere on a moment's notice.

Mike notes that Sandia's own mobile sniffing technology, based on microchemlab technology, may at some point in the future be the method of choice for explosive detection work. In the short term however, the canine teams provide the reliability, track record, discriminatory capabilities, and flexibility that Sandia needs to demonstrate responsiveness to the security audit findings, Mike says.

The two dogs in the first deployment have been trained and selected for their nonaggressive natures as well as their sniffing capabilities, Mike says. One of the dogs is a Czechoslovakian shepherd; the other is a Belgian Malinois. Both are large (not huge), hardy dogs.

Mike says the dog handlers will have no enforcement authority. "If a detection occurs," Mike says, "they tell a security police officer (SPO) that their dog has detected something of interest." The SPO then takes over, doing whatever enforcement or screening follow-up may be called for.



GOING TO THE DOGS — A K-9 Search-on-Site team, at Sandia to demonstrate its explosives detection capability, pauses for a moment for a photo with members of Sandia's Protective Force. Pictured here, from left, are ProForce Capt. Chris Garcia, K-9 SOS handler Shane Trew, ProForce Deputy Manager Mike Schaller, K-9 SOS President Freddie Brasfield, and ProForce Lt. Donnie Greene. The K-9 SOS teams shown here are not the teams that will be deployed at Sandia.

Mike reminds Sandians that although the tendency may be to want to pet these beautiful and intelligent animals, that is a no-no.

"You can't pet these dogs," Mike says. "The handlers will tell you not to approach any dog; they'll try to keep a 10-foot radius around their dogs at all times. So if a handler tells you not to approach a dog, don't be offended; that's their job."

Mike says the implementation of the canine detection services is consistent with Sandia Protective Forces mission to provide the best possible protection to Sandia employees and Labs assets.

"We're confident that the addition of these resources will help achieve this goal," Mike says.

Handlers, dogs get thorough training

Before being certified to perform functions at Sandia, each K-9 Search-on-Site handler will have a certification from a nationally recognized trainer's course and a minimum of two years' experience working with or handling canines. The handler will possess a master training certificate from a certified canine association, an explosive detection trainer's certificate from a certified kennel, be certified in explosive ordinance disposal, and be a member of the International Association of Bomb Techs and Investigators.

All canines assigned to perform explosive detection at Sandia will be accustomed to working in institutional and commercial conditions. Each canine has undergone a thorough health examination and will receive routine health exams, chemistry work up, heartworm test, fecal analysis, and annual boosters.

To mitigate potential for property damage and/or injury, Sandia has specifically contracted the services for passive-indication, nonaggressive canines. Each canine has been selected based on personality and temperament, which has been guaranteed and will be tested before permitting the dogs to operate in the laboratory environment.

For additional information, contact Mike Schaller at 284-9595.

Using the (brackish) water beneath our feet: Tularosa Basin desalination facility dedicated

By Will Keener

"Water, water every where, nor any drop to drink."

The line from the epic Samuel Taylor Coleridge poem *The Rime of the Ancient Mariner* was written about a crew becalmed in the Pacific Ocean. But it was very much appreciated by the group of people who gathered last week in Alamogordo, N.M., for the dedication of the Tularosa Basin National Desalination Research Facility. The facility will be a major focus of Sandia's water research for the next few years (*Lab News*, June 25).

Take Donald Cooper, City Commissioner of Alamogordo: "We don't have an industry base here because we don't have the water. We are strictly a service economy. This facility is very important to us."

Take Bruce Johnson, representing the water utility in Tucson, Arizona: "Enhanced treatment [of brackish waters] is a part of our comprehensive long-range water resource plan. If we are going to rely on



VP 6000 LES SHEPHARD (center) talks shop with Tucson Water Utility representative Bruce Johnson, left, and Sandia Manager Mike Hightower (6202) at the Tularosa Basin dedication. Mike has been instrumental in much of the planning for the new facility.

work to make highly mineralized, or brackish, water into useful water. It's an old idea that they will shine a new light on with the latest of technologies.

Key partners in the Tularosa Basin effort are the Office of Naval Research, the Bureau of Reclamation, and Sandia. New Mexico's Laguna Industries is prime contractor for the construction phase of the project.

"Water issues increasingly limit economic development, impact infrastructures such as energy and agriculture, and are a source of conflict between nations, states, and even municipalities," said Sandia's Les Shephard (VP 6000) in his remarks to the group.

"We have a scarcity of water and a growing population in the west," said Tom Jennings, of the Bureau of Reclamation's Denver office. "We want to develop the technology and the systems that will provide that population with sustainable water." The Tularosa Basin facility is unique, he adds, because of its focus on inland groundwater rather than on seawater.

Erik Webb (12100), a Congressional Fellow and Sandia manager, spoke on behalf of Sen. Pete Domenici, R-N.M.: "Right now it's too difficult and too expensive for us to extract the water beneath our feet." The research partners are now going to address that problem on a 40-acre site that is optimal for the range of water qualities it provides and for the opportunities it creates for testing solar, wind, and other alternative energy sources in combination with desalination technologies, he added.

Authorizing agreements and congressional funding have brought the 16,000-square-foot facility to the verge of reality for desalination and associated research, Erik said. Domenici's challenge to all involved: "Now, make it work."



AMONG THE MANY shovelers at the dedication were two Sandians — Erik Webb (second from left) currently a Congressional Fellow representing Sen. Pete Domenici, and Les Shephard (third from right), who spoke on behalf of the Labs.

these technologies in the future, we want to participate in their development and evolution."

Take Ed Archuleta, representing the City of El Paso, Texas: "We are developing plans for the largest inland desalination plant in the world. It will supply 20 percent of the current El Paso water demand. With surface and reclaimed water, we hope to stabilize our groundwater wells and develop a sustainable water supply for our residents."

These and many others, including two dozen blue-vested boosters from the Alamogordo Chamber of Commerce, are counting on the new desalination research facility to give them something nature hasn't: a supply of *beneficial* water. To do so, researchers there will

NanoSummit

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President C. Paul Robinson, who presented the session's luncheon speech, and Terry Michalske, CINT director, and was pleased by his reception. "We have other project ideas as well," Aviles told the *Lab News*.

Others, like Lloyd Tran, found dealing with DOE labs altogether too slow and cumbersome a process for his small medical products company. "The labs don't give you exclusive license, either," he said. But he paid to attend because, wearing his other hat as program director of the International Association of Nanotechnology, Inc. in Sacramento, Calif., he was interested in meeting as many people as he could in the nanotechnology field.

DOE Secretary Spencer Abraham opened the day's talks expressing the hope that "any time researchers anywhere in the world think of [nanotechnology] research, they think of these [Office of Science] centers." He listed areas in which nanotechnology could play an important role, such as new chemical processes for clean energy, lubricants that improve efficiency, and molecular machines that revolutionize solar energy.

Referring to his audience, he said, "Everyone who has the vision today to participate in today's events will wear a badge of honor 10 years from now; I congratulate you on the commitment you have made."

US Rep. Zach Wamp, R-Tenn., said, "The biological sciences have been sexy in the past 10 years, but nano will bring the physical sciences back to where they should be. . . . You need to continue to push us [congressional people] to stand with you on this technology we don't understand that well. Then our children will have a bright future."

John Marburger, director of the White House Office of Science and Technology Policy, was introspective. "It's amazing how uniform the vision of nanoscience is around the world," he said. "The world's nations are increasingly able to participate in the new world economy, and each country's ability to produce a technologically competent work force is increasing."

Said Marburger, "It's remarkable that the same [DOE] labs [whose technologies are helping] to solve the world's energy problems are investigating the deepest secrets of science." That's so because, he said, "It's the limitations of your technologies that define where you can research." The nanotech centers "offer an enhanced value of existing instrumentation and an array of facilities unmatched in the world."

