

Sandia demonstrates Athena tag for preventing tragic battlefield 'friendly fire' incidents



An Athena-tagged vehicle rumbles into action during recent field exercises.

By Michael Padilla

Designed to help the military avoid "friendly fire" incidents, the Sandia-created Athena Radar-Responsive Tag was recently tested during Exercise Urgent Quest in the UK.

Sandia, along with General Atomics Aeronau-

"Athena is effective because it uses a fighter aircraft's existing radar for detection. It is simple, rugged, small, and inexpensive to integrate."

Project Administrator Darick Lewis

tical Systems, Inc. and Sierra Monolithics, demonstrated Athena during the exercise. Athena was developed with sponsorship from the US Army CERDEC I2WD Division and the US Air Force Air Warfare Battlelab.

During the demonstration, Athena tags were placed on military vehicles participating in the exercises. The tag device, tracked via aircraft radar, can be used to identify both US and coali-

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Photo by Ron Ralston (6356)



Hispanic Heritage Month: a photographic celebration by Randy Montoya. See page 7.

Sandia LabNews

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Managed by Lockheed Martin for the National Nuclear Security Administration

Goodyear/Sandia partnership shines in company CEO's conference call

CRADA has led to new tire design — and new insights for Sandia

By Bill Murphy

It was the kind of phone call a CEO loves to make.

In late October, during a routine third quarter conference call, Goodyear Tire and Rubber Co. CEO Robert Keegan was able to tell Wall Street analysts that in the preceding three months, the company had achieved its most profitable quarterly earnings in seven years.

And here's where it gets good for Sandia. Keegan, noting that quarterly sales of more than \$5 billion was the company's best quarter ever, attributed a large part of the success to the enthusiastic public acceptance of the Goodyear

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Sandia to conduct three workshops to gauge nation's energy and water concerns

Information from meetings to be used to develop energy-water roadmap

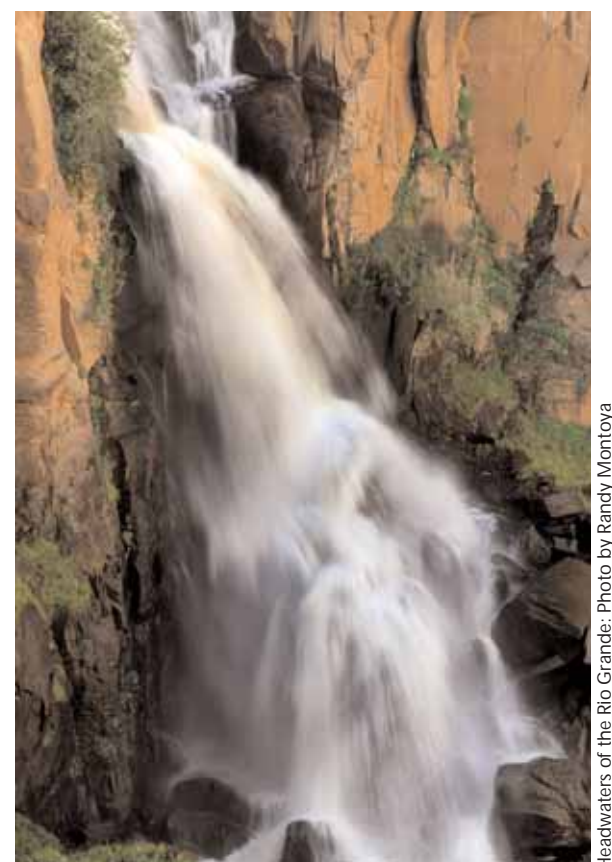
By Chris Burroughs

Sandia will conduct three national workshops over the next few months to gauge future energy and water concerns of water and electric utilities, environmental organizations, policy and regulatory groups, tribal groups, economic development organizations, government agencies, universities, research institutions, and others.

The information compiled at the meetings will be used in the development of a national science and technology roadmap looking 25 years into the future to help address major energy- and water-related issues facing the country. The roadmap will help identify both national and regional needs, issues, and gaps in technology, policy, and regulations related to the interdependency of energy and water that can be addressed through improved science and technology initiatives.

"People don't realize that energy and water are interdependent," says Mike Hightower, one of the Sandia researchers leading the roadmap effort. "Much of energy production is done with water, and water pumping and treatment require a lot of energy. Currently, electric power generation in the US accounts for almost 40 percent of all fresh water withdrawals, equivalent to the amount of

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Headwaters of the Rio Grande: Photo by Randy Montoya



After nearly drowning, Alfred Sanchez develops a remote-controlled water-rescue vehicle — and gets a patent for it. Story on page 6.



Clean energy, gnarly waves, and redundant cell phone nodes: Sandia Student Science Symposium brings brainstorming to the fore. Story on page 12.

Sandia giving campaigns in N.M. and Calif. headed back in right direction

We at the *Lab News* hope you will consider this serious message in a space that we often fill with not-so-serious matters.

Along with many other Sandians, we have been concerned in recent years about the long-term downward trend in the Labs-wide participation rate in Sandia's employee giving programs, but it looks like some hard work and new approaches this year are paying off handsomely in both the ECP (Employee Contribution Plan/New Mexico) and SHARE* (Sandia Helps and Reaches Everyone/California) programs. If you don't yet participate, we want you to know there's still time to sign up, and we hope you will give it serious consideration. Although the ECP campaign drive ends officially today (Friday, Nov. 11), and the SHARE campaign has already ended, employees can still sign up and begin participating at any time. You can find out how and much more about the programs at <https://ws26snlnt.sandia.gov/ecp/start.do> or <http://www.ca.sandia.gov/share>.

Because this year's ECP campaign was still under way when we prepared this message, and the SHARE campaign had concluded, we are mixing some old numbers and some new numbers here and don't yet have the final results, but we have seen some very encouraging numbers indicating that the long-term downward trend in employee participation is changing and headed back in the right direction.

First, a more proactive and user-friendly 2005 California *SHARE* campaign increased the site's total participation by a whopping 10 percent. Hearty congratulations to California Sandians and SHARE leaders!

And as of Wednesday morning, Nov. 9, the numbers indicated that *all* employee categories in the ECP campaign and members of all three Sandia unions had already increased their participation rates – some significantly – with three full days still left in the campaign.

And this is particularly encouraging: New hires (employees with five years of service or less) had increased their participation rate by almost 23 percent, up to almost 48 percent of new hires. Remembering our younger years, we understand well that many younger workers cannot contribute as much as older workers who generally have higher salaries, but we hope even more new hires will consider participating at some level, with the thought of increasing their contributions in future years as their salaries rise.

Helping people in need is a very good thing to do. So, if you don't participate now, please reconsider. Today – right now while you're thinking about it – would be a fine time. How about going to one of those web addresses above and getting started? We'll share the final results of the ECP and SHARE campaigns soon in *Lab News* stories.

Forty years ago (1965), nearly 85 percent of employees participated. Ten years ago, 75 percent participated, and two years ago, participation had dropped to less than 65 percent. Now it looks like we are headed back higher, and that is wonderful news. Let's keep it headed up and up.

*Sandia/California's campaign was renamed this year to SHARE, Sandia Helps and Reaches Everyone, to better reflect its goals. It had long been called the LEAP campaign, Livermore Employees Assistance Program.

Tom Mehlhorn elected a AAAS Fellow

Sandia physicist and fusion research leader Tom Mehlhorn has been elected a fellow of the American Association for the Advancement of Science (AAAS). Tom is manager of High Energy Density Physics and ICF Target Design Dept. 1674.



TOM MEHLHORN

Each year the AAAS Council elects members whose "efforts on behalf of the advancement of science or its applications are scientifically or socially distinguished."

Tom is being honored specifically "for scientific and managerial leadership in studies of high energy density physics, particularly those involving Z-pinch."

LDRD lead on advanced fusion design

In his present position, Tom is responsible for, among other things, integrated target designs for the Sandia inertial confinement fusion program. He leads the development of a theoretical understanding of X-ray power scaling from Z-pinch for application to ICF targets, and is principal investigator for the Sandia Grand Challenge Laboratory Directed Research and Development project on advanced Z-pinch fusion.

He came to Sandia in 1978 after receiving his PhD in nuclear engineering from the University of Michigan, where he also did his undergraduate work. As a member of technical staff, he was chief theorist for ion diode experiments on both the PBFA I and PBFA II pulsed power accelerators.

In 1989 he became manager of the Diagnostic Theory Department and then successively managed the Target Physics Analysis Department, the Beam Focus & Energy Accounting Department, and (1995-1998) the Ion Beam Physics Department.

In September 2004 Tom received the Lockheed Martin NOVA award as manager of the team that produced thermonuclear fusion at Sandia's Z machine.

He is a member of the American Physical Society, the American Nuclear Society, and is a senior member of the Institute of Electrical and Electronics Engineers.

Tom will be inducted at the AAAS Fellows Forum as part of the AAAS Annual Meeting in St. Louis on Feb. 18, 2006.

Recent Patents

Robert Nilson (8764) and Stewart Griffiths (8700): Axially Tapered and Bilayer Microchannels for Evaporative Cooling Devices.

Timothy Shepodd (8762): Mobile Monolithic Polymer Elements for Flow Control in Microfluidic Devices.

