

Quiet revolution in solid-state lighting may change the way we light our homes, offices, and world

Sandia at forefront of the revolution with LDRD Grand Challenge

By Chris Burroughs

A revolution is quietly going on that promises to change the way we light our homes, offices, and world. And Sandia is at the forefront.

Some 20 Labs researchers are working on a Grand Challenge project in the Laboratory Directed Research and Development Program (LDRD) that will establish the fundamental science and technology base to replace the country's primary lighting sources, incandescent bulbs and fluorescent tubes, with semiconductor light-emitting diodes (LEDs) — solid state lighting.

Senior Scientist James Gee (6200), together with Department Managers Jerry Simmons (1123) and Bob Biefeld (1126), head up the project.

"In some ways the revolution in lighting can be compared to the revolution in electronics that began 50 years ago and is only now reaching maturity," James says. "Just as for electronics, glass bulbs and vacuum tubes are giving way to semiconductors. And as in the microelectronics revolution, many of the possible applications for solid-state lighting will occur in ways that have not yet been envisioned."

LEDs are already found in toys, electronics, traffic lights, automobile signals, and large outdoor displays — devices that require durability, compactness, and cool operation. In some applications they also enable significant cost savings due to their lower consumption of energy: LED-based red traffic lights, for example, consume one-tenth the energy of their incandescent counterparts, enabling them to pay for themselves in as little as one year.

As LED technology matures, revolution leaders
(Continued on page 7)



NEW WHITE LIGHT — Art Fischer (1123) holds a sapphire substrate with indium gallium nitride layers. This is the base material for one type of semiconductor light-emitting diodes (LEDs). (Photo by Randy Montoya)

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Z-Beamlet lab wins R&D Magazine 'Special Mention' award

The Z-Beamlet facility in Sandia's Area 4 has won a special mention for engineering in *R&D Magazine's* 36th annual competition for the renovated laboratory of the year.

The award was announced on March 20 at the Pittcon Conference in New Orleans. A description of the project will be included in a Lab-of-the-Year section of the May 2002 issue of *R&D Magazine*.

The panel of judges included architects, researchers, equipment suppliers, lab design consultants, and editors of the magazine.

"I'm very pleased," says John Porter (1673), manager of the Z-Beamlet facility. "It always feels good to be recognized for hard work."

Mike Hurst (1673), Z-Beamlet operations coordinator, will journey to New Orleans to receive the award, a plaque. "It's a public recognition of his hard work in helping to bring it all together. He was kind of the glue," says John.

Says VP Al Romig (1000), who first suggested entering the lab in the competition, "It was such a significant achievement — to take one of the world's most powerful lasers from Lawrence Livermore and move it to Sandia to provide important diagnostic capabilities for the Z machine. With a near-miraculous team effort led by John Porter, our folks in Area 4 were able to take what had formerly been a warehouse and turn it into a high cleanliness facility to house this large, complex laser. We're delighted the renovated lab won the special mention."
— Neal Singer

Massive MESA project advances to next step \$68 million arrives to fund equipment, utility relocations

By Neal Singer

On a cold day in February, MESA program director Don Cook (1900) stands with his hands in the pockets of his black overcoat, looking through a chainlink fence at two huge front-end loaders digging up the field west of Bldg. 897 at the southeast corner of Area 1.



DON COOK at MESA site.

Sixty-eight million dollars will come in this year from the NNSA to push further forward a \$423 million project expected not only to

renovate much Sandia physical plant and equipment but also revive any flagging Sandia spirit (if any still remains to be energized post-9/11).

"This is where the Weapons Integration Center will be — three stories, with 181 weapon engineers," Don says. Gesturing to the east of the Microelectronics Development Lab, he says, "There is where the MicroFab will be, with new cleanrooms and equipment to replace CSRL [the Compound Semiconductor Research Laboratory]."

"The pedestrian walkway will be here where we're standing. We'll have a Starbucks and maybe a cafeteria."

Pointing north of MDL, he indicates the site for the upgrade of major support systems, and in MDL, the installation of the latest equipment for producing radiation-hardened circuitry.

"We've already paid \$9 million for rad-hard
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Sandia targets play key role in successful missile defense test

What's what

Know what Bettas are? Yes? . . . No? . . . Well, if not, it may just be because you don't know what you know, because they're all over the place.

They're those little fish you see in small fishbowls all over the place, including Sandia. They come in all colors and, I'm told, are a snap to take care of – which explains their popularity.

A nifty little desk adornment – something colorful drifting serenely on your otherwise cluttered desk, lending a little grace to the workday. In our building, there are three: Valentine, Fernando, and Frodo. Got any in your place?
* * *

There was a little practical return on a *Sandia Daily News* notice a few days ago. A reader responding to the announcement that Sandia's acronym/initialism guide has been upgraded and could be accessed in a pdf file via the Web wrote:

"Thanks. I was pleased to finally learn that a 'pdf' file is a 'probability density function' file."

You just never know when you're going to run across really meaningful information.
* * *

And there was a return on the blurb in this space last time about the really bright full moon. Bearing out the intro to that piece, that you find all kinds of esoteric information working in a place like Sandia, one reader pointed out that my friend's reference to the "prettiest 29/30ths moon" was off by a bit. He wrote that "since there are 13 lunar months in an Earth year, which makes somewhere near 28 as the denominator of the equation, I wonder which planet those mountains are on. Send him to astronomy class at UNM."

Well, . . . maybe. But editor Ken Frazier's trusty *World Almanac and Book of Facts*, 1998 edition, says this:

"The Moon completes a circuit around Earth in a period whose mean or average duration is 27 days, 7 hours, 43.2 minutes. This is the Moon's sidereal period. Because of the motion of the Moon in common with Earth around the Sun, the mean duration of the lunar month – the period from one New Moon to the next New Moon – is 29 days, 12 hours, 44.05 minutes. This is the Moon's synodic period."

So maybe everybody's right – sort of.
* * *

So just how much weight should you give employee comments in "Your Thoughts, Please?" Well, like talk radio, some of the chatter's from left field and some is pretty good stuff. You have to decide which is which for you. Read about it on page 12.
* * *

Think the lawyers know just about everything? Well, Larry Greher (11200) doesn't know at least one thing: Where do you get one of those Sandia mouse pads that seem to proliferate about as fast as their namesake?

No immunity for knowing the answer.

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

Diversity and Sandia — Some Thoughts

A letter from Labs President C. Paul Robinson

I had the chance to speak to all of you during the Diversity Standdown. Please let me have a few more minutes of your time to share some additional thoughts.

Sandia's diversity focus began in the early 1990s and took a significant step forward when more than 300 Diversity Champions (a grass roots effort) pressed Sandia's management to wake up to the problems in our lab and recognize the opportunities for improvement if we all embraced diversity. This month Lockheed Martin is initiating a renewed emphasis on diversity, as well.

I think we really "got it" when we heard the shocking and sad stories which some among us had experienced within our own workplace. Some individuals had been mistreated and made to feel uncomfortable by thoughtless acts by coworkers and some that must have been intentional. We were motivated then – and are still today – to achieve an environment where no one is made to feel uncomfortable.

Diversity is not just about equal employment opportunities (although I must tell you I take pride in the fact that Sandia has been steadily improving our demographics of women and minorities as employees and in our career ladders). Nor is diversity only about realizing the strong lesson nature provides us – that within each species, including humans, diversity is a strength in advancing that species or ensuring its prospects for long-term survivability.

In my view, the strongest reason why we should each embrace diversity and try hard to model inclusive behavior in our workplace is because no one – I repeat, no one – should ever be mistreated or made to feel uncomfortable because they are different from another's view of the norm. On the contrary, we should each respect and take pride in our coworkers, lifting them up rather than putting them down. Intolerance and hurtful acts toward others make no sense for bright, thoughtful people; and you are possibly the smartest workforce ever assembled.

Thus, I urge you to model the best of human behaviors in your dealings with your colleagues, not just to end any discrimination or thoughtless acts which cause offense, but to help fuel a warm and caring atmosphere where no one ever doubts that they are welcomed and valued.

Thanks for the chance to get this off my chest, and thanks for your exceptional service.

Perry speaks April 1 in Distinguished Lecture Series

Former Defense Secretary William Perry will speak at Sandia/California Monday, April 1, in a talk titled "National Security Implications of September 11th." He'll give his perspectives on current international military efforts in the war on terrorism and other current issues of interest to a national lab audience.

Perry will speak in the Bldg. 904 Auditorium from 11 a.m.-noon PST as part of Sandia's new Harry S. Truman Distinguished Lecture Series. His talk will be videolinked to Sandia/New Mexico's CNSAC (Bldg. 810) Auditorium from noon-1 p.m. MST and will be shown live on the Video Sandia monitor network around the New Mexico site.

Those who want to watch the speech from the CNSAC Auditorium (seating limited to 90) should contact Traci Parsons (12111) at 844-9078.

Retiree deaths

Arthur W. Barth (age 82)Dec. 23
Edward D. Herrity (86)Feb. 2
Charles H. Carlson (78)Feb. 13
Thomas N. Earp (84)Feb. 16
Allen E. Asselmeier (72)Feb. 17



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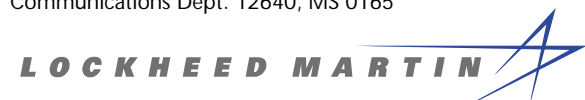
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Readiness Program exhibit on display in Bldg. 800, SLFCU

The Sandia History & Archives Program invites everyone to see the Readiness Program exhibit now on display in the Bldg. 800 Lobby and at the Sandia Laboratory Federal Credit Union on Juan Tabo.

The Readiness Program was one of four safeguards tied to US ratification of the 1963 Limited Test Ban Treaty.

Corporate Archivist Myra O'Canina (9612) prepared the exhibit, and Michael Vittitow of Creative Arts (12620) designed the six posters that outline the leadership, technical expertise, and manpower Sandia provided for the Readiness Program from 1963 through its conclusion in 1975.

Recent Patents

Edward Russick (1811): Method of Making Thermally Removable Epoxies.

David Haaland (1812): Hybrid Least Squares Multivariate Spectral Analysis Methods.

Kevin Linker and Charles Brusseau (both 5848): Two-Stage Preconcentrator for Vapor Particle Detection.

John Brockmann (9117), John Torczynski (9113), Ronald Dykhuizen (9116), Richard Neiser (1833), and Mark Smith (1833): Aerodynamic Beam Generator for Large Particles.

'Graduates' praise site's first biotechnology class

By Nancy Garcia

A cross-section of highly credentialed researchers, management, and staff has been spending afternoons at Sandia in a classroom, learning the intricacies of life science.

The on-site class, overenrolled during its first session, was a convenient and enlightening introduction to biotechnology, according to some of the 46 Sandians who attended the 28-week session that recently ended. Another session of weekly three-hour classes started in March and is being taught again by instructors from the University of California, Berkeley.

"After this session, roughly one fourth of the technical staff at the California site will have taken the course," says Len Napolitano, deputy director of Exploratory Systems and Development

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Center 8100, "and this is key in changing perceptions and culture."

