

# Arsenic-trappers could allay national sticker shock of new EPA standard

## Albuquerque to try Sandia sorbents at water-treatment plant

By John German

Sandians who have used Labs supercomputers to custom-design chemicals with flypaper-like arsenic-trapping properties plan to test the new materials in a city water-purification demonstration plant being built on Albuquerque's West Side.

Successful trials of the materials, called Specific Anion Nanoengineered Sorbents (SANS) by their Sandia developers, could have major national implications as thousands of communities and other water providers tally up the costs of complying with a controversial new Environmental Protection Agency (EPA) mandate that reduces the maximum allowable amount of arsenic in drinking water from 50 to 10 parts per billion.

About 3,200 of the nation's 74,000 water systems supply drinking water with arsenic levels that exceed the new limit, according to EPA estimates. Almost half of Albuquerque's wells will fail to meet the new standard. (See "The controversial new arsenic standard" on page 5.)

"In essence the ruling says Albuquerque can't use half its wells after 2005 without additional treatment," says Dave Teter of Geochemistry Dept. 6118.

The national price tag for complying with the EPA ruling might be in the tens of billions of dollars. Albuquerque's compliance could cost \$150 million, the City estimates.

### Water sans arsenic

Inorganic arsenic occurs naturally in some groundwater, seeping out of rock and soils that neighbor the aquifer. Ingesting

arsenic over long periods of time can cause cancer of the skin, bladder, liver, kidney, prostate, and other organs and has been linked to a variety of other cardiovascular and neurological illnesses, although scientific data linking low-level, chronic arsenic ingestion to health effects is limited.

The Sandia developers — Dave, Pat Brady, and Jim Krumhansl (all 6118) — think the new arsenic-getting SANS could reduce the sticker shock of complying with the new EPA standard for cities served by water treatment plants, rural communities, and homes, schools, and apartment complexes served by single wells.

They also have proposed using the getters to purify arsenic-laden well water in Bangladesh that is poisoning millions of people there (*Lab News*, April 7, 2000).

### Materials selective for arsenic

"We've zeroed in on five classes of materials that are affordable and obtainable and peculiarly selective for arsenic," says Dave.

Most mineral getters have negatively charged surfaces, so they repel similarly charged anions. The SANS selectively attract anions such as arsenate (a toxic arsenic-containing compound) dissolved in water to positively charged sites on the SANS' surfaces and then grab hold.

"It's like a guest who eats the cashews out of a nut bowl," says Pat.

To create the materials, the research team selected mineral families with known affinities for anions, then used Labs supercomputers  
(Continued on page 5)



WATER SANS ARSENIC — Through a combination of computer modeling and experimentation, Dave Teter (left) and Pat Brady are among the Sandia developers of new materials they call Specific Anion Nanoengineered Sorbents (SANS). Water flowing through a column of the SANS would have its arsenic content reduced to undetectable levels. (Photo by Randy Montoya)

## The technology lab

Labs President and Director C. Paul Robinson and Executive VP Joan Woodard shared a vision of Sandia's future with more than 200 business, civic, and community leaders during the annual State of the Labs address in late February at the Steve Schiff Auditorium.

In remarks that focused on Labs' facility improvements, technical accomplishments, and community involvement, Paul and Joan said Sandia's goal is to be the laboratory the nation turns to first for technology solutions to most pressing problems and challenges. See story on page 6.

## Labs set to release new version of popular CTH shock code to customers

By Chris Burroughs

The latest version of the widely used Sandia-developed shock wave physics computer code called CTH, which simulates high-speed impact and penetration phenomena involving a variety of materials, will soon be available to some 250 customers nationwide.

"This new version is really exciting because it offers a computational capability never before available in this type of code, an adaptive mesh refinement model [AMR]," says Paul Taylor, head of the CTH project in Computational Physics/Simulations Frameworks Dept. 9232.

"AMR, developed for CTH by team member Dave Crawford [9232], gives the software the ability to increase resolution and accuracy in those regions of a simulation where it is needed and reduce resolution in those regions where it is not. For example, in the simulation of a projectile penetrating a target material, greater resolution can be achieved in the region surrounding the impact interface between the two materials where large distortions and high strain rates are occurring."

Interest in the soon-to-be-released version of

(Continued on page 4)

# Sandia LabNews

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## Sandia's Explosive Destruction System destroys sarin bomblets at Rocky Mountain Arsenal

### System designed for Army neutralizes 1950s-vintage munitions

By Nancy Garcia

Sandia's Explosive Destruction System successfully destroyed six sarin-filled bomblets recovered at the Rocky Mountain Arsenal in Colorado.

The self-contained unit, designed and built by Sandia, safely neutralized the last of the nerve agent-containing bomblets (each about the size of a grapefruit) on Feb. 10. The six bomblets were found in October during Superfund cleanup of the site, which is also a wildlife refuge. They had been designed for a 1950s-era missile called "Honest John," and were never used.

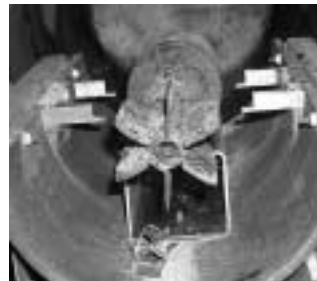
"The highlights were the first successful destruction and the sixth suc-

cessful destruction," says John Rosenow (8118), a field test engineer who has traveled with the system since September 1999. "There was a lot of concern by local citizens. After the first shot Jan. 28, the public seemed much happier."

As the first couple of cars approached the arsenal at 6:30 the morning of the last shot, the drivers saw a bright flash from a power line that had broken in the minus 18-degree weather. The operation "hardly missed a beat" despite this unforeseen happenstance, which was fixed within two hours, John says.

Once the operation was successfully completed, "we were ecstatic," says Al McDonald (8118),

(Continued on page 3)



THIS MORTAR shell was one of 30 destroyed by the EDS during testing at Porton Down in the United Kingdom.

Exhibit at Alamogordo's Space Center museum showcases Sandia's space technologies

7

Sandia organizational chart shows latest Labs management team at VP and director levels

9



# This & That

Local interest in Sandia on a high – It was great seeing the tremendous interest in Sandia displayed by Albuquerque and state leaders and media at our Feb. 22 State of the Labs presentation to the community and preceding press conference (story on page 6).

This is just one fellow's observation, but at least since I hit town 18 years ago, it's clear that Sandia has a better, more open, friendly working relationship with the Albuquerque community and media than ever, and it is great to see. For example, both Albuquerque daily newspapers covered the day's events, along with the Associated Press, four major news-gathering TV stations, and the major news radio station, and the coverage was overwhelmingly positive, bordering on flattering. And it was evident that many of our community (and state) leaders at the presentation are glad we're here and mighty proud of us.

You can't buy this kind of interest and support. You have to build it – work at it. Lots of Sandians have worked hard building it over the years – in Albuquerque and Livermore. I know many by name, but I won't mention names for fear of leaving someone out who's done just as much or more. But you know who you are and – if your bursitis doesn't prevent it – reach around and give yourselves a big, well-deserved pat on the back!

\* \* \*

Retirees: Who's bringing the ants? – Spring can't be far off because several retirees have contacted me asking when the annual Albuquerque retiree picnic will be. Chief picnic planner Linda Stefoin (3341) says it'll be Thursday, May 24. Retirees will get details soon by mail, but rumors are that Sandia is going all out this year and will provide all the barbecued tofu you can eat! I was thinking about doing my Elvis impersonation as an added attraction, but Linda said she'd pay me only what my act is worth, and I just don't work that cheap.

\* \* \*

Anyone seen the Four Lads? – Speaking of old musicians, after watching five minutes of the annual Grammy awards show last month (all I could stand), I had one main, longish thought: Where are you today when we really need you ... The Four Lads, The Lettermen, Nat King Cole, Vikki Carr, Jim Reeves, Sonny James, Sonny and Cher, Elvis, Frank Sinatra, Dean Martin, Jose Feliciano, Patsy Cline, Merle Travis, The Ventures, The Shirelles, Roy Orbison, The Platters, Judy Garland, Dion and the Belmonts, and the like? I know ... I'm showing my age big-time, but I really, really miss musicians who make music instead of noise.

\* \* \*

Rod a "tapeworm?" – One of my colleagues, Chris Miller, posed an interesting question to another colleague, Rod Geer, last week. Rod apparently learned about half of what he knows listening to lots of books on tape. Chris asked him, "If a person who reads lots of books is called a bookworm, does that mean you are a 'tapeworm'?" Rod was a good sport; he laughed and didn't even try to wiggle out of it.

– Larry Perrine (845-8511, MS 0165, [lgperri@sandia.gov](mailto:lgperri@sandia.gov))

## Sandia joins SSTA construction safety organization

### Group aims to reduce number, severity, cost of work injuries

Sandia has joined New Mexico construction companies and other organizations with construction groups in signing a charter establishing the New Mexico division of the Southwest Safety Training Alliance (SSTA).

The SSTA's goal is to make construction job sites safer places to work through creation of courses that meet general construction safety training requirements. Signatories say that before creating the New Mexico group, they looked at a similar program in Arizona that has shown good results.

The SSTA's 16-hour course includes a 10-hour course designed by the US Occupational Safety and Health Administration (OSHA). The New Mexico Building Branch of the Associated General Contractors of America says workers who complete the SSTA program receive both an SSTA and OSHA 10-hour completion card, which can help them gain employment on construction sites of participating organizations.

"We have numerous construction projects going on at Sandia all the time, and we're always concerned with safety," says Rick Ramirez, the designated representative for construction and service contracts in Construction Inspection and Acceptance Dept. 7864. "So, joining with other organizations that do work generally around the state, as well as at the Labs, just helps us all emphasize safety."

Members of the group who designed New Mexico's SSTA division say others who have created similar groups found that the consolidated training helps reduce the frequency and severity of injuries, and, therefore, the financial costs associated with injuries. They get access to a database that contains records of workers who have completed the training.

And they say the training program creates a heightened sense of safety across the board – for company management as well as workers.

A major advantage for workers is that they can avoid repetitive training when they work on different construction sites for different organizations.