He emphasized the importance of solid state lighting, a major initiative at Sandia and a part of CINT.

"He saw this as one of — if not the most promising — area for implementing nanotechnology," said Terry Michalske, director of CINT.

Mildred Dresselhaus of MIT, one of a select group of approximately 100 researchers worldwide to be a member of both the National Academy of Sciences and National Academy of Engineering, mentioned the competitive aspects facing nanotechnology research. Her talk focused on the difficult prospect of achieving a hydrogen-based energy economy. "In the Manhattan Project and in getting a person to the moon, this nation has competed successfully in any number of projects," she said. "But this one has to be commercially competitive. And we need aggressive basic research at the nanoscale to achieve it."

Sandia's Paul Robinson took a wider view and, in addition to speaking generally about the field, mentioned direct examples from Sandia in which nanotechnology is already impacting lives.

He discussed Sandia's achievement, via Brian Swartzentruber's (1114) group, of watching atoms

move on a surface in real-time video. He compared the interest in nanotechnology to the childhood excitement of putting together Tinkertoy building blocks, "welding together the physical sciences and biology at the level where biological clusters self-organize, proteins fold at different temperatures, new laws of physics are being written, and chemical properties and the phenomenology of hardness changes."

He mentioned the deployment of Sandia chemical microsensors in several US subway systems and airports, mechanical "sniffers" that detect explosives, and Sandia's Combustion Research Facility that investigates the processes of fire at the molecular level.

He occasionally leavened his talk with humor.

He mentioned the approving remark of one of the first air travelers subjected to Sandia's explosives sniffer: "I'd rather be sniffed than snuffed."

Earlier, Paul broke whatever ice might adhere to a defense lab at a non-defense gathering by recounting his mention at a congressional committee hearing of the-then Sandia motto, "Science with the end in mind." A young staffer responded, "You nuclear weapons people! Is that all you can think of?" And so, Paul said, Sandia changed its motto to "Science with the mission in mind."

Pat Dehmer of DOE's Basic Energy Sciences office emphasized that the nanosummit hadn't been called by the Office of Science but by the Secretary himself. "There's a very strong commitment from DOE," she said. "Too little, too late is the history of science, so we're moving forward aggressively."

Clayton Teague, director of the National Nanotechnology Coordination Office, said there was "great opportunity to identify problems early" and set up "best practices" for working

(Continued on next page)

Hydrology an important aspect of WIPP monitoring

By Chris Burroughs

Editor's Note: The June 11 Lab News featured work at the Sandia/Carlsbad site. This article focuses on one area of research at the site mentioned in the previous stories. It is hydrology — one of the most important research projects at the site.

An important aspect of monitoring the Waste Isolation Pilot Plant (WIPP) near Carlsbad, N.M., and ensuring that it will perform as expected over the next 10,000 years involves hydrology — studying how groundwater may impact the repository.

Several Sandia/Carlsbad staff members devote their time to monitoring groundwater at WIPP as part of an overarching monitoring program.

"The Environmental Protection Agency (EPA) requires DOE to monitor the waste disposal system at WIPP both while it's open and following its eventual closure," says Rick Beauheim, the WIPP Hydrology Team Lead. "The reason is to detect any changes from what's expected."

The hydrology team monitors well water levels and water quality, while other DOE and Sandia groups monitor geomechanics, regional drilling activities, and waste inventory.

Monitoring program

In 1996 DOE prepared the original Compliance Certification Application (CCA) required for WIPP to open. The CCA described a formal monitoring program to be implemented upon WIPP certification. Two years later the EPA decided the federal requirements were met and certified WIPP as the first geologic repository for the disposal of transuranic waste. WIPP has been receiving waste for more than five years.

As the WIPP scientific advisor to DOE, Sandia is responsible for evaluating the monitoring data and submitting the results of the evaluations to DOE and EPA annually.

Rick says hydrology is an important aspect of this ongoing monitoring program. "Groundwater provides a potential way for radionuclides in WIPP

to exit the repository and possibly reach the accessible environment, a regulatory boundary defined by the Land Withdrawal Act," says Rick.

Release scenarios

Besides monitoring the groundwater at WIPP, the hydrology team has modeled two performance or "release scenarios" — undisturbed and disturbed. Both involve groundwater flow.

For the undisturbed scenario, groundwater (brine) that naturally occurs in the host Salado Formation salt is assumed to seep slowly into the repository. Over time as the salt closes in, the brine becomes pressurized. If pressures are high enough, the brine could possibly flow up through the materials used to seal the access shafts reaching either the ground surface or the aquifer located above the Salado.

For the disturbed scenario, groundwater is assumed to enter the repository, become contaminated with waste, and then exit the repository to the overlying aquifer through boreholes drilled for oil or gas exploration. These boreholes also provide potential pathways for contaminated solid material to reach the ground surface or the aquifer.

"Although both scenarios are plausible, modeling results for the CCA showed potential radionuclide releases to the boundary were below limits established by EPA," Rick says.



MOBILE LABORATORY — Tom Pfeifle (6117), left, and Wes DeYonge (6822) check out equipment in the mobile hydrology laboratory researchers take to the WIPP site to check out well levels and water quality.

Team members

Sandia/Carlsbad hydrology team: Rick Beauheim (6822), Tom Pfeifle (6117), Randy Roberts (6822), Dave Chace (6822), and Ed Schaub (6822).

Support team: Sean McKenna and Tom Lowry (6115), Joe Kanney (6821), Josh Stein (6852), and Michael Schuhen (6855) and several contractors — Intera, RESPEC, Orion, Dennis Powers, and Robert Holt.

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with nanomaterials. He mentioned health and safety research, and National Science Foundation centers evaluating toxic and carcinogenic potentials in the manufacture of quantum dots and nanotubes.

Nathan Lewis of Caltech in his talk (see a version at http://www.its.caltech.edu/~mmrc/nsl/Energy_Notes.pdf) and Rick Smalley, a Nobel laureate chemist from Rice University, painted a dim view of mankind's abilities to produce sufficient energy for its needs unless radical changes in current science technologies and investments were made.

Among Lewis' criteria for energy salvation is the emergence of a "disruptive technology in solar" aided by improvements in chemical processes.

Smalley backed nanoscience research as a boon in creating more usable energy. He wants energy to be the focus of the five DOE nanotechnology centers, with \$200 million a year put into new programs by FY06 to provide incentives to the best researchers to switch to the "Energy Challenge."

"The biggest single challenge for the next few decades," Smalley said, "is producing energy for 10-to-the-tenth-power people." What we need, he said, "is a bold new Apollo program to find the new, [much needed] energy technology."

Approximately 35 students attended the meeting, presenting poster sessions that highlighted student-user research projects.

"The meeting was an excellent opportunity for students to see the importance of the field of nanotechnology, meet with policy makers, and speak directly with the Secretary of Energy," said Terry.

Well monitoring keeps tabs on water levels

As early as the 1970s during the initial planning stages of WIPP, some 100 wells and exploration holes were drilled to characterize the Culebra Dolomite Member of the Rustler Formation that overlies the Salado Formation where the repository is located. The water levels in many of these wells continue to be monitored on a regular basis as part of the compliance-monitoring program.

These monitoring data are evaluated for comparison with and confirmation of the WIPP hydrologic conceptual models.

In the original Compliance Certification Application modeling, water levels in the Culebra were assumed to be at steady-state based on historical records.

Rick Beauheim, the WIPP Hydrology Team Lead, notes that changes in well water levels were observed during site characterization, but were attributed to sinking the WIPP shafts and testing various wells to evaluate hydraulic properties.

"However, shortly after the WIPP was certified, we began noticing changes in water levels in some wells around the WIPP site even

though the transients were no longer present," Rick says. "We then needed to develop an explanation for these observations and determine the impact on previous modeling results."