Barry Spletzer (6600), Diane Callow (6632), James Jones (6632), and Michael Kuehl (6634): Apparatus and Method for Cutting Soft Materials, Especially Meat.

Kenneth Peterson (2452): Encapsulants for Protecting MEMS Devices During Post-Packaging Release Etch.



Lab News *schedule and classified ads deadlines*

Two more *Lab News* issues will be published this year. The next issue will be dated Nov. 25, the day after Thanksgiving, but because of the Thanksgiving and Energy Conservation holidays, it will not be delivered to employees until Monday, Nov. 28. The final 2005 issue will be published Dec. 9.

The first 2006 issue will be published Jan. 4. The deadline for submitting classified ads for that issue will be noon, Tuesday, Dec. 20; a reminder will be published in the Dec. 9 issue.

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To notify of changes in address, contact Carol Wade, Benefits Dept. 3332, at 505-845-9705, e-mail cawade@sandia.gov, or Mail Stop 1021, Sandia National Laboratories, Albuquerque, NM 87185-1021.

Others:

To receive the *Lab News* or to change the address (except retirees), contact Michelle Fleming, Media Relations and Communications Dept. 3651, 505-844-4902, e-mail meflemi@sandia.gov, or Mail Stop 0165, Sandia National Laboratories, Albuquerque, NM 87185-0165.

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The *Lab News* is on the Web at www.sandia.gov/LabNews.

Up on hydrogen: Terry Johnson reviews Laboratories' multifaceted hydrogen energy research efforts

By Nancy Garcia

As a focus of Sandia energy research, hydrogen has a number of advantages. It's light, it's abundant, it's nonpolluting, and Sandia has plenty of experience working with it.

Terry Johnson (8775) recently described Sandia's broad and coordinated hydrogen effort in a Technology Symposium videolinked to Sandia/California. About Sandia's historical experience with the substance, he recalled his former director quipping, "It's no secret there's hydrogen in a hydrogen bomb."

"It's light, it's abundant, it's non-polluting, and Sandia has plenty of experience working with it."

Terry Johnson

That background is leading to new avenues of materials research supporting Sandia's national security and environmental missions.

DOE FreedomCar initiative

One area is DOE's FreedomCAR initiative. DOE is targeting a hydrogen-fueled vehicle with the same performance and cost as a gasoline-powered car; a 300-mile range; on-board storage of 5 kilograms of hydrogen in the same space as a gas tank; a refueling time of less than three minutes; and fuel costs equivalent to gasoline.

The refueling time, Terry said, is a "big issue," but, given rising gas prices, the fuel cost "is getting easier to meet these days."

Since hydrogen is not a dense material, one of the biggest challenges is keeping the volume manageable. Its volumetric energy density is about 1,000 times less than that of gasoline.

Various ways to compact hydrogen include storing it as a cryogenic liquid, a compressed gas, or in a complex metal hydride — which Sandia is pursuing through new materials research.

These storage methods all fall short of the DOE targets of carrying 6 weight percent hydrogen by 2010 or 9 weight percent by 2015. The strong point of complex metal hydrides is their potential to store more than 10 weight percent hydrogen, although the fueling timeframe is slow and heat management is a problem.

Simpler classic hydrides have been used to store hydrogen on the space shuttle, where it is bound in the metal lattice. The more complex



RECHARGING OF THE HYDRIDES and release of the hydrogen from metal hydrides such as sodium alanate requires heat, which can reduce overall fuel economy. Terry Johnson (8775) sets up a test apparatus that, when verified, will generate external heat that improves the overall energy density compared to traditional heat sources. (Photo by Bud Pelletier)

materials include sodium alanate, and in a similar class of compounds, lithium amide and borohydride.

"Sodium alanate is a very difficult material to try to develop a system around," Terry said. "It releases a lot of heat — you could boil 64 gallons of water with the heat from refilling 5 kilograms in five minutes. It expands 25 percent, and it doesn't conduct heat well."

Sandia designed and developed a hydride storage system for a fuel cell-powered mining locomotive, which replaced the original batteries. The system operates for eight hours after being refueled in less than an hour, compared to the eight-hour recharge time required for batteries.

'We caught the attention of GM'

"It was partly due to that that we caught the attention of GM," Terry said. Sandia is halfway through a four-year \$10 million project with this industry leader to design, construct, and test a model hydride storage system for on-board vehicle storage. Terry is the lead system engineer and said thermal and chemical kinetics modeling of



system behavior is contributing to conceptual designs and requirements for drive conditions.

Previous work in hydrogen-powered transportation at Sandia included the RATLER™ remotely operated reconnaissance vehicle and Red Thunder (a small radio controlled car). In addition to studies conducted under the Laboratory Directed Research and Development Program and partnerships like that with GM, Sandia leads the Metal Hydride Center of Excellence, a DOE-funded consortium of eight universities, three businesses, and five other national laboratories, in which metal hydride storage issues are being investigated. Sandia is also contributing to safety, codes, and standards through partnering with Los Alamos and Pacific Northwest national laboratories and the National Renewable Energy Laboratory; international efforts; and the National Hydrogen Association.

Sandia California News

California team honored at R&D 100 celebration



TEPIC HONORED AT R&D 100 — *R&D Magazine* held a formal banquet in Chicago this fall for winners of its annual contest that honors the 100 most technologically significant new products. This event has been dubbed the "Oscars of invention." Among Sandia's four winning technologies this year (*Lab News*, July 22) was TEPIC, a rigid structural foam developed at Sandia/California to be used as a molding form for advanced composite materials that cure at high temperatures without the need for expensive metal tooling. From left are Tim Shepodd, LeRoy Whinnery, Tom Bennett, Chris Binns (all 8762), Jim Sampson (Scion Industries-licensee) and Steve Goods (8754). Also on the team (but not present) was Pat Keifer (8762).

San Joaquin school conference draws 366 students



IN THE SWIM — A participant at the San Joaquin Expanding Your Horizons in Science and Mathematics conference experiences one of the hands-on workshops. There were 366 young women from grades 6 through 12 who attended the Oct. 1 conference at the University of the Pacific in Stockton, which co-sponsored the event along with Sandia and Lawrence Livermore National Laboratory (LLNL). About a half-dozen Sandians volunteered to put on the conference for the 13th year in Stockton, one of 140 such conferences that take place around the country. The keynote speaker this year was Tammy Jernigan, a former NASA astronaut who now serves as a principal deputy director at LLNL. (Photo by Lynda Hadley)

Athena tag

(Continued from page 1)

tion forces during combat to avoid fratricide. During war, fratricide is the act of killing one's own soldiers.

Aircraft radar 'sees' friends on ground

Aircraft on bombing runs used their on-board radar systems to ensure there were no friendly troops in their sights. If an Athena-tagged vehicle was present, a unique identifier appeared on the pilot's screen alerting him to a friendly force in his target area, thereby avoiding a potential friendly fire incident.

"It was very gratifying for the project team to listen in to the combat radio link in real time and hear the pilots describe seeing the Athena tag on their radar screens," says program manager Lars Wells (5354).

The exercise was a Military Utility Assessment, associated with the Coalition Combat Identification Advanced Concept Technology Demonstration, organized to demonstrate the effectiveness of new technologies in preventing friendly fire, or fratricide.

In preparation for the exercises, the Athena tag had been demonstrated with several US and European aircraft. In addition to combat identification, the tag can be used for "blue force tracking," a similar but not identical mission.

Sandia project administrator Darick Lewis (5053) says the exercises were intended to evaluate the effectiveness of various technologies in preventing friendly fire.

"Ideally, worthy candidate technologies can be transitioned into final development programs

The tag can be used for "blue force tracking," a similar but not identical mission.



AN ARMORED VEHICLE deployed during Exercise Urgent Quest is seen here with the Athena tag mounted atop the roof, affording clear line of sight to friendly aircraft above. The Athena unit is shown in more detail in the inset photo.

(Photos by David Erlandson, General Atomics Aeronautical Systems, Inc.)

and produced for warfighter use," he says. "Athena is effective because it uses a fighter aircraft's existing radar for detection. It is simple, rugged, small, and inexpensive to integrate."

General Atomics Aeronautical Systems, Inc., an affiliate of privately held General Atomics,

provides comprehensive solutions for military and commercial applications worldwide.

Sierra Monolithics, Inc. is a leading supplier of high-frequency mixed signal integrated circuits and modules for the wireless and telecommunication industries.

Goodyear CRADA

(Continued from page 1)

Assurance TripleTred™ tire, with consumer demand much stronger than predicted.

That's the tire that Goodyear and Sandia worked on together under a long-standing cooperative research and development agreement, or CRADA. To the partnership mix, Goodyear brought its long-cultivated knowledge of tires, materials, highway/tire interface phenomena, and other tire design expertise. Sandia brought to the table its increasingly powerful and extremely robust computer modeling and simulation tools.

As Keegan noted to analysts, "The joint work on TripleTred replaced our need — as has been the case for many years — to build, test, and repeat, with a powerful set of simulation tools for design, prototype development, and performance evaluation of new tires."

