

Making miners safer



Sandia's Gemini-Scout robot likely to greet future trapped miners before rescuers do

By Stephanie Hobby

As each of the 33 Chilean miners emerged from 69 days of subterranean captivity to worldwide celebration, a team of Sandia engineers on the other side of the equator was wrapping up its own, much quieter, mine rescue operation. Sandia engineers were busy putting the finishing touches on a robot that would alleviate some of the unknowns of mine rescues and arm rescuers with the most valuable tool: information.

In any mining disaster, rescuers who move in before the dust settles face unknown obstacles and conditions that can be just as harrowing and dangerous as what faced the miners. They must overcome poisonous gases, flooded tunnels, explosive vapors, and unstable walls and roofs, all of which work against teams who are up against a ticking clock.

To combat those deadly challenges and help rescue efforts move faster, Sandia robotics engineers have designed the Gemini-Scout Mine Rescue Robot. Able to navigate through 18 inches of water and crawl over boulders and rubble piles, the robot is able to go into dangerous situations ahead of rescuers to evaluate precarious environments and determine how operations should proceed.

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SANDIA'S GEMINI-SCOUT MINE RESCUE ROBOT is equipped to handle any number of obstacles, including rubble piles and flooded rooms, to help rescuers reach trapped miners safely and efficiently. (Photo by Randy Montoya)

"We have designed this robot to go in ahead of its handlers, to assess the situation and potential hazards, and allow operations to move more quickly. The robot is guided by remote control and is equipped with gas sensors, an infrared camera to locate survivors, and another pan-and-tilt camera mounted several feet up to see the obstacles we're facing."

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Open enrollment is Oct. 18-Nov. 5



Information on benefits fairs, Health Care Flexible Spending Accounts, Health Reimbursement Accounts, and more. See page 6 for details.

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Sandia Labs wins 3 technology transfer awards for projects, student research

By Heather Clark

Sandia has won technology transfer awards for a water disruptor now diffusing improvised explosive devices in Afghanistan; mobile, fuel-cell-powered lighting used at the 82nd Annual Academy Awards; and a national institute that teaches students cutting-edge nanoengineering.

The winners of the Federal Laboratory Consortium (FLC) Mid-Continent Regional Awards were honored recently in Jackson Hole, Wyo. They include the Sandia team that invented the water disruptor and licensed the technology to Albuquerque-based TEAM Technologies Inc.; a Sandia-led partnership that developed the fuel-cell lighting system; and a collaboration that created the National Institute for Nano Engineering (NINE) hosted at the Labs.

"These exceptional projects highlight Sandia's efforts to transfer its technologies outside the laboratory, whether to private companies to create jobs, to provide technical solutions where they're needed, or through educating our college students and readying them for future science or engineering careers," says Jackie Kerby Moore, manager of Technology & Economic Development Dept. 1933.

The three winners were selected from an FLC region that is home to more than 100 federal laboratories in 14 states: Arkansas, Colorado, Iowa, Kansas, Missouri, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, and Wyoming.

Sandia's water disruptor, which shoots a blade of

(Continued on page 4)



LUXIM AND LUMENWORKS manufacture and design the plasma lighting sources and reflectors used in the fuel-cell-powered mobile lighting system spearheaded by Sandia. The lighting system won a technology transfer award. (Photo courtesy Stray Light Optical Technologies)

That's that

Well, they're out. The Chilean miners trapped underground for more than two months have emerged back into the sunlight of a budding South American spring. As the global media converged on the rescue site, news reports described a world transfixed by the drama, with heads of state and even the pope weighing in with best wishes and prayers as the meticulously planned, complex rescue operation commenced.