Based on these data, DOE funded a program directing Sandia to investigate the cause of the water-level changes as well as the impact these changes have on repository performance. Rick prepared a WIPP hydrology program plan describing a series of phased investigations. The plan includes developing hypotheses to explain the observed water-level changes, testing of these hypotheses through numerical modeling, and drilling and testing new wells to obtain important information from locations where data are limited or not available.

The leading hypotheses explaining the water-level changes include recharge of water-bearing units from potash mining operations in the area and/or leakage through poorly abandoned boreholes or poorly completed resource production wells and potash core holes.

Mobile laboratory can go to test wells

To regularly test wells placed strategically around the WIPP site, Sandia/Carlsbad recently acquired a mobile laboratory.

The state-of-the-art laboratory is equipped with hydraulic and control systems, instrumentation, and a data-acquisition system to permit Sandia to run long-term (up to 30 days) constant-head or constant-flow-rate tests under full

computer control.

The data-acquisition system is loaded with nSIGHTS® software, a sophisticated well test analysis program developed by Randy Roberts (6822) in collaboration with a private firm named Intera. The software evaluates test data in real time, providing instant feedback to Sandia staff for input into test management and control decisions.

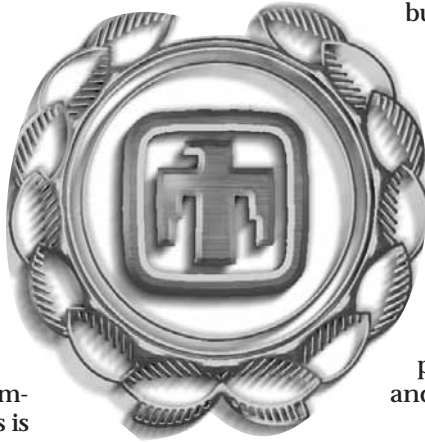
Sandia Employee Recognition Night 2004 honors 65 individuals, 57 teams for exceptional achievements

Annual recognition program was launched by Lockheed Martin in 1994

Some 300 Sandians — individuals, team representatives, and their guests — gathered June 19 at the Albuquerque Marriott Pyramid for the 2004 Employee Recognition Night, Sandia's annual celebration of exceptional service, leadership, technical accomplishment, and teamwork. The celebration banquet, which itself has earned a reputation for excellence and quality, is one of the ways the Labs says "thank you and congratulations" to individuals and teams selected in the annual Employee Recognition Awards process.

This year, the awards honored 65 individuals and 57 teams for such qualities as leadership, technical excellence, and exceptional service.

"Your vision and talent, your dedication and hard work comprise the foundations upon which Sandia National Laboratories is



building the trust of the nation and the world to deliver solutions in these times of great complexity," said Labs President C. Paul Robinson in an introductory note to the Employee Recognition Night program. "I thank each of you here tonight and all of the team members many of you represent."

Each year, the gala event is built around a theme; this year it was a 1950s-oriented blowout called "A Blast from the Past."

Sandia's Employee Recognition Awards program carries on a tradition that since 1994 has honored Sandians — individuals and team members — for outstanding services rendered to Sandia and the nation.

The individual recipients are pictured over the next few pages. A complete listing of team winners and team citations and the names of individual team members begins below.

*New Mexico photos by Bill Doty
California photos by Bud Pelletier and Randy Wong*

Individual honorees



Teresa Antolak
8529



Mary Bower
12620



Lucille Baca
2002



Sandra Chavez
2951



Glenn Barker
5533



Nancy Clark
2522



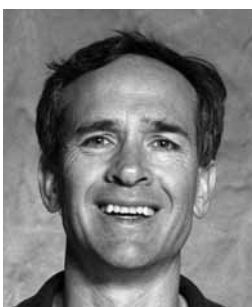
Barbara Bays
10267



John Clauss
4154



Trudy Blake
Org. 1



Leonard Connell
9745

Team honorees

The 2004 Employee Recognition Awards program, continuing a trend begun several years ago year, again found divisions placing a special emphasis on team accomplishments.

The teams listed over the next five pages were deemed to have made exceptional contributions to an important program or process. A few representative teams are pictured.



THE TARGET HARDWARE FABRICATION TEAM, which fabricated and assembled hardware to manufacture large, complex target units to support target missions for Center 15400, was one of 57 teams honored in the 2004 Sandia Employee Recognition Awards program.

B61 Vortex/Fin Interaction and Spin Rocket Aero Team

For providing comprehensive engineering analysis to quantify effects of vortex/fin interaction on B61 spin behavior to aid in the design of new spin motors.

Rocky Erven, Carl Peterson, Walter Wolfe, Jeffrey Payne, Steven Beresh, John Henfling

Antineutrino Detector Team

The Antineutrino Detector Team has deployed an antineutrino detector at a commercial nuclear power reactor for core monitoring and to report detection of antineutrino-like events.

C. Michael Greaves, Mark Zimmerman, Steve Karim, Nathaniel Bowden, James Brennan, John Van Scyoc, John Estrada, Duane Sunnarborg, Joel Groskopf, James Gollnick, James Lund, Grace Petines, Patricia Nicasio

SHIPALT Threat Analysis Team

Exceptional technical assessment and analysis by the SHIPALT Threat Analysis Team resulted in significant progress and improvements in the overall US Navy SSBN SHIPALT Program.

Donald Wesenberg, Mary Cocco, Barbara Cain, Debbie Eaglin, Krisan K. Smith, Shirley J. Turner, David J. Swahlan, Tommy Goolsby, Stephen Attaway, Roger Showalter, Steve Jordan, Robert D. M. Tachau, Vernon Koonce, Vanessa S. Berg, Richard D. Brown, Jeri D. Davis, Weston D. Henry, Paul Lee Johnston, John Lavasek, Deborah Lewis, Michael Lucas, Laura Myers, Brady Pompei, James Rivera, W. Venner Saul, Steven H. Scott

Space Shuttle Inspection Team

This team produced nondestructive inspection systems that have been selected by NASA for health monitoring and flight certification of all Space Shuttle heat shield components.

Dennis Roach, Phillip Walkington, Kirk Rackow, Kyle Thompson, Richard Perry, Jose Hernandez

BDYE Sensor Development Team

Sandia has designed and built the first of a new generation of integrated microsystems suitable for use in satellite sensor applications.

Todd Embree, Gary Zender, Christopher Garrett, Kerry Lamma, Paul Albert Lemke, Leslie Krumel, Georgia Yawakie, Belinda Tafoya-Porras, Leslie Vonderheide, Allison Tafoya, Lauren Rohwer, Marlene Chavez, Alice Kilgo, Ronald Grant, Jerome Rejent, Cathleen Ann Reber, Katherine Myers, Veronica Chavez-Soto, Patricia Snipes, Sarah Everist, Beverly Silva, Julia Blocker, J. Mark Grazier, John Falls, G. Ronald Anderson, James Mulhall, Paul Vianco, Robert Mitchell, Stephen Garrett, Riley Kilgo, Geoffrey Torrington, Robert Burr, Mike Montoya, Thomas Fisher, Guy Prevost, David Campbell, John White, Harold Anderson, Jr., Delfin Bangate, Edward Barreras, Irene Bentz, Matthew W. K. Brown, Rebecca Coones, Mandy Ferrizz, David Galdony, James Garsow, Ronald Goeke, James Gonzales, Donald Lee Greene, Darlene Anne Maldonado, Kevin Marbach, Fredrick McCrory, Kenneth McGuire, Michael Rightley, Edward Scussel, Sherrie Trezza, Fernando Uribe

DISL Project Team

The Distributed Information Systems Laboratory building construction was completed in November 2003, one month ahead of the DOE milestone and within budget.