How good is the resulting tire? Keegan noted that the Assurance TripleTred tire

"earned a number one rating . . . by the top US consumer magazine, providing further validation that TripleTred technology is a home run for us." Goodyear devotes an entire, dedicated website to Assurance TripleTred tire technology. It's at <http://www.goodyearassurance.com>.

TripleTred is a radical new tire design with treads unlike any previously used on automobile tires. The three tread patterns are optimized for driving in ice, rain, and dry conditions. The tread design was refined and perfected using Sandia modeling and simulation tools.

Joint R&D 100 winners

Keegan noted that Goodyear and Sandia shared an R&D 100 award for developing the Assurance tire, which he called a "further validation" of the partnership approach to tire design.

Keegan noted that in September, the company released a new SUV TripleTred tire, the Fortera. Like the Assurance tire, it is based on R&D done with Sandia.

The Goodyear/Sandia relationship goes back more than a decade. Joe Gingo, now the company's Executive VP and Chief Technology Officer, was there at the beginning of the Sandia relationship. Speaking of that relationship, he told a tire industry magazine last year: "I was very fortunate because in 1994, when I was VP of tire technology, we bet a lot of our R&D resources on predictive modeling and predictive testing. I don't think I've ever made a better bet; nine years later, that investment in research was a huge payoff for this company."

A win/win teaming

Hal Morgan, the Sandian perhaps most closely associated with the Goodyear team during the long-term partnership, emphasizes that, as much benefit as Goodyear has gained from the relationship, the Labs and the nation have also come out as winners.

Says Hal, "Our partnership with Goodyear has been extremely gratifying. I've never worked with a partner who has so clearly expressed the value that we bring to their business both publicly



GOODYEAR and Sandia partners examine a tire-testing configuration in this 2002 photograph. In the foreground are Goodyear executives Joe Gingo, left, and Bill McLendon. (Photo by Randy Montoya)

and in other ways as Goodyear has.

"Our work with Goodyear has brought many benefits to Sandia. The computational mechanics capabilities that we have developed with them are capabilities that we have applied in many of our nuclear weapons applications. We've also learned from Goodyear how computational capabilities can be integrated into design and manufacturing processes.

"Furthermore, they have willingly provided proprietary business information that we have used at Sandia in developing critical infrastructure models for homeland security applications.

"Sandia has even done testing at Goodyear's test tracks, which probably would not have been available to us without our strong partnership. This is indeed a real partnership in that both Sandia and Goodyear are truly concerned about each other's best interests."

Energy/water

(Continued from page 1)

water withdrawn for agriculture. While the water consumed by electric power generation is not as great as in agriculture, as fresh water resources become more scarce, we are seeing an increasing number of power plant applications across the country being denied because of a lack of available water resources."

Mike adds that a major concern is the upward trend for electrical power use. Electricity use in the US is projected to increase 20 to 30 percent over the next 25 years. That will involve a greater demand for water, which is in limited supply in many regions, including the Southeast, Southwest, and the Pacific Coast.

Water 'tapped out' in some areas

"Water is already tapped out in these areas," Mike says. "For the next 25 years US demand for electrical power will grow at a projected 30 percent rate, while the Southeast, Southwest, and the Pacific Coast are doubling their power needs. We are growing fastest in areas with limited water resources. To address the growing shortage of fresh water, we are turning to the use of impaired waters, like desalination and wastewater reuse, which are much more energy-intensive. This spiral of energy

Energy-water workshops

Central US Region

Nov. 15-16, Kansas City
Location: Hilton Kansas City Airport
Contact: Cliff Ho (6115)

Eastern US Region

Dec. 13-14, Baltimore
Location: Sheraton Inner Harbor Hotel
Contact: Jacquelynne Hernandez (6202)

Western US Region

Jan. 10-11, Salt Lake City
Location: Hilton Salt Lake City Airport
Contact: Ronald Pate (6115)



of fresh water and impact on energy production and generation, cost of adhering to regulations, and policy issues.

Identifying, ranking solutions

Following the three regional meetings and subsequent data and gap analysis, a national Energy-Water Technology Innovations and Solutions Workshop will be held next spring to begin to identify and rank potential solutions and identify future science and technology directions, which will become the basis for the final roadmap. The final energy-water roadmap will summarize the identified needs, major gaps, innovative technical approaches and research needs, research and development priorities and strategies, and associated science-based policy evaluations.

Sandia is working collaboratively with several entities to develop the roadmap. These include an executive committee of national water and energy experts representing federal and state agencies and water and energy associations from around the country, and an advisory panel of DOE national laboratory representatives.

Other Sandians helping with the logistics and coordination of energy-water roadmap workshops include Michael Ross (6202), Terry Wilson (6032), Goldie Platt (6031), Marie Garcia (1010), and Sandhya Rajan (6118).

and water relationships is impacting the long-term energy security of the country."

Sandia received \$2 million from DOE to develop the roadmap. It must be completed by the end of fiscal year 2006. Coordinating the roadmap activity are a team of researchers from Centers 6100 and 6200 with additional technical support from representatives of all other DOE national laboratories.

Among concerns likely to be discussed and considered at the regional meetings are general lack

Technology Maturation Program provides funds to help commercialize Sandia technology

By Michael Padilla

A new Sandia program has been created to provide funding to help commercialize early-stage technology, and proposals will be called for this month.

The goal of the Technology Maturation Program is to fund and improve Sandia's success in commercializing technologies, says Kevin McMahon (10104), Licensing and Intellectual Property manager.

He says many Sandia technologies are often in too early a stage to attract commercial partners, and federal research sponsors will not typically fund technology maturation efforts. While the level of maturation funding required to completely commercialize technologies often exceeds that necessary for developing the technology, small amounts of maturation funding can be useful in demonstrating a proof-of-concept or a working prototype. Once a proof-of-concept or working prototype is demonstrated, industry interest in the

"We hope to prove to industry that Sandia technology will work in a commercial product."

technology is increased.

"We hope to prove to industry that Sandia technology will work in a commercial product," he says.

The awards through the Technology Maturation Fund (TMF) would not be for a specific time period, but rather to achieve specific milestones in a defined development path leading to commercialization. The funds are meant to remove some of the hurdles in early-stage commercial development.

Award amounts from TMF are determined based on the specific milestones to be achieved. A single invention or intellectual property portfolio can receive multiple awards over time with no defined maximum, as long as a review panel is

convinced that further funding will be recouped in future licensing income.

The awards may also be made from a fund comprising licensing royalties including division and Intellectual Property management monies and from non-Sandia funded awards, for example from companies interested in Sandia technologies or investors such as venture capitalists.

A call for proposals will be made in mid-November. The criteria for the proposals are based on market opportunity, technology risk, market risk, people risk, and matching funds.

A review panel will evaluate proposals and select finalists. Based on the written proposals and any discussion with finalists, the panel will select projects to receive initial awards.

Once an award is made, the investigator must pursue the approved work. The review panel reserves the right to withdraw funding if the approved work is not completed in a timely manner.

More information about the program will be announced Labs-wide and posted on the Corporate Business Development and Partnerships internal website.

Citizen reception on environmental stewardship Nov. 17 at National Atomic Museum

Members of Sandia's Long-Term Environmental Stewardship (LTES) program will host a Citizen Reception at the National Atomic Museum, 1905 Mountain Road NW, Thursday, Nov. 17, from 6 to 8 p.m.

This free event will introduce the Citizens' LTES Working Group and other members of the public to the museum's new permanent LTES exhibit. This exhibit was created at the recommendation of the Citizen Working Group, to help educate the public about the need for long-term environmental stewardship at Sandia. Sandia's LTES program is explained through use of an interactive display located in the radiation exhibit of the Atomic Museum. Demonstrations of several environmental education models and a status update for the LTES Implementation Plan will be given during the reception. The public is invited.

The National Atomic Museum is two blocks east of Rio Grande Blvd., north of Old Town.

For more information, contact Oriana Saiz (10331) at oasaz@sandia.gov or 284-8046.

Sandia Club carts get new names



IN AN EFFORT to make ownership of Club carts easier to identify, some Sandians are starting to give their carts names as well as numbers. These two carts were spotted in front of Bldg. 800. (Photo by Bill Doty)

After nearly drowning, Alfred Sanchez develops El Salvadore, a remote-controlled water-rescue vehicle — and gets a patent for it



A LIFESAVER — Alfred Sanchez holds the remote control box that operates his El Salvadore life-saving device. In the photo below left, Al explains El Salvadore's features to Albuquerque Fire Department personnel. At lower right, Al explains some of the features of his new, second-generation prototype, which will be lighter, faster, and more agile than the original, patented device.

Story by Iris Aboytes • Photos by Randy Montoya

Sandia fabricator Alfred Sanchez (2431) was recently awarded a patent for a water-rescue vessel he named El Salvadore (the savior, a knight in shining armor). It is a remote-controlled rescue vehicle that can launch in an arroyo or river when the water is deadly and can perform a rescue without putting additional lives in danger.

The vehicle has three actuators and pneumatic air cylinders to ensure its reliability. Water goes through a vent at the front and out the rear of the vessel, causing it to be stable for rescue of victims in swift water. The internal rudders are used to turn the vehicle. A stabilizer moves the water going through the vessel when it moves into a certain angle.