Sometimes the events that grab our attention are things that we should, perhaps, avert our eyes from, so full they are with images of human suffering, but a grim fascination compels us to watch: the tsunami in the Indian Ocean, the earthquake in Haiti, and Hurricane Katrina come to mind here. But sometimes, the drama offers the possibility for a happy ending. Such was the case with the rescue of the Chilean miners. But there was nothing guaranteed about a positive outcome for this bold operation. It was, as the Duke of Wellington said of the battle of Waterloo, "a close run thing." The ingenious rescue system, conceived of and designed on the fly, had to work properly not once but 33 times (and another six times to retrieve the rescue team that went downhole to help load the miners into the recovery capsule). And work it did. Magnificently.

* * *

Once again, this was a triumph for the skill and creativity of engineers, the unsung heroes of so many of these kinds of events; as the miners one by one emerged from what might have been their tomb, they hugged their wives, their children, the President of Chile – and the leader of the team that engineered their salvation. Too, a lot of the miners specifically sought out American master driller Jeff Hart, a well-driller from Colorado with – as they say in baseball – "soft hands." In an era of high-tech marvels and computer-driven controls, Hart describes his drilling approach as something he has to feel through his hands and feet.

And I hope you'll forgive a bit of hometown boosterism, but I couldn't help but feeling some pride in American ingenuity in this rescue: The drilling proceeded far, far faster than Chilean officials had originally estimated, thanks to an American-developed drilling technology called percussion drilling, which happens to be far more effective than conventional drilling in hard-rock mines.

By the way, Sandia has been working on the mine safety issue for some time; if there's a national problem with a technological solution, we're there. A story beginning on page one talks about some of our most recent impressive mine safety work.

* * *

Speaking of those rescuers, the ones who went down into the mine to help the miners, what can you say? Well, you can't say enough, really. Like the firefighters, paramedics, and other first responders at the World Trade Center who headed up the towers when everyone else only wanted to get down, the downhole rescuers headed down through the darkness with absolutely no certainty that they would come back. Like first responders everywhere – not least here at Sandia – these are individuals who "ride to the sound of the guns," who put themselves willingly in harm's way to help protect and save others. That is character of a rare and special kind.

* * *

Last time, I wondered out loud about who might fill the shoes of the late Carl Sagan, the Cornell astrophysicist who became the public face of science in America and served as a remarkably capable and charismatic ambassador for science and technology. Well, I might have found my answer. Or, that is, an answer has been suggested to me. A retiree called and, after identifying herself, said the perfect successor for Carl Sagan is Neal DeGrasse Tyson, director of the Hayden Planetarium. Yep, like Sagan he is an astrophysicist and, like Sagan, seems born to communicate about science to a lay audience. And he has a flair for the telling soundbite: Talking about the movie *2012* – which was, let's face it, just preposterous – he says, it was "written by people who didn't take enough science classes in school." In short, he's funny, he's smart, and he's got tons of credibility. A great suggestion. Any other ideas out there?

See you next time.

– Bill Murphy, (505-845-0845, MS0165, wtmurph@sandia.gov)

LouAnn Burnett is president-elect of American Biological Safety Association

By Stephanie Hobby

One of the world's pre-eminent biological safety associations has selected Sandian LouAnn Burnett (6724) to serve as president of the American Biological Safety Association (ABSA) in 2012. LouAnn is a member of Sandia's International Biological Threat Reduction (IBTR) group, which seeks to reduce biological safety and security threats worldwide through education and outreach.



LOUANN BURNETT

"As president-elect for ABSA, I look forward to using my experiences within IBTR to increase ABSA's international focus," LouAnn says. "We are at a crux, where this organization is moving from strictly a North American perspective to an international perspective, and Sandia has been doing international outreach for years, so I'm looking forward to melding my work between the two organizations."

One of 300 certified biological safety professionals worldwide

ABSA was founded in 1984 to promote biosafety as a scientific discipline and serve the growing needs of biosafety professionals throughout the world. Its goals are to provide a professional association that represents the interests and needs of practitioners of biological safety, and to provide a forum for the continued and timely exchange of biosafety information.

LouAnn has been a member of ABSA since 1993, and has served on its council for the past three years. LouAnn is credentialed by ABSA as a certified biological safety professional (CBSP) and is one of fewer than 300 persons worldwide with either a certified or registered biosafety professional credential. ABSA has about 1,500 members and provides its members, and those outside its membership, with both a technical and professional resource. About 10 Sandians also are members of the organization.