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Ken Frazier, Editor 505/844-6210  
Bill Murphy, Writer.....505/845-0845  
Chris Burroughs, Writer.....505/844-0948  
Randy Montoya, Photographer.....505/844-5605  
Nancy Garcia, California site contact 925/294-2932

Contributors: Janet Carpenter (844-7841), John German (844-5199), Neal Singer (845-7078), Larry Perrine (columnist, 845-8511), Howard Kercheval (844-7842), Barry Schrader (925/294-2447), Iris Aboytes (Milepost photos, 844-2282), Rod Geer (844-6601), Sandy Smallwood (Ads, 284-3704).

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## Lab News, Daily News readership survey on way

Do Sandians' opinions change?

We'll know soon after results are compiled for the *Lab News/Daily News* Readership Survey 2001, scheduled to take place in the next several weeks.

A survey form will soon arrive in the e-mail of about 500 randomly selected Labs employees.

For those selected who don't have handy access to e-mail, an old-style paper will be mailed as a follow-up.

The survey, last administered in late 1997, should take about 10 minutes to complete.

For consistency's sake, the survey is much the same as the ones administered dating back more than 10 years; however, there are a few new items this time. For example, one question

will be, "What tough, probing or interesting question would you like to ask a member of Sandia's Labs Leadership Team? Which member?"

Also, for the 1997 survey, the electronic *Sandia Daily News* was relatively new and was available to employees only via the internal Web. Now it also arrives daily via every employee's e-mail.

The results of past surveys — dating back 20 or more years — have enjoyed high response rates and have led to a variety of changes to the publications, while providing an opportunity for readers to express what they like most — or least — about them.

So, if you turn out to be one of the randomly selected, please respond quickly and thoughtfully. We'll appreciate it.

## Manos program reaches out for 10th year

The Hispanic Leadership Outreach Committee, has launched its Tenth Annual Manos Science and Engineering Program. Manos, offered in partnership with Albuquerque Public Schools, the University of New Mexico, and the New Mexico Hispanic Medical Association, is designed to introduce math, medical, science, and engineering concepts to mid-school students and spark their interest to pursue careers in science and engineering.

The four-week programs, offered at West Mesa and Rio Grande High Schools from 4-6 p.m., began this week and run through the end of the month.

The workshops offered this year include: Medical Technology; Computer Discovery; the Wonderful World of Electronics; Fun with Math & Money; Magic of Physics Workshop; and ChemisTRY Exploration.

## For the record

Chuck Yagow (2992) and Larry Ray (6523) were omitted from the list of contributors to Sandia's Automated Weigh and Leak-Check System (WALS) featured in the Feb. 23 *Lab News*.

# Destroying bombs

(Continued from page 1)

whose staff led the EDS design. "Here was a way for Sandia to be involved in a national problem and work with the Army to get it up and running. It made everybody very glad and happy to contribute to a solution." The US is committed to dispose of all chemical munitions by 2007.

The EDS (*Lab News*, Aug. 27, 1999) was developed by Sandia for the Army's Non-Stockpile Chemical Materiel Program. It is designed to safely dispose of old munitions deemed too unstable to

transport. The system can be pulled by trailer to sites where these munitions are recovered. The munitions are placed within an air-tight chamber, where their metal shells are opened with an explosive charge. The contents are then neutralized with caustic chemicals. An alternative disposal method, open burn/open detonation, involves packing explosives around the munition to incinerate the contents. However, the lack of containment has posed concerns for the public.

"You don't want to be breaking anybody's window, even if you do burn everything that's there," says Tim Shepodd (8722), EDS lead chemist.

As an extra reassurance, at the Rocky Mountain Arsenal the trailer carrying the EDS was placed within a large building equipped with an air filter, Tim says. Also, the process is closely monitored through sampling. "We never open the door until we see that both the liquid and atmosphere are completely neutralized."

*"They felt like they were the cavalry, they had trained for this."*



ARMY ORDNANCE EXPERT uses protective gear and a long pole to load the sarin-filled bomblets into the Explosive Destruction System at Rocky Mountain Arsenal.

## **Sandia** California News

Acting program manager John Didlake calls the Denver operation a defining moment. "We built up a bunch of confidence," he says, "with the public, the EPA, and the Army."

When the bomblets were found, the EDS had been undergoing field testing at the United Kingdom's Defence Evaluation and Research Agency in Porton Down, England. The tests, spread over 13 months, primarily involved destroying WW I and WW II-era munitions containing phosgene gas or mustard. In anticipation of the Colorado project, one test also included destruction of a 1.3-pound bottle

of sarin fabricated for this purpose.

John Rosenow says he really enjoyed working with the British crew, two of whom came to Colorado for the bomblet destruction. Both the British safety officer and the lead crew operator helped train the Army crew that handled the operation (which was pre-approved by a 25-person safety team).

"They felt like they were the cavalry, they had trained for this," John Didlake says.

The current system will undergo more operational testing at Aberdeen Proving Ground in Maryland. Meanwhile, Sandia is building two more systems of the same size (a three-foot-long chamber, pulled on a 30-foot trailer), as well as a third with larger capacity.

Rick Moehrle (8118), acting lead engineer on the new system, says the next models will incorporate some design improvements, such as a trailer layout that provides more space for workers to move about and an electric motor-rotary agitation system to mix the chemicals.

From New Mexico, Jerry Stofleth of Explosives Applications Dept. 15322 has led the development of the explosive munition opening system. The system includes a metal shield to suppress fragments within the reusable containment chamber, shaped charges to cut open the item being destroyed, and a firing system to detonate the charges.

## Recent Retirees



Anna Isham  
39 8522



Blanche Matter  
37 2211



Bruce Nevin  
37 2255



"Woody" Green  
36 2255



Ralph Clark  
34 8411



Tom Jefferson  
31 8920



Taz Bramlette  
30 8365



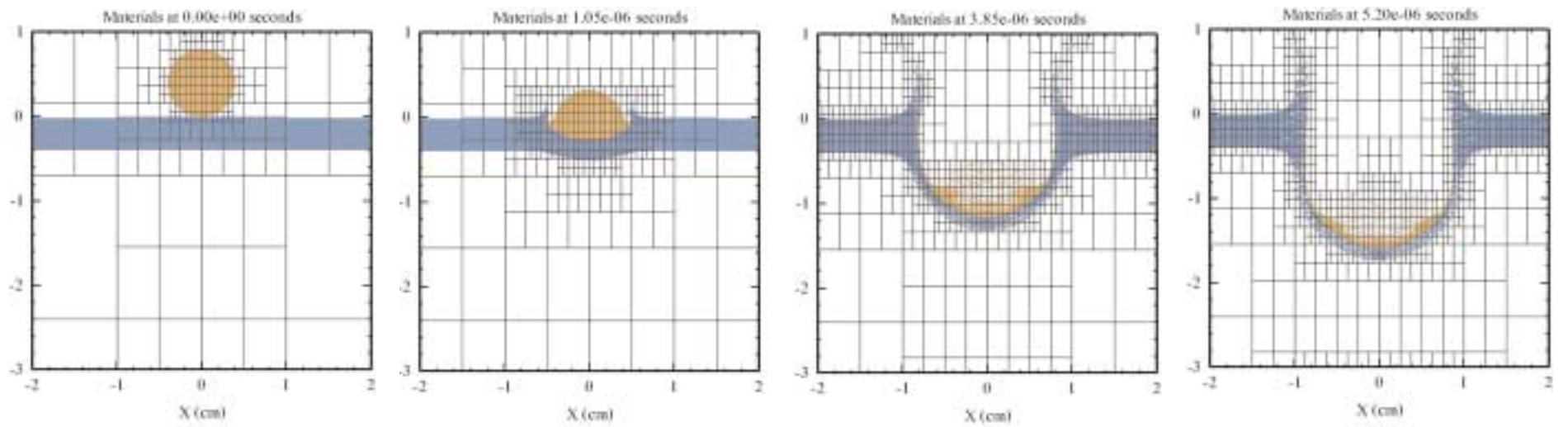
Mark Perra  
25 8728



Noel Baggett  
17 8945



THE GRAPEFRUIT-SIZED bomblets had been recovered among scrap metal in a parking area known as "the boneyard."



CTH IMAGES — This series of CTH images show the impact and penetration of a steel plate by a copper ball. The copper ball is eight millimeters in diameter

impacting a plate of 4340 steel, four millimeters thick, at an impact velocity of 4.52 kilometers per second (10,111 miles per hour).

## CTH code

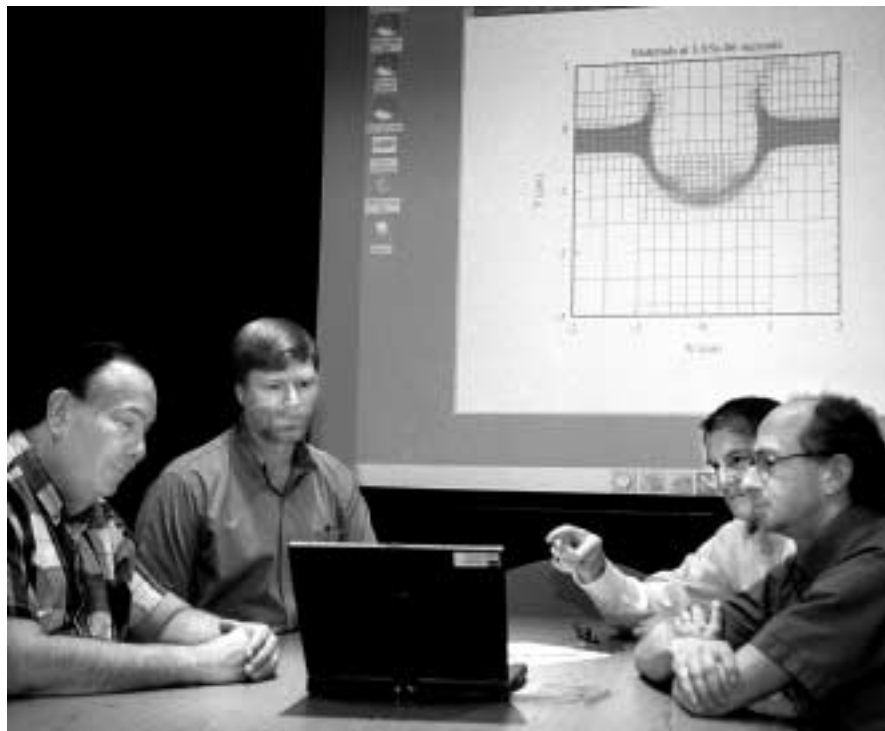
(Continued from page 1)

the software is particularly high among customers like DOE and the Department of Defense (DoD), which use the software for studying weapons effects, armor/anti-armor interactions, warhead design, high-explosive initiation physics, and weapons safety issues. Major users include the national laboratories, the Army, Navy, and Air Force laboratories, and their subcontractors. At Sandia the code is used in national missile defense, hazardous material dispersal by explosive detonation, weapon components design, and reactive materials research.