Opening the vents lowers the vehicle so the person being rescued can hold onto the rails along each side. If that is not possible, an automatic launcher sends out a life preserver attached by a rope. The remote-control returns the vehicle to the shore without endangering anyone.

About five years ago, Al almost lost his life in the water. He and his wife, Linda, had gone to Roswell to spend Easter with their son, Jared, who was attending New Mexico Military Institute. Jared had just learned to swim and was eager to show his parents. He jumped into Bottomless Lake near Roswell. In a matter of minutes, Jared was yelling for help.

In an almost super-human effort, Al saved Jared's life but nearly lost his

own. "I could not let my son drown," says Al. The cold, emerald-green water, his son's limp body with bubbles coming out of his mouth, and the almost impossible task of swimming to shore left an indelible imprint in his mind. He could not leave it at that.

Years ago while in California with his father, Elfego, he watched a newscast about an attempt to rescue a child going downstream in a canal and his mind drifted as he thought of a possible rescue vehicle. After this incident he decided he would make his thoughts become a reality.

As a mechanical fabricator, Al has built many things that were once someone else's idea. This time it was his idea, his design, and his work that would bring the vehicle to life. It consumed all his time. "I never had a thought of quitting," says Al. "I knew I could make it work."

Sandia recently performed an analysis on the prototype. The report came back as probable. "That is all I needed," says Al. He is hard at work on the second generation. "This one is going to be sleek like a stealth and weigh a lot less," he says. "I learned a lot building the prototype. I am confident that I will be able to perfect it."

"This vessel will help save lives," says Al. "I know it will. I don't want anyone to go through what I did. I am confident El Salvadore will make a difference in someone's life."



Viva!

As part of the recent Hispanic Heritage Month observance, Sandia's Hispanic Leadership Outreach Committee sponsored a series of events touching on various aspects of Hispanic achievement and culture. *Lab News* photographer Randy Montoya took his camera along to one of those events, the celebration at the Steve Schiff Auditorium, and came away with some memorable photos that caught the essence and energy of the happy day.



To keep Sandia's people safe, a team of Sandians took to the streets

Rocks on steps, cones in the middle of the streets, missing floor strips, picnic tables on gravel, and frayed electrical cords — these were some of the findings of a team of Sandians who took to the streets to make our workplace safe.

Last September, the Lean Six Sigma slips, trips, and falls reduction event had but one thing in mind: eliminate as many pitfalls as possible so Sandians can go back home safe. Sponsored by Deputy Labs Director Joan Woodard and Senior Manager Jennifer Girand (3810), the team walked through a predefined boundary area in Tech Area 1 inspecting buildings and streets looking for anything that could cause injury. The area was chosen because historical data identified the location as a high-risk area.

They looked at cracks in sidewalks. Three buildings had boxes stacked in hallways; another had boxes in the entry. A smoke container sitting

Sandians need to know how easy it is to report safety concerns via the Telecon Hotline at 844-4571.

in the middle of the hallway had taken residence in one of the buildings. One of the buildings had poor lighting, as several lights were out.

Actions were taken on most items. All it took was one or two calls. Some of the findings were minor but could have caused potentially serious problems. According to the team, Sandians need to know how easy it is to report safety concerns via the Telecon Hotline at 844-4571. For the items that could not be fixed during the event, the team met to address potential hazards, take action to resolve them, and brainstorm to keep them from reoccurring.

The results of the event reported to LLT by Joan were well received. LLT is committed to conducting mission work safely by effectively managing risks to the business, people, and environment.

Each team member's awareness of safety was elevated by participating in the event. By taking time to really look at the surroundings and personal behavior, the team began to notice their own shortcomings regarding safety. According to the team, there is a need to create a "caring culture" at Sandia — one where each person takes responsibility for being safe and reporting safety concerns. — Iris Aboytes



[Safety First]

This is not the trip you had in mind.

- Watch out for any irregularities in your walking path
- Report potential tripping hazards to Telecon Plus

Telecon Plus: 844-4571

Brought to you by the Sandia Management Team



This monthly column highlights Sandia Lab News items from 50, 40, 30, 20, and 10 years ago, but each column does not necessarily include items from each decade.

40 years ago . . . The Nov. 19, 1965, *Lab News* announced that a new pulse reactor would be added to Sandia's reactor facilities in Tech Area 5. The new Annular Core Pulse Reactor was to be used to study the behavior of electronic systems and circuits during and following intense neutron bombardment. Its rate of energy output — in terms of electrical kilowatts — was to be 20 times greater than the rated output of Hoover Dam for a few thousandths of a second. Now called the Annular Core Research Reactor (ACRR) and operated by Nuclear Reactor Facilities Dept. 1381, the ACRR's 236-fuel-element core is shielded in an open pool that's about 10 feet in diameter, nearly 28 feet deep, and contains about 16,800 gallons of deionized water. It now has a peak power of about 30,000 megawatts in pulse operation.



SANDIA'S ANNULAR CORE RESEARCH REACTOR as seen in this 2003 photograph.

30 years ago . . . Serious Sandia search for suitable salty site — Sandia's Waste Management Systems Department was busy trying to determine the best site in southeast New Mexico for what is now the underground Waste Isolation Pilot Plant (WIPP) repository for transuranic radioactive waste. Then department manager and now retired Sandia Fellow Wendell Weart reported in the Nov. 14, 1975, issue that his group was evaluating data gathered from an exploratory drill hole into the Salado salt formation about halfway between Hobbs and Carlsbad. This particular hole encountered an unexpected "finger" of an ancient reef in which brine and toxic gas were found. Wendell said his group

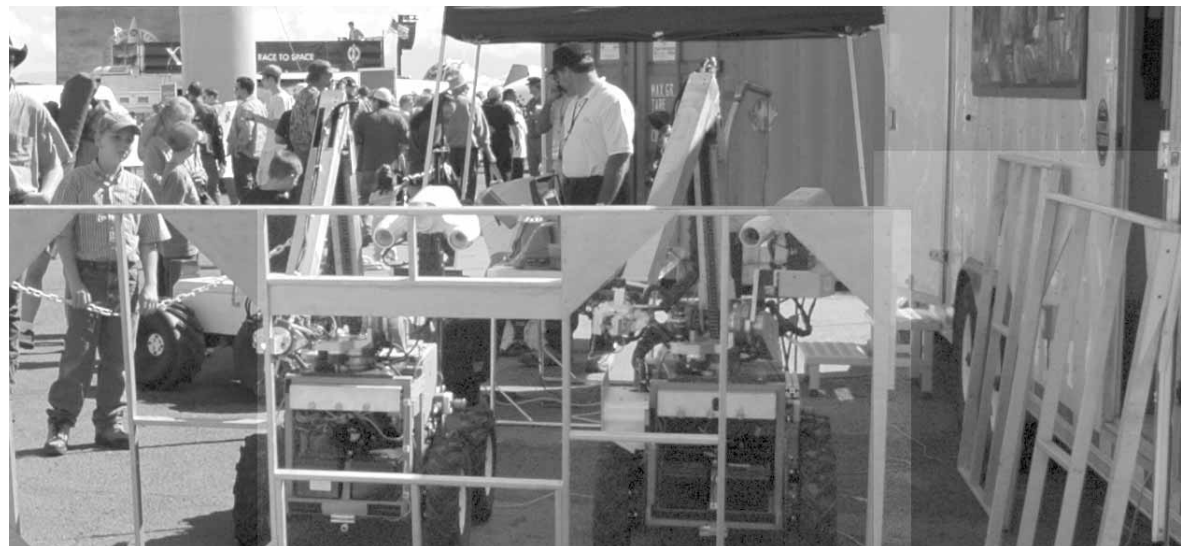
would shift its efforts a few miles and do more exploratory drilling. Eventually constructed about 2,100 feet below the surface about 26 miles south-east of Carlsbad, WIPP is in full operation today after opening in March 1999, only 23-plus years after the *Lab News* story.

20 years ago . . . The Nov. 8, 1985, issue reported that a Sandia-designed advanced security system called PIDAS, for Perimeter Intrusion Detection and Assessment System, had just been installed at DOE's Rocky Flats plant northwest of Denver. Rocky Flats was still operational then, producing nuclear weapons pits. Environmental problems caused DOE to shut down manufacturing operations there in 1989, and major cleanup efforts began in 1992. The Nov. 22 issue reported on a Sandia colloquium featuring then-Congressman Manuel Lujan (R-N.M.), who touted the Strategic Defense Initiative (SDI), saying Sandia and Los Alamos national labs "will play a large part in the research." Much of the SDI program was scaled back or redirected in the early 1990s, and some elements continue today as part of the Ballistic Missile Defense System development under DoD's Missile Defense Agency.