Biology is considered by President and Labs Director Paul Robinson, among others, as the science of the 21st century, due to the promise posed by as-yet-not-fully-answered mysteries, such as how complex, self-regulating biological systems use molecular interactions to manage information from their heredity and surroundings and to direct dynamic processes.

"We think we work on complex issues with nuclear weapons," Len commented. "Many people did not realize how complicated even relatively 'simple' things are in biology."

Kevin Schroder (8120), an electrical engineer who is adding laser-based detection to a biosensor, found that the questions from peers who already had well-developed problem-solving abilities were incredible, insightful, and thought-provoking.

"I gained a new perspective on the possibilities of bioengineering and what might be done," he says. Never really having had a biology class before, he enjoyed the comprehensive

"We think we work on complex issues with nuclear weapons. Many people did not realize how complicated even relatively 'simple' things are in biology."

approach. "Now I understand what molecules are, where they come from, and why they are where they are."

He also developed a feel for a scientific discipline that still entails surprises. "It's not an exact science. There's a lot of knowledge, but few absolutes."

Senior scientist Walter Bauer (8704) particularly enjoyed a lecture about AIDS by a presenter who had conducted her thesis research as the health crisis unfolded. "The perspective of the evolution of the disease was fascinating," he says. He called the class "really necessary" for Sandians getting involved in bioscience research. It highlighted many differences for him between physics and the state of biological sciences. "There are enormous opportunities in the 21st century to bring the underlying, fundamental understanding up to the level of physical sciences in the 1940s and 1950s," he says. "There's a lot to be learned."

Bill Even, Manager of Materials Chemistry Dept. 8722, has several people from his department taking the class. Having studied enzyme coatings for solid-state materials for his doctoral

"Offering the class took foresight to give us an edge. There's traditionally a big disconnect between the physical sciences and biological sciences. . . . It was interesting to learn what a miracle life is."

work more than 20 years ago at Northwestern University, he was excited to revisit the "bio arena."

The class, Bill says, "is probably a key means of trying to move Sandia as a laboratory in new directions. It's very creative of Sandia to be proposing and doing something corporately at an upper-division educational level."

Bill finds it particularly important for existing staff to partner with newly hired specialists in the biochemistry arena to broaden both groups' perspectives.

"Graduates of the class gained enough familiarity in the subject to build these bridges. This way, various disciplines can technically play off one another to make the sum greater than the whole," Bill says.

"We need to provide an opportunity for people to learn more about biology because it's so important to people performing our mission," agrees Kurt Olsen, Director of the California Legal and Patent Center 11600. "Offering a class was visionary, exciting, and long-range. It was one of the most valuable and rewarding things I have done at Sandia."

Trained in mechanical engineering as an undergraduate, Kurt welcomed this survey of the field as he anticipates new biotech disclosures (a precursor to intellectual property) from inventors.

"I was astonished with how complex and difficult biology is," he says, adding, "But we have an opportunity to contribute in an original way. There's a huge amount of information that has to be managed. Understanding how molecules interact is a rich territory to mine with our computational techniques and modeling."

Laser spectroscopist Scott Bisson (8356) was so fascinated that he completed all the extra reading, including current interdisciplinary journal articles about biotechnology. He was thrilled to absorb a good year's worth of material, presented at an advanced undergraduate level, through an on-site course. He found a five-week section on immunology applicable to his interest in expanding his work to biosensors, and enjoyed developing a working vocabulary.

"Offering the class took foresight," he says, "to give us an edge. There's traditionally a big disconnect between the physical sciences and biological sciences. . . . It was interesting to learn what a miracle life is."

Wireless data transmission will be new wave in test flights

Vision is to use distributed intelligence to select relevant information

Wireless communication is moving beyond personal data assistants like Palm Pilots and other consumer electronics into warheads, as Sandia develops more compact and versatile ways to gather flight test information. The developments are also being adapted to other applications.

"Our mantra is to 'measure everything, interfere with nothing,'" say Curt Nilsen and Art Hull, managers of the two joint test assembly telemetry organizations (Depts. 8232 and 8333). The goal is a

wireless network of sensors that gather the right information in a joint test assembly in which each unit is smaller than a bottle cap.

Curt says there can be benefits in other national security applications. "If you get the right information to the right person at the right time, you can save lives and better utilize resources."

Part of the push to develop good, small instrumentation comes from Sandia's mission to ensure the safety, security, and reliability of the nuclear stockpile. As weapons age, "doing surveillance well is going to be extremely critical," he says, "as the stockpile is reduced in size and there are fewer flight

opportunities."

The vision is to use distributed intelligence to send back the most relevant information to the ground. This conserves bandwidth, since the capacity of the data "pipeline" to the ground is fairly fixed. With modeling and simulation (assisted by the Accelerated Strategic Computing Initiative), normal conditions of vibration and temperature can be predicted. Remote sensors can be designed to send back more information if the status differs from the expected baseline. Filtering of what data is transmitted will make use of dynamic bandwidth allocation.

Sensors, microprocessors, and communication algorithms will be the enabling glue to allow this transition to wireless data transmission, Curt says.

Also has security applications

There are other diagnostic applications at the Labs. On the security front, a new initiative has been championed by Materials and Engineering Sciences Center 8700 Director Rick Stulen to develop three hybrid microsystems, including an emergency radiation detector that incorporates wireless communication, a global positioning system, and radiation sensing. To characterize a threat from, say, a "dirty" bomb dispersing radioactive materials, many of these detectors would be scattered in an area where they would employ their built-in ability to "think and communicate" to

quickly relay an accurate, real-time description of the contaminated area.

"We want them small and inexpensive," Curt says. "We want them to be dropped from a plane, scattered from a vehicle, or deployed in several ways." The first prototype is expected as early as this summer.

"By using distributed wireless intelligence for sensing over an area — especially a system that can be rapidly deployed — we think we can contribute to homeland defense," Curt says.

At the Combustion Research Facility, a sensor mounted on a moving engine piston has been sending out pressure information wirelessly for research into engine efficiency. The Labs' μ ChemLab can also integrate small, wireless sensors to provide more complete information when assessing chemical "fingerprints." The Embedded Reasoning Institute is helping refine the quality of processors used at each node. And overall, the effort fits well with the newly formulated site mission to advance hybrid microsystems.

"By using distributed wireless intelligence for sensing over an area . . . we think we can contribute to homeland defense."

— Nancy Garcia

RSVP system deployed on US-Mexican border reports disease outbreaks

Medical community sees value in early detection, faster treatment along border and elsewhere

By Howard Kercheval

A system developed by Sandia and the New Mexico Department of Health to detect disease outbreaks more quickly and now deployed in southern New Mexico has demonstrated one of the goals of the Bi-National Sustainability Lab (BNSL) concept — the application of new technologies for economic development and better public health along the US-Mexican border.

In late January, the Rapid Syndrome Validation Project (RSVP) provided timely information on FluType-A and RSV — a children's respiratory ailment — to physicians using the system even before a major upswing in patient visits in Las Cruces, N.M. The information augments the traditional notification of outbreaks such as those from the Department of Health.

RSVP was conceived by Senior Scientist Al Zelicoff, a physician/physicist working in Cooperative International Programs Dept. 5320, and spearheaded by Dr. Gary Simpson of the New Mexico Department of Health.

Al is also a member of the team led by VP/Principal Scientist Gerry Yonas (16000) that is developing the Bi-National Lab concept (*Lab News*, April 2, 2001). The idea was conceived by Gerry after a trip to Juarez, Mexico, during which he was struck by the grinding poverty and absence of technology development on both sides of the border.

Since then, US and Mexican officials have met at various levels with Gerry and other members of the BNSL team. Those discussions have centered on ways to jointly develop the concept and exploit US and Mexican technology as a way to realize sustainable economic development and lessen tensions where international borders separate areas of need from areas of plenty.

Firsthand look for Bingaman

Sen. Jeff Bingaman, D-N.M., an early supporter of the BNSL concept, got a firsthand look at the RSVP system Feb. 19 during a visit to Memorial Medical Center, the largest comprehensive medical-care campus in Las Cruces. It was demonstrated by Dr. Catherine Torres, a pediatrician and commissioner on the US-Mexico Border Health Commission, who entered an actual case she was handling — a child with influenza-like symptoms.

Vipin Gupta (16000), on assignment in the

Las Cruces-El Paso area as part of the BNSL initiative, was present for the demonstration and pointed out to Bingaman that it is the same system he had seen only a couple of weeks before when he and Sen. Pete Domenici, R-N.M., hosted a briefing for Sen. Harry Reid, D-Nev., on counterterrorism technology being developed by Sandia and Los Alamos (*Lab News*, Feb. 8). Reid, Senate majority whip and chairman of the Energy and Water Development Appropriations Committee, said in a news conference following his Sandia tour that he had been impressed with Al's briefing on RSVP's potential.

Vipin said 33 members of the Memorial Medical Center staff — including physicians, nurse-practitioners, and nurses — now have RSVP log-in privileges. He said each case takes a minimum of 30 to 40 seconds to enter. The right combination of symptoms automatically notifies the New Mexico Department of Health by pager, fax, and e-mail. Public health officers can then call and talk to the care provider right away.

Torres said the system is a valuable aid in her practice. "Before, we never really knew what the rest of the state was doing," she said. "The reporting system was slow and more difficult. Now, we can just push a button and get information."

Simplicity of use is key

RSVP's simplicity is key to its use, Al said recently after evaluating the numbers that show its growing popularity since the code was rewritten late last year.

"The good news is that Version 2.0 works very well," he said. "Hospitals and clinicians like it. We keep stats on when they look at it, and it's more or less while they're drinking their morning coffee. They look and get a sort of 'lay of the land.'"

"It creates sort of an 'index of suspicion' — the aches and pains could be flu, or something else," he said. "Docs never had that data before. We gather it once a week and put it on the RSVP web page and, finally, we have people in public health updating."

"We really are trying to capture their experience," Al said, "because public health has the official role of declaring an epidemic. The system alerted physicians in Las Cruces to a sudden increase in flu and RSV, even before they began to see patients in their offices. By Saturday afternoon, stats were up on the Web, and they began to see

patients in their offices Monday morning.

"In practical terms, they probably avoid lots of unnecessary tests, and probably lots of unnecessary drugs," he added. "We are going to try to evaluate these and other parameters as part of the implementation in all clinics."

Torres agreed. She pointed out that there are medicines to prevent RSV in "preemies" — who might be at particularly high risk from pulmonary complications — and detecting the presence of the disease by way of high numbers of symptoms delivered on RSVP makes treatment more likely to succeed.

She said she hopes the system will eventually be functioning in at least 150 sites strung out along both sides of the border. At the time of Bingaman's visit to see the system in action, Al was in Brownsville, Texas, setting up three stations in public health facilities for beta-testing prior to putting them on-line as part of the system.

Widespread use predicted

RSVP also got a favorable nod from Dr. Bert Garrett, program director for the Southern New Mexico Family Practice Residency Program.

"Having RSVP in areas along the border would allow for immediate input and useful information to be disseminated to a broader group of providers," he said. "We predict that when the usefulness and potential of this program are generally understood, it will find widespread acceptance and application in the medical community."