For armor/anti-armor design — which is of interest to the DoD — the software allows users to determine which types of bullets or projectiles can best penetrate armor. It also provides information about how to design an improved penetration protection mechanism.

The medical community is also paying attention to Sandia's CTH software. Paul currently has a small collaborative research effort underway with the University of New Mexico School of Medicine, which is interested in using the shock physics code to better understand brain injury caused by physical trauma, such as a person's head hitting a car windshield. Using the magnetic resonance image (MRI) of an individual's head to construct a CTH model, simulations can be performed showing how shock waves travel through the head and cause damage to the brain.

The software breaks down the penetration



AMONG MEMBERS OF THE CTH TEAM are, from left, Robert Cole, Paul Taylor, Ray Bell, and Stuart Silling (all 9232). (Photo by Bill Doty)

### CTH team members

Over the years many people have worked on the CTH, making it into the robust and reliable software that it is today. Among those with major contributions were Ray Bell (9232), Rebecca Brannon (9232), Robert Cole (9232), Dave Crawford (9232), Millie Elrick (9232), Archie Farnsworth (9232), Chris Garasi (9231), Gene Hertel (9116), Roy Jorgensen (1642), Jerry Kerley (consultant), Luba Kmetyk (5712), Mike McGlaun (9140), Sharon Petney (9231), Steve Rottler (2100), Stewart Silling (9232), Paul Taylor (9232), Sam Thompson (dec.), and Lane Yarrington (6115).

simulation into millions of grid-like "cells." As the modeled projectile (such as a copper ball impacting a steel plate) impacts and penetrates the target, progressively smaller blocks of cells are placed around the projectile, each showing in detail the deformation and breakup of the ball and target plate.

CTH with the AMR enhancement also offers the ability to analyze problems involving sophisticated materials with greater accuracy. With the addition of new material models, it can simulate a wider variety of materials, including metals, ceramics, plastics, composites, high explosives, rocket propellants, and gases (e.g., air).

Sandia developed the early precursor to CTH in the 1970s for one-dimensional problems, expanding it to simulate problems in two and three dimensions in the 1980s.

"The widespread popularity that CTH has today as the shock wave physics computer code of choice began in a competition with Los Alamos National Laboratory in the early 1990s," Paul recalls. "DoD wanted a code that could deal with problems such as armor/anti-armor design, weapons effects, and munitions design. The Los Alamos code was called MESA and ours was CTH. Both codes had comparable characteristics, but

DoD selected ours."

The Labs began licensing the shock wave physics code in the early 1990s to DOE, DoD, their contractors, and some private US companies with interests in shock physics. An updated version of the software, which is export-controlled, is distributed to customers about every 18 months. Currently 259 licenses have been issued.

DoD, DOE, and their contractors receive licenses for a small distribution fee to use the software. Commercial companies can purchase licenses for \$25,000. The updated software will be distributed on CDs at a cost of \$400 for each noncommercial, licensed customer.

One of the important aspects of CTH development is validation of code predictions using actual physical testing. Data gathered in a variety of experiments are compared to CTH models.

"In cases where we are studying situations in which the materials are well-characterized, the code predictions and the actual experi-

ments are very close," Paul says. "The fidelity of the simulations is very good. In fact, CTH is used in many programs to simulate events that are either too costly or dangerous to conduct in full-scale tests. Other researchers use the code to reduce the amount of experimental testing that would otherwise be required."

Paul offers CTH classes several times a year so that customers can fully understand how to use the software and have a full grasp of its capabilities. Users from all over the country come to Sandia to take the classes. Department team members help Paul with the classes, which are broken down into theory and lab segments held over a three-day period.

Paul says one of the most appealing aspects of CTH for users is that it can run on almost any computer platform. The code runs on most Unix and Linux-based workstations and personal computers running Windows NT or 2000.

For users who have access to parallel-architecture computers, CTH can run in parallel mode. This feature permits running large three-dimensional simulations using many processors or nodes to break the problem up into smaller pieces, each of which is solved in parallel with neighboring pieces of the problem.

CTH simulations, conducted in parallel mode on Sandia's teraflops computer, tend to be the largest problems the code handles. Last December a CTH simulation was performed by Marlin Kipp (9232) on the teraflops computer for a problem containing more than 260 million cells, using 1,024 nodes (2,048 processors) and requiring over 60 hours of computer CPU time.

"CTH problems scale very well with the number of processors allocated for the job," says Paul. "The only limitation to the size of a problem that can be treated using CTH appears to be the availability of processors to complete the computing task."

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# Arsenic

(Continued from page 1)

to rapidly simulate the arsenic-trapping aptitudes of thousands of combinations and variations of the minerals.

"We knew which classes of materials should be highly selective for arsenic at the atomic level," says Pat, "so we asked ourselves what is peculiar or common about those materials. Then we tried to find or make other materials with similar properties."

Because there are nearly infinite variations of chemical species, phases, and surface chemistries, the researchers let the computer sort out the very best performers.

"We got some big hits on materials that had never been considered before," says Dave. "We expected good results, but not this good."

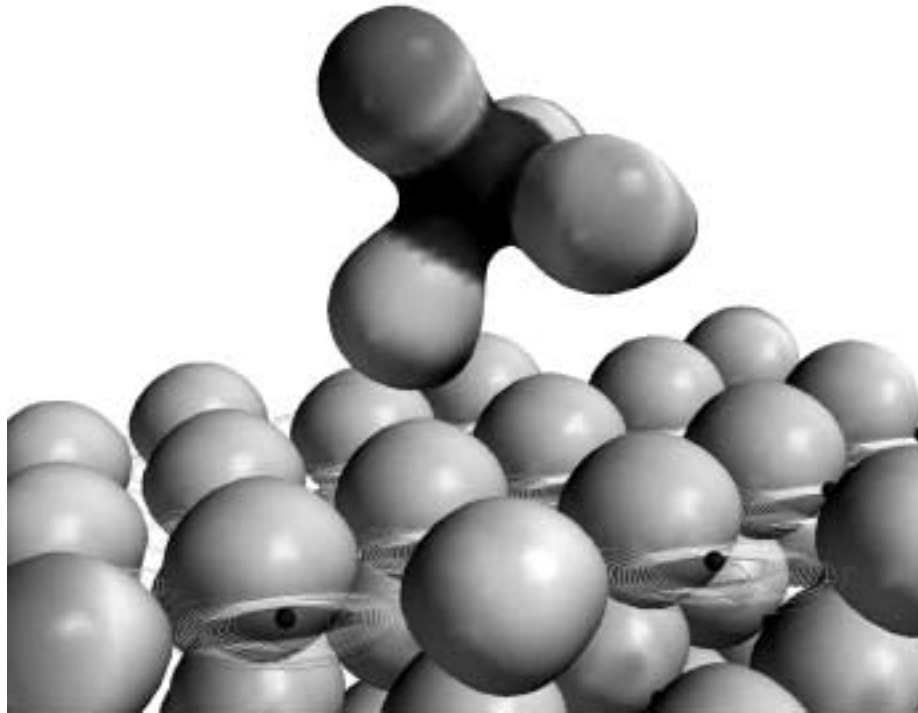
They ruled out those minerals that are difficult or expensive to obtain or produce, that would become saturated too quickly, or that would result in a hazardous byproduct.

"A prerequisite for us was that the solution be at least as simple, safe, and efficient as, and more affordable than, the current technology," he says.

They verified the computers' results in a lab, pumping arsenic-contaminated water through the powdered materials, then measuring the arsenic content of the outflow.

For proprietary reasons, Dave can't yet divulge what materials the team found, but they generally are nontoxic mixed metal oxides with high molecular surface areas.

At water treatment plants, groundwater could be pumped through columns containing the powdered materials. Arsenic content in the outflow would be reduced to undetectable levels. After perhaps years of use, the nonhazardous



SANS SORB — Image of an arsenate ion sorbing onto an oxide surface. The image is generated using a form of quantum mechanical modeling called density functional theory that examines the electrostatic potential surfaces of the two materials.

arsenic-saturated getters could be disposed of in a standard landfill.

Sandia's relationship with the City of Albuquerque's subcontractor on the new treatment plant, CH2M-Hill, has helped the research team understand the practical needs of municipalities, especially the need for a simple, affordable, available treatment technology.

"Technology has no impact if it isn't used," says Dave.

## Needle in a haystack

He estimates that some of the SANS could be supplied for as little as \$200 to \$300 a ton, compared to the \$4,000 a ton for conventional iron hydroxides used in typical water treatment plants. (Iron hydroxides, adopted for water purification around the turn of last century, sweep out many contaminants simultaneously but don't selectively remove arsenic.)

"Municipalities filter out dirt, silt, and sewage, but pulling out stuff at the parts-per-billion range cheaply is new," says Pat. "This is harder than finding a needle in a haystack."

The SANS could be adapted for use with smaller water systems, even down to the individual well or household scale, says Dave.

Albuquerque's Arsenic Removal Demonstration Plant should be operational by next summer, according to City Water Resources Manager John Stomp. The plant will process more than 2 million

*"We got some big hits on materials that had never been considered before. We expected good results, but not this good."*



SANDIA RESEARCHERS Dave Teter and Pat Brady.

## Feedback

### Update on status of South Valley gate

**Q:** Is there any truth to the rumor that the South Valley Gate is going to be closed? I've heard that the Security Police on base are considering closing the gate.

**A:** I apologize for not responding sooner but the issue of the South Valley gate has been under active discussion over the last several months. The KAFB security forces folks and our security folks have been trying to hammer out an agreement that would allow Sandia Protective Force personnel to operate the South Valley gate for the few hours it is open each day. The Air Force has asked for our help because of serious personnel shortages and real-world commitments that they must meet. Sandia's Protective Force is quite willing to take on this task but there are some legal ramifications

over jurisdiction that we are having a hard time overcoming. The base has recently been hit with additional tasking for its Security forces and they are seriously considering closing the South Valley gate, but no date has been set. Based on current traffic counts there are a total of 600 vehicles a day that go in and out through that gate, and I'd venture to guess that two-thirds of that number are Sandia or DOE personnel. Sandia Protective Force management and Sandia and DOE legal experts continue to look at possible ways to avoid having to close this gate. We will just have to wait and see if something can be worked out.