Forest Blair, Diane Gomes, Christine Yang, James Keeton, Gerald Leroy Creager, David Dirks, James Bottorff, Dennis Beyer, Dave Nagel, Dave Rabb, Steve Carpenter, Todd Felver, Richard Gay, Alan Pomplun, Diane Veca, Rick Maurer, P. Douglas Vrieling, Gayle Allen, James Brandt, Robert Garrett, Martin Gresho, Craig Taylor, Anne Yang

Sandia Radiological Assistance Program Team *Outstanding radiological emergency response ser-*

(Continued on next page)

Not pictured

William Greenwood . . . 8945
William Hanson . . . 14401
Harold Hjalmarson . . . 9235
Patrick Lewis . . . 1764
Anthony Medina . . . 5700

Team awards recognize achievement



THE NEW EMPLOYEE ORIENTATION TEAM

(Continued from preceding page)

vice in the face of expanded mission, space, increased threat levels, and operational security requirements.

William Larkin, Brenda Townsend, Betsy Neuhaus, Alex Horvath, Jr., Kevin Rolfe, John Kilbane, James Keagy, Marvin Garcia, Christopher Mullaney, Hans Oldewage, Edward Schultz, Richard Stump, Michael Torneby

The W80-3 Environmental Case Stiffener Attachment Team

On a very tight, nearly impossible schedule, the team conceptualized, developed, ground tested, and provided a new stiffener for a critical W80 Flight test.

David A. H. Shimizu, Leroy Whinnery Jr., Kristopher Hearman, Joseph Puskar, Arthur Brown, Paul Dentinger, Lois Johnston, Christy Woodcock, Patrick Keifer, Doug Adolf, John Cates, Robert Chambers, John Friddle, Phillip Ferschbach, Timothy Gilbertson, Aaron Hall, Donald Herron, Marian Jackson, Andrew Joseph Mayer, Bernice Mills, Richard Neiser Jr., John O'Connor, Yuki Ohashi, Timothy John Roemer, James Spoonmore, Michael Tootle

SMART Development Team

This team recognized the need for remote sensing tools at the non-scientist level, and answered that need with the Sandia Labs Multispectral Remote sensing Toolkit (SMART).

Peter Geib, Nairong Nancy Wang, Stephen Lindsay, Prabal Nandy, Brian Post, Jody Smith, Clark Poore

Pollution Prevention (P2) Staff and Line Partners

This team enhanced the effectiveness and efficiency of line operations through technical analyses of processes, products, and facilities to conserve resources and reduce waste.

Christopher Evans, Jeffery Miller, Matthew Brito, Camille E. J. Gibson, Malynda Aragon, Judith Jajola, Sherron Hirdman, Margie Charlotte Marley, Kristin Ann Klossner, Jack Mizner, Sylvia Saltzstein, Charles Kearns, Douglas Vetter, Anastasia Dawn Richardson, Chad Hjorth, Nicholas Durand, Corey Campbell, Mark Crawford, Dolores Gonzales-Limon, Roy Hertweck, Jolyn Maheras, Kandice McDonald, Craig Nimmo, Maryann Olascoaga, James Romero, Lucille Roybal, Max Saad, Arthur Sena, Lonnie Trujillo, Ralph Wrons, John Zich

MC4300 Value Stream Team

This lean/six sigma team demonstrated a next-



SANDIA INSTITUTIONAL COMPUTING CLUSTER TEAM

generation approach to project management, resulting in reduced project cycle time and reduced changes to customer expectations.

Elsi Rodriguez, Carla Neumann Busick, Ruth Bargman-Romero, Maria Walsh, Richard Diprima, Gary Pressly, Gregory Neugebauer, Matthew Senkow, Keith Meredith, Carolyn Ann Neugebauer, Lisa Walla, Robert Welberry, Douglas White

Purchased Material Acceptance Application (PMAA) Implementation Team

Created a custom web-based application that significantly increases efficiency, decreases costs, and mistake-proofs incoming receiving, inspection, and non-conformance resolution of WR materials.

Andrew Brooks, Leanna Fresquez, Corey Reitz, Bruce Bowles, Eric Santillanes, Anne Lacy, Ruth Harris, Cynthia Huber, Marie Gendreau, Antonio Lara, Floyd Gallegos, Christopher Mauro, Kenneth Varga, Robert William Humbert-Hale, Odelia Griffin, Richard Baird, Gilbert Theroux, Norma Deanda, James Lazos, Monico Lucero, Gloria Roybal, Mark Rule

Field-Structured Composites Team

By innovative application of magnetic fields, this team has created new classes of structured nanocomposites with unusual properties and broad potential for technology.

Eugene Venturini, James Martin, Rodney Williamson, Dale Huber, Robert Anderson, Gerald Gulley

Improved Surveillance Data Infrastructure (ISDI) Core Team

The ISDI core team is responsible for implementing the shared vision of accessibility, understandability, and analysis of surveillance data in assessing state-of-health of the stockpile.

Sandra Chavez, Arthur Verardo, Sheryl Hingorani, John Larson, Cheryl Willan, Heidi Ammerlahn, Frank Bacon, Steven Biehl, Rene Bierbaum, Teresa Lynn Cutler, Donna Sue Eaton, Robert Goetsch, Ronald Hahn, Lillian Ingham-Hill, James Andrew Johnson, Siviengxay Limary, Richard Pepping, Janet Sjulian

Moves Team

For designing and implementing an automated-integrated process providing a single point-of-contact to initiate a move, and reduced customer downtime and coordination time.

Robert Douglas Shinn, Israel Martinez, Timothy Peterson, Mary Tidwell, Tracy Lynn Ray, Dana Striker, Beverly Ortiz, Gabrielle Josephine Rosen, Kenneth Keahbone, K. Wayne Shirley, Pamela Katherine Thullen, Frederick William Carpenter, Julie Perich, Patrick Manke, Garron Christie, Robert Cantey White, Jr.

ECP Working Core Team

Recognition of the 2003 ECP Campaign Core Team, which helped raise nearly \$2.25 million, making Sandia
(Continued on next page)



Christine Cooper
10253



Daniel Gallegos
2664



Linda Daniels
2561



Curtis Gibson
5714



Tammy Eldred
9103



Susanna Gordon
8114



Judy Follis
10852



Robert Griego
10843



Danny Frew
15412



Edward Bruce Held
Org. 30



Stanley Fritz
6956



Michael Hightower
6202



John Fulton
4117



Marianne Hill
11100



2660 ADMINISTRATIVE SUPPORT TEAM



Belinda Holley
3521



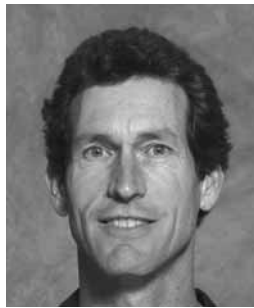
Patricia Hough
8962



Patrick Hunter
9125



Karen Jefferson
8964



Joseph Jones
6874



Deborah Linnell
8225



Dora Lovato-Teague
3001



John Ludwigsen
12333



John Macha
15414



Connie Martin
10741



Carolyn Marvin
15405



Jimmie McDonald
6873



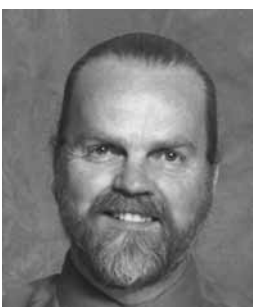
Paul Miles
8362



M. Teresa Olascoaga
6920



Adelita Montoya
4222



Kenneth Peterson
14152



John Mounho
10501



Carolyn Pura
8115



Stanley Mrowka
8751



Imelda Quam
5923



Richard Neiser Jr.
1833



Jacquelyn Rambo
10251

Team honorees

(Continued from preceding page)

the number-one United Way donor in New Mexico.

M. Griselda Armijo, Deborah Knewitz, Juanita Sanchez, Iris Aboytes, Deanna Gomez-Dalton, Michael McClafferty, John Merson, Janet Carpenter, Lynne Powell, Carol Wade

Corporate Construction Projects Delivery Team

In FY03, the Sandia Corporate Construction Program performed the most work in over 10 years while maintaining outstanding performance rating.