LouAnn came to Sandia in August from Vanderbilt University in Nashville, Tenn., where she managed the biological safety programs for 11 years. Prior to that, she served in a similar role at the University of Illinois at Urbana-Champaign for six years.

"I'm thrilled to be at Sandia, because when I was a university biosafety officer, I was pretty much the sole expert for that field and all the other duties as assigned, so it's great to have so many incredible brains to bounce things off of," LouAnn says. "I am really looking forward to using my knowledge of these organizations to promote the growth of both."



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Bobby Baca represents US in international competition for one-armed golfers



Bobby Baca (2714) recently participated in the Fightmaster Cup, an international match play golf competition between European and North American teams from the Society of One-Armed Golfers and the North American One-Armed Golf Association supported by the Royal & Ancient of St. Andrews. The competition took place in Wales. Qualification was based on points accrued over previous tournaments. The US team was made up of the top 10 players and two captains' picks.

Hertz Fellows tour the Combustion Research Facility

By Karen McWilliams

On Oct. 1, more than 40 Hertz Foundation Fellows visited Sandia's Combustion Research Facility (CRF) as part of their autumn West Coast Retreat. The Hertz Foundation provides fellowships to exceptionally talented individuals studying in the applied physical, biological, and engineering sciences.

Bob Carling, director of Transportation Energy Center 8300, addressed the group, giving an overview of Sandia and the CRF, major milestones in the CRF's 30-year history, and current directions in research.

"The vision of the CRF is to understand the properties and processes that underpin the production and utilization of modern chemical fuels," he said.

To this end, predictive simulation of combustion engine performance has become a crucial area of research. Currently under development, validated simulation tools to model in-cylinder processes and predict fuel spray structures are a key focus of scientists and engineers. Unraveling some of the mysteries of combustion chemistry is crucial to industry efforts to squeeze the highest efficiency and lowest pollution levels from future combustion engines.

"What is the right mix for the future? We don't know yet, but systems analysis will help us find out," Bob said. "By partnering with scientists all over the world, the CRF is a key player in helping to reduce the carbon footprint of the automotive industry."

High-fidelity computing

CRF postdoc Guilhem Lacaze of Reacting Flow Research Dept. 8351 then delved deeper into the subject of high-fidelity computing in turbulent combustion. He stressed the need for synergy and cooperation between those in experimental and numerical disciplines in order to achieve multiscale modeling of combustion.

Two complementary approaches are needed — direct numerical simulation (DNS) and large eddy simulation (LES). DNS, which involves the numerical solution of the equations that govern fluid flows, enables research on a fundamental, small-scale level. This method provides an extremely detailed description of



HERTZ FELLOWS Josh Waitzman and Kenneth Franko take a closer look at the direct-injection, spark-ignited (DISI) engine in the Alternative Fuels DISI Engine Laboratory while on a tour of the CRF labs. (Photo by Dino Vournas)

the flow field, but is expensive and unsuited to commercial use. LES, on the other hand, relies on complex models to gain insight into the turbulent, high-pressure environments and complex geometries of real-world combustion engines.

After these presentations, the Hertz fellows divided into five small groups to tour CRF labs. In the Alternative Fuels DISI Engine Laboratory, Magnus Sjoberg (8362) spoke about providing the combustion science needed for fuel-efficient and robust implementation of gasoline replacements. Nils Hansen (8353) explained how Sandia research provides a fundamental understanding of combustion chemistry in the Flame Chemistry and Diagnostics Laboratory. In the Laser Chemistry Laboratory, Judit Zador (8353) discussed how fundamental chemistry governs autoignition. Isaac Ekoto (8367) explained ongoing characterization of turbulent flame behavior with complex flow dynamics in the Turbulent Combustion Laboratory. In the Heavy Duty Diesel Laboratory, Mark Musculus (8362) talked about providing the science base to set and achieve fuel efficiency and emissions standards.