Bingaman, who watched the RSVP system operate in Las Cruces just a couple of days before joining Homeland Security Director Tom Ridge and NNSA Administrator Gen. John Gordon for briefings and demonstrations of counterterrorism technology at Sandia and Los Alamos, pointed out its utility in the current environment of the country's war on terrorism.

"The Rapid Syndrome Validation Project could play a vital role in maintaining the public health, whether [health problems were] caused by Mother Nature or terrorists using biological agents," he said. "This system could help quickly track illness outbreaks before they become a major threat. I'm pleased this system is now being deployed in communities along the border, and I also hope this technology can be put to use across the public health system."

Zelicoff urges Senate committee to adopt Internet-based disease surveillance

Labs senior scientist Al Zelicoff appeared Tuesday before the Senate Foreign Relations Committee to discuss the merits of RSVP. It was Al's first testimony before a full congressional committee; his two previous appearances were before House subcommittees. Excerpts from Tuesday's testimony follow. The full text of his testimony can be found at http://www.sandia.gov/testimony/test_hom.html.

"My message to the Committee is a simple one: We must rethink our approach to the unique challenges of bio-terrorism. . . . I believe that peculiar aspects of the bio-weapons craft — small sites, an absence of signatures, ubiquitous availability of organisms — make it awfully difficult for analysts to locate, predict, or anticipate an attack except in the most general of terms. . . . Similarly, traditional arms control — declarations, inspection, counting, and compliance judgments — falls flat in adding any substantive strengthening of treaties such as the BWC. . . ."

"Fortunately, the news here is not all bad. We can address many, perhaps most, of our counter-bioterrorism needs through shared interests in the international community in disease-monitoring, biosecurity arrangements and assistance, and, at least among our allies, collective preparedness against bio-terrorism. The central and most substantive facet is enhanced disease surveillance, accomplished through an inexpensive, international, secure, Internet-based system located in primary care clinics and some hospital emergency wards, and an analogous system in the veterinary community. . . ."

"In almost any scenario involving the use of a bio-weapon, we have the ability to prevent illness and death in all but a small fraction of those infected, if — and only if — we have early warning that an epidemic is brewing. Hours matter. . . ."

"Today, it is unlikely that local public health officials — the true experts in infectious disease in their communities by dint of years of experience and observation — would know much of anything about any severe symptoms in the population until hospitals were overwhelmed with cases or autopsies revealed the diagnosis in droves. By then, it would be too late to save the vast majority of people succumbing to anthrax. Our current disease reporting system is stuck in the 19th century — paper based, disease specific, and so time-consuming as to frustrate even the most well-intentioned physicians who serve as the 'sensors' for illness in the community. . . ."

"But there is another way: In New Mexico, and in close collaboration with

the NM Department of Health, Sandia has developed and implemented a stable, physician-friendly surveillance system called RSVP — the Rapid Syndrome Validation Project. We've had about 50 doctors using the system over the past 6 months. Physicians actually take the time out of their busy schedules to consult the system to 'see what is going on' in their communities; public health officials review the data and update advisory messages on a near-real-time basis. The cost is that of a computer, a touch-screen, and a low-speed Internet connection — maybe \$5-6,000 per clinic serving 5 to 15 doctors. The physicians are delighted to have the information, and return the favor by entering suspiciously ill patients — and they're very good at sensing when something is amiss. And public health officials can quickly analyze the information with geographic tools that are part of the software. . . ."

"We've had requests from dozens of public health jurisdictions around the US to participate in and use RSVP; about two hundred more physicians are about to come onto the system. The Government of Singapore is installing RSVP throughout that island nation, and other governments have requested the software as well. In the end, the system works because it is in the enlightened self-interest of doctors and epidemiologists to have it; sharing the data makes it that much more valuable, as diseases respect no borders. . . ."

"Mr. Chairman, the traditional approaches to counter-proliferation of bio-weapons — more intelligence spending and arms control treaties — are largely ineffective in this context. It is simply impossible to detect and thwart all individuals or groups that are determined to use an infectious organism or a toxin as a biological weapon of terror. . . . We will have to rely on early detection of cases, in humans and in animals, in order to mitigate the worst consequences of a large-scale use of these kinds of bio-weapons. We ignore these conclusions at our peril. . . ."

"When all is said and done, should would-be perpetrators of bio-terror know that the effects of their attacks would be blunted if not eliminated, they might well re-think their strategy in the first place. A multi-national cadre of clinicians and nurses exchanging up-to-the-minute information is our single best defense, and we have the resource — now — to so equip them. All that is required is a policy shift emphasizing and strengthening this lynchpin capability.

"I am looking forward to the insightful questions of the Committee. I expect that I will learn from you much more than I impart."

Protecting sensitive information through OPSEC

Program teaches that the whole can be greater than the sum of the parts

By Bill Murphy

Poker players have it figured about right. Don't give anything away: not by how you grin or frown, by how you raise your eyebrows or wrinkle your nose; not by how you rearrange your cards, place your bets, or clear your throat. And if you must smile, smile enigmatically.

Any or all of those things could be an tip-off to the cooler head across the table that you either do — or don't — have something of interest fanned out in front of you.

The successful poker players, the Amarillo Slims of the game, are nothing if not masters of OPSEC. They don't call it that, of course, but that's what it is.

OPSEC, short for "Operations Security," is a way of thinking and acting in such a way as to protect critical and sensitive information from inadvertent compromise.

The operative phrase here is "inadvertent," says Reggie Tibbetts, Sandia's OPSEC program manager.

In the wake of real and perceived information compromises at the DOE/NNSA labs over the past few years, all aspects of security have been ramped up. The most visible programs — counterintelligence efforts, cybersecurity measures, and various forms of physical security — share a common purpose, Reggie notes: to foil, preclude, or otherwise prevent proactive attempts by adversaries to steal sensitive and critical information.

OPSEC is different.

"You might think of us as the other side of espionage," Reggie says. "Spies try to take sensitive information out of the Labs; we're trying to help Sandians avoid inadvertently releasing it."

What's an "inadvertent" release of information?

"Spies try to take sensitive information out of the Labs; we're trying to help Sandians avoid inadvertently releasing it."



BE CAREFUL of what you throw away. Trash cans and dumpsters are easy pickings for an adversary in search of "soft" sources of information.

Some examples: Old papers with sensitive data thrown in the trash instead of shredded or burn-bagged. An off-hand comment at a social gathering. An inappropriate mention of travel plans.

"We're not just talking about classified information here," Reggie says, "A lot of people think

Want an OPSEC briefing or audit for your group? Here are some contact names: OPSEC Program Manager Reggie Tibbetts, 844-5244; Sandia/New Mexico OPSEC Administrator Juanita Archuleta, 844-8762; Sandia/California OPSEC Program Manager Cindy Green, 294-2454; Tonopah Test Range OPSEC Program Manager Steve Feador, 702-295-8327.

that's what OPSEC is about. It's broader than that. Sensitive unclassified information and proprietary information need be handled with care, too."

Those little bits and pieces of otherwise insignificant information can add up to a pretty big picture, one you'd perhaps rather not paint. As Reggie notes, a trained operative can glean a lot from a little. "The adversary is going to go after the easy stuff, the soft stuff, any time they can. With OPSEC, our approach is to make it as hard on the bad guys as we can . . . let's not give anything away."

OPSEC is one component of the overall security approach at Sandia designed to protect the information the Labs is entrusted with.

Says Barry Schwartz, Integrated Safeguards and Security Management (ISSM) system project manager: "ISSM strives to integrate security into management and work practices at all levels so that Sandians can accomplish their mission securely. OPSEC applies the ISSM approach by providing Sandians tools and several forms of assistance so that the line organizations can protect sensitive information as they plan, perform, and check their work. OPSEC is providing people tools, not more rules."

Americans have recognized the value of OPSEC in trying times since the very beginning. Here's something George Washington said in 1776: "Even minutiae

should have a place in our collection [of intelligence], for things of a seemingly trifling nature when enjoyed with others of a more serious cast may lead to valuable conclusions."

By the time World War II came around, the concept of OPSEC had become ingrained into habit across the entire society. Everyone was reminded: "Loose lips sink ships."

OPSEC audits available

Reggie and OPSEC Administrator Juanita Archuleta have put together an OPSEC program to help organizations throughout the Labs understand the OPSEC implications of the way they handle sensitive information. To accomplish this, Reggie and Juanita are available to conduct organizational-level OPSEC audits, in which they'll identify the critical information a group generates, analyze the threats and vulnerabilities to that information, assess the risks associated with losing control of the information, and to recommend countermeasures to protect the information from adversaries. "Those countermeasure suggestions might be as simple as acquiring a shredder, or they might be something more extensive. Mostly what we offer is a common-sense perspective on how to do the right thing with sensitive information."

Reggie emphasizes that his OPSEC team doesn't issue demands; rather it offers recommendations. As he puts it: "We're there to help, not to write up [citations]. We're looking to find facts, not fault."

In addition to the on-site reviews and assessments, Reggie and Juanita offer presentations for Sandia groups of all sizes, from departmental staff meetings to Center and Divisional all-hands gatherings. The presentation lasts from 15 to 30 minutes, features a couple of brief OPSEC-related videos, and provides a review of OPSEC concepts, concerns, and countermeasures. They can also supply information that can be used within staff meetings around the labs.

Guess who's good at OPSEC?

The following article was provided by OPSEC Program Manager Reggie Tibbetts. — Ed.

Imagine our surprise on 9/11. No one believed the US could ever sustain a devastating event like the Twin Towers attack, but because of great (OPSEC) practices by the terrorists they were able to pull off a very devastating attack. In their minds, their mission and accomplishments were larger and more successful than they could have ever hoped. It is believed that the terrorists, using only open source information, were able to understand much about the structural complexity of the buildings and floor locations of the larger groups of occupants.

They were able to obtain flight plans and keep their mission under a blanket of secrecy. Apparently, each player was only privy to their role in the mission and therefore the main event was not compromised.

Keeping our Classified and Sensitive Unclassified information protected is very critical in these days. Protecting our national security-



OSAMA BIN LADEN, seen here at one of his al Qaeda training camps in June 2001, just months before the terror attack on the US. (Reuters photo)

related information and the proprietary information from the companies we perform work for gains more importance every day.

In the Vietnam era a team was formed to research how important maneuver information was getting to the enemy. This information allowed the enemy to counter many of our strategic maneuvers, leading to the deaths of soldiers. The team discovered that the enemy was intercepting flight plans being communicated. Allowing research & development information out of our Labs can ultimately leave our troops in a precarious position if the enemy has details about our weapons and defense systems. It can also lead to the deaths of innocent citizens as well as giving our adversaries important information about the research we perform.

Need assistance with your program or just want to know more about OPSEC? In New Mexico, call Reggie Tibbetts at 844-5244 or Juanita Archuleta at 844-8762. In California, call Cindy Green at 925-294-2454. At the Tonopah Test Range, call Steve Feador at 702-295-8327.

MESA funding

(Continued from page 1)

tools for MDL, with another \$30 million to be spent this year," he says.

To the west, almost to the Technology Transfer Center, will be the Joint Computational Engineering Laboratory building, a construction project managed separately from MESA but integrated functionally, where facilities and equipment for computational research and engineering will be located.