Lynne Schluter, David Wisler, Steven Fattor, David Hendrick, Marlene Hyde, Jenny Dubbs, Regina Dolores Sanchez, Dianne Duncan, Brandi Joy Yearout, Jennifer Medina, George Greer, Anthony Chavez, David Gibson, Rick Ramirez, James Smith, Brian Behling, William Hendrick, Stephen Fritz, Daniel Borneo, James Dawson, Thomas Faturros, Walter Heimer, Noreen Mary Johnston, Ricardo Ortiz, Loretta Peterson, Scott Rowland, Edward Sanchez, Paul Schlavin, William Tierney, Ralph Wrons

US Army's Transformational Future Combat Systems (FCS) Integrated Support Team (FIST)

Powerful national laboratory team led by Sandia National Laboratories, selected by US Army to bring broad, complementary objective technical expertise to the US Army's cornerstone transformational program.

Brian Van Leeuwen, Leon Chapman, Randall Rigby, Margaret Hauer, Michael McDonald, James Campbell, Alice Ann VanDevender, Dennis Anderson, Mark Yee, Eric Parker, Russell Skocypec, Charles Villamarin, Brian Hart, Fred Opper III, Alan Nanco, Robert Cranwell, James Phelan, John Wagner, Michael Senglaub, Frank Nutt, Ronald Halbgewachs, Bobby Turman, Raymond Harrigan, Carl Edward Lippitt, John Michalski, Dwight Miller, Phil Chamberlin, K. Terry Stalker, Philip Campbell, Kathleen Cash, Brian Clark, Steven Dron, Vivian George, Ronald Kaye, Andrew Lanzone, Thomas Lockner, Gregory Mann, Laurence Phillips, Robert Pollock, Nathaniel Roehrig, Steven Shope, Mark Torgerson, Stephenson Tucker, Bill Bui, Dennis Longsine, Bob Malins, Marta Parnall, Paul Patterson, Cecil Powell, Donald Shirah, Russell Stewart, Al Ferzacca

JTP Qualification Team

For the JTP (Joint Test Program) team's pioneering work in structural-dynamic model validation that provided critical design-qualification evidence for US and UK weapon components.

Garth Reese, Jeffrey Gruda, Sheryl Hingorani, Jennifer Gilbride, Paul Gabaldon, Anthony Gomez, David Clauss, James Allen, Scott Klenke, Todd Simmermacher, D. Gregory Tipton, Stephen Crowder, Randall Mayes, Charles Adams, Manoj Bhardwaj, Larry Dorrell, Clay W. G. Fulcher, Ronald Hopkins, David Kelton, Thomas Paez, Luis Paz, Angel Urbina

Facilities Control System (FCS) Team

Employed a team approach in concert with IES objectives to support the construction of multiple new facilities.

Gerald Ray Gallegos, Michael Rocco, Randall Patrick Lanier, David Dobias, Ronald Rymarz, Edward Gore, Jason Jerome Laney

MicroHound Portable Explosives Detector Team

In response to a customer's urgent request for an improved anti-terrorism tool, the MicroHound Team

developed a lightweight, handheld explosives detector in a 14-month period.

Francis Bouchier, Arthur Rumpf, Diane Ross, Kevin Linker, Christian Hartwigsen, Douglas Adkins, Daniel Barfoot, Gary Shannon, Robert Sanchez, Kent Pfeifer, Steven Rohde, Charles Brusseau, Lester Arakaki, Mary-Anne Mitchell, Charles Rhykerd, Jr., Eric Varley

Project GENIE (GENERIC In-situ Emplacement)

For outstanding development of a complex set of counterproliferation technologies and their successful demonstration in a counterforce test series.

Marcus Martinez, Ron Lundgren, Agapito Chapa, Jerry Adams, Dante Berry, Mark Vaughn, Daniel Zimmerer, Frank Whiston, David Vigil, John Sichler, Dennis Anderson, Everett Hafenrichter, Steve Harris, Edward Henry, Mark Howard, Thomas Martinez, Mark Retter, Tedd Rohwer, Wendy Siemens, Gerald Wellman, Steven Wright, David Zamora, Roy Baty

MESA-TOP Occupancy Team

The MESA-TOP Occupancy Team ensured that the vision of a technology and operations prototype facility for MESA became real.

Ronald Jones, Karen Higgins, Taffey (Steel) Maddox, M. Edna Nolan, Mary Woodruff, Mark Schaefer, Mario Garduno, Timothy Frock, Ivory Alexander, Daniel Fleming, David Stauder, Frank L. Martin, A. L. Cindy Olson

Unclassified to Classified Image Management System (U to C IMS) Migration Team

The IMS Migration Team developed a solution that allows users to access the entire design definition collection (over 2.5 million documents) on Sandia National Laboratories' Classified Network.

Angela Romero, Susan Romero-Sosa, Amy Shrouf, Devra Francis, Mary Compton, Debra Stephens, Jimmy Tempel, Thomas Feeney, Adrian Miura, Craig Crowder, Richard Graham, Jeffrey Anastasio, James Andrew Johnson, Frederick Mitchell, Larry Kincaid, Patricia Kaufmann, David Longinotti, Julie Maggi, Alan Smith, Jay R. K. Smith

Massively Parallel Circuit Simulator (Xyce) Team

For developing and releasing a parallel circuit simulation code, for its successful application in a ASCI Milestone, and for performing the largest-ever analog circuit simulation.

Ronald Sikorski, Mark Gonzales, Regina Schells, Smitha Sam, Greg Valdez, Joseph Castro, Roger Billau, Michael Deveney, Michael Heroux, Thomas Russo, Eric Keiter, Rebecca Arnold, Albert Nunez, David Noyes Shirley, Eric Lamont Rankin, Todd Coffey, Scott Hutchinson, Charles Michael Williamson, Robert Hoekstra, William Ballard, Carolyn Bogdan, Stephen Brandon, Sudip Dosanjh, Teresa Gutierrez, Raymond Heath, Charles Hembree, Kathryn Hughes, Kenneth Donald Marx, Roger Pawlowski, Paul Plunkett, Bart Van Bloemen Waanders, Steven Wix, Jaijeet Roychowdhury

Oracle Purchasing Web Queries Team

Providing customers with enhanced easy-to-use capability to gain purchasing information, real-time, real fast.

Lucille Shaw, Marie Gendreau, Richard Baird, M. Louise Britton, Dorothy Brockman, Ramona Gauna, Tracy Jones, Suzanne Simpson

(Continued on next page)



Elizabeth Roll
10751



Daniel Segalman
9124



Joel Siemers
5940



Walter Smith
4211



Danny Thomas
2132



Rosalinda Vargas
14151

Team honorees

(Continued from preceding page)

Design of Integrated Infrastructure Planning (IIP)

IIP design team's process helps achieve Sandia National Laboratories' vision by addressing strategic gaps where mission needs are not being met because of insufficient infrastructure resources.

Samuel Felix, Donald Schroeder, Rosemary Dunivan, Katherine Rivera, Toni Leon Kovarik, Janet Williams, John Coffman, William Seier, Carol Manzanara, Carol Meincke, Susan Pickering, Jennifer King Girand, Pamela McKeever, Michael Quinlan, Mary Adams, Bonnie Apodaca, Virginia Clark, Kathy Lou Domenici, Richard Dunn, Roy Fitzgerald, Karen Gillings, David Rosenzweig, Carl Skinrood, C. Marie Steele

Fire Protection Program Team

The Fire Protection Group is a behind the scenes team which protects Sandia National Laboratories' personnel, including contractors, assets, and mission.