— Ed Tooley (7850), Chair,  
Sandia Traffic Safety Committee

gallons of water a day using a micro-filtration/iron coagulation process, but the facility will reserve space to test developmental technologies such as the SANS.

"We're very interested in working with Sandia to look at emerging technologies that are cheap and easy to dispose of," says Stomp.

In addition, the same research methodology used to identify the SANS for arsenic removal — computer modeling followed by experimental verification — has been used to design getters for removing other contaminants as well, says Dave.

"We are now able to predict the outcome of sorption processes at the atomic scale and chemically modify inexpensive natural materials to selectively sorb anions," he says.

"Arsenic is the focus right now, but EPA is looking at restricting concentrations of many more micropollutants in the future," he says.

Future custom-designed getters could be used to purify drinking water as well as industrial waste water, process streams, and other effluents, he says.

The SANS team includes Dave, Pat, Jim, Buddy Anderson (6118), May Nyman, Steve Thoma (both 6233), Joe Chwirka (CH2M-Hill), Nadim Khandaker (OCETA), and Bruce Thomson (University of New Mexico).

The SANS work is part of a larger Water Initiative managed by the Energy and Critical Infrastructure SBU and led by a team of Sandians from centers 6100, 6200, 6800, 5300, and 5800. The initiative seeks technical solutions to key water issues — vulnerability of and threats to water-distribution infrastructures, socio-geopolitical stresses relating to water scarcity, and economic concerns associated with supplying drinkable water. Watch for more about the Water Initiative in future issues of the *Lab News*.

### The controversial new arsenic standard

The new EPA ruling, issued Jan. 22 in the *Federal Register*, reduces the maximum allowed concentration of arsenic in drinking water from 50 to 10 micrograms per liter (parts per billion). It gives water suppliers until January 2006 to comply.

The standard applies to cities and towns, schools, churches, nursing homes, factories, apartment complexes, mobile home parks, and other water suppliers.

The EPA estimates that the reduced standard will prevent 21 to 30 deaths from bladder and lung cancer and 37 to 56 total arsenic-related cancer cases each year.

But the new rule is controversial.

Sen. Pete Domenici, R-N.M., is working with new EPA administrator Christine Todd Whitman to repeal the mandate, stating that the "excruciating financial burden" the new regulation would impose on communities is not warranted by the "insufficient scientific information" to link low-level, chronic ingestion of arsenic to health effects.

Sen. Jeff Bingaman, D-N.M., calls the regulation "prohibitively costly" and wants to extend the compliance deadline until emerging arsenic-removal technology such as Sandia's can mature into practical solutions.

Rep. Heather Wilson, R-N.M., has promised to work with the Bush administration to repeal the standard, stating: "These rules may double the water bills of New Mexicans without improving anyone's health."

The EPA and the National Academy of Sciences/National Research Council have acknowledged that more health studies are needed to evaluate potential health benefits provided by the lower arsenic standard.

# A vision for the future: *the* technology lab for the nation

## Annual State of the Labs address says Sandia well-poised to fulfill ambitious vision

By Bill Murphy

The Sandia vision: to be the laboratory the nation calls on for technological solutions when serious threats or challenges arise; to help our nation secure a peaceful and free world through technology — in short, to be the nation's problem solver.

That was the message Labs Director and President C. Paul Robinson and Executive VP Joan Woodard conveyed to an audience of some 200 community leaders during the annual State of the Labs address at the Steve Schiff Auditorium in late February.

And given the breadth and excellence of its work in a staggeringly wide range of technical fields — highlighted in a fast-paced video produced especially for the occasion — Paul said the Labs is well-positioned to make good on that vision. Indeed, Paul joked that being director of the Labs is like being “king of an anarchy” because of the huge diversity of technical projects under way. The best part of the job, Paul added in a more serious vein, is the opportunity to learn first-hand of technological advancements taking place across the entire spectrum of Labs programs.

In prepared remarks that focused on technical accomplishments and upgrades to Labs facilities, Paul said the combination of a broad and deep R&D portfolio, an increasingly diverse set of customers, and a forward-looking and aggressive building program puts Sandia in a strong position for the future.

“Of all the national labs,” he said, “I think we're in the best shape to face the future as we move forward.”

During her portion of the one-hour presentation, Joan focused on many international initiatives in nonproliferation and arms control (notably the Multispectral Thermal Imager [MTI] satellite program, which involved the efforts of some 500 Sandians), energy research, cybersecurity, and technology commercialization. She also took note of Sandia's substantial impact on the local communities in New Mexico and California, both in direct Labs-related spending and in volunteer contributions of time and money.

Paul presented a brief summary of major facilities improvements either just completed, in progress, or in advanced planning.

Among them are the Processing and Environmental Technology Laboratory (PETL), which



EXECUTIVE VP Joan Woodard and Labs President Paul Robinson meet with the media during a news conference preceding the annual State of the Labs address to the community. (Photo by Randy Montoya)

Paul characterized as “one of the finest laboratories” for chemical R&D in the nation, and, with its advanced ventilation systems, one of the safest research facilities anywhere. Paul also touched on the innovative work being done at the Gamma Irradiation Facility (GIF), the Center for National Security and Arms Control (CNSAC), the Robotic Manufacturing, Science, and Engineering Laboratory (RMSEL), the neutron generator facility, the



Labs President C. Paul Robinson visits with community leaders in a reception preceding the State of the Labs address. (Photo by Bill Doty)

Combustion Research Facility-Phase 2 (in California), and — in Amarillo — the Weapon Evaluation and Test Laboratory.

Paul called the Labs' Microelectronics Development Laboratory (MDL) “one of the most important facilities” at Sandia. Along with a new Compound Semiconductor Research Lab (CSRL), it will form the heart of what will be perhaps the Labs' single most important facility ever — MESA, the Microsystems and Engineering Sciences Applications facility. That campus-like complex, which could represent an investment of up to \$400 million, will be home to advanced R&D in microelectronics, microelectromechanical systems (MEMS), and the emerging but enormously significant field of nanotechnology.

Paul noted with obvious pride and enthusiasm the successful completion of a prototype Extreme Ultraviolet Lithography (EUVL) manufacturing tool. That tool, the result of a \$250 million investment by industry partners Intel, Motorola, Advanced Micro Devices, and others, will enable chipmakers to continue to sustain “Moore's Law” (which holds that computer chips double in capacity approximately every 18 months) for another 15 to 20 years. Sandia and other DOE labs involved in the EUVL project will turn over the tool to the industrial consortium during an April 11 ceremony in California.

He also noted the new partnership among Sandia, Compaq, and Celera (the private sector company doing human genome research) to move computers from the teraflops (trillion-operation-per-second) level to the petaflop (quadrillion-operation) level.

Other key points during the State of the Labs presentation and a preceding news conference:

- A “very good budget year” ahead, according to Paul, with funding in the \$1.5 billion range and \$48 million for capital improvement.

- Previously announced plans to maintain a 500-person-per-year hiring program for the next several years are still on track.

- Progress, with the support of Gen. John Gordon, head of the National Nuclear Security Administration, to move to a multi-year budgeting process. The process would be modeled on the Pentagon's five-year budgeting system. “We still need to get Congress to go along,” Paul said. Such a system would help the DOE labs avoid the annual “roller coaster effect we experienced the past few years [over budget fluctuations].”

- Work for Others (WFO) income continues to increase year-to-year, with major projects associated with national missile defense (building and flying target vehicles), satellite work (supporting MTI and other satellite systems), and critical infrastructure.

- Sandia is facing “a rather large workload” in maintaining the nation's existing nuclear weapons stockpile, Paul said. Even in the absence of an order for a new weapon design, there has been substantial work “with real deliverables” associated with refurbishing and extending the lifetime of existing weapons. That stockpile work, Paul said “has put a lot of life back into the nuclear weapon design community here.” The large nuclear weapon workload, he said, “is likely to stay that way for the next several years.”

Sandia was able to give life to its vision — to be the lab the nation calls on first in a pinch — when some aging but still dangerous chemical-warfare shells were discovered at the Army's Rocky Mountain Arsenal outside of Denver.

“Sure enough,” Paul said, “the nation called on Sandia.” The Labs' Explosive Destruction System technology, recently proven out in rigorous real-world tests in England, was brought in to tackle the Denver challenge. The technology worked like a dream, and a serious threat to the people of Denver was defused (see story on page 1).

US Army officials sent a highly complimentary note of gratitude to Sandia, and “the folks who did that work just couldn't be more proud,” Paul said.

“Being the technology lab is the right mission for Sandia — a mission we intend not only to pursue but to fulfill.”

## FAA team visits Labs' research and test facilities



FAA RESEARCH AT MELT LAB — Retired former Sandian Frank Zanner (left), who is serving as a consultant, and Richard Salzbrenner (center), Manager of Tribology, Mechanics, and Melting Dept. 1835, listen to a question from Jorge Fernandez (right) during a recent visit to Sandia's Liquid Metal Processing Lab. Fernandez, Tim Mouzakis (just behind Frank), and Dave Downey (just behind Fernandez), who all work for the Federal Aviation Administration, came to the Labs for a look at the facilities that will be used in research aimed at improving metal

parts used in aircraft engines. Sandia coordinates and manages the Specialty Metals Processing Consortium (SMPC), a 14-member group of specialty metals producers and aerospace alloys users created to perform joint research in specialty metals production, processing, quality, and performance. The research is expected to lead to an advanced commercial manufacturing process standard aimed at eliminating metallurgical defects and producing premium quality turbine rotor disk-grade alloy materials. The SMPC work will bring about \$1.5 million to the Labs.

# Sandia space exhibit takes off at Alamogordo's Space Center museum



Thousands of people each month are learning about Sandia technologies that have reached into outer space through a new exhibit at the Space Center in Alamogordo, N.M.

The exhibit includes information about the Labs' connection to the Galileo spacecraft flight to Jupiter, the Multispectral Thermal Imager (MTI) satellite, the Mars Pathfinder airbags, the Robotic All-Terrain Lunar Exploration Rover, or RATLER, and the Shoemaker-Levy comet impact on Jupiter. A five-question quiz also challenges children about New Mexico's connection to the space program.