"The CRF is the largest concentration of this work in the world," Bob said. "Because we do not build

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engines here — we develop knowledge and information, then pass this on to private industry — partnering with top scientists such as those mentored by the Hertz Fellowship program is a key component of the CRF's mission."

Hertz Foundation fellowships

Each year the Hertz Foundation conducts a national competition for new fellows. The award, according to the foundation's website is "to support the graduate education of America's most promising technical talent, the Ph.D.-directed effort of the young men and women who can be expected to have the greatest impact on the application of the physical sciences to human problems during the next half-century."

Of those who apply, only about 3 percent are awarded fellowships. Recipients receive a cost-of-education stipend and a personal-support stipend of up to \$36,000 annually for five years. The foundation also awards a thesis prize to one fellow each year. The cost-of-education stipend is accepted in lieu of fees and tuition at 50 tenable schools that include all of the University of California campuses, Stanford University, the California Institute of Technology (CalTech), the University of Southern California, and the Scripps Research Institute.

Steven Rice (8224) received a Hertz Fellowship from 1978-82 while he was pursuing a doctorate in chemistry at CalTech. "The fellowship really enabled me to focus on my research as a graduate student without distractions," he says. "I think it contributed to my success and helped me finish graduate school a little faster."

Currently, 10 other recipients of the Hertz Fellowship are working at Sandia: Brad Boyce (1831), Christine Coverdell (5935), Bruce Hendrickson (1410), Michael David Henry (1746), Mark Herrmann (1640), George Lasche (6418), Dana Powers (6770), Gerard Sleaf (2210), Stephan Slutz (1644), and Tracy Vogler (8246).

For more information on the Hertz Foundation, visit www.hertzfoundation.org. The fellowship application deadline is Oct. 29.

— Patti Koning

Janice Leach and Carolyn David to receive Women of Color magazine's Technology Rising Star awards

By Iris Aboytes

Janice Leach (6752) and Carolyn David (10245) will receive *Women of Color* magazine's Technology Rising Stars awards on Oct. 29 at ceremonies to be held at the Sheraton Dallas Hotel in Dallas. The Women of Color Science, Technology, Engineering, and Mathematics (STEM) Conference recognizes outstanding women in the science, technology, engineering, and math fields and provides opportunities for professional development, networking, and recruiting.

Janice Leach

Janice was nominated for her efforts in supporting the development of a new modeling and simulation



JANICE LEACH

"I love my work. Imagine having my job and getting rewarded for it. I feel very proud to be working for Sandia. I've been fortunate to have had bosses who have believed in me."

tool to be used in international work efforts.

She is the vulnerability assessment and modeling and simulation project leader. She and her team evaluate physical protection systems of facilities housing critical assets to calculate the risk of outside threat. This work is in direct support of DOE/NNSA's material protection, control, and accounting (MPC&A) efforts to reduce the proliferation of weapons-usable material.

Janice came to Sandia as an intern, left to work for

DOE, then returned to Sandia as an office administrative assistant. She has also worked as an administrative staff associate (ASA) and is currently a technologist working on her undergraduate degree in environmental science at Oregon State University. "I'm almost there," Janice says.

As part of a team, Janice has traveled to Russia, Mongolia, China, and Japan. "It is very eye-opening," she says, "I would have never traveled to these places on my own."

Janice says that the food in the various countries has not always been to her liking.

"Granola bars, are great," she says. "In Beijing, I ate a fried scorpion, kind of like a lolipop. They also had fried parakeet. When I get home, I go right for the Mexican food. I have to have my chile."

"I love my work. Imagine having my job and getting rewarded for it. I feel very proud to be working for Sandia. I've been fortunate to have had bosses who have believed in me."

Carolyn David

Carolyn was nominated for developing the acquisition strategy agreements and for serving as project manager for the Solar Energy Grid Integration Systems (SEGIS) program.