Bernard Argo, Joshua Sers, Laura Draelos, Alan Dickinson, Alcario Armenta, Robert Bruhn, Rick Hartzell, Paul Smith, Peter Feng, Michael Edstrom, Carlos Trujillo

BV+ Guidance and Control Team

For delivery of guidance and control hardware resulting in a successful flight of Booster Verification 5(BV5), a key element of the Ballistic Missile Defense System.

Bob Hurtado, Joseph Lucero, Stefan Thompson, Paul C. Brophy, Steven Gentz, Marsha Leatherwood, Cynthia Blain, Mellisa Heller, Stephanie Otts, Veronica Lopez, Etta Tsosie, Tammie Neill, Dennis Floyd, Charles Healer, Wesley Landaker, Paul Vianco, Ross Youngblood, John Sarsfield, Brian Henderson, Andrew Petney, John Wronosky, Bruce Bainbridge, Patrick Barney, Vesta Bateman, Frederick Brown, Lawrence Carlson, Richard Corderman, Donald Davis, Peter Dudley, Bettie Fisher, R. David Foral, Susanne Gabaldon, Louis Gonzales, Danny Lynn Gregory, William Hughes, Barbara Lagree, Jason Lechtenberg, Candace Majedi, Frank Paulic, Danisha Peterson, Gary Dwayne Peterson, Michael Plowman, John Romesberg, Randy Rosenthal, Hui-Chien Shen, Bertice Tise, Marian Van Delinder, Alfred Watts, Donna Young



INFORMATION MANAGEMENT TEAM

Sandia Science & Technology Park

Sandia Science & Technology Park is a 200-plus-acre technology community adjacent to Sandia National Laboratories. It serves as a partnership tool for the Labs.

Carl Becker, Carmen Good, Jacqueline Kerby Moore, James Clinch, Chuck Atwood, Tim Callahan, Deirdre Firth, Toni-Lei Ponic, Jim Trump, Randy Wilson

Permafrost ASIC Implementation Team

This team achieved first-pass design success, fast-turn fabrication, and on-time delivery of the Permafrost ASIC to meet critical W76-1 LEP system flight test schedule.

Adam Tanuz, Paiboon Tangyonyong, George Laguna, Jose Rodriguez, Thomas Hill, J. David Kestly, Kathleen Wilkel, Patricia Smith, Bradley Havener, Kurt Wessendorf, Jerry Soden, Lee Schoeneman, Harold Cooper, Richard Flores, David Renninger, Timothy Mirabal, Marcos Sanchez, Linda Cecchi, Rajen Chanchani, Guy Chun, Douglas Deming, Paul Dodd, Dale Hetherington, James Lee Jorgensen, Russell Mikawa, Michael Nicholas, Marty Shaneyfelt

WEPAC - Weapons Energetic Packaging Committee

The WEPAC team achieved engineering excellence in Weapons Packaging Technology to assure safety in the transportation of explosive products on public highways.

Charles Eberle, Cynthia Kajder, Roland Michael Kelley, Gordon Roubik, Riyaz Natha, Roger Smith, David Carroll, Allan Herrbach, Ron Karpen, Randy Medley, Steve Poteet, Dave Waltersheid

Sandia Semiconductor Ultraviolet Optical Sources (SUVOS) Team

For unprecedented advances in the performance of deep-ultraviolet GaN-based light-emitting diodes for bio-agent detection.

Firouzeh Jalali, Kristine Fullmer, Katherine Bogart, Karen Cross, Andrew Allerman, Robert Biefeld, Arthur Fischer, Jerry Simmons, Jeffrey Figiel, David Follstaedt, Stephen Lee, Weng Chow, Mary Crawford, Robert Kaplar, Steven Kurtz, Paula Provencio, Allen West, Sebastian Wiczorek

Radiation Protection Sample Diagnostics Team

Development of Uranium Technique for Bioassay Analysis Utilizing ICP/MS Technology

Manjit Ahluwalia, Kathryn Chavez, Sarah Dufay, Megan Lautman, Sonoya Shanks, Rose Preston, Jason Martinez, Justin Griffin, Michael Buvinghausen, Robert Reese, John Kilbane, Kimberly Brower, Beverly Key, Kenneth Sansone, Joseph Zigmund

Space Shuttle Columbia Accident Investigation Team

For the timely and comprehensive analyses identifying that foam-debris impact on the Columbia's wind leading edge was the most probable cause of the accident.

Kyle Thompson, Moo Lee, Donald Potter, David Kuntz, Ronald Loehman, Rodney May, David Crawford, Carl Peterson, Kurt Metzinger, Arthur Ratzel, Edward Piekos, Kenneth Gwinn, William Oberkampf, Basil Hassan, Jeffrey Payne, Wilson Brooks, Bonnie Antoun, Sam Glenn Beard, Jr., Thomas Bickel, Bennie Francis Blackwell, Thomas Buchheit, Brian Dodson, Michail Gallis, John Gieske, Jill Glass, Robert Hardy, Michael Hassard, Eugene Hertel, Jr., Roy Hogan, Jr., Teresa Jordan-Culler, Robert Kerr, John Korellis, Wei-Yang Lu, Richard Perry, Kirk Rackow, Dennis Roach, Christopher Roy, Simon Scheffel, Phillip Walkington, Kenneth Wilson, Steven Younghouse, Roger Max Zimmerman, Jose Hernandez

2660 Administrative Support Team

In recognition for proactive and exceptional customer service members of the 2660 departments in all areas of administrative support.

Cynthia Bermudez, Michelle Hadady

Center 1700 Technologist Team

Multiple significant contributions of the Center 1700 Technologist Team has led to their success in resolving technologist issues and serving as a resource to Sandia.

Manuel Montano, Karen H. Tatum, Kathleen Wilkel, Charles Fuller, Alejandro Pimentel, Kevin Fox, Donald Bradley, William Cavanaugh, Riley Kilgo, Thomas Hamilton, Carol Gutierrez, Sara Sokolowski, Earnest Roberts

(Continued on next page)



Paul Vianco
1861



Walter Wapman
15272



ANTINEUTRINO DETECTOR TEAM



Richard Wickstrom
5531



Christopher Young
5533



Gail Willette
9724



Ann Marie Zachar
4200



Vicki Williams
9334



Daniel Zimmerer
2334

(Continued from preceding page)

CMC at Amman Team

For excellence in the establishment and operation of the Cooperative Monitoring Center in Amman, Jordan, to promote cooperation in the Middle East through technology.

Adriane Littlefield, Arian Pregoner, Michelle Kent, Lydia Montoya, Charles Schaub, Nora Tankersley, Laura McNamara, Christopher Runyan-Beebe, Todd Dunivan, Amir Mohagheghi, Susan Caskey, Debbie Evanko, Karl Horak, Gregory Kolb, Michael Vannoni

Target Hardware Fabrication Team

The team fabricated and assembled hardware to manufacture large, very complex target units to support several target missions for Center 15400.

Johnson Morgan, Rex Jaramillo, Rosalinda Vargas, Tracy Jaramillo, Lin Nguyen, Jack Heister, Clarence Sanchez, Henry Romero, Johnny Montano, Jason Tillotson, Henry Baca, Gregg Jones, Herman Molina, Terrance Smith, Mark Kumpunen, Kraig McKee, Ernest Correa, Richard Miller, James Pankey, Mark Forster, Glendon Craig Clark, Bruce Page, Daryl Reckaway, John Dunton, Michael McReaken, David Rogers, Michael Vining, Ronnie Albers, Jose Barela, Roy Bonsack, David Calkins, Francisco Carrillo, John Cresap, Anthony Gomez, Donald Greene, Glen Heston, Thomas Kaufmann, Joseph Nekoranec, Fred Sanchez, Daniel Sena, Robert Sierra, Ronald Sorley, William Vanselous, Robert Vargas, Antonio Zamora

Advanced Atmospheric Research Equipment (AARE) Team

The AARE team developed an airborne nuclear radiation sampling system to provide national leadership with a unique nuclear proliferation monitoring capability indispensable to US security.