"It has turned out to be one of our most popular exhibits," says Space Center Director Mark Santiago. "It's an interactive exhibit, and visitors really enjoy that."

The information and quiz are transmitted via two touch-screen video kiosks. A large display provides additional facts about Sandia's connection to outer space, including an account of Albuquerque native Sid Gutierrez, a former astronaut who now manages Sandia's Physical Sciences Department (5932).

The exhibit was created last year by

Sandians Mike Clough (12640), Tom Salazar (12660), Bob McInteer (12610), Mike Vittitow, and Noel Fletcher (both 12620) in cooperation with Space Center Exhibit Coordinator Rick Dukes and Curator George House. Space-Techs Exhibit Designs of Albuquerque fabricated and installed it in August.

"This exhibit was designed with 'edu-tainment,' in mind — a blend of interactive education and entertainment," says Tom, Exhibits Coordinator



ALL AGES CAN ENJOY Sandia's new space exhibit at the Space Center museum in Alamogordo. Laura, 9, and Amanda, 7, daughters of Sandia photographer Randy Montoya, gaze at the main display in the top photo, and use the touch screen in the lower photo to watch videos of Sandia's work in space. (Photos by Randy Montoya)

## MESA celebrates \$20 million authorization

A celebration was held Feb. 13 at the Microelectronics Development Laboratory for Sandians and contractors involved in the MESA Project to celebrate the \$20 million authorized this year by DOE/NNSA for engineering design of the \$374 million project.

In addition to a recently signed contract of \$3.9 million for Title I architectural/engineering services to Carter & Burgess Inc., a \$1 million agreement for construction management services for the coming year has been awarded to the URS Corporation. URS project employees all reside in New Mexico.

The purpose of the MESA project is to assist in modernizing the electrical, optical, and mechanical components for the US nuclear deterrent using new computationally enabled design tools. Technologies developed by MESA, as well as tools available there, are also expected



SANDIANS CELEBRATED the \$20 million authorization with a specially made cake.

to significantly benefit universities and US businesses.

— Neal Singer

at the National Atomic Museum. "I believe this exhibit does an excellent job of promoting Sandia's role in space and allows the visitor to better understand Sandia's impact into the space technology field," adds Tom, who donated his design time to the project.

Mike Clough says the exhibit demonstrates Sandia's desire to partner with the state of New Mexico. It also fulfills a commitment to Rep. Joe Skeen, R-N.M., to have a Sandia exhibit at the Space Center.

So what is Sandia's connection to the space missions and technologies listed above? Sandia produced some 2,000 radiation-hardened microchips for the Galileo spacecraft now orbiting Jupiter, designed and built the MTI satellite now orbiting Earth, designed and built the RATLER robotic vehicle, helped design and test the airbags that brought Pathfinder to a safe landing on the Martian surface, and used the world's fastest computer to successfully model the impact the Shoemaker-Levy 9 comet would have when it collided with Jupiter.

— Chris Miller

# Meet the parents: Sandia retiree Matt Roach talks about famous son's career as a movie director

*Jay Roach has directed 'Meet the Parents,' 'Austin Powers' pictures, 'Mystery, Alaska'*

By Bill Murphy

Being the son of a famous father — that's tough.

Consider, for example, that actress Catherine Zeta-Jones has been quoted as saying that her biggest concern as a new mom is how baby Dylan will bear up under the burden of being actor Michael Douglas's son.

Most of us don't face that particular psychological challenge. But retired Sandian Matt Roach and his wife Peggy *do* have to deal with sort of mirror image of it: They're the parents of a famous son. Far from being psyche-threatening, though, Matt says he and Peggy couldn't be prouder of son Jay's achievements.

"Jay" as in Jay Roach, director of the *Austin Powers* movies and the recent Robert DeNiro-Ben Stiller hit, *Meet the Parents*, which, if Hollywood gave comedies their due at Oscar time, might be up for best-picture consideration. "Jay" as in husband of rock singer Susanna Hoffs of the Bangles.

Yes, Jay's a Sandia brat, born at the old Doctors Hospital in 1957, a 1975 graduate of Eldorado High School who grew up with a dad in his home who couldn't even talk about his weapons-related work. Indeed, Matt's Sandia job required some overseas travel: that makes him — you got it — *Matt Roach, International Man of Mystery*.

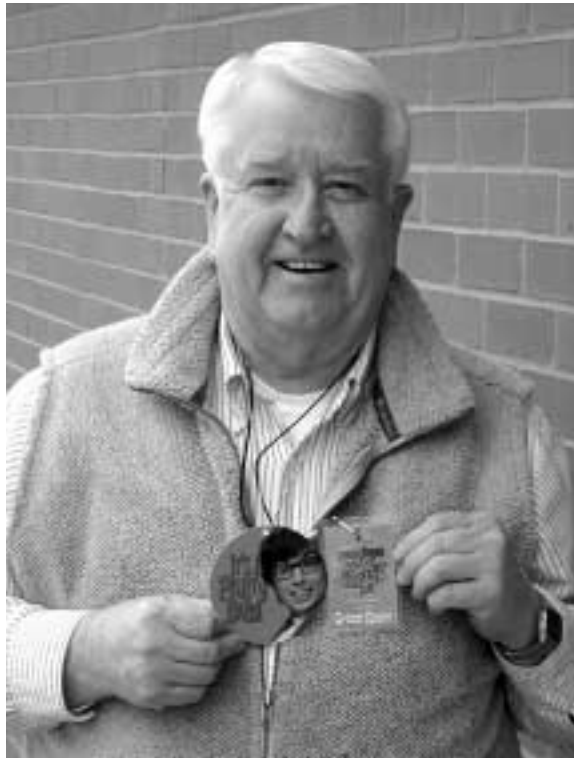
Which leads to another interesting twist on the father-son thing: Matt, who couldn't talk about his own job, just loves talking about Jay's work.

As Matt recalls it, the signs were there early on that Jay was slated for directorial distinction. "He wrote the third grade play for his class," Matt says. "That's when Peggy and I began to ask ourselves 'Wow, what have we got here?'"

Jay was a good student at Eldorado, but not, Matt notes, the valedictorian. "He got a B once, in typing." He was involved in everything: student senate, football, extracurricular stuff. An impressive



JAY ROACH directs stars Ben Stiller and Teri Polo in a scene from his smash hit, *Meet the Parents*.



PROUD DAD — Matt Roach, father of Hollywood director Jay Roach, shows off VIP passes that allowed him to go behind the scenes during an *Austin Powers* movie premier. (Photo by Randy Montoya)

enough set of high school credentials that he earned a scholarship to Stanford. "Jay's always been an overachiever," Matt says.

At Stanford, Jay did well, majoring in communications and economics. There was even a peripheral Sandia connection. He managed a Stanford-operated teleconferencing center, and one of its clients was Sandia-Livermore.

After Stanford came grad work at the USC film school, where Jay did some highly honored student films. That work helped him get his foot in the door of the movie industry. Over the years between the mid-80s and the mid-90s, he earned writing, producing, and cinematography credits on a number of projects. And he married Susanna Hoffs in 1993. That was obviously a great personal life-changing experience for Jay — he and Susanna have two kids — but it turned out to be a terrific career move, too.

Susanna Hoffs happened to be a close friend of Mike Myers' wife, Robin Ruzan. Myers, with his wildly inventive comic creations, was by the early 1990s a major star, coming off big box office hits in the *Wayne's World* pictures. With their wives being so close, Myers and Jay began to see a lot of each other, and they hit it off, too. At some point (Matt Roach recalls) Myers began to kick around some ideas for what became his greatest comic invention — *Austin Powers*. Jay was present at the creation and tossed an idea or two of his own into the mix. When Myers felt he had enough of an *Austin Pow-*

ers concept to start looking for studio backing, he had just one condition: that he be able to choose the director for the project.

But "Sure, Mike, baby, sure," turned into "Jay who?"

"No question about it," Matt says, "Mike went to bat for Jay."

After a week or two on the first *Austin Powers* set, all that "Jay who?" stuff was forgotten. Jay proved to the studio guys' satisfaction that he knew what he was doing, and they stopped looking over his shoulder, Matt says.

The movie, of course, was a big hit, and the sequel even bigger. Since those breakthrough movies, Jay's career has been on the fast track. While the Russell Crowe-Burt Reynolds picture *Mystery, Alaska* didn't catch on, the critics liked it, and of course, *Meet the Parents* has been a terrific success.

Matt says there have been some neat perks to being the father of a famous son. He and wife Peggy spent time on the *Austin Powers* sets and got to meet Mike Myers, Liz Hurley, and Heather Graham. (Both Hurley and Graham are "very sweet" ladies, Matt says, and both even prettier in person than they are on film.) They've been to a number of movie premiers and have just generally enjoyed themselves.

And finally, good news for *Austin Powers* and *Meet the Parents* fans. Matt says there *will* be an *Austin Powers 3* and a *Meet the Parents 2: Meet the Fockers*. "I'm sure they're going to happen; it's just a question of when," he says.

As *Austin Powers* would say: "Yeah, Baby, yeah."



JAY ROACH and his wife, Bangles ("Walk Like an Egyptian") lead singer Susanna Hoffs.

## 'I wouldn't change a thing' about Sandia career, says director's dad

Matt Roach, father of big-time Hollywood director Jay Roach, enjoyed a 37-year career at Sandia, starting out right out of high school as a trainee in the drafting department and ending up as an engineer MTS. Highlights of his career include providing important support on a number of weapons tests and helping develop and refine various security systems. Matt and his family spent a year on temporary assignment in Las Vegas and a year at Livermore. Since his retirement he's done some consulting work for Sandia as a senior engineer for Albuquerque-based Val-Comm, Inc.

Of his career at Sandia Matt says, "I wouldn't have changed a thing. I got to help some of the smartest engineers in the world. In that kind of company, you can't help but pick up a few things along the way."

## Retiring and not seen

Retiring and not seen in *Lab News* pictures: **John Bell** (7843), 21 years; **Clyde Cano** (9325), 32 years; **Susan Fischer** (2554), 20 years; **Ronald Gasser** (6415), 17 years; **Richard Gido** (6415), 10 years; **Tommy Guess** (14172), 36 years; **Gary Mauth** (5730), 35 years; **Max Morris** (6433), 34 years; **Lil Radtke** (7102), 29 years; **Robert Romero** (2541), 15 years; and **Frank Whiston** (2993), 33 years.