After several years of occasionally frustrating, line-by-line budget discussions with staff of the Senate, House, DOE, and NNSA, Don — a flexibly strong person who is calm on the outside but driven on the inside — has developed so intense and unswerving a belief in this project that he can make listeners almost see buildings otherwise invisible already standing on bare earth.

He points out the contributions of others as he itemizes the varied achievements of the massive project as it moves from paper to physical reality:

- \$68 million allotted this year by NNSA for MESA engineering design completion, rerouting of MESA site utilities, upgrading of the MDL major support systems, and retooling of the equipment for producing radiation-hardened microelectronics.

- "[Nuclear Weapons Senior VP] Tom Hunter's vision and leadership for the nuclear weapons program has been invaluable," says Don. "[Chief Technology Officer] Al Romig's drive for science and engineering integration to assist all the SBUs has been unwavering." The work proceeds under the direction of project manager Bill Jenkins (1920). The site utilities work is under the direction of deputy project manager Dave Bailey (10810). In upcoming work, there will be upgrades to the deionized water system, acid exhaust system, chilled water system, and the specialty gas system (toxic gases used for microcircuits and microsystems). The last is under deputy project manager Jim Beals (10810). The face of the ground is changing at the southern end of Area 1.

- A contract, under the supervision of Erlinda Silva (10253), has been signed with a local company, Albuquerque Underground Inc., to move utilities. The company did excellent work on Albuquerque's Big I highway project, says Erlinda, as well as on a previous sanitation project at Sandia..

- An in-house video of the MESA project won the 2001 Telly Award (which offers recognition to outstanding non-network and cable TV commercials) for portrayal of a computerized flyby of the complex as it will look when built.



MASSIVE PROJECT — Don Cook stands at the location where MESA will be built. (Photo by Randy Montoya)



"This is the largest construction project in the history of the Labs. While success has many fathers and mothers, [VP for Energy, Information and Infrastructure Surety] Bob Eagan envisioned a revitalized future for microelectronics at a time when capital equipment had eroded in the early 1990s."

— Sandia President C. Paul Robinson



"This huge project — which will be a significant landmark for the entire country — is a legacy from earlier work achieved at Sandia." — Chief Technology Officer Al Romig (1000), who mentions Willis Whitfield's invention of the clean room, the fabrication of VCSELS, and innovations in microelectronics as signature Sandia contributions.



"What we see in MESA is a foundation for the future of this laboratory. It's an out-growth of NNSA and maintaining the nuclear weapons stockpile. We care enough about the future of this country to make this kind of commitment."

— Nuclear Weapons Senior VP Tom Hunter (9000)

The video was made under the leadership of K-Tech contractor Dan Fleming (1900) and Video Services' Myra Edaburn and manager Lana Everett (both 12610).

The point of the huge project is to combine microsystems, advanced computation, and engineering design to create 21st century weapons and sensors for the United States, as well as to provide facilities for joint work with researchers from universities and business. "Ten years from now, we will have very few weapons engineers who aren't using microtechnologies and new, high-speed computational techniques in their design work," Don says.

Don nevertheless commends those Sandia engineers who have asserted that current control systems are more than adequate to direct nuclear weapons and that microtechnologies are as yet too unproven to control weapons of mass destruction. "Those are the right questions at this time. You need such folks to keep saying, 'It's not proven,' to keep us working on improving the technologies."

On the other hand, he says, "People don't often point out that we can't use vacuum tubes in these systems, even if we could buy them, because new hires don't know how to design circuits using tubes anymore. Technologies advance. Vacuum tubes have been replaced by microelectronics. The question is the amount of work we have to do to get new technologies ready for prime-time, high-consequence applications."

To this end, two design teams are working together programmatically to integrate nanotechnology and microsystems.

Another process that runs in parallel, Don says (returning mentally to the paper chase as he stands in the cold air at the MESA site), is the work authorization process within NNSA. "Under that process, the part for completing the engineering design has been freeing up nicely."

As he turns for a last look at the far reaches of MESA's rising domain, he looks in profile strikingly like a hawk. "We recently got approval from NNSA to begin final engineering for all of MESA," he says.

Technologies for solid-state lighting also benefit national security

Much of the technology being developed for solid-state lighting (SSL, see stories on next page) involves the growth of higher quality gallium nitride (GaN) and aluminum gallium nitride (AlGaIn) materials. It turns out that this same technology will benefit a number of important national security applications.

"Fundamental understanding of GaN materials physics and growth chemistry underlies not only SSL, but a whole host of technologies vital to national security interests," says Jerry Simmons (1123), the program manager for all of Sandia's SSL activities.

High-power electronics play an important role in synthetic aperture radar (SAR). Electronics

made from gallium nitride enable the heavy, bulky traveling wave tubes and gimbaled antennas to be replaced by arrayed antennas, resulting in dramatic reductions in weight. This in turn allows SARs to be placed on smaller unmanned aerial vehicles (UAVs) that can fly longer and farther and present a smaller target to any enemy. Centers 1100 and 1700 are working together to develop this gallium nitride high power electronics technology. Gallium nitride is also important for solar-blind detectors of missile launches.

Even more closely related to solid-state lighting is an approach to detection of chemical and biological warfare agents. When illuminated with deep ultraviolet (UV) light, bacteria, including

anthrax, will fluoresce — re-emit light at a slightly longer wavelength. This can be used to detect anthrax.

However, at present the sources of UV light are heavy tabletop-sized instruments. The technologies Sandia is using to further solid-state lighting are also being used to develop deep UV LEDs and laser diodes. In February the solid-state lighting team, along with the bio-detection system team headed by Phil Hargis and Randy Schmitt (both 1118), were awarded a \$4.5 million grant from the Defense Advanced Research Projects Agency to develop UV LEDs and lasers, and demonstrate their use in a compact prototype anthrax detector.

LEDs

(Continued from page 1)

expect solid-state lighting to also rapidly outdistance conventional lighting sources in both performance and cost.

"This new white light source could change the way we live, and the way we consume energy," James says. "LEDs are 10 times more efficient than incandescent bulbs and two times more efficient than fluorescents. Clearly, LEDs' replacement of conventional light sources would significantly reduce worldwide energy consumption."

LEDs were first demonstrated in 1962 by General Electric. The first products were introduced in 1968 — indicator lamps by Monsanto and an electronic display by Hewlett-Packard. LEDs were limited to small-signal applications until 1985 when LED power was increased, resulting in new applications. In 1993 researchers at several universities in the US and Japan developed a fairly efficient blue light LED based on gallium nitride. Efficiency improvements followed quickly. Today, efficient LEDs are available from red to green to blue light, making it possible to generate white light for illumination.



CLOSEUP view of LEDs substrate.

However, James says, LED-based light sources are expensive — more than two orders of magnitude more expensive than commercial incandescent light bulbs —

and will not be practical until their costs are reduced and efficiency is increased.

As part of the LDRD Grand Challenge, some 20 Sandia researchers are exploring ways to do exactly that — make LEDs more efficient and less costly. They are working on the fundamental science and technology challenges where Sandia has unique capabilities. Among those challenges are:

- Developing an improved understanding of the physics of the gallium nitride-based materials that are the base materials of the LEDs.
- Improving optoelectronic devices and materials for high photon generation and extraction efficiency.
- Improving wavelength conversion and color mixing technologies for generation of white light.
- Improving packaging technologies for high power LEDs.
- Developing an improved understanding of the physics of the gallium nitride-based materials used in LEDs.

"These are exciting challenges that will engage our scientists over the next several years," James says. "Our work will position Sandia to become a leading developer of the science and technology for this revolution in lighting."



NEW SUBSTRATE — James Gee and Jerry Simmons examine an image of light emission from an indium gallium nitride LED on a new type of substrate that was developed at and patented by Sandia. The new substrate features reduced densities by growing suspended wings, "cantilevers," of the semiconductor over an etched trench. (Photos by Randy Montoya)

New solid-state lighting web site offers complete information on LEDs

Sandia has recently launched a new web site (<http://lighting.sandia.gov>) that will offer comprehensive information on semiconductor light emitting diodes (LEDs) — solid-state lighting.

The site covers everything from up-to-date science and technology and business news to a calendar of industry events. Also provided are background articles and updates on the National Lighting Initiative.

Another feature of the website will be a searchable database of relevant patents — a bonus for those interested in tracking the intellectual property in this field.

The site is sponsored and maintained by Sandia's internal research and development team on Solid State Lighting Grand Challenge project.

Fulfilling the need for a single, comprehensive source of information, the site will be kept current and focused on this fast-paced technology area. For more information and for cross-linking opportunities, please contact Jeff Tsao (1123) at jytsao@sandia.gov.

Working on the web site project were Jeff, Dorothy Meister (1118), Mike Vittitow (12620), James Gee (6200) and Perspectives, a market intelligence company.

Solid-state lighting may change our lives for the good

If and when semiconductor light emitting diodes (LEDs) become the general lighting source, solid-state lighting proponents say our lives will change in good ways.

Some of those changes might be:

- Worldwide electricity consumption from lighting could be decreased by more than 50 percent and total consumption of electricity could be decreased by more than 10 percent.
- Carbon emissions and new capital infrastructure associated with electricity generation would decrease proportionately, also by more than 10 percent.
- The human visual experience would be enhanced through digital control over color and spatial distribution of light.

Bingaman introduces Next-Generation Lighting Initiative bill to Senate

How long will it take for the paradigm to shift and semiconductor light-emitting diodes (LEDs) to become the primary lighting source? Some estimates are 15 to 20 years to capture specialized markets and several decades to replace conventional lighting.

Sen. Jeff Bingaman, D-N.M., hopes to speed that up with legislation calling for the establishment in DOE of a "Next-Generation Lighting Initiative." Last year he, together with Sen. Mike DeWine, R-Ohio, introduced a Next-Generation Lighting Initiative bill to the Senate. It was later rolled into Bingaman's Energy Policy Act of 2002 (S1766), which was debated last week on the Senate floor.

Under the proposed legislation, the energy secretary would set up a planning board that

would have 180 days to develop a strategy for developing and implementing the technology. The energy secretary would then seek to establish a consortium of companies, national laboratories, and other entities to accelerate the development and introduction of solid-state lighting.

The bill would authorize \$30 million for fiscal year 2002 and \$50 million per year for fiscal years 2003 through 2011.

Interest in and support of the bill was catalyzed by an April 2000 white paper co-authored by Hewlett-Packard Co. and Sandia that outlined the benefits of converting general illumination to solid-state lighting.

In March 2001, the National Academy of Sciences held a workshop in Washington to

assess the promise of solid-state lighting and a Next-Generation Lighting Initiative. At that workshop, Sandia VP Al Romig (1000) spoke on the benefits solid-state lighting technologies can provide to national security needs — such as high-power electronics, solar-blind detection, and chem/bio detection.

Before that, in October 2000, Sandia, DOE, and the Optoelectronic Industrial Development Association (OIDA) sponsored a roadmapping workshop on solid-state lighting in Albuquerque and prepared the final roadmap report. A follow-up roadmapping workshop, with the same sponsors, will be held in Albuquerque on May 30. More information can be obtained by contacting Jeff Tsao (1123) at 844-7092.