Walter Caldwell, Agapito Chapa, Joseph Sanders, Lemna Joseph Hunter, Bryan Spicer, Jeffrey Duncan, Jeffery Hampton, Yvonne Holling, Ann Louise Hodges, Susan Moore, Marcia Espander, Veronica Argo, Margaret Jacobs, Erik Ellis, Rubel Martinez, David Rakestraw III, Jerry Strother, Glenn Barker, Brian Schwaner, James Reid Finch, Lara Adams, James Doorn, Peter Havey, David Hawn, Claudia Jean Lokinski, Elijah Ezra Lynn, Dean Mitchell, Linda Moore, Frank Noda, Carl Sicking, John Pendleton Spruce, Rudy Villanueva, Timothy Wiseley

LDRD Office Team

Outstanding, responsible, and progressive stewardship of the Laboratory Directed Research and Development Program.

Gwendolyn Zon, Joy Bemdeserfer, Cynthia Harvey McDonald, Yolanda Moreno, Donna Chavez, Keith Ortiz, Richard Lewis Macklin, John Brewer, Charles Meyers, Donna Louise Drayer, Marie Garcia, Lucius Holton, Donald James Lealos, Margaret Carol Lovell, Edwin Theo Southwell, Jr., Carol Price Whiddon

Sandia Institutional Computing Cluster Team

For the Institutional Computing Clusters (ICC) at Sandia National Laboratories' two major sites, Albuquerque and Livermore, which began executing production jobs on Oct. 1, 2003.

Peter Wilson, W. Franklin Mason, Anh Lai, John Zepper, Jerry Smith, James Ang, J. Michael McGlaun, Pablo Garcia, Robert Leland, Geoffrey McGirt, Eric Arthur Engquist, Tuesday Armijo, Linda Bonnefoy-Lev, Douglas Doerfler, Joshua England, David Evensky, Jerrold Friesen, Darrian Hale, Grant Heffelfinger, Kathie Hiebert-Dodd, Catherine Houf, Michael Koszykowski, Christopher Daniel Maestas, Normand Modine, John Noe, Don Rudish, Kenneth Wilson

New Employee Orientation Team

The team's focus has been to bring new employees to full productivity as quickly as possible during their first year.

Valerie Knighten, Nancy Garcia, Daniel Lopez, Dana Cicone, Kathryn Mello, Beverly Kelley, Jason Reicks, Velma Bartholomew, Merlinda Winbush

Nuclear Power Plant Vulnerability Analysis Team

This Sandia-Los Alamos team completed a state-of-the-art, high-profile vulnerability assessment of two nuclear power plants to aircraft attack, bringing praise from several high-level government officials.

Jamie Cash, Vincent Dandini, Joseph Arguello, Jr., Gregory Wyss, Paul Demmie, Rodney May, Alexander Brown, Willard Roy Thomas, Barbara Meloche, Elizabeth Greene, Rebecca Campbell, Barbara Hawkins, Linda Flores, Ann Smith, Vincent Luk, Thomas Blanchat, Nathan Bixler, Floyd Eric Haskin, Robert Dallman, Allen Camp, Timothy Wheeler, Kirt



ARES FIELD TEST TEAM

Metzinder, Francis Wyant, Benjamin Spencer, Patrick Chavez, Randall M. Summers, Brian Oase, Jeffery Foster, Robert Waters, Stephen Attaway, Nicole Breivik, Jeffery Cherry, Robert Cole, Randall Gauntt, Fred Gelbard, Sylvia Gomez, Michael Hessheimer, Dann Jernigan, Eric Klamerus, Mark Thomas Leonard, Eric Lindgren, Yvonne McClellan, Harold Morgan, Charles Morrow, Jill Murphy, Vernon Nicolette, Emily Preston, Thomas Reecer, Salvador Rodriguez, Patrice Saxton, Stewart Silling, Annie Valencia, Kenneth Charles Wagner, Mary White, Hugh Whitehurst, Michael Wilson, Scott Ashbaugh, Daniel Brewer, Russ Johns, Rene LeClaire, Patrick McClure, Ray Nause, D. V. Rao, Kent Sasser

Problems in the Production of Natural Gas: Solutions, Methodologies, and Modeling Project Team

This research maximizes the extractable volume a vital domestic energy resource, while minimizing the environmental impact of surface disturbances associated with drilling and production.

John Lorenz, John Holland, William Olsson, Bill Arnold, Scott Cooper, James Herrin, Russell Keefe, Christopher Rautman, Paul Basinski, Connie Knight, Rich Larson

Bent Crystal Imaging Radiography

A high-resolution monochromatic X-ray radiography diagnostic was developed and used on Z to measure the mass evolution of z-pinches, ICF capsules, and complex hydrodynamic targets.

Benjamin Thurston, Laurence Ruggles, Walter Simpson, Daniel Sinars, Michael Mazarakis, Guy Bennett, Thomas Nash, Michael Cuneo, Patrick Rambo, Dean Rovang, Robin Scott Broyles, Richard Adams, David Hanson, Keith Keller, David Wenger, Christine Coverdale, Christopher Deeney, Drew Johnson, Brent Jones, Ian Smith, Christopher Speas

3M Biosensor CRADA Team

Acoustic wave biosensor R&D activities over the past two and a half years have helped 3M move Sandia National Laboratories technology to the product development phase.

Edwin Heller, Dennis Rieger, Amelia Sanchez, Darren Branch, John P. Lucero, Susan Brozik, Tina Petersen

Information Management Team

The Information Management Team (IMT) continually rises to challenges and generates products that enable its customers to accomplish their missions and exceed their expectations.

Elizabeth Ann Kivlighan, Stacey Durham, Jeanne Therese Yorke, Lucie Mayeux, Kasumi Silva, Janell Waquie, Jessica Dixon, Stephanie Anderson, Armando Lopez, Dan Nester,

Jewelee Lucero, David Furbush, Sally Kmetz, Linda Lovato-Montoya, Viola Madrid, Mark Montoya

Microarray Analysis Team

For working with the UNM Cancer Center to help develop a new understanding of the genetic basis of infant leukemia.

Shawn Martin, George Davidson, David Haaland, Cheryl Willman

The Symbiotic Communications (SYCO) Team

The SYCO team developed a unique bistatic airborne radar system to produce SAR imagery, digital terrain data, and ground moving target indication for DARPA/ATO.

Patrick Barney, Billy Brock, Mark Dowdican, Charles Healer, Kathie Woods, Steven Allen, Douglas Bickel, Bryan Burns, Michael Pedroncelli, Robert Morris, Robert Bugos, Darrell Kirby, Michael Striker, Jeffrey Greving, Timothy Bielek, Robert Martinson, Douglas Thompson, Lars Wells, Michael Taylor, J. Thomas Cordaro, Jeffrey Bradley, Paul Eichel, Irene Erteza, Richard Hurley, Philip Kahle, John Littlejohn, Joe Lucero, Stephen Reber, Bertice Tise, David Zittel

Custodial Services Improvement Initiatives Team

Employed team approach in concert with IES objectives to develop and implement new processes to improve customer service and to reduce costs in Custodial Services.

Pamela Mincey, Lavone Jones, Vicky Blackberg, Donald Lincoln, Gil Sanchez, Donald Bailey, James Rush, Charles Hollis, Mary Wagner

East Avenue Security Enhancement Project Management Team

This project was a high priority effort between LLNL, SNL, and NNSA to enhance safety and protect essential facilities and infrastructure along East Avenue.

Gary Shamber, Craig Taylor, Edward Cull, Jr., Pam James, Edwin Diemer, Donald Charlesworth, James Keeton, Theresa Price, Patricia Smith

The MC4652 Crypto Coded Switch (CCS) Team

The MC4652 CCS Team developed PAL Switch capabilities in support of W80-3 LEP requirements, and completed Evaluation Status Release (ESR) Stages 1 and 2.