## Sandia to co-host biological threat reduction workshop with UNM Advanced Studies center

**Program looks at predicting, detecting, and responding to attacks**

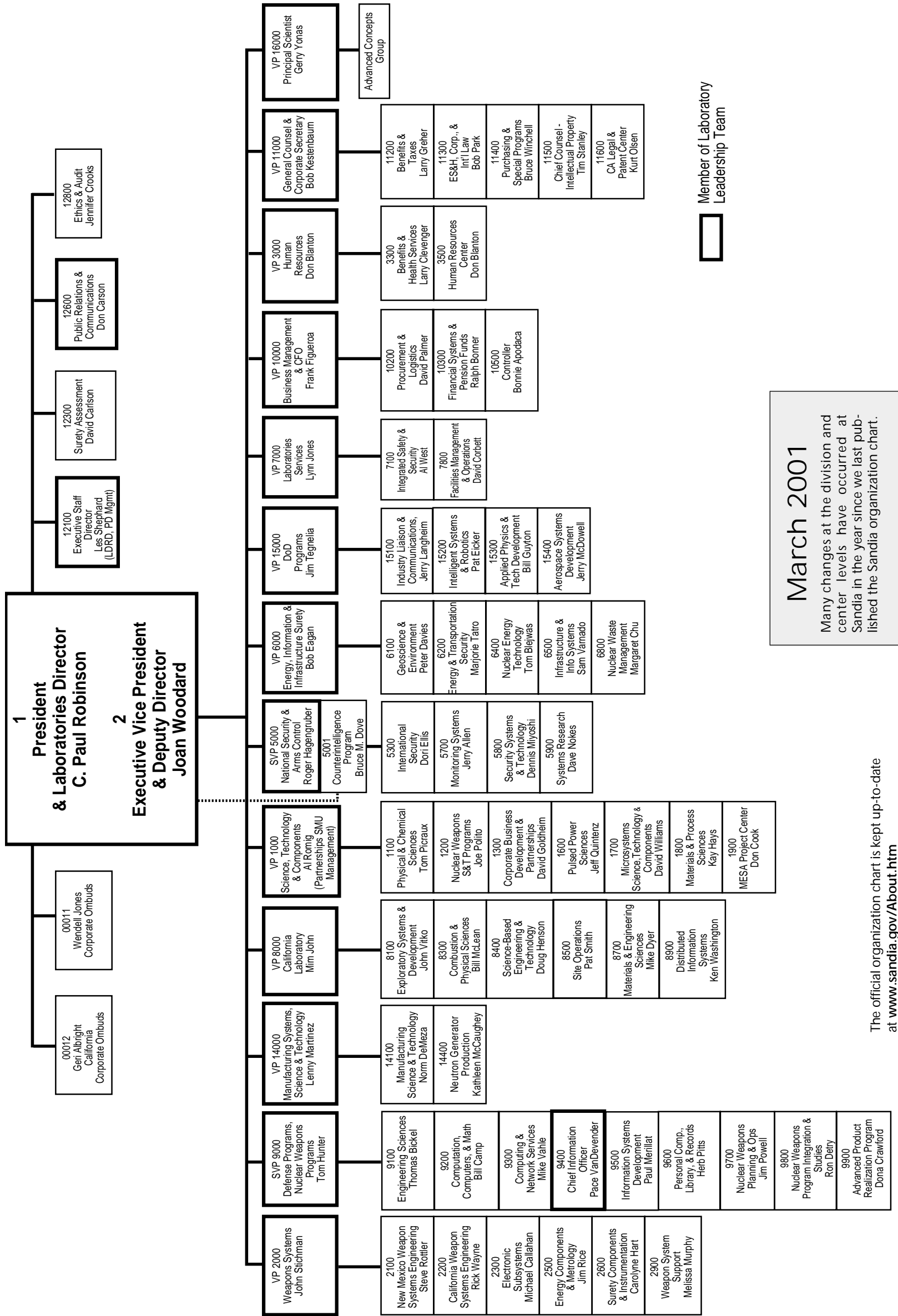
Sandia and the University of New Mexico's Center for Advanced Studies are hosting a Workshop on Unified Science and Technology for Biological Threat Reduction March 16 and 17 at Regener Hall on the UNM campus. The workshop addresses three questions: "How will we know if we are under attack?" "What clues, if any, exist within our complex communications infrastructure that such an attack will occur or has occurred?" "What emerging technologies exist that are relevant to our detection and response efforts."

Brig. Gen. (elect) Annette Sobel, M.D., of Sandia's Systems Analysis Dept. 5907 and the National Guard Bureau, will serve as the workshop's program chair. She is one of the nation's leading scientists active in this field of research.

The event features a panel of invited guest speakers, poster sessions, and open discussions. The workshop is bringing together national security strategists, faculty from leading science and engineering departments at various universities, and staff from national laboratories and industrial scientists working on new sensor technologies.



# Sandia National Laboratories



**March 2001**

Many changes at the division and center levels have occurred at Sandia in the year since we last published the Sandia organization chart.

The official organization chart is kept up-to-date at [www.sandia.gov/About.htm](http://www.sandia.gov/About.htm)

# Mileposts

New Mexico photos by Iris Aboytes  
California photos by Lynda Hadley



Roger Busbee  
40 8411



Duncan Tanner  
40 8945



Arthur Sena  
35 7849



Kent Biringer  
25 5324



John Didlake  
25 8118



Peggy Montoya  
25 7101



Juanita Padilla  
25 3525



Larry Rahn  
25 8351



Ken Stewart  
25 8420



Douglas Trump  
25 2992



Alicia Cloer  
20 16000



Jeffery Everett  
20 12334



Lois Johnston  
20 8361



Bruce Kistler  
20 8727



Corey Knapp  
20 2220



Neville Moody  
20 8725



Carl Pretzel  
20 8414



Jose Rodriguez  
20 5355



Kent Schubert  
20 1763



Mary Stoddard  
20 8119



Annie Webb  
20 15414



Theodore Wrobel  
20 15345



Roger Adams  
15 9334



Mark Allendorf  
15 8361



Arnold Augustoni  
15 1118



Kurt Berger  
15 8421



Victor Chavez  
15 1302



Dennis Clingan  
15 5712



Mark Dickinson  
15 9821



Michael Gilbert  
15 14402



Michael Hardwick  
15 8414



Ronald Hoskie  
15 7842



Martin Mikolajczyk  
15 8945



Timothy Mitchell  
15 14181



Michael Morrow  
15 5932



Bob Oetken  
15 8415



Donald Rhodes  
15 7844



Michael Saavedra  
15 14184



Brent Sims  
15 15425



Ken Washington  
15 8900

# Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads Sandia Classified

## MISCELLANEOUS

FUTON, black frame & cushion, \$250; oak freezer-box-style coffee table, \$75. Sala, 323-9571.

COMPAQ COMPUTER, 100-MHz Pentium, 16MB RAM, 1.2GB HD, 56K modem, great for Internet use, \$200 OBO. Henderson, 858-1321.

PC, HP, PZ-300 MHz, 2GB HD, DVD-ROM, 120MB removable drive, 17-in. monitor, accessories, software, \$600. Thomas, 822-1923.

QUEEN-SIZE WATERBED, mattress, liner, wood frame, w/4 drawers, headboard & footboard need minor repair, \$50. Laiche, 798-1986.

JEEP BESTTOP SOFT TOP, w/dr., fits '76-'95, CJ7 or Wrangler, very good condition, all parts, \$250. Savage, 890-4796.

HEELER/LAB RETRIEVER, 9 mos., female, black, loves to play. Gibson, 275-6680.

GATEWAY, P5-75 MHz, 4.4GB HD, 28MB RAM, Win95, Office, 15-in. monitor, keyboard, mouse, HP printer, CD-ROM, speakers, fax/modem, \$300 OBO. Case, 293-5466.

WHIRLPOOL APPLIANCES & CABINETS: electric cooktop, almond/black; dishwasher, black; double oven, chrome/black; oak cabinets, honey oak finish, \$500 OBO. Thomas, 284-2083.

CHAIN HOIST, 2-ton rated capacity, like new condition, \$55 OBO. Smith, 296-1908.

CRAFTSMAN TABLE SAW, 10-in., w/many accessories, excellent condition, \$350. Guttman, 888-5114.

PIANO, 45-in. upright, Weinbach 114 IV, badged Petrof., polished ebony, 2-yrs. old, European sound, \$3,900. Renk, 242-1277.

SOFA, love seat, Autumn Wood, solid oak, \$325; '71 Schwinn Varsity 10-spd. bike, needs tires, otherwise perfect operating condition, \$30. Sansone, 296-7945.

SLC OLYMPICS, 8 great tickets, you may not be able to get them elsewhere, any interest? Twitchell, chadthedad@juno.com.

NOSE MASK, for '83 BMW, \$25; power mower, B&D, electric, \$45; desk, large antique, \$400 OBO; wardrobe, wooden, \$50. Jones, 352-1007.

SWORDS, limited number of medieval swords, oriental sets & sabers, \$60 ea. & up. Grosso, 821-9012.

KING-SIZE BED, Sealy Posturepedic mattress, box spring, frame, like new, approximate cost \$1,000, asking \$300. Hartwig, 797-8406.

PURGATORY LIFT TICKETS, 2 available, good weekdays except March 12-20, \$25 ea. Moore, 764-8489.

LAWN MOWER, 6-hp, mulcher, 20-in., very good condition, used once, \$100 firm. Herrera, 833-5035, leave message.

BUNKBED, w/mattresses, \$60; portable crib, \$35; Isuzu Impulse shop manual, \$20; aquarium, w/accessories, \$20. Axness, 332-9769.

SOFA-SLEEPER, great condition, \$100; microwave, w/meat probe, temperature controls, excellent condition, \$40. Carroll, 284-4288.

TV STAND, wood, w/chrome trim, great condition, \$10; 2 full/queen-size quilts, like new, \$12 each. Burstein, 821-6688.

TRAIL BICYCLE, girl's, 21-in., \$100; portable evaporative cooler, \$75; upholstered bar chair, \$40; piano-tuning course, \$200. Noack, 828-1180.

NEW DOG CRATE, w/pad, Midwest, model 37C, 24"L x 20"W x 21"H, epoxy coated; \$82; Jenny Lind crib, w/mattress, \$50. Irwin, 296-2842.