She works in Energy, Security, and International Procurement Dept. 10245 where she places contracts for energy and security programs that range from small to very complex multimillion dollar procurements.

"I thoroughly enjoy my job and all the challenges it offers on what seems like a daily basis," Carolyn says. "Every day is a new journey that sometimes takes me places I don't want to [go], but at the

"Every day is a new journey that sometimes takes me places I don't want to [go], but at the completion of the trip I am definitely wiser and stronger."



CAROLYN DAVID

completion of the trip, I am definitely wiser and stronger. The procurement world is interesting, diverse, and rewarding. I can honestly say that boredom will never be an option with a career in procurement. The overall atmosphere here is based on learning, working hard, and growth. Procurement management and Sandia sincerely care about investing in their employees, and I truly value that.

"I am grateful to my mentor, management, and coworkers (my procurement family). And, also the SEGIS engineer team is the most incredible team of engineers anyone could work with. I'm proud to accept this award in honor of my team."

Carolyn came to Sandia about five years ago from the South Florida Water Management District where she was an IT business analyst. She earned her bachelor's degree in organizational management.

"At a time when 60 percent to 70 percent of federal programs fail or are seriously questioned, SEGIS has been rated as the top solar energy program at the Department of Energy," says her manager, Randy Shibata (10245). "This is due to the project management of Carolyn and her collaboration with the technical team."

Sandia's photovoltaic vehicle receives GreenGov Presidential Award

By Stephanie Hobby

Sandia has received White House recognition as one of eight recipients of the 2010 GreenGov Presidential Awards. The awards honor federal agencies and employees who work to reduce greenhouse gas pollution; meet a number of energy, water, and waste reduction targets; and leverage federal purchasing power to promote environmentally responsible products and techniques. More than 300 nominations were submitted for the eight awards; Sandia earned the Green Innovation Award for developing and implementing photovoltaic (PV) powered carts at a ceremony on Oct. 7.

"It is a primary mission of Sandia Labs to seek out alternative energy sources, and I am thrilled that this great team is being honored with the 2010 GreenGov Presidential Award for Innovation for its outstanding work," says Div 4000 VP Michael Hazen, who heads up infrastructure operations at Sandia. "It is an honor and a privilege to accompany key members of the team and family members to the White House for this ceremony as they are recognized for leading by example by demonstrating environmental and energy excellence, and we look forward to discovering new ways to save energy and reduce costs."

Designed in 2009

Sandia's Facilities Energy Management team and Fleet Services organization designed the experimental, solar-powered carts in 2009 with the goals of creating a more energy-efficient campus, reducing grid-tied energy use, increasing renewable-energy use, and implementing solutions for reducing greenhouse gas emissions while determining whether a PV-driven concept could be developed that did not have a lifelong payback period. The program was completed within two months of funding and has been in operation for more than a year.

The modified Global Electric Motorcars (GEM) carts take advantage of the region's abundant sunlight by collecting solar energy in rooftop panels to charge the batteries, but can bypass the PV system to be plugged in on cloudy days when needed. Batteries are equipped

with an automatic shutoff to prevent overcharging, thereby extending their lifespan.

Traditional electric charging stations cost about \$10,000 to install and require substantial site modifications and construction. PV-powered GEM carts would reduce the number of needed charging stations, resulting in fewer repairs and decreased maintenance costs. Converting to solar-powered carts also translates to significant environmental savings. Because no power is purchased for the PV-powered cart, no coal is burned and no carbon dioxide is released into the atmosphere.

Sandia's carts use an off-the-shelf PV mounting kit, and modifications can be made in about 30 days. The GEM cart pilot project has received so much positive feedback that Sandia Fleet Services is working to expand the program and to improve the original design concept on a different platform with five new Club Car Low-Speed Vehicles (LSVs) carts at a reduced cost.