10 years ago . . . Sandia was preparing to

do business in FY96 with a flat budget, according to a Nov. 10, 1995, *Lab News* story, but as then-CFO and Financial Management VP Gary Riser put it, "In the context of the times, having a 'flat budget' is doing pretty darned well." To help deal with flat and possibly even declining budgets, Sandia had recently pledged to DOE to reduce laboratory support costs by \$250 million over the next five years. A number of "reengineering" and "realignment" initiatives were under way to make the reductions possible, and the Labs would soon announce a Voluntary Separation Incentive Program (VSIP) to reduce the number of Sandia employees (more on that in the next "This Month in the Past" column). — Larry Perrine

Robotic capabilities demonstrated for interplanetary expeditions



AT THE X-PRIZE EXPOSITION in Las Cruces Oct. 9, Phil Bennett, Jim Buttz, and Bob Anderson (all 6644) demonstrated a Sandia control system for multiple cooperating robots that could build structures on the moon or Mars. Two mobile manipulator robots directed invisibly by Bob (in trailer at right in photo) raise a 4x8-foot wooden frame vertical, and will use two horizontal 4x4-foot frames (leaning against the trailer) to stabilize the large frame. Phil (background) observes the procedure; Jim snaps the shot. Vipin Gupta (6218) and Ed Baynes (6418) of the Labs' Frontera Group, working at the US-Mexico border, brought Sandia's educational sponsorship and invited participation to the attention of the *Lab News*. The annual expo encourages startup companies to create space-going craft.

Sandians (help) write homeland security book from McGraw-Hill

T. J. Allard (4210), the New Mexico Sandian perhaps most closely associated with Sandia's homeland security programs since 9/11, and retired Senior Administrator and current Labs consultant Nigel Hey, wrote the book on homeland security — or at least a chapter of it.

T.J. and Nigel contributed a chapter called "Science, Technology, and Terrorism" to the magisterial McGraw-Hill *Homeland Security Handbook*.

In their lead sentence, Nigel and T.J. assert that "Science and technology are important in a coordinated, systematic approach to preventing terrorism, and in managing operations after a terrorist act." The rest of their text amplifies and fleshes out that initial assertion.

The authors outline what they characterize as the "three overlapping chronological segments" of a terrorist event: prevention and detection; interdiction and crisis management; and mitigation and consequence management.

In an accompanying chart, they show graphically how technology solutions can address the issues associated with each of those three event segments. The authors also note, in their chart and in subsequent narrative, how various terrorist

threats — chemical/biological; radiological/nuclear; explosive/fire; and cyber — demand varying technological responses.

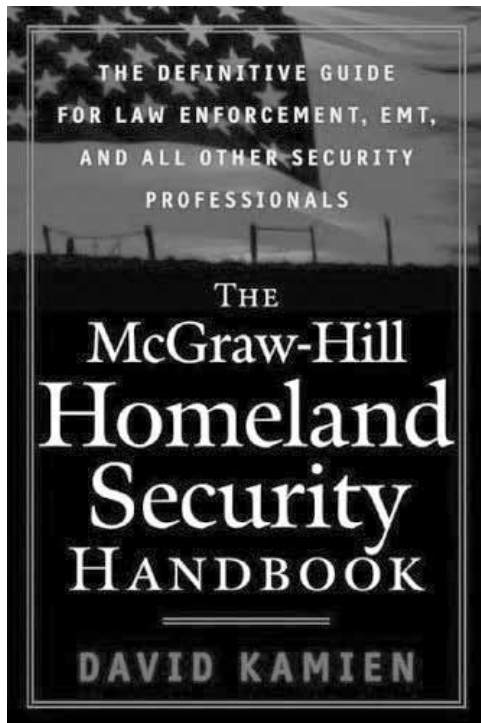
The authors conclude their 21-page treatise by noting that the US and other western nations have "incalculably better" science and technology resources for combating terrorism than do terrorists for using technology to advance their aims.

T.J. and Nigel note that President Ronald Reagan, at the height of the Cold War in 1983, challenged scientists and engineers "to turn their great talents to the cause of mankind and world peace."

"The world has changed since [the Cold War]," T.J. and Nigel write, "but the sentiment retains its validity. The agents of conflict and chaos will remain in jeopardy for as long as science and technology remain in the service of peace and goodwill."

In other sections of the 1,100-plus page book, editor David Kamien includes more than 70 articles that address

such issues as Al Qaeda and global Jihad, terrorism beyond Al Qaeda, border and transportation security, the role of government, domestic counterterrorism and civil liberties, the appropriate roles of academia and the private sectors, and more.



Manager promotions

Neil Lapetina, from DMITS, Product/Process Development Value Stream Dept. 2722, to Manager of Readiness Campaign Management Dept. 2732.

Neil joined Sandia/California in 1981 as a systems engineer to conduct aircraft compatibility and nuclear safety system tests in the B83 mechanical engineering department. Then he conducted in-bore environment telemetry tests while in the W82 Artillery Projectile Department, and strategic earth penetrator weapon tests while in the California Advanced Concepts Department.

Neil transferred to Sandia/New Mexico in 1990 and participated in a variety of Phase I and II system studies for the New Mexico Advanced Concepts Department. He transferred to the neutron generator production organization in 1994 to help with production start-up and integrate new manufacturing technologies. In 1999, he became the Sandia Process Development Program manager.

Neil has a bachelor's of mechanical engineering from the University of Utah and a master's in mechanical engineering from the University of California, Berkeley. He is also certified in integrated resource management by APICS and in project management by the Project Management Institute.



NEIL LAPETINA

Dick Perry from Manager, Airworthiness Assurance Dept. 6252, to Senior Manager, Corporate Plans, Studies, and Government Relations Dept. 3820.

Dick joined Sandia in 1996 following a 28-year Air Force career. His experience is in engineering, safety, and operation and maintenance management.

Dick's work experience at Sandia concentrated in Work for Others programs for the Federal Aviation Administration, DoD, Coast Guard, Forest Service, and the aviation industry as manager of the Airworthiness Assurance NDI Validation Center and transportation programs within the Energy and Infrastructure Assessment Strategic Management Unit. He also served in Headquarters Air Force staff functions in long-range planning and weapon requirements for the Deputy Chief of Staff, Plans, and Operations, and as the Director of Engineering and System Safety for the Air Force Chief of Safety.

Dick has a BS in engineering science from the US Air Force Academy, a Master of Aeronautical Engineering from the Air Force Institute of Technology, and additional graduate study at the Industrial College of the Armed Forces, National Defense University.



DICK PERRY

Favorite Old Photo



DURING WORLD WAR II five of my half-brothers were either drafted or volunteered for military service. My half-brother Elton Jandrey (front row, far left), shown in front of a Navy SNJ trainer, came from a farm near Hilbert, Wis., where he grew up during the Depression. When his father died (before I was born) he and his mother and four siblings moved to Appleton, Wis., where his mother later married and I was born. By February 1943 Elt figured it was his time to be inducted so he joined the US Navy. Once he had completed his basic training he was singled out to become a naval aviator. He was sent to a college in Missouri to attend preflight school. From there he was sent to Livermore Naval Air Station in California where he took flight training. After several more assignments he qualified on the USS *Sable* aircraft carrier for carrier landings. His skills at flying were noted and he was singled out to attend flight instructor school in New Orleans. Elt trained many carrier pilots during the war. I remember Elt flying a Navy trainer SNJ aircraft home twice while he was in Memphis. One time was for his sister's wedding when he flew over my school somewhat too low for the school principal's liking, but making me feel so proud. When I visit Appleton, which I did this August, I look forward to playing golf with Elt. Though he is now in his 80s, Elt is still a formidable golf partner.

— Ken Bauhs (retired)

2005-2006 'Shoes for Kids'

Donations should be sent to:

Shoes for Kids Fund
Sandia Laboratory
Federal Credit Union
Acct. #223180
P.O. Box 23040,
Albuquerque, NM
87192-0500

Or call 293-0500 to
make a transfer online:
223180, 90-01, shoes

Account remains open
throughout the entire
year.



Mileposts

New Mexico photos by Michelle Fleming
California photos by Bud Pellitier

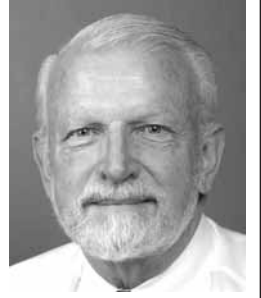


Paul Attermeier
30 5524



Paul Brannan
30 6439

Recent Retirees



Jeff Lawrence
38 1674



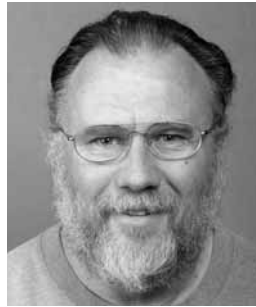
Danny Holloway
30 5531



Bert Tate
30 5339



Al Ver Berkmoes
30 8242



William Wenrich
30 4537



Jim Rice
36 200



Tom Wright
36 5923



Kathleen Diegert
25 12335



William Pasco
25 2714



Suzanne Weissman
25 6006



Francis Wyant
25 6861



Ray Burchard
20 5734



Ralph Carr
20 12345



Raymond Heath
20 1734



Shawn Kerr
20 2137



Alice Kilgo
20 1822



Lydia Perez-Romo
20 4232



Patty Zamora
20 3652



Michelle Barela
15 6034



Aida Garcia
15 3000



Jennie LeBow
15 8963



Stephanie Perea
15 6872



Rekha Rao
15 1514



Richard Talbot
15 8513



Feedback

Q: While the achievement of a lofty "goal" of zero occurrences (for any bad thing) is desirable, one must reasonably ask what behavior one might derive by setting a goal of "0" job-related injuries or illnesses for a workforce of 8,000+ personnel? Clearly this is a most unlikely thing to have happen in any given year. The hope seems to be that this goal would drive us to a culture where everyone is safety conscious at all times in everything we do (good) and that because we are safety conscious, nothing unforeseen will ever occur (unlikely). Of course, what in fact happens, in part, is that under-reporting of accidents and illnesses will result, so that individuals keep themselves from being identified as "accident or illness prone." Thus, goal setting of this type can potentially have the undesirable effect of driving toward unethical behavior.