DOUBLE SOFA-SLEEPER, blue/white check, \$150; 2 mauve La-Z-Boys, \$75 each. Schuler, 298-5827.

GERRY BACKPACK, w/frame, \$15; Groves target bow, \$50; Groves hunting bow, Kinoshits, 299-6491.

PINBALL MACHINE, '85 Williams "Fire Power," w/all operating coin slots, spare parts, & manual, full-size floor model, 4-1/2"L, 6"H, 2-1/2"W, great gift, \$475 OBO. Dybwad, 296-9047.

TOOLBOX, for small pickup, lockable, w/keys, \$25. Williams, 298-2624.

EXERCYCLE, weight bench, free-weights, light duty workout set & much more, \$200. Chavez, 275-0490.

KITCHEN CABINETS, complete set, drawer, shelving & wall units, mahogany, sell all or part, \$150; electric double-oven, \$25. Roberts, 275-2941.

TRAMPOLINE, large, missing the pad around the springs, great condition, \$100 OBO. Serna, 899-9618.

QUEEN HEADBOARD & FOOTBOARD, oak, mattress set, dresser, w/mirror, & nightstand \$1,000; 5-pc. dining set, \$25. Kettleborough, 293-4503.

PAINTBALL GUN, Stringray II, w/200 round drum & face mask, excellent condition, \$40. Anderson, 897-2772.

WURLITZER ELECTRIC SPINET ORGAN, bench, automatic church/pop settings, multi-matic percussion, & chimes, \$150. Nicholas, 294-2651.

VINTAGE RAYETTE BEAUTY SHOP HAIRDRYER, 3 speeds, works great, \$75 OBO. Anderson, 232-2167.

ALUMINUM SPORT WHEELS, Nissan Pathfinder or truck, 6-hole, 4 Michelin M/S tires, new \$2,100, asking \$800. McCoy, 323-2273.

SIX MINI-BLINDS, 30" x 60", w/hardware, \$8 each; stereo, turntable, AM/FM radio, dual tapedeck, sound design, \$20; Sears electric portable typewriter, \$20. Roberts, 323-7268.

CAMERA, Pentax P645, medium format, single lens reflex, w/55 & 150 mm lenses, excellent condition, \$2,000. Smith, 256-9413.

WESTERN BOOTS, woman's size 9, brown leather, golden brown eel, black leather print, black lizard, excellent condition. Wilson, 293-2228.

TWO UNITED AIRLINES VOUCHERS, \$300, good till Jun. 15, '01, \$200 each. Hertel, 345-1088.

CONCRETE MIXER (Montgomery Ward), w/1/2-hp motor, \$150; Kirby vacuum cleaner \$45; steel shelf unit, \$10. Gluvna, 884-5251.

CRAFTSMAN RADIAL ARM SAW, 2.75 hp, 10-in., w/stand, \$275; Ryobi 10 table saw, w/stand, \$250; Olympic weight bench/bar/leg curl/300 lb. weight, \$250. Valencia, 298-9254.

MAYTAG NEPTUNE DRYER; baby items, including car seats; miscellaneous household/kitchen items; & more, call for prices. Ludwig, 856-5111.

TREADMILL, Weslo Cadence 850, 2-hp, 10MPH, \$150; stair machine, \$100; fax machine, Sharp UX300, \$75; all OBO. Plummer, 898-7089.

GIUITAR, Celebrity by Ovation, acoustic electric, good condition, plays well, paid \$400, asking \$200. Holmes, 897-0916.

BASKETBALL BACKBOARD, roll-around type, w/base, pole, rim, good condition, sells new for approximately \$200, asking \$80. Cocain, 281-2282.

TRACTOR LAWN MOWER, 18-hp, 46-in. cut, w/mulcher, 3 yrs. old, used only 1st yr., lot too small, \$850 OBO. Archuleta, 565-9481.

GAS DRYER, \$100; 4 oak barstools, \$130; whitewash square coffee & 2 end tables, \$110. Maddox, 298-3815.

SOUTHWESTERN SOFA, \$150. Harris, 821-3001.

EXERCISE BICYCLE, DP airgometer, electronic monitoring; help me eliminate that never used exercise equipment, \$75. Platzbecker, 299-6096.

ANTIQUUE '05 "SUPERB" ICEBOX, golden oak, 2-dr., brass nickel-plated hardware, all original, really nice condition, \$495 OBO. Hollister, 323-1659.

COUCH, full-size, 84-in., navy blue leather, excellent condition, \$500. Gasser, 255-4562.

USB SCANNER, Visioneer OneTouch 7600, w/Paperport software, never used, in original cartoon, \$50. Crooks, 858-1180.

BOTTLE WATER COOLER, Oasis, \$75 w/bottle, \$65 without bottle; Texas Instrument PC100A, w/TI programmable 59, solid state. Chavez, 842-6374.

NORDICTRACK TREADMILL, digital pulse, calorie count, speed, distance, timer, excellent condition, \$100. Peterson, 883-8463.

FURNITURE: glass top coffee table, like new, \$75; dining table, dark wood, nice, \$175; refrigerator, GE, works great, \$150 OBO. Kamat, 292-3431.

## How to submit classified ads

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

- E-MAIL: Sandy Smallwood (sksmall@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 Sandy at 284-3704. 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.

PIANO, Wurlitzer console, recently tuned, good practice piano, \$1,000. Martin, 299-6768.

## TRANSPORTATION

'84 FORD RANGER, 6-in. lift, new brakes, rear springs, tires, rebuilt engine, 128K miles (60K miles were towed miles), \$4,000. Garner, 286-4352.

'97 DODGE RAM 4X4 PICKUP 1500, club cab, long bed, V8, AT, 56K miles, \$19,000. Cruz, 897-1932.

'89 BMW 525i, great condition, AT, 4-dr., fully loaded, black exterior/gray interior, \$7,000 OBO. Serna, 899-2905.

'76 FORD VAN, 1-ton, power, AC, AM/FM, trailer package, good condition, \$1,500. Elder, 888-3099.

'91 MAZDA MIATA, AC, PB, stereo, bra, red convertible, \$3,600. Lenberg, 238-0362.

'99 GMC YUKON, SLT, 4WD, 4-dr., excellent condition, 25K miles, one owner, always garaged, leather interior, too many extras to list, must sell, \$3,000 below book, Cummings, 884-3602.

'70 CHEVY CHEVELLE SS-454, red/black stripes, 4-spd., same owner 16 yrs., show car, immaculate condition. Temer, 822-9255.

'94 MAZDA MX-6, excellent condition, 6-cyl., 5-spd., leather, sunroof, gold, 95K miles, \$6,000. Longenbaugh, 869-6908.

'90 OLDSMOBILE CIERRA, 4-dr., 78K miles, good tires, good condition, AC, AM/FM, AT, \$3,500 OBO. Dunham, 828-1755.

'91 MERCURY CAPRI CONVERTIBLE, 55K miles, good condition, \$3,500. Whinery, 271-1653.

'95 TOYOTA SUPRA, AT, AC, all power, CD/CS, keyless, spoiler, 65K miles, garaged, \$17,900. Brown, 262-1998.

'99 SATURN SW2, 37,500 miles, excellent condition, cranberry, fully loaded, keyless entry, security system, CD, \$11,000. Rosen, 792-2924.

'97 CHRYSLER LHS, white, w/gray interior, power everything, 55K miles, V6, excellent condition, \$11,500. Tomasi, 797-2661.

'92 PONTIAC FIREBIRD, 90K miles, V6, loaded, nice, \$5,500 OBO. Dempsey, 281-9101.

'96 CHEVROLET Z-71, 1/2-ton, 3-dr., V8, AT, 4x4, 70K, excellent condition, \$15,975. Strader, 890-3198.

'95 CHEVROLET TAHOE LT, 4x4, all options, runs perfect, 145K highway miles, \$17,000 OBO. Sanchez, 866-4225.

'95 JEEP WRANGLER SE SPORT, red, 6-cyl., 4.0-liter, AC, 64K miles, hard top & bikini top, \$11,500. Laundre-Woerner, 896-6874.

'97 GMC SUBURBAN SLT, 4x4, V8, 5.7-liter, 72K miles, excellent condition, blue book \$26,700, asking \$22,000. Blickem, 323-6832 or 247-7346.

'94 CHEVY SUBURBAN, Silverado, 4x4, 350 V8, one owner, garage kept, 94K miles, \$14,300. Zarrella, 891-2550.

'90 SKYLARK, 95K, 2.5-liter, AT, AC, PB, PS, runs great, many new parts, \$3,495 OBO. Barthelmes, 286-1491.

'98 DODGE RAM PICKUP, w/Cummins turbo diesel, 15K miles, over \$5,000 in accessories, will negotiate, \$32,000. Yip, 294-8124.

'97 MUSTANG GT CONVERTIBLE, 31.3K miles, all options, new tires & top, fun car, below book, \$15,900. Rarrick, 792-5181.

'87 TOYOTA PICKUP, extra-cab, 4WD, 5-spd., blue, 125K miles, \$2,500 OBO. Hunter, 294-2877.

'88 JEEP CHEROKEE CHIEF, 151K miles, white, loose speaker lead, one dr. hold-open inoperable, \$4,000. Mullendore, 281-5304.

'98 FORD EXPEDITION, 4.6-liter, V8, 4WD, XLT; front/rear AC, 3rd seat, privacy glass, running boards, skid plates, alloy wheels, ABS, excellent condition, 44K miles, \$22,650. Owyong, 797-4137.

'96 CHEVY BLAZER, 4WD, 4-dr., V6, AT, AC, cassette, white, 57K miles, excellent condition, \$13,900 OBO. Wilson, 821-6703.

'91 FORD AEROSTAR, 4WD, 7 passenger, all power, original owner, runs great, all maintenance records, excellent condition inside & out, 98K miles, \$4,900. Terhune, 823-6606.

'89 DODGE DAKOTA, original owner, 68K miles, V6, AT, AC, PS, PB, bed-cap, liner, nice & clean, \$4,600 OBO. Torres, 294-7273.

'96 OLDS ACHIEVA, 4-dr., PS, PW, ABS, great condition, extra clean, less than 45K miles, below book. Williams, 271-8104.

'96 TOYOTA 4RUNNER SR-5, V6, 4x4, excellent condition, AM/FM/cassette /CD, 48K miles, dash/cargo covers, alloy wheels, must sell, \$18,999 OBO. Basil, 822-9544.