Project team members include Matthew Brito (4821), Erika Barraza (4821), Mark Crawford (10260), Diana Gould (10265), Jennifer Keese (former intern in 4821),



A SUNNY RIDE — Israel Martinez, left, Erika Barraza, and Matthew Brito (all 4821) were key members of a Sandia team that developed a photovoltaic-powered cart that won a 2010 Presidential GreenGov award. The cart is based on a modified GEM cart, familiar around Sandia's Tech Area 1. Members of the PV cart team were honored at a White House ceremony on Oct. 7. (Photo by Randy Montoya)

Israel Martinez (4821), Richard Otero (10265), and Darcy Fischer (10265).

The GreenGov program builds on a 15-year history of presidential awards for agency environmental achievement. The GreenGov awards honor exceptional federal civilian and military personnel, agency teams, agency projects, and facilities and agency programs that exemplify the federal government's charge to lead by example. Other GreenGov awards were offered in the following categories: Lean, Clean and Green, Sustainability Hero, Good Neighbor, Green Dream Team, and Building the Future.

Federal Laboratory Consortium awards

(Continued from page 1)



A MEMBER OF THE US AIR FORCE demonstrates the placement of a water disruptor developed at Sandia near its target in a simulated village used to train soldiers heading overseas. The water disruptor has just won a regional award from the Federal Laboratory Consortium. (Photo by Randy Montoya)

water capable of penetrating steel to safely diffuse improvised explosive devices — IEDs — won an Excellence in Technology Transfer Award after the technology was licensed to TEAM, a small minority-owned business.

The company has marketed the device as the Stingray, and has sent about 7,000 water disruptors to Afghanistan and military training sites since July.

The collaboration between TEAM, a company of 75 employees located in the Sandia Science & Technology Park, and Sandia enabled the water disruptors to be delivered seven months after the licensing agreement was signed.

TEAM also plans to sell the water disruptor to law enforcement and airport security agencies.

A 14-partner team of technology holders, manufacturers, and end users led by Sandia won a Notable Technology Development Award for a Fuel Cell Mobile Light. Sandia, Boeing Co., the California Department of Transportation, Alteryx Systems, Stray Light Optical Technologies, Multiquip Inc., and other partners developed the system as a clean, efficient alternative to traditional technologies powered by diesel fuel generators.

In March, the lighting system lit the construction of the famed red carpet area and an entrance to the red carpet used by the international press corps and production personnel and powered a security portal at the Academy Awards ceremony in Hollywood.

Using funding from DOE's Office of Energy Efficiency and Renewable Energy and Boeing, the project is constructing six "near-commercial" units that will be subjected to rigorous environmental and performance testing in order to finalize the commercial design. The team hopes to offer the unit for sale by late this year or early next year.

Finally, NINE received the Science, Technology, Engineering, and Mathematics (STEM) Education



THE NATIONAL INSTITUTE for Nano Engineering is the recipient of an award from the Federal Laboratory Consortium.

Award for its public-private partnership of government, industry, and universities that brings college students and faculty to its facility to focus on developing nanoengineering solutions to national problems.

NINE was established as a national innovation hub for nanoengineering three years ago, and is the only such program in the US. It provides nanoengineering solutions to meet Sandia's mission and real-life, large-scale nanoengineering research opportunities for students and faculty. The institute has a collaborative environment that matches students with Sandia and industry mentors and motivates top undergraduates to obtain advanced degrees.

This year, for the first time, Sandia and its industrial and university partners together selected the technical projects that will receive more than \$9 million in research and development funding and will be NINE's focus for several years. The projects will provide



Mine safety

JON SALTON (6533), project manager for the Gemini-Scout program, controls the robot from a remote location during a simulated mine disaster.

(Continued from page 1)

“We have designed this robot to go in ahead of its handlers, to assess the situation and potential hazards, and allow operations to move more quickly,” says project manager Jon Salton (6533). “The robot is guided by remote control and is equipped with gas sensors, an infrared camera to locate survivors, and another pan-and-tilt camera mounted several feet up to see the obstacles we’re facing.”