Jackie Kerby Moore named a YWCA Woman on the Move

By Janet Carpenter

Sandia's Jackie Kerby Moore (14004) has been honored as one of 12 community women to receive a 2002 YWCA Women on the Move award.

The award honors women from all walks of life who have an impact on the growth of others through their leadership and public service. The YWCA of Middle Rio Grande established the Women on the Move Awards Program in 1985 to recognize women who have made significant contributions to their communities, businesses, and organizations.

Recipients must demonstrate outstanding professional achievements and/or outstanding volunteer contributions, and the qualities of a leader.

Other Sandians nominated for the 2002 award were Brenda DeLaurentis (10502), Merri Lewis (12660), Chris Morgan (9323), Julia Phillips (1100), Rebecca Spires (10310), and Amy Tapia (12650).

The Sandia Women's Program Committee (WPC) has participated in the WOTM Awards program since its inception and continues to sponsor and coordinate Sandia/New Mexico's involvement.

"Though I am honored to receive this award, what I feel good about is that I have a job that is making a difference in the community where we all live and work," says Jackie. "And, giving back to the community through volunteer service is just part of the culture at Sandia. There are thousands of us doing it."

Four years ago, Jackie was asked by Sandia executive management to create a research park



JACKIE KERBY MOORE



adjacent to the Labs. She now runs the Park on behalf of a nonprofit organization — the Science and Technology Park Development Corporation. As the executive director, Jackie has been

About Sandia Science & Technology Park

The Sandia Science & Technology Park (SSTP) is a 200-plus acre technology community. Located adjacent to Sandia, tenants have easy access to world-class facilities, technologies, scientists, and engineers.

Tenants in SSTP include Sandia industry partners and critical suppliers, as well as companies providing services to other high-tech



companies in the Park.

Under the direction of Lockheed Martin's Technology Ventures Corporation, the Science and Technology Park Development Corp. manages all aspects of Park development, from marketing to master planning. The staff at STPDC, including contract personnel and loaned employees from Sandia, enlists a variety of resources to ensure professional, competent Park management.

responsible for all aspects of bringing the Park to reality. Land that used to be just "dirt and tumbleweeds" in the southeast part of Albuquerque now serves as the home for 10 companies employing more than 500 people in technology-based jobs. She assembled teams and worked with community leaders to create a public/private partnership that could create an additional 6,000 to 12,000 high-tech jobs in the Park in the next 10 to 20 years.

Jackie and the Park have won awards for excellence from the New Mexico State Land Office, the Middle Rio Grande Council of Governments, and Quality New Mexico that recognize the impact that Jackie and the Park are having in the community. She has been featured recently on CNBC Television, KQOB Radio, and at numerous conferences and events touting the success of New Mexico and the Park. At the international level, Jackie was recently elected to the Board of Directors for the Association of University Research Parks.

She has been recognized as an "Up-and-Comer" by the UNM Anderson Schools of Management and was recognized with a "Smart, Savvy, and Successful" award by the Albuquerque Women in Business Directory. She was elected Vice President of the Board of Directors for Camp Fire USA, selected as an Advisory Board Member for the Assistance League of Albuquerque, and selected as the presiding sponsor for Beta Sigma Phi's City Council, a group of more than 250 women engaging in community service.

Jackie received the "Outstanding Keyperson" award from United Way of Central New Mexico for her leadership of the 1997 Sandia Employee Contribution Plan campaign, which raised over \$1.6 million for the community.

"My first involvement in the community was through Sandia," she says. "My boss asked me to lead our center's ECP/United Way campaign, and I have been working with social service organizations ever since."

ATA building dedicated in Sandia Science & Technology Park



The fifth new building in the Sandia Science & Technology Park, east and north of the Eubank Gate area, is now completed and officially dedicated.

Applied Technology Associates (ATA) had a ribbon-cutting ceremony Feb. 21 dedicating its new 15,000-square-foot building at 1300 Britt St. SE (at Gibson) there. Rep. Heather Wilson, R-N.M., was the keynote speaker. The facility will house ATA's 50 employees.

ATA, founded in 1975, is a precision measurement, sensing, and control company that provides services and products to government and commercial customers, Sandia among them. It has engineering experience developing technology and products for systems in directed energy, laser remote sensing, scientific data processing, pointing stabilization, and vibration characterization and control.

ATA President and CEO Anthony Tenorio says locating the new facility in the Sandia Science & Technology Park will allow the company to more aggressively introduce its products and services to a wider array of customers.

With the inclusion of ATA, the Sandia Science & Technology Park now employs almost 600 people from 10 different companies, says Jackie Kerby Moore (14004), executive director of the Park.

Lockheed Martin survey results indicate Labs 'Total Rewards' package is on track

No showstoppers — not even any real surprises — emerged out of the Sandia-specific data extracted from the 2001 Lockheed Martin Employee Preferences Survey, says Karen Gillings, Manager of HR Strategies and Services Dept. 3050.

"The survey was very useful," says Karen, "in that it gave us a great deal of feedback about the value of continuing to reinforce our entire Total Rewards package."

Sandia's Total Rewards — the overall combination of pay and benefits, work/life policies, work environment, and career development opportunities — has evolved over the years to reflect preferences indicated by Sandians

Sandia's "Total Rewards" — the overall combination of benefits, work/life policies, work environment, and career development opportunities — has evolved over the years to reflect preferences indicated by Sandians in previous in-house surveys.

in previous in-house surveys.

Corporation-wide, more than 46,000 Lockheed Martin employees participated in the April-May 2001 survey process. Sandia's own response of 2,300 constituted about one-third of all participants from Lockheed Martin's Technology Services Business unit. Because of the way the survey was conducted, Karen says, Sandia was able to get a Sandia-only "cut" of the results.

The survey, Karen says, indicated some areas where more emphasis will be placed, specifically in the realm of enhanced learning and career development opportunities.

One particularly gratifying result from the survey, Karen says, was the fact that many respondents had cited pension plan equity with other companies as a major consideration. Since the survey was conducted, Sandia and Lockheed Martin have won DOE and NNSA approval for a new more equitable pension formula (*Lab News*, Feb. 22).

"The activities we're pursuing under our Total Rewards program are consistent with what this survey and previous surveys are telling us," Karen says. "We're on track — and surveys like this one serve as a useful mid-course correction for us from time to time."

New Mexico students explore careers at 'School to World'

More than 500 volunteers, including many Sandians, participated in the third annual "School to World" career exploration event for New Mexico 8th and 9th graders at the Albuquerque Convention Center on March 9.

More than 1,500 New Mexico students and their families attended this event sponsored by Sandia, Lockheed Martin, area businesses, government agencies, and educational institutions. Sandia's Community Involvement Dept. 12650 organizes School to World.

The event gives students an opportunity to look at various career and educational opportunities and get started on their pathway in life. One student reported, "I really liked being able to talk with people who have had experience in the careers I am interested in."

At School to World, students meet people established in their careers and discover what kind of educational courses they need to pursue careers of their own. "They learn why school is critical for students to prepare for any career or job they choose," says Mike DeWitte (12650), event organizer.

This year, more than 150 careers in fields ranging from medicine to art and social work to business were included. Volunteers from the various career fields explained their job duties, told what educational skills and training are needed for their occupations, and shared why they chose their specific career or job. Most important, volunteers showed students the link between school subjects they are learning



IT'S LIKE THIS — Franz Lauffer (3121) gets passionate in his advocacy of education during the March 9 "School to World" career exploration event at the Albuquerque Convention Center. (Photo by Bill Doty)

today and the work skills needed for the future.

Representatives from colleges, universities, and vocational schools, along with community agencies that promote citizenship and hands-on skills development, were also on hand to speak with students.

Among the sponsors of this year's School to World were Philips Semiconductors, the New Mexico Commission on Higher Education/GEAR UP, the Central Area Workforce Investment Board, Albuquerque Public Schools, and Public Service Company of New Mexico. — Janet Carpenter

Two Sandians author new book on Monte Carlo theory

Sandians Stephen Dupree (5914) and Stanley Fraley (5003) are authors of a newly published book on Monte Carlo theory, *A Monte Carlo Primer: A Practical Approach to Radiation Transport* (Kluwer Academic/Plenum Publishers, New York, 2002, \$125). The book introduces readers to the use of Monte Carlo methods for solving practical problems in radiation transport and also serves as a reference work in the field.

According to a listing of the book that first appeared recently on Amazon.com, "It [the book] is suitable for advanced undergraduate and graduate



AUTHORS Stephen Dupree and Stanley Fraley with a copy of their book. (Photo by Walter Dickenman)

students and researchers who wish to expand their knowledge of the Monte Carlo technique." And it says, "Because Monte Carlo methods are closely linked to the use of computers, from the beginning the reader is taught to convert the theoretical constructs developed in the text into functional software for use on a personal computer."

"The book is quite an accomplishment," says Jim Yoder, Manager of Systems Technologies Dept. (5914), where Steve works. "It is useful to both practicing engineers and students. In

fact, the theory presented in the book provides underpinning for some of the radiation detection and materials interdiction part of Sandia's current counterterrorism effort."

"Although we started the book in 1991," Steve tells the *Lab News*, "we didn't begin a serious, concentrated effort to finish until 1998. We finished it in the summer of 2001, ten years and one month after we began."

Stan says it was gratifying to get advance copies of the book over the Christmas break. "It made for a great Christmas present!" This was especially so, he says, because some previous Christmas breaks had been used working on the book.

Stan and Steve say they want to thank friends and colleagues who helped with the review of the manuscript. "Kevin O'Brien [9815] and Jim Renken [ret.] reviewed the entire manuscript," Stan says. "Eleanor Walther [5914] reviewed the appendix, and we especially thank Len Connell [9815] and Tom Laub [15341], who not only reviewed the text but also devoted considerable effort to checking and using the Monte Carlo routines given in the book."

— Ken Frazier

Feedback

Whatever happened to the Harvard Health publications? Renewal costs were 'prohibitive'

Q: What has happened to the Harvard Health publication that we have been able to obtain previously? Will they be available again soon?

A: Prior to the onset of the information age, *Harvard Health Letters* were provided to all Sandia employees in print and then morphed into web-based periodical subscriptions in 1997. The web-based subscription to *Harvard Health* expired in October 2001. In considering renewal, we examined cost and reader feedback. The cost proved to be prohibitive. Interestingly, in reviewing years of feedback, a pattern of web user expectations for the delivery of online health content emerged. As web usage increased, we saw an increase in request for Harvard's articles to be indexed by topic rather than by issue date and to make the content searchable enabling future reference (common practice with web periodicals). We passed all Sandia readers request to Harvard but were unable to influence the enhancement of Harvard's periodicals to meet our user expectations of the web media.

Recognizing that current, authoritative, consumer-oriented and easily accessible health information plays an important role in helping consumers make preventive, proactive, and informed health care decisions, we continue to fund the *Harvard Health Letters* in printed form at the Technical Library and in the Health Services Waiting Room (Bldg. 831). Moreover, we negotiated a 25 percent discount for Sandia on individually purchased printed Harvard subscriptions. This equates to \$12 per annual subscription or \$1 per issue. We then carried a link to Harvard's Sandia discounted subscription for three months on our most popular web, the UPDATE homepage. This link was migrated to the Health Services homepage on Jan. 7, 2001. From Oct. 1, 2001, through Jan. 10, 2002, Harvard has received only 31 subscription orders, 13 for the *Health Letter*, 9 for the *Men's Health* and 9 for the *Women's Health Letters*. We will continue to carry Harvard's link at <http://www-irrn.sandia.gov/HR/health/> while the discount offer is in effect.