'96 FORD ESCORT, 4-dr., HB, 5-spd., AM/FM/cassette, AC, 69K miles, red, good condition, trailer hitch, spoiler, \$4,200. Stromberg, 255-6131.

'97 TAURUS, PS, AC, PW, CC, ABS, cassette, dual air bags, runs, looks great, \$7,200. Arellano, 890-1062.

## RECREATIONAL

SNOWBOARD (146.5), & boots, size 9?, \$100. Jansma, 294-3524.

'87 WINNEBAGO CHIEFTAIN, 27-ft., new batteries, excellent condition inside & out, \$15,000. Armstrong, 832-4496, ask for Barbara.

'98 YAMAHA YZ125, new chain & sprocket, new top-end pro circuit graphic bill pipe, \$3,000 OBO. Gallegos, 281-5515.

'00 MOTOR HOME, Georgie Boy, 32-ft., fully equipped, 454 Chevrolet vortec engine, generator, queen-size bed, TV, rear camera, microwave, refrigerator, freezer, separate shower, 18-ft. awning. Tennant, 275-8980.

BICYCLE, Trek Mountain Track 800, woman's, 17-in. frame, 26-in. wheels, 6-spd., like new, \$140; Rhode Shuttle adjustable 3-bike carrier, \$35. Smallwood, 839-7298.

'73 GLASSMASTER, split windshield, 14-ft., 70-hp motor, trailer, trolling motor, \$900 OBO. Estes, 856-1893.

'95/'96 MOUNTAIN BIKE, Marin Ultimate Titanium, 20-in., XTR/XT, Manitou shock, SPD, King hub, Mavic 231 rims, \$1,250 OBO. Evans, 897-4782.

SLEEPING CAMPER, for S-10SB or equivalent, double bed, storage, no facilities, 12 & 110V lights, garageable, \$1,950. Prekker, 896-6869.

'96 TRAILMANOR CAMPING TRAILER, 27-ft., excellent condition, garaged, shower, toilet, furnace, refrigerator, awning, range/oven, boat rack, \$13,800. Hutchins, 856-3361.

MOUNTAIN BIKE, Specialized Stumpjumper, 19-in. frame, LX components, front shocks, \$200 OBO. Pier, 281-0776.

'73 SPORTSTER, stocked 1100 cc, lots of new stuff & potential; Sholi helmet w/shield, white/pearl, new, \$250. Hall, 298-9254.

ROAD BIKE, Novara (REI), 24-in., 18 spd., Shimano Rx100 components, nearly new, \$250. Heffelfinger, 281-1733 or 379-9487.

## REAL ESTATE

3-BDR. HOME, 1-3/4 baths, 1,450 sq. ft., on 10 acres, off N14/344, good well, amazing views, \$143,000. Haggerty, 232-8398.

2-BDR. TOWNHOUSE, 3 baths, 2-story, loft, skylights, 2-car garage, roses, delightful North Valley. Ginn, 761-0101.

LAND, 10 acres, San Pedro Creek Estates, \$140,000. Rutherford, 924-2197, ask for Brian or 265-1428, ask for Kathy.

2-BDR. HOME, 2 full baths, Towne Park, gated community, near base, 1,300 sq. ft., former model, 2-car garage, new condition, \$123,000. Salas, 271-9922.

3+BDR. HOME, NE Heights, 2,730 sq. ft., 2-story, views, central atrium, large kitchen, attic storage, builder/owner, \$235,000. Martinez, 298-7382.

2-BDR. MOBILE HOME, 1 bath, alarm system, carport, porch, well maintained, \$5,000 OBO. Luther, 294-2863.

## WANTED

HOUSEMATE, private bedroom & bath, fully furnished, non-smoker. Taylor, 822-9819.

VENDORS "Cherished Creations" Arts & Crafts Show 2001: Mother's Day, May 11-13; Balloon Fiesta, Oct. 5-14; Santa Fe, Oct. 26-28; Thanksgiving, Nov. 22-25. Self, 296-4137.

TUBE RADIOS & HI-FI, collector/hobbyist always looking for old transistor radios or just old tubes themselves. Roose, 296-4129.

WHEELCHAIR, in good condition, for senior citizen at reasonable price. Denman, 247-8798.

RESPONSIBLE STUDENT, to house sit from May 20 to June 3, includes feeding dogs & cats. Putelli, 867-6653.

BICYCLE CHILD CARRIER, seat or trailer in excellent condition. Shollenberger, 237-2677.

BAUSCH & LOMB TELESCOPE, discovery zoom, 15-60, w/3' tripod (Sandia 30 & 35 yr. service award), trade. Northcutt, 299-6958.

TODDLER BED &/or Little Tykes toddler gym (for outdoor use). Mills, 256-4110.

## WORK WANTED

UNM STUDENT, responsible, experienced, will housesit your home while you relax, plants/pets/yard upkeep included, reasonable. Rockwell, 884-4206.

## LOST & FOUND

SILVER RING, found in SW hallway of Bldg. 960. Olson, 845-7527.



# Labs' new recruiting booklet challenges potential Sandians to help us 'change the world'

The story has often been told that when Apple Computer co-founder Steve Jobs was looking for a new CEO to manage the legendary computer company's transition from garage start-up to multi-billion-dollar industry leader, he thought he'd found his man in John Sculley. Sculley was an up-and-comer in the corporate pantheon, a youngish CEO of PepsiCo, makers of Pepsi Cola. Sculley was intrigued by the Apple offer, but wary. PepsiCo was comfortable; hi-tech was terra incognita.

Jobs was relentless in his pursuit, Sculley noncommittal. Finally, Jobs laid it on the line to the Pepsi chief: "Do you want to sell sugar water for the rest of your career, or do you want to change the world?"

A stunned Sculley hadn't quite looked at it that way. He signed on with Apple right there.

Sandia, in its new recruiting drive, takes a similar approach. The cover of a new Sandia recruitment booklet invites potential Sandians to "change the world." Flip open to the first page and there is the familiar epigram from Chinese philosopher Lao Tzu: "The journey of a thousand miles begins with a single step."

The colorful booklet is a new tool that Labs' talent scouts are using as they seek out the best and brightest to join the ranks of Sandians.

As noted by Executive VP Joan Woodard in the annual *Lab News* State of the Labs interview (*Lab News*, Feb. 23), and reported previously in the *Lab News* (Sept. 8) Sandia is in early stages of its most aggressive hiring program in years. In the State of the Labs interview, Joan confirmed that Sandia hopes to bring on board 500 new people this year (about half technical professionals), and is likely to maintain that hiring level over the



COVER of the Labs' new recruiting booklet offers potential Sandians a chance to "Change the World."

next several years.

The recruiting booklet is one component of a multifaceted effort that is going great guns. As Joan noted: "[T]hings are really picking up in terms of activity: interviews, candidates coming in, offers going out. Our acceptance rate is going pretty well. Across the Lab, it's still in the mid-80s. Even in Division 1000, which is largely a science and technology organization, we're running at about a 75 percent acceptance rate. We're getting in grads from some great schools, so we're hitting the kinds of schools we need to be hitting."

"We seek out-of-the-box thinkers," the booklet states. It challenges: "So what are you going to do with your life? Punch a clock? Or change the world?"

The booklet appeals to potential Sandians' highest ideals, telling them that as Sandians, they'll be using science and engineering to help

solve America's thorniest national security challenges while working in an environment that requires "the collective, creative minds of the nation's top scientists, engineers, and support staff."

The booklet profiles a number of Sandians, depicting them involved in off-the-job pastimes: rock climbing, music, hiking, martial arts.

In addition to highlighting technical work and accomplishments, the booklet offers details of the Labs' Total Rewards benefits package. It also features a number of pull-out information sheets offering more details about specific job opportunities and employment options.

Also in the works is a CD-ROM-based multimedia show that presents a flashy, fast-paced look at Sandia. The CD is designed

to reinforce the information in the recruiting booklet. It also links to Sandia's recruiting Web site. And here's a neat feature: although the CD-ROM disk is about the size of a business card, it fits in a standard CD-ROM drive and plays on any computer.

— Bill Murphy

## Coronado Club

March 8, 15, 22, 29 — Bingo

March 16 — St. Patrick's Day celebration, 7-11 p.m. Music by Roger Burns Trio; Irish Step Dancers of Colorado, 8-8:30 p.m. Reservations required: 265-6791.

March 18 — Sunday brunch buffet; buffet 10 a.m.-1 p.m.; music by Swing Shift 1-4 p.m.

## Recent Retirees



George Edgerly  
41



Roger Roberts  
38 2616



Robert Eldredge  
37 10262



Philip Thacher  
35 2541



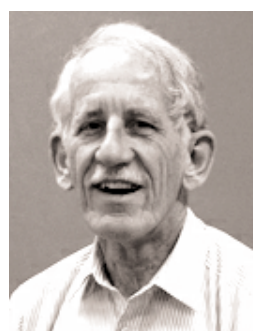
Billy Thorne  
31 9126



Debra Pool  
30 2102



Art Morales  
21 8721



Donald Mitchell  
15 6413

## Creative Arts staff, partners win five STC 'Distinguished' awards

The Southwest Region of the Society for Technical Communication (STC) recently presented awards to members of Sandia's Creative Arts Dept. 12620 and their partners in other organizations. Five of Sandia's Distinguished Award winners will go on to the international STC competition in late spring.

First place Distinguished Award winners are Alice Baltz for the Computer Science Research Institute logo; Michael Vittitow for *Sandia Perspectives 2000* (with Randy Montoya, 12640) and Sandia recruiting ads; Noel Fletcher for the National Laboratory Tax Credit Partnership Act brochure (with Chris Miller, 12640) and Microsystems Technology CD (with Michael Vittitow and Jim Lloyd, 5845).

"More than 17 percent of the awards presented by Sandia won first place," says Loraine McCutcheon, Dept. 12620 Manager. "A very good showing for Sandia. We compete with products in graphic arts, technical writing, and multimedia." STC Award competitors come from other national laboratories and graphic arts companies in private industry.

Mitzie Bower, Jan Gaunce, Carl Mora (9612), Jerry Gorman, Patty Guyer-Stevens (9904), Kay Rivers (9517), and Walt Dickenman (12630) also won awards in the Art, Publications, and On-line award categories.