I suggest to the management team that what is missing from this approach is the big fat "A" in the middle of SMART — Achievable. Where slips, trips, and falls are apparently the primary source of injury at the laboratory, and (to date) we have not been able to gain substantial control of the weather in this area of

the planet, we are destined to fail in the attempt to reach this goal.

The achievement of this goal (or something akin to this goal) is now apparently one of the key elements of our deliverables to our customer. In an environment where "Mission Success" is viewed as meeting all the customer requirements, I suspect that we are actually working on "Mission Impossible."

On occasion, it is wise to inform a customer that one cannot deliver the "product" they want, if it is unlikely to occur.

Nevertheless, I'll try to do my part.

A: Thank you for your insightful comments. The intent is not to invoke a culture that fosters nonreporting of accidents and injuries. Reporting is the right ethical thing to do. We intend to raise the awareness of all members of the workforce and to illustrate that management is committed to providing a safe work environment. An injury-free working career should be an expectation of any employee working at Sandia. We report the number of incidents as a mechanism to heighten awareness of the workforce about the issues associated with slips, trips, and falls. We also have provided advice to empower employees to prevent

risk behaviors that could lead to slipping, tripping, and falling as recently reported in *Lab News* articles. The Facilities organization is working throughout the site to mitigate potential hazards before an injury occurs. It's important that each of us take responsibility to properly integrate programmatic, safety, and security requirements into all our activities. With a concerted effort, we will be able to achieve remarkable improvements and outstanding results in all three areas. Certainly, our mutual success depends on all employees proactively endorsing a safety culture where problems are immediately identified and corrected, and people are not hesitant to intervene in safety matters.

— John Loye (6320)

Take Note

Sandia Benefits
Open enrollment deadline: Nov. 16

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

MISCELLANEOUS

HOUSE INTERCOM, TI 35 calculator, compression gauge, timing light, garden sprayers, high voltage relay, very old golf clubs, all free. Leeman, 281-7949.

TIMESHARE, red week, Pinecliff, Ruidoso, 2-bdr., sleeps 6, \$950. Wilkins, 884-5130.

DINING SET, solid light oak table, (2) 23-in. leaves, 8 chairs, paid \$1,350, asking, \$650. Langwell, 293-2728.

MOVING/GARAGE SALE, Sat. Nov. 12, 8 a.m.-3 p.m., 2705 Rio Grande Blvd. NW. Brown, 232-2626.

DINING ROOM SET, '70s Bernhardt, solid wood, walnut, table, 2 leaves, 6 chairs, hutch, sideboard, \$850. Laskar, 250-1209.

WATERBED, queen, soft-sided leather, mirror headboard w/bookshelf, excellent condition, \$350; FitnessQuest Ab Lounge, brand new, \$175. Layne, 299-6123.

TURKEY FRYER, electric, Masterbuilt, 28-qt., w/accessory kit, never used, \$75 for both. Hawbaker, 856-6409.

GAS GRILL, \$75; fireplace wood-holder & tools, \$75; couch, \$125; microwave, \$35; captain's chairs, \$65; dining set, \$200; treadmill, \$100; hot tub, \$600. Castillo, 884-6857.

WEIGHT SYSTEM, NordicTrack GRT470, \$100 OBO; heavy-duty golf hitting mat, 4' x 4', \$40. Klavetter, 299-4299.

REFRIGERATOR, washer & dryer, corner desk, moving boxes, packing paper, call for details & prices. Plummer, 286-8200.

MEDICINE CABINET, bathroom, tri-mirror, 30" x 48", medium oak frame, \$55. Morales, 821-5417.

BASKETBALL SEASON TICKETS, Lobo Men's, sec. 20, row 13, seats 3 & 4, \$550 OBO. Chirigos, 298-3837, ask for Mickey.

CHAINSAW, Poulan, 16-in., 3 yrs. old, carry case, extra chain, gas can, oil, \$75. Hoadley, 797-4251.

SECTIONAL SOFA, 3-pc., excellent condition, \$350; dining table, w/4 chairs, good condition, \$85; entertainment center, black, sliding door. Vigil, 293-4874.

CRT MONITOR, 19-in., too big for desk, want to trade for much smaller monitor. Winowich, 872-3876.

DINING TABLE, tall, Southwestern, w/chairs & cushions, \$300 OBO. Lesperance, 328-3143.

DINING ROOM CHAIRS, 6, honey oak, early-American style, all for \$100. Hurst, 896-4218.

GUITARS, Austin Les Paul, w/amp & case; Charvel acoustic electric w/case, excellent, \$395 OBO. Whitlow, 286-2591.

MATTRESS & BOX SPRING, king, firm, Sterns & Foster, \$500. Claunch, 980-3212.

WATERBED, super single, 56" x 87", full-length bookcase, underneath storage, bladder & liner, heater, excellent condition, \$250. Bonahoom, 296-4450.

SILENT AUCTION, Nov. 16, Thunderbird Café, benefits Shandiin Child Development Center, all welcome, no need to be present. Giersch, 845-5013, ask for Desiree.

BASSETT CRIB, dark wood, w/mattress & pad, bumper pad, 1 sheet, excellent condition, \$100. Blackburn, 828-9687.

UPRIGHT VACUUM, Eureka Boss Smart-Vac, 12 amps, w/all standard accessories & extra bag, <1 yr. old, very good cond., \$75. Lauben, 275-7466.

GOLF SET, South Bay XTD 2000, over-size irons 3-PW, XTD drivers 1,3, & 5, all graphite shafts, w/matching bag, paid \$349, asking \$150 OBO. Burr, 293-2588.

COMPUTER ARMOIRE, large, wood, 41"W x 21"D, 80"H, beautiful, plenty of storage/shelves, excellent condition, \$180. Rolfe, 833-5109.

REPTILE AQUARIUM, glass, 2' x 2' x 2', screen top, good for snakes, large lizards, w/heating accessories, \$75. Rightley, 293-9780.

XBOX CONSOLE, upgrades, advanced AV pack, controllers, DVD movie playback kit, Halo 2, like new, \$199. Demosthenous, 400-0741, ask for Byron.

BRASS BED, antique, full-size, unique headboard style, call for pictures, \$400 OBO. Shaw, 239-1517.

SCOPE, Tasco 4X LER (Long Eye Relief), \$15. Dietz, 286-8244.

STEREO SPEAKERS, Magneplanar MG-1 upgraded, w/new tweeter ribbon, good condition, \$150. Hertel, 345-1088.

WASHER & DRYER, good condition, \$100 for both. Leyba, 877-0114.

CRAFT FAIR, Sat. Nov. 19, 9 a.m.-4 p.m., Georgia O'Keeffe Elementary, 11701 San Victorio (between Academy/Eubank & Academy/Tramway. Ekman, 296-3758.

MATTRESSES: Sealy, queen, mattress & box spring, \$150; Denver, full, feather down pillow-top, \$50; Sealy twin set, \$100. Lucero, 899-0521.

TIMESHARE, Dominical Costa Rica, new 2-bdr., 2 baths, AC, 10 min. to beach, Dec.-April, \$800-\$1,000/wk. Healer, 350-0727.

LEG PRESS/HACK SQUAT MACHINE, w/200-lbs., \$100 OBO; free weights, 20, 15, 10 & 5-lbs.; 42-in. ceiling fan, white, still in box, \$15. Silva, 450-1054.

CHAISE LOUNGES, 2, w/cushions, \$30; desk, 3-drawer, walnut, w/chair, \$50. Philbin, 828-2414.

WOMEN'S ROLLER BLADES, w/pads, size 7, used once, excellent condition, \$60. Northrop, 275-1830.

WASHER & DRYER, Kenmore 80/70 series, super-capacity plus, \$300/pair; moving boxes, \$1 ea.; freezer, free. Simper, 977-0750.

CLARINET-VITO, w/case, excellent condition, \$125. Switendick, 255-1003.

ROWING MACHINE, NordicTrack, \$100; 400-MHz computer, Windows 98, Office SBE, needs new CD drive, \$100; stereo equipment. Chapa, 822-1528.

BOOKSHELF, wrought-iron frame, 5 wood shelves, made in Mexico, \$450 new, make offer. Cook, 256-5196.

ELECTRIC BEER SIGNS, numerous, wall hanging, clocks & plaques, perfect for home bar or pool room, prices vary. Edmund, 881-7974, ask for Stanley.

FENCING RAZOR WIRE, full box, never used, cover 40-50 ft., cost \$62.50, asking \$25. Mozley, 299-4204.

REFRIGERATOR, side-by-side, excellent condition, \$575; Showtime rotisserie, new, \$150 OBO. Southward, 821-0390.