Furthermore, we migrated the monies that were no longer sufficient to procure *Harvard Health* to the purchase of Reuters Health Topic Wires. Reuters Health is a consumer-oriented health news content service provider that delivers clinically relevant healthcare information. You might have already noticed that Reuters Health is often the source of the local and national media's coverage of the health news. We hope that by providing Reuters Health articles directly to you, Sandia's readers will become the most informed and knowledgeable health consumers by enabling readers to view the actual source of the current week's health news prior to it being sensationalized through television and other medias. UPDATE has purchased rights to publish five Reuters Health articles per week on our intranet and 50 to start an archive with the rights to maintain each article for two years on our site. UPDATE publishers are able to view the topic wires on a daily basis and publish the articles that are most relevant to our population and to the mission of the Health Services Center. Because Reuters resides on Sandia's server it is searchable, and the UPDATE publishers will soon release a Reuter's specific search as well as a topic index to include the Reuters news articles.

— Larry Clevenger (3300)

Mileposts

New Mexico photos by Iris Aboytes
California photos by Lynda Hadley



Jane Ann Lamph
20 8111



Timothy Lucero
20 3132



Andy Lutz
20 8362



Marion Martin
20 8945



Ruth Padrick
20 8529



Michael Patton
20 3114



Robert Schefer
20 8351



William Silva
20 14181



Geraldine Smith
20 8517



Lila Zurzolo
20 1642



Geri Albright
15 0012



David Bodette
15 6531



Gary Cordes
15 14407



Scott Ferko
15 8111



Ed Hathaway
15 8529



Jeff Jortner
15 8990



Douglas Lawson
15 9813



David Rosenzweig
15 8524



Michael Thomas
15 1744



Ray Trechter
15 8945

Recent Retirees



Jerry Hochrein
15 15413



Bob Gardner
41 12610

Take Note

Retiring and not seen in *Lab News* pictures: **Roy Hamil** (15300), 21 years; **Keith Johnstone** (12334), 31 years; **Ted Montoya** (14192), 34 years; **Ursula Rounds** (5744), 17 years; **Jesus Sanchez** (15309), 33 years; **Robert Walko** (15336), 27 years.

Senate confirms Chu's appointment to head DOE waste management office

Margaret Chu is now officially a top DOE official in Washington.

Sandia's former director of Nuclear Waste Management was confirmed by the US Senate March 6 as director of DOE's Office of Civilian Radioactive Waste Management.

The office is responsible for evaluating the suitability of Yucca Mountain in Nevada as a permanent repository for high-level civilian and military nuclear waste.

To take the new position, Margaret retired from Sandia this week, effective March 19.

"Dr. Chu now has a monumental job before her, but I believe she will serve her country well in this post," said Sen. Pete Domenici, R-N.M., who strongly recommended her for the position last year.

"It has taken longer than it should have, but the Senate's endorsement of her nomination is a confirmation of her abilities to help move the nation toward meeting the challenges posed by nuclear waste," said Domenici. "I believe she has the talent, education, and professional qualities to be a positive force for helping resolve some of the complicated and controversial issues surrounding the nuclear waste issues in this nation."

Sen. Jeff Bingaman, D-N.M., chairman of the Senate Energy and Natural Resources Committee, which oversaw the Chu nomination, agreed. "Margaret Chu has a long and distinguished his-



FINALLY OFFICIAL — Margaret Chu with Sen. Pete Domenici at the time of her nomination last year.

tory managing nuclear programs at Sandia Labs," he said. "She will be a tremendous asset to the Department of Energy's Yucca Mountain program, which has been without a leader for more than a year. There are many complicated issues involved with the nuclear waste issue and Yucca Mountain, and I know Margaret's leadership is much needed and will be much appreciated."

Margaret has worked in various nuclear waste management positions since she first came to Sandia. She has a bachelor's degree in chemistry from Purdue University and a doctorate in physical chemistry from the University of Minnesota.

Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads

MISCELLANEOUS

EVENFLO CRIB, Jenny Lind, oak finish, excellent condition w/mattress, \$60. Gunkel, 797-7521, picture at babyterritory.com/j/lenny_lind/

EXERCISE BICYCLE, Tunturi Ergometer, gently used, 40-lb. flywheel promotes smooth, even riding, \$100. Keck, 237-0392.

BRUNSWICK BILLIARDS TABLE, w/accessories, 9 mos. old, cost \$1,900, asking \$1,100. Gaither, 559-9223.

SPINET PIANO, oak, excellent condition, \$800 OBO. Shoemaker, 869-2775, ask for Peggy.

EQUIPMENT RACK, 19-in. panels, 71-in. high, 35-in. deep, \$20. Williams, 298-2624.

IBM SELECTRIC II TYPEWRITER, long unused, \$50; 2 bar stools, chamois-colored faux-leather, \$40 ea. Gomez, 291-1062.

TWO-PERSON RUBBER RAFT, \$55; water cooler, \$65; trailer, 3/4-ton springs, needs electrical hook-up, \$75. Chavez, 842-6374.

WHIRLPOOL ELECTRIC DRYER, brand new, almond color, sacrifice at \$175 OBO. Rogers, 263-9459.

DINING ROOM TABLE w/6 chairs, \$350; double bed w/headboard, mattress, box spring, \$150; sofa, \$250; chest of drawers, \$50. Dye, 299-2250.

KENMORE UPRIGHT VACUUM, needs brush, available at Sears, free. Hayes, 299-1200.

KENMORE UPRIGHT FREEZER, 30" x 30" x 66", 15.9 cu. ft., excellent condition; washer & dryer, both Kenmore, excellent condition, \$100 ea. Wood, 299-8826.

UPRIGHT PIANO, tuned & serviced, \$250 OBO; composter tumbler, 9-bushel, sifting screen, \$190 OBO; inexpensive or free sewing fabric. Lagassee, 298-0977, www.composttumbler.com.

HAMMERED DULCIMER, 12/11, adjustable stand, case, all Masterworks, 6 mos., kept tuned, beautiful condition, sound, \$650. Talandis, 239-4005.

EXERCISE, very good condition, \$25. Moss, 298-2643.

COMPUTER COLLECTION: multiple monitors, CPUs, software, printers, cables etc., Mac/PC/Amiga/CPM/Apple II/TRS80/ZX81/other, \$1,000 OBO. Charles, 296-5851.

DINETTE, w/ 4 swivel chairs, nice glass/brass, \$200; La-Z-Boy recliner, \$75; dark wood-veneer entertainment center, \$50. Poitras, 293-4885.

WATERBED HEATER, Aqua Queen, 300W, new, \$35; Kenmore dehumidifier, \$40. Kettleborough, 293-4503.

CHILDREN STUDENT DESKS, 2, w/chairs, good condition, maple color, \$50 per set OBO. Webb, 828-2271.

PC COMPONENTS, used, baby AT desktop chassis, 250W ps, Pentium 200MMX mother board, 48MB, \$25. Sinton, 828-9672.

SOFA SLEEPER, full-size, brown & blue stripe pattern, great condition, \$250. Johns, 858-1430.

SOUTHWEST TICKETS, 2 roundtrip, w/drink coupons, expire June 02 & later, \$280 ea. OBO. Sikora, 296-1762.

SOUTHWEST AIRLINE VOUCHERS, 2 roundtrip, travel to be completed before June 15, \$300 ea. Thomas, 237-0467.

DOUBLE CRYPT, at Sunset Memorial Mausoleum, going rate, \$7,800. Martinez, 884-6836.

NORDICTRACK, good condition, \$25 OBO. Provencio, 797-2460.

CAR TOW BAR, base plate fits VW Rabbit, \$250; Rototiller, small, light, high-spd., \$150; floor polisher/shampooer, \$50. Breeding, 260-0820.

WHITE FOUR-DRAWER CHEST, corner desk, eggshell, bookshelf, \$45 ea. or \$115 for all; NordicSport ski machine, \$175. Samlin, 877-5771.

BEDROOM SET, 2 complete twin beds w/mattress, dresser w/mirror, nightstand w/lamp, \$400. Sansone, 296-7945.

WATERBED, waveless, large oak headboard w/glass display, make offer. Hamilton, 858-1371.

HO TRAIN SET, many cars, switches, buildings, spurs, trestle, 4x8 table, power supply, extras, \$100 all. Thornberg, 869-0421.

SPINET, PIANO, 1946 Wurlitzer, w/bench, very nice condition, appraised at \$800 to \$1,000, asking \$500. Martin, 296-6727.

BUCKSHOT MUDDERS TIRES, 4 plus spare, 225-75/15, on Jeep rims, used 600 miles, \$300. Kidner, 831-2868.

LA-Z-BOY RECLINER, black leather, like new, worth \$1,000, asking \$550. Nygren, 344-3332.

PROFESSIONAL-STYLE MOP BUCKETS, 4, 35-qt. capacity, w/mop wringers, paid \$100, asking \$35. Montano, 363-2906.

OAK ENTERTAINMENT CENTER, \$300; antique desk, \$250; oak end tables, 2, \$15 ea. Kellogg, 828-9523.

PORTABLE KENMORE DISHWASHER, excellent condition, all hardware included, \$300 OBO. Hjorth, 271-4111.

CHIPPER/SHREDDER/YARD VACUUM, Yardvark brand, 3-hp Briggs & Stratton, great shape except engine frozen, \$75. Packwood, 867-4743.

SOUTHWEST AIRLINE TICKETS, 3 roundtrip, \$270 ea. Wiseley, 286-9473.

KODAK 280 DIGITAL CAMERA, extra lens, 2.1 megapixel, rechargeable batteries, AC adapter, extra memory card, \$230. Hale, 298-1545.

TWO-HORSE TRAILER, \$1,000; stock tank, w/heater, \$50; 70 bales grass/alfalfa hay, \$6/bale; 16.5-in. Cordura saddle, \$200. Furry, 281-1024.

WICKER BEDROOM SET, like new, double/queen headboard, 5-drawer chest, 2 nightstands, new \$1,200, asking \$600. Hartwigsen, 865-7836.

CRIB, mattress, changing table, \$125; Twinnor baby jogger, \$285; high chair, \$15; baby swing, \$25; play yard, \$30; playpen, \$25; walker, \$10; exersaucer, \$30. Sanchez, 265-1365.

AB-DOER, exerciser, good condition, includes videos, \$50. Smith, 888-5184.

MOTORIZED WHEELCHAIR, brand new/ totally unused, retails for \$8,600, willing to bargain. Zelnio, 243-2652, ask for Jerry.

FUTON/BUNKBED, black glossy finish, futon lays flat or folds up like couch, \$60. Zender, 294-8210.

GOODYEAR WRANGLER GS/A TIRES, 5, 30x9.5R15, steel belted, only 6,500 miles, good tread condition, \$250. Melville, 299-6141.