In addition to giving rescuers an idea of what they’re headed into, the robotic scout can provide some relief to trapped miners. Less than four feet long and two feet tall, Gemini-Scout is nimble enough to navigate around tight corners and over safety hatches a foot high. It is equipped with two-way communication radios and can bring provisions such as food, air packs, and medicine to those trapped underground. Additionally, Gemini-Scout can be configured to potentially drag survivors to safety.

Deadly gases, flooded tunnels

A number of challenges faced designers. They had to keep in mind the hazards typically found in mines. Methane and other gases could ignite if exposed to sparks, so the electronics are housed in casings designed to withstand an explosion. “Such measures would prevent a spark from causing further destruction. While it might harm the robot, it wouldn’t create another dangerous situation for the miners or rescuers,” Jon says.

And to ensure functionality in flooded tunnels, Gemini-Scout’s controls and equipment are waterproof. “When we were designing a robot that could

provide this level of assistance, we had to be aware of the pressures and gases that are often found in that environment,” says Clint Hobart (6532), who was responsible for the mechanical design and system integration. “So we had to make sure the strength of materials matched what our goals were, and we had to keep everything lightweight enough so it could navigate easily.”

In addition, engineers had to make sure that the design was user-friendly enough to be intuitive to new operators who were trying to learn the system quickly. To overcome that challenge, they used an Xbox 360 game controller to direct Gemini-Scout, and the screen feels much like a video game. “We focused a lot on usability and copied a lot of gamer interfaces so that users can pick it up pretty quickly,” says Justin Garretson (6532), the lead software developer and an avid gamer.

The National Institute for Occupational Safety and Health (NIOSH) provided funding for the efforts, which have been underway for about three years. If all goes well, the Gemini-Scout could be in full production by the end of next year. The team is in the final stages of licensing Gemini-Scout to a commercial robotics company, but for now, the Mine Safety and Health Administration will be the primary customer.

“We anticipate that this technology is broad enough to be appealing to other first responders, such as police, firefighters, and medical personnel,” Jon says. “Gemini-Scout could easily be fitted to handle earthquake and fire



A-MAZING — Gemini-Scout can navigate through tight openings, up stairs and over rubble piles to reach trapped miners and assess any dangers rescuers might face.



CLINT HOBART (6532), who was responsible for mechanical design and system integration, directs the Gemini-Scout to load for transport after an exercise.

Open Enrollment 2011 for employees has begun

Open Enrollment is under way. Go to the website www.SandiaTakeCharge.com for detailed information on your 2011 options. Open Enrollment 2011 for all active employees is Oct. 18-Nov. 5, 2010 (5 p.m. MST).

During Open Enrollment you may:

- Enroll, disenroll, or make changes to your medical plan(s)
- Enroll or disenroll in a dental and/or vision plan
- Enroll or disenroll a dependent in your medical, dental, or vision plans
- Enroll in a health care or daycare flexible spending account (even if you are currently enrolled)
- Enroll in the vacation buy plan (even if you are currently

- enrolled)
- Enroll in the voluntary group accident plan

Employee benefits fairs

HBE will host several benefits fairs (see dates, times below) for employees. Come ask your benefits questions to the Sandia health plan vendors and/or the benefits staff.

Albuquerque, N.M.

- Thursday, Oct. 21, 10 a.m.-2 p.m.
Employee Fair at Steve Schiff Auditorium
- Wednesday, Oct. 27, 10 a.m.-2 p.m.
Employee Fair at Steve Schiff Auditorium

- Thursday, Oct. 28, 10 a.m.-2 p.m.
Employee Fair at Steve Schiff Auditorium
- Wednesday, Nov. 3, 10 a.m.-2 p.m.
Employee Fair at Steve Schiff Auditorium

Livermore, Calif.

- Monday, Oct. 25, 10 a.m.-2 p.m.
Employee & Spouse Fair at 904 Auditorium

More information

Open Enrollment website: www.SandiaTakeCharge.com. Don't forget to add this site to your trusted sites. Also, you may need to refresh your Take Charge pages to ensure you're seeing the most current content.