LADDER, 32-ft., \$175; PA systems, \$600; shot glass collection, \$250; 8-hole rim, \$45; autoharp, \$50; RC hardware, \$120; '99 Dodge truck service manual, \$50. Dobias, 856-7841.

LONG-TWIN MATTRESS SETS, 2, will make king bed, 1 firm, 1 cushy pillow-top, like new, \$150/set OBO. Mooney, 294-5161.

MOVING SALE, all items gently used, ~10 mos. old, Hoover Wind Tunnel, 12-amp, \$150; Sylvania 27-in. color flat-screen TV, \$200. Thibodeau, 280-8435.

CAMPER SHELL, \$450; Mercedes Sedan roof rack, \$250; squat rack, \$300; weightlifting bar, \$50; 350-lb weights, 50c/lb., curing chair, \$50; push mower, \$30. Carlson, 401-9435.

COMPUTER, iMac, original Bondi blue, 192MB RAM, 4GB HD, keyboard, mouse, software, \$75 OBO. Garcia, 831-3824.

GAS RANGE & HOOD, Whirlpool, black, 8 mos. old, \$400 new, asking, \$200. Richardson, 332-8769.

HOYT MAGNATEC BOW, new, cam 1/2, trophy ridge sight, whisker biscuit, quiver, hard case, other extras, \$650. Ortiz, 610-3278.

GOLF CLUBS, Golden Bear, graphite, 1/3/5 woods, 3-PW, putter, 1 yr. old, \$190 OBO. Branscombe, 881-4589.

WASHER & DRYER, Kenmore series 70, white, 5 yrs. old, very good condition, \$500. Kapuranis, 237-7211, ask for Diane.

CHILD CARRIER BACKPACK, Kelty Kids "Town," \$60; child bicycle seat, Kettler "Teddy," \$45; both great condition. Dwyer, 271-1328.

BOOKS, hundreds, various subjects, strong emphasis on military history, free. Holzrichter, 298-5695.

CRAFT SHOW, Cleveland Middle School, 6910 Natalie NE (near Louisiana/Montgomery), Sat. Nov. 12, 9 a.m.-4 p.m., breakfast & lunch served. Edgar, 884-8567.

How to submit classified ads

DEADLINE: Friday noon before week 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. 12651)
- 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 (If you include a web or e-mail address, it will count as two or three words, depending on length of the address.)
2. Include organization and full name with the ad submission.
3. Submit 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.

COMPUTER DESKS, vanity desks, step end table, 16-in. laser level, '87-'01 country music magazines, will email photos. Little, 883-9329.

FOOTBALL TICKETS, 2, Arizona vs. Philadelphia, Dec. 24, 45-yd. line. Chavez, 898-9252.

PIANO W/BENCH, Henry F. Miller spinet, good condition, \$350; dual recliner sofa, Southwest pattern, \$150. Ehgartner, 259-3889.

BEDROOM SET, oak, nightstand, short & tall dressers w/mirrors, \$200; grandfather clock, \$150; treadmill, \$75; women's 10-spd., \$50. Crossno, 262-0855.

STUDENT DESK, solid maple, Sprague-Carlton Patriot, 4-drawer, 18" x 44", high quality, Ethan Allen equivalent, \$250. Wilson, 247-2032.

ELECTRIC DRYER, <2 yrs. old, \$100; washer, Maytag Performa, runs OK, \$50. Coverdale, 286-2664.

PHOTO DEVELOPMENT EQUIPMENT: Durst enlarger, Premier dryer, safe-light & more; Midland CB radio; Sears fertilizer, seed spreader. Kepler, 296-0402.

IRRIGATION PIPE, black, poly, 3/4-in. diameter, ~300-ft., \$30. Barnard, 771-4620.

LUGGAGE CARGO CARRIER, \$55; TKO beginner's 5-pc. drum set, \$155; baby crib, no mattress, good condition, \$25. Barba, 507-1461.

ROUTER, Bosch model 1617, w/plunge base & carrying case, never used, paid \$220, asking \$190. Bono, 292-2152.

UPRIGHT FREEZER, white, 18 cu. ft., works great, \$125. Kerekes, 281-2153.

BODY TECH home gym, 4-station, dual weight stack, 7' x 8' footprint, sturdy, w/manual, \$200. Suber, 247-2032.

TRANSPORTATION

'94 TOYOTA 4RUNNER SR5, AT, AC, CD, sunroof, alloy wheels, very nice, needs some work, make offer. Humphrey, 249-4508.

'02 FORD ESCORT, 4-dr., AC, AM/FM/cassette, ~56K miles, \$6,300 OBO. Salazar, 250-9306, ask for Matt.

'98 GMC SONOMA, 60K miles, great condition, \$3,200. Gutierrez, 830-1212.

'93 FORD ESCORT LX, 4-cyl., 2-dr., clean inside, runs great, needs shocks/struts, great on gas, \$800. Valdez, 550-1993.

'82 CHEVY DIESEL 3/4-TON PICK UP, runs but engine needs work, excellent body/tires, \$950 OBO. Nutt, 856-8267.

'96 AUDI A6, power everything, memory seats & mirrors, leather, sunroof, 116K miles, \$6,000 OBO. Panowski, 865-6340.

'02 FORD EXPEDITION XLT, 4WD, 5.4L, loaded, CD, 3rd row seat, silver/gray, 36 mo./35K warranty, 40K miles, good condition, \$20,000. Smith, 922-8720.

'85 VOLVO 240, very safe, 175K miles, runs well, \$1,750. Banet, 828-2701.

'02 MITSUBISHI MONTERO SPORT, V6, AT, CD, tint, luggage rack, 53K miles, excellent condition, \$12,900 OBO. Otero, 319-4409.

'00 JEEP WRANGLER SPORT, 4WD, great condition, \$12,000. Sienkiewicz-Aguilar, 228-1196, ask for Gregg.

'89 TOYOTA TERCEL COUPE, 2-dr., AT (recently replaced), AC, AM/FM/cassette, great gas mileage, 184K miles, runs perfectly, \$1,750 OBO. Salazar, 474-0499.

'96 DODGE RAM PICKUP, silver, long bed, great work truck, very good condition, well maintained, \$4,500. Cantu, 899-2103.

'03 VOLVO S80, black w/beige interior, 1 owner, 20K miles, excellent condition, \$21,500. Derzon, 299-0523.

'91 GMC SAFARI MINIVAN, AC, PS, PW, tint, seats 8, blue, Michelin tires, 130K miles, runs great, \$2,100. Quintana, 296-9155.

'95 PLYMOUTH VOYAGER, 3.6L, seats 7, child seats, rebuilt transmission, good tires, new brakes, \$2,000. Niper, 299-6290.

'96 MAZDA MX6, AT, all power, sunroof, new tires/hoses/belts, 49K miles, \$6,000 OBO. Jackson, 620-4116.

CHRYSLER SEBRING, convertible, AT, silver, limited, leather, CD changer, excellent condition, well maintained, \$13,000. Jensen, 892-8761.

'00 JEEP CHEROKEE SPORT, 4x4, PW, PB, PL, 61K miles, good tires, \$8,950 OBO. Griego, 264-3512.

'01 TOYOTA TACOMA SR5/TRD, 4x4, x-cab, V6, loaded, 48K miles, immaculate, \$3,000 under retail, \$19,598, www.pgeo.com/car.htm. Gaitner, 975-1365.

'97 CHRYSLER CONCORDE, white w/gray interior, 125K miles, very well maintained, runs great, \$3,000 OBO. Farmer, 417-5430.

'02 BMW 325i SPORT, premium, manual transmission, black, tan leather, 25K miles, \$25,000 OBO. Hoekstra, 242-7931.

'00 MERCURY GRAND MARQUIS, clean, 73K miles, NADA retail \$10,175, asking \$8,000 OBO. Rebarchik, 299-1385, ask for Frank.

'98 BMW 528i, AT, side airbags, traction control, black, tan leather, safe, sharp, sporty, 114K miles, excellent condition, \$12,100. Carrejo, 286-0714.

'01 HONDA CRV, 4WD, trailer hitch, great mpg, 93K miles, well maintained, \$13,500. Campbell, 286-9595.

'81 OLDSMOBILE 98 REGENCY, loaded, garaged, 124K miles, great condition, email for more info, \$1,850. Bentley, 856-7661, hollyhouse@email.com.

'95 CHEVY S10, single cab, extended bed, w/bed liner & camper shell, 110.6K miles, runs perfect, very reliable, \$4,200 OBO. Johnson, 250-3205.

'93 NISSAN PATHFINDER, 4x4, AT, silver/gray, 125K miles, runs great, good condition, \$3,800 OBO. Allen, 856-7891.

'02 NISSAN XTERRA SC, V6, 5-sp., AM/FM/6-disc CD, white, 1 owner, 42K miles, excellent condition, \$16,500 OBO. Gibson, 797-8253.

RECREATIONAL

SPORTMOBILE POP-UP CAMPER, '92 Ford, self-contained, sleeps 4, refrigerator, stove, microwave, marine head, AC, fits garage, \$11,900 OBO. Everett, 505-585-2299.