ENGLISH CHINA, antique, white/blue, plates in 3 sizes, serving platters, covered bowls, & ladles, \$150. Treadway, 345-7302.

KITCHEN TABLE, w/benches & 2 leaves, \$200; 4 fiddleback chairs w/upholstered seats, \$100. Loeber, 821-3674.

VICTORIAN GENTLEMAN'S CHAIR, velvet, rose colored; 2 carved roseback chairs; animal crate, 21" x 30" x 24". King, 294-3125.

BABY CRIB/DRESSER COMBO, changing table, \$350; bouncy seat, gates, other baby items. Tucker, 822-5660.

HOMEMADE ICE-CREAM MAKER, electric, used once, includes box & instructions, cost \$20, asking \$10. Locher, 266-2021.

TROY BILT ROTOTILLER, 6-hp Tecumseh, excellent condition, \$650. Smith, 891-2098.

GOLF CLUBS, women's RH, 1,3,5 woods, 3-P irons, bag; fax machine. Spray, 821-5877.

ROTTWEILER PUPPIES, 2 females, 1 male, 8 weeks old, parents on premises, 1st shots, \$200. Gonzales, 898-8543 or 898-1609.

METAL RAIN GUTTERS, mitres, caps, downspouts, elbows, connectors & associated hardware, inquire about prices. Thompson, 292-2877.

MANUAL LAWNMOWER, Scotts 16-in. to 17-in. w/grass collector, \$25. Anderson, 232-2167.

COUCH/LOVESEAT, contemporary Southwest design, good, clean condition, green/beige/mauve, \$375 OBO. Sers, 344-4079.

DINING SET: table, 6 chairs, hutch, server, pecan, glass table top, excellent condition, \$1,250; dinette set, oak butcher block, 4 chrome/wicker/upholstered chairs, \$400. Thompson, 293-8390.

SOLAR PANEL, 42W, 2.4a, \$150. Horton, 883-7504.

PC MONITOR, large 20-in., \$75; 17-in., \$50. Celina, 232-8023.

NEED A VACATION, Hawaii timeshare for one week, \$750. Varoz, 831-6093.

SOUTHWEST AIRLINE TICKET, expires July 18, \$250. Chen, 821-6242.

KENMORE CLOTHES DRYER, almond color, \$125. Sedillo, 298-2527, evenings, leave message.

CASIO ELECTRONIC KEYBOARD/ORGAN, portable, huge variety of sounds & accompanying rhythms, like new, originally \$220, asking \$80. Clough, 821-2729.

KITCHEN DINETTE SET, 4 chairs, & 1 leaf. Campbell, 888-3135.

OMNIBOOK 6100 LAPTOP, Pentium III, DVD, MS Office, port replicator, new, \$4,000+ value, \$2,000 OBO. Cordova, 792-4859.

GARAGE SALE: sofa sleeper, \$75; antique & assorted chairs, March 23, 4005 Embudito NE. Creighton, 292-6805.

DINING ROOM SET, Formica table, 6 swivel chairs w/casters, vinyl backs, fabric seats, good condition, \$100. de la Fe, 271-6694.

KITCHEN CABINETS, full set, dark solid wood, plus double pantry, still installed for viewing. Gallegos, 293-8885.

DESK, large L-shape, w/hutch on one side, dark brown laminate, 65" x 65", \$80. Hernandez, 899-9080.

DACHSHUND PUPPY, 1 male, 7-wks. old, AKC-registered, \$300. Malbrough, 319-4023.

How to submit classified ads

DEADLINE: Friday noon before week of publication unless changed by holiday of publication unless changed by holiday. Submit by one of these methods:

- E-MAIL: Michelle Fleming (classads@sandia.gov)
- FAX: 844-0645
- MAIL: MS 0165 (Dept. 12640)
- DELIVER: Bldg. 811 Lobby
- INTERNAL WEB: On Internal Web homepage, click on News Center, then on Lab News frame, and then on the very top of Lab News homepage "Submit a Classified Ad." If you have questions, call Michelle at 844-4902. Because of space constraints, ads will be printed on a first-come basis.

Ad rules

1. Limit 18 words, including last name and home phone (We will edit longer ads).
2. Include organization and full name with the ad submission.
3. Submit the ad in writing. No phone-ins.
4. Type or print ad legibly; use accepted abbreviations.
5. One ad per issue.
6. We will not run the same ad more than twice.
7. No "for rent" ads except for employees on temporary assignment.
8. No commercial ads.
9. For active and retired Sandians and DOE employees.
10. Housing listed for sale is available without regard to race, creed, color, or national origin.
11. Work Wanted ads limited to student-aged children of employees.
12. We reserve the right not to publish an ad.

TRANSPORTATION

'99 TOYOTA AVALON, loaded, keyless entry, alarm, new tires, excellent condition, 39K miles, \$17,200. Coughenour, 294-3528.

'93 FORD EXPLORER, 2WD, 2-dr., 6-cyl., standard, extended warranty expires Nov. 4, 85K miles, \$5,500. Milliman, 256-5312 or 804-4739.

'99 CADILLAC DEVILLE, fully loaded, white/oyster leather interior, 39K miles, factory warranty, one owner, \$20,000. Turner, 345-1086.

'84 PONTIAC PARISIENNE, new carburetor & transmission, only 74K original miles, makes great low-rider, \$1,300. Barbera, 275-2562.

'93 LEXUS ES300, sunroof, CD, AT, AC, cruise, power, chrome, leather, 84K miles, excellent condition, \$11,900. Vigil, 271-7610.

'94 CHEVY 1500 Z71, 4x4, xtra cab, AT, AC, CD, cruise, 90K miles, excellent condition, \$12,500. Marchi, 271-7610.

'94 FORD F350, V8, AT, AC, LWB, crew cab, all power, 80K miles, excellent condition, \$13,750. Eisenberger, 877-7041.

'95 CHEVY SUBURBAN 4x4, AC, AM/FM/cassette, power seats/brakes/steering, green exterior w/beige interior, luggage rack, running board, approx. 96,984 miles; bids accepted through March 22; right to refuse bids; sold as is. Sandia Lab FCU 237-7254 or 237-7386 or 237-7384.

'91 PONTIAC SUNBIRD, convertible, V6, 72K miles, includes tonneau cover & convertible boot, \$3,500. Miles, 796-9354, after 6 p.m.

'02 MAZDA PROTEGE, white, 5-spd., polished alloy rims, 3K miles, 2-1/2 years left on warranty, \$15,900 OBO. Thomas, 294-2960.

'81 CHEVROLET SILVERADO, V8, AT, AC, PS, PB, tilt, runs, needs work, \$800. Browning, 255-8249.

'98 CHEVROLET 1-TON, dually, extended cab, turbo-diesel, 4x4, many extras, 54K miles, \$20,000 OBO. Bentz, 232-2558.

'87 TOYOTA PICKUP, new brakes, clutch & tires, low mileage, excellent condition, \$3,800. Yrene, 823-1126.

'86 HONDA CIVIC, 4-dr., 5-spd., AC, AM/FM, new tires, brakes & timing belt, very reliable. Mills, 823-4484.

'00 Z24 CAVALIER, blue, sport coupe, 4-cyl., 5-spd., AC, PS, PB, PL, PM, PW, cruise, airbags, alarm, moonroof, AM/FM/CD/cassette, 35K miles, clean & excellent condition, \$11,000 OBO. Enyart, 823-4811.

'93 FORD BRONCO, 5.0L, AT, AC, PS, PB, cassette, custom wheels & new Michelins, 150K miles, \$5,500 OBO. Bailey, 286-2450.

'96 FORD EXPLORER, Eddie Bauer edition, AWD, looks & drives like new, \$9,950. Henfling, 869-4119.

'99 SOLARA SLE, V6, fully loaded, CD, leather interior, sports package, 43K miles, excellent condition, \$17,000. Aponte-Rexach, 260-1317.

'76 MERCEDES 450SL ROADSTER, SOHC V8, hard/soft tops, ivory, many extras, 138K miles, excellent condition, \$10,900. Juveland, 459-7511.

'98 PONTIAC BONNEVILLE SSEI, super-charged, fully loaded, extended warranty, SW protection package, 34K miles, mint. Freshour, 256-9168.

'90 FORD PROBE LX, V6, 5-spd., 77K miles, very good condition, \$2,200. Able, 296-6089.

'91 LINCOLN MARK VII, excellent mechanical condition, very comfortable, \$5,000. Campos, 890-4462.

'92 MAZDA MPV, 7-passenger van, loaded plus, a very nice auto, \$4,900 OBO. Rea, 286-0286.

'94 FORD CONVERSION VAN, full-size, TV/VCR/CR/CB, convertible bed, trailer hitch, 69K miles, excellent condition, \$9,500. Burstein, 821-6688 or 897-7562.

'91 CHEVY SUBURBAN, 4x4, red/white, nice condition, \$5,200. Reese, 281-6658.

'94 BMW 325i, 4-dr., 6-cyl., 5-spd., gold, power everything, tan leather, ABS, sunroof, airbags, 102K miles, \$11,800. Taylor, 280-0433.

'98 JEEP CHEROKEE, V6, 4WD, 5-spd., power options, cruise, tint, luggage rack, new tires, 46K miles, 1 owner, garaged, excellent condition, \$12,500. Wilson, 294-4238.

'93 DODGE DAKOTA, club van, V8, 4WD, AT, AC, pickup shell, new tires & more, 32K miles, \$8,800. Pelletier, 884-3726.

'94 F150, 6-cyl., 72K miles; '76 18-ft. pop-up; 16-ft. boat motor, extras, for all, \$7,500 OBO. Camillo, 861-7212.

'95 HONDA ODYSSEY EX, front/rear AC, PS, PB, PL, PW, ABS, sunroof, alloys, magic seat, 66K miles, excellent condition. Comer, 281-9189.

'97 CADILLAC SEVILLE STS, 4-dr., 4.5L, V8, Northstar, black, all power, FWD, leather, sunroof, loaded, 74K miles, below book, \$16,900 OBO. Smith, 797-1517.

'00 TOYOTA 4RUNNER, 4-dr., 5-spd., 4WD, V6, AC, PS, AM/FM/CD, extras, 102K miles, excellent condition, \$6,500. Garcia, 823-6630.

'87 TOYOTA CAMRY, 4-dr., gray, AT, AC, PS, tilt, AM/FM, 60.5K miles, excellent, \$2,995. Maroone, 294-9844, leave message.

'97 CHEVY CONVERSION VAN, fully loaded, 24K miles, 1 owner, garaged, perfect condition, all service records, \$19,500. Robertson, 293-1007.

'98 HONDA CIVIC DX, sedan, 4-dr., 5-spd., dark green, AC, 30K miles, great condition, \$9,500. Kercheval, 266-5833.

RECREATIONAL

'84 JAMBOREE RV, 26-ft., rear bed, 4.0 Onan generator, very well maintained, 46,748 miles, \$12,995 OBO. Maish, 898-8027.

MEN'S ROADMASTER, 26-in bicycle, women's 24 Murray, both 5-spd., green, high- & low-range, \$35 ea. Hurst, 896-4218.

'92 JAYCO EAGLE 8, tent trailer, sleeps 6-8, garaged, new spare, awning included, great shape, \$1,400. Lopez, 291-0010.