David Peercy, Gregory Wickstrom, Hazel Rodriguez, Mary Akins, Elizabeth Lopez, Dominic Montoya, David Neidigk, Mathew Donnelly, R. Reed Jackson, Jr., Elmer Chavez, Steven Morrison, Ron Meyer-Hagen, Brent Meyer, John Williams, M. Ray Thomas, Rodema Ashby, Mark De Spain, Jason Gale, Victoria Hamilton, Elaine Lopez, Nathaniel Madrid, Timothy Mirabal, Gideon Robertson, Fernando Uribe, Roger Vogel

Z Dynamic Hohlraum ICF Team

Thermonuclear fusion produced at Z.

John McKenney, Thomas Mehlhorn, Carlos Ruiz, Thomas Nash, Gary Wayne Cooper, Stephen Slutz, Patrick Lake, Dan Nielsen, Gordon Chandler, James Bailey, Ramon Leeper

Ares Field Test Team

For dedicated and tireless support during field testing of the Ares biological weapons (BW) standoff detection system.

Isaac Shokair, Kevin Schroder, Philip Hargis, Craig Boney, Randy Schmidt, Mark Johnson, Jim Klarkowski, Jim Daniels, Glen Magee

Advanced Penetrator Technology

Per request of DTRA, Sandia engineers (2000, 9000, 15000) demonstrated new technology critical to remote target characterization in support of war fighter, bomb damage assessment.

James Calderone, Danny Frew, Robert Gilchrist, John Heise II, Edward Henry, James Arthur Jones, Clinton Landron, Randal Lockhart, Donald Longcope, Amos Martinez, Anthony Mittas, Michael Partridge, Edward Russick, Troy Satterthwait, Matthew Sena, Thomas Warren

MENTOR/Pal Team

This team took an innovative concept from idea to prototype hardware in six months.

Steve Birch, Ellen Cook, Richard Craft, Adele Beatrice Doser, Curtis Johnson, Wendell Jones, Peter Merkle, William Peters, Tim Murphy, David Sparks, David Warner, Crystal Yalch



**Exceptional service
Leadership
Technical excellence**

Remembering Rachel, celebrating her life

Through United Way, Sandians help make Rachel's Courtyard a reality

By Iris Aboytes

Knowing that our life made a difference and leaving the world a better place — that is the impact most of us would like to have made when we leave this world. Five-year-old Rachel Laub made a difference, and she left this world a better place. Rachel was the daughter of Tom (15341) and Julie Laub and the sister of William and Tingting Laub.



RACHEL LAUB

Rachel died in April 1999. In October of that year, Tom asked Sandians for help through an article in the *Lab News*. He told how his daughter died suddenly and unexpectedly. He shared with us how Rebecca Armstrong, Child Life Director at Presbyterian Hospital, where Rachel died, approached Tom and his wife Julie about the possibility of building a courtyard on the sixth-floor pediatrics unit. It would be called "Rachel's Courtyard" in honor of their daughter.

To open in October

In October of this year Rachel's Courtyard will be completed. Rebecca's vision will be a 3,600-square-foot facility. In the courtyard is a mini street scene with four scaled-down little houses. Inside each house will be games. There will be a miniature park with a playground and a sand box. There will be planters with trees and flowers, and places to just sit. At one end of the street there will rise an observatory-planetarium where children can study the stars.

"I was overwhelmed by the response of my fellow Sandians," says Tom. "Working at Sandia, I had always felt part of a community rather than a company, and the way Sandians came together to support me and the larger Albuquerque community just solidified my feeling. At the beginning of this ordeal, my fellow Sandians helped me and my family in our time of intense need, and Sandians continued to help us in our quest to build Rachel's Courtyard.

"It is a good feeling to know that the people



ARCHITECT'S DRAWING of the wildly inventive, colorful, and sun-washed Rachel's Courtyard.

Dekker/Perich/Sabatini

you work with aren't just coworkers, they're friends. If Sandians had not given to Rachel's Courtyard, it would not be happening. That is a fact, not a feeling. We had to show community commitment and support before the Presbyterian Healthcare Foundation would commit their own resources to the project, and Sandians provided that support and commitment."

Zizi Fritz of Presbyterian Healthcare Foundation says, "The capital campaign is finished and construction is scheduled to be completed by early October. The total cost of the project is about \$1.5 million."

Sandians have contributed \$100K+

Over the last four years, Sandians have contributed about \$100,000 through the United Way of Central New Mexico. That number does not include amounts Sandians have contributed directly on their own or through holding fund-raisers. Sandia/Lockheed Martin Corporation contributed \$75,000 for sponsorship of the observatory.

The initial fundraising was spearheaded by Tom and Julie. They wrote grant proposals and spoke to groups interested in holding fundraisers. They received donations not only from Sandians, Albuquerqueans, and New Mexicans, but also

from people all over the United States, thanks to a Web site designed and donated by one of their friends. After 2-1/2 years, Presbyterian Healthcare Foundation took over the fundraising.

The entire community has embraced Rachel's Courtyard. There have been donations from construction companies and architects. Light fixtures, flooring, counter tops, building materials, and labor have been given. Twelve panels for the courtyard were designed and built by a company and then each one (\$7,000) was purchased and donated by a separate sponsor. Children from Albuquerque Day School donated their allowances (many pennies). Loose-change drives by students at SY Jackson Elementary School have netted about \$5,000.

Rachel's Courtyard will be visible from Interstate 25. Steel beams are being installed as it takes on a life of its own. Imagine an ill child and his or her family feeling the warmth of the sun on their faces and the bright blue sky creating a canvas of peacefulness and escape. At night the bright celestial stars will appear, offering peace and hope. The frightening medical procedures will be gone for a while, and there will be no shots here!

Find more detailed information on Rachel's Courtyard at www.phs.org/rachel/index.htm.

Sandia News Briefs

Arian Pregoner named to US Council on Foreign Relations

Arian Pregoner, Senior Scientist in Sandia's Cooperative Monitor Center, has been named a member of the US Council on Foreign Relations. Founded in 1921, the Council is an independent, national membership organization and nonpartisan center for scholars dedicated to producing and disseminating ideas related to better understanding the world and foreign policy choices facing it. The Council publishes *Foreign Affairs*, the preeminent journal covering international affairs and US foreign policy.

Video history of NTS by Weapon Intern Program mentors wins Aurora Gold Award

The Video Services Department (12610) has won three Aurora Awards, an international competition to recognize excellence in the film and video industries. Competitors come from private and corporate production groups, advertising agencies, and television stations throughout the US and abroad. Video Services won a Gold Aurora for "The Weapon Intern Program Senior Mentors Present Their History of the Nevada Test Site — Part 2, Underground Testing." This video was produced for the Weapon Intern Program (2914). A Gold also went to "Containment Foam," produced for the High Consequence Assessment & Technology Program (4117). A Platinum Best of Show Aurora went to "Model Based Product Realization, Visions of Light." This video was produced by Video Services in collaboration with the Technical and Compliance Training Department (3521) for the Quality Engineering Department (12326).

Julia Phillips receives Yale University Wilbur Lucius Cross Medal

Julia Phillips, Director of Physical and Chemical Sciences Center 1100, returned to Yale University recently to be awarded Yale's Wilbur Lucius Cross Medal. This is the highest honor bestowed on alumni by the Yale graduate school. Julia received her PhD in applied physics from Yale. She was cited for being both a pioneering scientist and an important role model. Her research has advanced work in semiconductor materials and technology. Earlier this year Julia was elected a member of the National Academy of Engineering (*Lab News*, Feb. 20), and that induction will take place in Washington, D.C., Oct. 3.

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