'03 TRAILBAY, 31-ft., smooth side, large slide out, ducted AC, rubber roof, sleeps 8, like new, \$12,800. Pool, 832-1520.

ROAD BIKE, Cannondale R600, size 60, aluminum frame, brand new tires, excellent condition, \$800. Schuler, 299-7552.

MOUNTAIN BICYCLE, Sach 3-spd. hubs, black, drum brakes, nickel finish, powder coated wheels, \$200. Ginn, 286-4425.

'05 RV TRAILER, 24-ft., Fleetwood Pioneer, w/hitch & stabilizer, used 3 times, loaded w/options, still under warranty, \$14,500. Buteau, 856-7705.

'00 POLARIS SPORTSMAN 500, 2,000-lb. winch, heated grips, front & rear boxes, gas pod, \$2,995. Hufnagel, 890-8122.

'99 WINNEBAGO ADVENTURER, Class A, 32-ft., many options, original owner, 16.5K miles, excellent condition, \$50,000. Hale, 286-2485.

'02 CABANA CAMPER, 21-ft., lots of options, sleeps 8, fiberglass, very clean, used 6 times, \$8,700. Potter, 869-4716.

MOUNTAIN BIKE, Giant Faith I, downhill/free-style, 8-in. full suspension, new, never ridden in dirt, \$1,700. Hannum, 296-2095.

REAL ESTATE

10-ACRE LOT, San Pedro Creek Estates, lot-37, phase-II, beautiful views, build your dream home, \$220,000. Cash, 271-2376.

1.1 ACRES, best value in PAA-KO, wooded & flat, great views, very private, all utilities, \$105,000. Olona, 299-1349.

4-BDR. HOME, 3 baths, 2-car garage, 2,530 sq. ft., landscaped front & back, Willow Wood subdivision, reduced, \$340,000. Benitone, 321-5246.

3-BDR. MOBILE HOME, 2 baths, doublewide, permanent foundation, '98 Schultz, 2 living areas, 1,539 sq. ft., 1-3/4 acre. Ortega, 385-2999.

4-BDR. HOME, 3-1/2 baths, 2-1/2-car garage, 2,721 sq. ft., stainless appliances, ID#20563545 at www.ForSaleByOwner.com, \$469,000. Meyer-Hagen, 573-6244.

4-BDR. HOME, 2-3/4 baths, 3-car garage, .25 acre, 2,345 sq. ft., built in '02, NE Albuquerque, backyard access, \$355,000. Johnson, 440-2764.

WANTED

KITCHEN TABLE, w/4 chairs, coffee table, all in good to fair condition, discount priced. Vigil, 822-1868.

CUB SCOUT UNIFORM, used, for enthusiastic 8 yr. old boy, uniform's age not an issue. Burgess, 866-1114.

HOUSEMATE, 3-bdr. home, 2 baths, NE Albuquerque, garage, 15 min. to base, available now, \$425/mo., flexible. Blaich, 350-3380.

GOOD HOME, 2 neutered male indoor cats, 1 yr. old brothers, shots current, very friendly/loving. Rymarz, 907-9779.

FEMALE ROOMMATE, share beautiful home, north of Tanoan, thoughtful, tidy student preferred, bed, bath, office, available Dec. 1, \$535/mo. Davis-Sneddon, 261-8342.

BABEE TENDA CHAIR/TABLE, and/or Babee Tenda crib, good or better condition. Jaramillo, 615-3616.

SHELL FOR '98 CHEVY S10. Bell, 286-8275.

MALE ROOMMATE, age 20-27, 2,000 sq. ft. home, gated community, no pets or children, \$350 + half utilities. Lujan, 720-1298.

TRUMPET OR CORNET, for 6th-grade granddaughter, good condition. Payne, 299-5966.

FRENCH HORN, used, for church choir, good condition. Hertz, 265-4729.

CLIMBING PARTNER, indoor climbing gym, ~once a month, any skill level. Tortora, 298-4580.

HOUSE TO SIT, Albuquerque area, all or part of Jan. & Feb., experienced senior sitter, no fee. Otey, 916-608-9153, BGOtey@comcast.net.



Clean energy, gnarly waves, and redundant cell phone nodes

Sandia Student Science Symposium attendees brainstorm tough science issues

By Jim Murphy

Surrounded by relics of the past, New Mexico's students faced the issues of tomorrow.

On Nov. 2 at the National Atomic Museum, some 50 Albuquerque high school science students met with Sandia volunteers from the Advanced Concepts Group (ACG) to discuss and brainstorm solutions to the world's problems. A tall order for a group of people without high school diplomas? Perhaps. But there is no question that students walked away from the Sandia Student Science Symposium knowing more about the issues their generation will face and feeling more prepared to face them.

Two opening talks got the students thinking not only about the literal problems of engineering in the real world but also about the changing face of science and science education. According to Sandia Vice President, Principal Scientist, and ACG leader Gerry Yonas, aspiring scientists currently in high school will face a life of education consisting of periodic updating of skills and theories in order to keep up with rapidly developing scientific fields.

While the prospect of a life of still *more* school elicited groans from some in the audience, most seemed eager and ready to pursue their interests to the greatest possible degree. A discussion session after Gerry's talk raised questions about the ethics, economic feasibility, and politics accompanying the burgeoning fields of

biotechnology, nanotechnology, and information technology. A consensus emerged that today's students will be tomorrow's stewards and that many of the most difficult decisions in science will fall to those currently in high school science classes.

After the initial session, students joined smaller group discussions on such topics as homeland security, epidemiology, technology for emergencies, and global warming.

Discussion in the global warming brainstorming group was diverse and far-ranging. Presenter Karl Braithwaite (7000) opened the discussion with a series of clips from the eco-thriller film *The Day After Tomorrow*. Students discussed the feasibility of the events depicted in the movie and, from there, began discussing what could prevent even non-blockbuster climate change.

The participants agreed that moving away from the current fossil fuel-based energy infrastructure is necessary and that international participation should be encouraged. Students concurred that national incentive programs should be in place to encourage a society based on a cleaner energy infrastructure.

While some students discussed measures to avoid global warming, others brainstormed new ideas concerning emergency technology. Of note was the concept of a networked wireless communication device that would enable redundancy and reduce the chance of disabled cellular nodes in an emergency situation.

Other brainstormed ideas included methods of avoiding disease spread both in schools and in the world at large. Students suggested disease prevention through the use of disinfectant materials in the school and disease tracking through infrared-equipped satellites. Also, students were called upon to analyze contemporary culture from the perspective of future anthropologists and archaeologists. The design features in common objects such as clothing and handbags were interpreted to provide insight into the nature of modern life.

Closing on a light note were the students who suggested that surfing would, in fact, be possible in New Mexico if water were allowed to flow down the mountainsides and into pools that would generate some gnarly waves, dude!

While the Sandia ACG brainstormers moderated and contributed to the discussions, the event was truly for the students.



BRAINSTORMER-IN-CHIEF Gerry Yonas (VP, 7000) prepares students for the intellectual adventure that awaits them in the Sandia Student Science Symposium, where students use Advanced Concepts Group brainstorming techniques to dissect thorny national issues. (Photos by Bill Doty)

How did the students like it? According to Brian Ehrhart, a senior at Sandia High School, "The symposium was an incredibly worthwhile event, in which we were able to discuss future problems facing our own generation's policymakers." Another student added, "It was really a lot of fun."

Jim Murphy is a senior at Sandia High School. He attended the Sandia Student Science Symposium as part of a contingent of Sandia students who participated in the event along with students from across the city.



CURTIS JOHNSON (7001) talks about "technology for emergencies."

Feedback

Any chance of building parking garages to solve parking problems? Maybe.

Q: Why doesn't Sandia build two- or three-story parking garages to relieve the parking problems? Low-rise parking structures would allow more people to park closer to their job locations without interfering with aircraft traffic (if that is the issue).

A: Sandia's current Ten-Year Comprehensive Site Plan does include a parking structure proposal to DOE. To relieve some of the parking problems, two new parking lots are planned: 1) south of Bldg. 899 and 2) south of Bldg. 897. We are also currently rearranging the lot east of the Steve Schiff Auditorium, which will add another 100 spaces. For a listing of current and planned parking improvements please visit the Traffic Safety Committee Web page at <http://www-irn.sandia.gov/facilities/esh/traffic.htm>.

Employees can also help relieve some of the parking headaches by using alternative transportation. Visit the Traffic Safety Committee website (<http://www-irn.sandia.gov/facilities/esh/traffic.htm>) or the Commuting Alternatives website (<http://www-irn.sandia.gov/hr/benefits/misc/commutingalt.htm>) for information about alternative transportation resources.

— Darrell Fong (6322)

Symposium presenters

What is homeland security all about?

..... John Cummings; John Taylor

Technologies for emergencies

..... Curtis Johnson

Archeology of garbage

..... Laura McNamara

Will there ever be surfing in New Mexico?

..... Summer Terhune

The day after tomorrow . . . Is global warming already causing disaster? What should government and science do?

..... Karl Braithwaite

Avian flu and other epidemics

..... Mark Grubelich

Sandia Student Science Symposium was organized by Community Relations Dept. 3650, Cheryl Garcia, event coordinator



JOHN TAYLOR (303) challenges students during a session on homeland security.

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