'99 HARLEY-DAVIDSON SPORTSTER XLC, red, black, plus extras, 5,300 miles, excellent condition, still has warranty. Mehreng, 877-1508.

'68 FISHERMAN PACKAGE: 12-ft. aluminum boat, 3.5-hp, Evinrude motor, poles, tackle, anchors, oar, cushions, jackets, \$500 OBO. Leeman, 281-7949.

'00 HALLUZAK HYBRID race recumbent with or w/o fairing & suspension fork; programmable Timex datalink watch w/Microsoft disks. Sotelo, 298-0358.

LONG-EZ 0-320, light speed, Ellison, high-compression cermicrome cyl., Hal Hunt exhaust, digital comm., gyro panel, CATTO prop, \$45,000. Lewis, 294-0766.

'00 POLARIS VIRAGE PWC, 3-seater, 700cc, blue/white, good condition, \$3,500. Baca, 271-2692.

SUNRADER RV, 21-ft., on '85 Toyota truck chassis, 41,700 miles, excellent condition, \$5,000. Thomas, 471-1036.

COLEMAN "CRAWDAD" SKIFF, 10-ft., w/electric trolling motor & battery, \$400 or trade for mountain bike. Miller, 284-2107.

NISHIKI CUSTOM SPORT, 21-in., black, 12-spd., Sugino crank, SunTour derailleur, 27-in. wheels, w/performance variable magnetic resistance trainer, \$195. Sears, 891-4409.

'78 DODGE SPORTSMAN MOTORHOME, sleeps 6, new refrigerator, new AC compressor, trailer hitch, 69K miles, \$2,500 OBO. Stromberg, 255-6131.

'00 JAYCO KIWI 21C TRAVEL TRAILER, AC, heater, refrigerator, bath, electric brakes, awning, equalizer hitch, \$12,000 OBO. Mathews, 881-7368.

'00 KAWASAKI KX 250, race suspension, \$3,800. Bonsack, 872-1102.

'93 DUTCHMAN CLASSIC, refriger-air, microwave, refrigerator/freezer, stereo, TV antenna, awning, powerjack, 2 batteries, excellent condition. Carroll, 839-4713.

REAL ESTATE

18.6 ACRES, Taos Canyon, 3 building sites, all underground utilities, trees & views, National Forest/NM64, \$233,000. Ginn, 286-4425.

2-1/2 ACRES in Algodones, all utilities, \$56,000 OBO, terms negotiable. Martinez, 294-7694.

MOBILE HOME, on private lot, 1-1/2 baths, upgraded, real nice, patio, carport, fenced, landscaped, close to downtown, \$32,000. Draper, 281-2663.

3-BDR. HOME, 2 baths, 2-car garage w/work area, covered redwood deck, 1.3 acres in Tijeras, N.M., \$265,000. Lewis, 286-2393.

3-BDR. HOME, 2 baths, 2-car garage, fenced back yard, easy access to I-25, Los Lunas. Minier, 866-6431.

3-BDR. HOME, 2 baths, 2-car garage, 1,700 sq. ft., wood floors, auto shop, 1 acre in Los Lunas, \$147,500. Pantuso, 865-1597.

3-BDR. MOSSMAN HOME, 1-3/4 baths, hardwood floors, fireplace, security bars, large backyard, updated, price reduced, \$99,500. Duran, 881-6713 or 293-9769.

3-BDR. HOME, 1 bath, den, fireplace, security wrought iron, fenced yard, patio, 5 mins. from base. Blain, 266-1503, ask for Lou.

3-BDR. HOME, 2-1/2 fenced acres, steel roof, large deck, close to schools, high-spd. Internet, Edgewood, \$159,000. Brenkosh, 286-9497.

WANTED

BUNK BED, twin-size, with or w/out mattresses. Billau, 323-6272.

MAC COMPUTER, donated to a Christian School Library, will provide tax donation receipt. Rogulich, 298-5261, ask for Debbie.

MATH TUTOR, for high-school & elementary students, Manzano Area. Padilla, 292-8936.

GOOD HOME for golden retriever, AKC, 1-yr.-old, energetic, loves everything & everyone, likes to play, needs loving home & own yard. Dempsey, 281-9101.

USED O-SCOPE, dual trace, fast. Menicucci, 842-6330, ask for Dave.

SCSI II COMPUTER PARTS, cards, cables, etc. Sarkis, 266-2790.

STUDENT, to do landscaping/yardwork. O'Rourke, 933-2334.

GOOD HOME w/spacious yard, for 3 Labrador retrievers (2 yellow, 1 black). Martinico, 292-5915.

SOFTBALL PLAYERS, to complete Sandia Softball league team roster. Subia, 265-0536, ask for Sam.

ROOMMATE, to share 1/2 of 4,000-sq.-ft. home in 4 Hills, pets allowed. Maddox, 298-3815.

LOST & FOUND

FOUND: silver bracelet w/American flag design, outside of Bldg. 811 in one of the parking lots. Fleming, 844-4902, ask for Michelle.

FOUND: woman's pin on ground at SE corner of the "mall" area in Area 1, silver/pewter-colored, w/4 birds in a row. Fleming, 844-4902, ask for Michelle.

Trinity Site tour is April 6

The National Atomic Museum will conduct its semi-annual guided tour of the Trinity Site National Historic Landmark on Saturday, April 6. Tour buses will leave Albuquerque from the southeast corner parking lot of Winrock mall at 6 a.m. on April 6 and return around 4 p.m. Cost is \$45 per person. Space is limited. For more information or to make reservations call 872-2353 or visit the Museum's web site at www.atomicmuseum.com for a complete list of the Museum's Scientific Tour Series.

Sandia targets play key role in missile defense test

Sandia again provided the target reentry vehicle (RV) and decoys in support of last Friday's successful US Missile Defense Agency flight test over the Pacific, known as Integrated Flight Test #8 (IFT-8).

During the March 15 test an exoatmospheric kill vehicle (EKV) launched from the Ronald Reagan Missile Site, Meck Island, Kwajalein Atoll, intercepted a mock RV launched 30 minutes earlier aboard a modified Minuteman II intercontinental ballistic missile from Vandenberg Air Force Base, Calif.

Labs-designed target RV and decoys

Sandia designed the test's target RV as well as three inflatable decoys that were released near the RV prior to intercept. The RV-mimicking decoys were designed to test the EKV's ability to distinguish between the target vehicle and decoys, says Sandia IFT-8 project leader Bob Stearley of Targets Dept. 15415.

A Pentagon statement says the test was the most complex missile defense intercept yet. The EKV, with the help of ground- and space-based sensors and ground-based radar, successfully located, distinguished, tracked, and intercepted the target vehicle resulting in destruction by body-to-body impact, the statement said.

Only system-generated data were used for the intercept after the EKV separated from its booster rocket, it said.

Twenty Sandians supported Friday's launch from Vandenberg, monitoring the target vehicle's health in the hours prior to liftoff and reporting to customers telemetry data from sensors onboard two of the decoys and the RV during the flight, says Bob.

"Everything on our end appears to have worked well," he says.

Many Sandia organizations contributed to success

"Sandians from across the Labs contributed to the success of this project," says Jerry McDowell, Director of Aerospace Systems Development Center 15400. "Thanks and congratulations to all for your hard work and dedication."

Contributing organizations included Centers 15400, 2600, 14100, 12600, 9100, and 2300.

Friday's test was the fourth successful intercept for the Ground-based Midcourse Defense test program out of six intercept attempts. Sandia targets have been aboard all 11 IFT flight tests so far (the other five were fly-by or demonstration flights), and the Labs already is working on a target payload for IFT-9, planned for this summer, says Bob.

The Long Range Targets Product Office manages the targets program for the Missile Defense Agency. — *John German*



SUCCESS — Sandia target vehicle leaves the launch pad atop an ICBM as part of a successful March 15 missile defense test, Integrated Flight Test #8. (Photo by Diana Helgesen)

'Your Thoughts, Please' employee comment program gets mixed reviews for its first year

By Rod Geer

Employees have offered their thoughts about "Your Thoughts, Please," and although almost half of them offered a lukewarm to strong thumbs up there's clearly room for improvement in this program, which one Sandian called the first forum in his 24 years here "where gripes can be aired at the Labs level."

"Your Thoughts, Please," which has been in operation a little more than a year, poses questions any Sandian can respond to anonymously or with signature. All responses then are published on the internal web as part of the News-Center (<http://www-irn.sandia.gov/newscenter/news-frames.html>).

It emerged as a way to increase "interactive" communications, which Sandians at all levels have said they favor. It complements the long-established Feedback program, which permits employees to ask questions that are answered by subject-matter experts, often management. Finally, it responds to messages employees deliver in a variety of ways, such as attitude surveys. That message is to have an avenue through which employees can speak respectfully but with candor about the Labs.

The program's birthday gut-check took the form of a question about itself — basically thumbs up, thumbs down, or neutral on the first year's operation? Twenty-one Sandians responded. Ten, or 47.6 percent, were positive; eight (38.1%) were neutral; three (14.3%) were negative.

"I think it's great," wrote Jeff White (9517). "I wish you would venture into more controversial areas."

In fact, questions generally being too

benign was one of the two common themes in responses, whether the writer's overall impression was positive or negative.

One person wrote, "None of the questions has yet touched a nerve with me." Another said, "The first few questions were substantive and gave Sandians a chance to . . . give some possible real solutions. After that the questions became what I call 'Rah-rah.'"

The other common theme — expressed in one form or another on 10 of the responses — focused on whether Labs' management has been, as one employee wrote, "listening" to messages "Your Thoughts, Please" responses have carried.

Albert Reichmuth (8243) wrote, "If senior management would really look at and interpret these thoughts . . . then Sandia would truly be the work place that everyone would like it to be."

Some other employee comments:

- "The answers have ranged from humorous to amazingly insightful. They have always been interesting to read, even when I disagreed with the answer."

- "I only vaguely remember that there is a thing called 'Your Thoughts, Please.'"

- "Questions that appear to me to be fishing for compliments (some have struck me that way) will certainly get no response."

- "I believe it is important to continue to ask for employee feedback even if employees' suggestions are not used."

- "Your Thoughts, Please' gives both a good and a very bad impression after its first year."

- "I'd like to see the employees have more of a part in forming the questions that are

discussed."

- "If future questions were chosen with less concern about managerial sensibilities, I think 'Your Thoughts, Please' would be of much greater value."

Answer the current 'stressful' question

The "Your Thoughts, Please" question currently open for comment was designed with some of the first-year feedback in mind — to spark conversation.

It is: "Given the level and pace of activity at Sandia, please offer whether, in your opinion, talk around Sandia about increased stress reflects reality or is simply isolated anecdotes. Feel free to express your thoughts about any or all of these: (1) whether your level of stress is greater today than it has been in the past and why, (2) if your colleagues' stress levels seem greater today and why, (3) what, in your view, are indications of too much stress, (4) if you believe it exists, how pervasive you believe it is, (5) what the source(s) could be, and (6) what remedies would be helpful."

* * *

Responses will be accepted through April 5. Go to the web site to respond or simply write your response to thoughts@sandia.gov.