Health Reimbursement Account (HRA) vs. Healthcare Flexible Spending Account (HCFSAs)

In 2011, Sandia will continue to offer a Healthcare Flexible Spending Account (HCFSAs) in addition to the Health Reimbursement Account (HRA) with Sandia Total Health. The HRA is funded by Sandia and the HCFSAs are funded by the employee. The following is an explanation of the numerous differences and similarities between the two accounts.

Health Reimbursement Account (HRA) overview

The Health Reimbursement Account (HRA) is a tax-free account included as part of Sandia Total Health that you can use to help pay for covered expenses — including your deductible, prescription drugs, and other out-of-pocket medical expenses. The amount of dollars allocated to your HRA is determined by 1) your coverage category/tier and 2) if you have taken a health assessment.

Coverage Category/Tier	Annual allocation of HRA dollars if health assessment is taken ^{2 3}	Annual allocation of HRA dollars if health assessment is NOT taken ²
Employee only	\$250	\$0
Employee + Spouse or Child(ren) ¹	\$500	\$250
Employee + Spouse + Child(ren) ¹ (also referred to as family)	\$750	\$500

¹ Includes same gender domestic partner and same-gender domestic partner child(ren).
² This is the only amount that will be placed in your HRA during the calendar year and may be used for any combination of Network and non-Network Covered Health Services, including prescription drugs.
³ IRS regulations prohibit Domestic Partners and Domestic Partner children from being eligible to use HRA funds.

You must complete your health assessment by Nov. 30, 2010, in order to receive your total 2011 HRA contribution. You must be enrolled in Sandia Total Health to be eligible for the HRA.

Healthcare Flexible Spending Account (HCFSAs) overview

Healthcare Flexible Spending Accounts (HCFSAs) are regulated by federal tax law and were established by Sandia for employees' benefit. HCFSAs allow you the option of setting aside tax-free dollars from your paychecks to pay for eligible healthcare expenses. All regular employees, postdocs, and limited term employees are eligible to participate in this plan. This program requires re-enrollment every year. The HCFSAs are limited to a minimum annual amount of \$100 up to a maximum amount of \$5,000. Eligible expenses include annual deductible amounts, copayments, coinsurance, and eligible out-of-pocket for medical, dental, and vision expenses not fully covered by your plan.

HCFSAs administrators: Your HCFSAs will be administered by the Sandia Total Health claims administrator you choose. Please review the chart below to see who will administer the HCFSAs.

	Kaiser Permanente	UnitedHealthcare	Blue Cross and Blue Shield of NM (BCBSNM)
Non-Represented Employees	HRA — Bank of America ¹ HCFSAs — Bank of America ¹	HRA — UHC HCFSAs — UHC	HRA — BCBSNM HCFSAs — PayFlex ²
SPA-Represented Employees	—	HRA — UHC HCFSAs — UHC	HRA — BCBSNM HCFSAs — PayFlex ²
Waive Medical Coverage	PayFlex will administer your HCFSAs		
¹ Kaiser contracts with Bank of America for HRA and HCFSAs administration. ² BCBSNM contracts with PayFlex for HCFSAs administration.			
Daycare FSA will be administered only by PayFlex			

HRA/HCFSAs comparison

Although both the HRA and HCFSAs can be used to pay for eligible health care expenses, there are some key differences.

	HRA	HCFSAs
Eligibility	To participate, you must enroll in Sandia Total Health and complete your Health Assessment. You do not need to estimate any contribution amount; Sandia contributes a set amount for you. Note: Covered dependents do not need to complete a health assessment to receive their portion of HRA funds.	You may enroll in an HCFSAs regardless of which healthcare plan you choose. You must estimate how much you want to contribute to your HCFSAs for the calendar year, and enroll during Open Enrollment. You can set aside up to \$5,000 per year.
Funding	You earn Sandia's HRA contribution annually by meeting the criteria listed above. The amount Sandia contributes is based on the coverage tier you elect and if you have completed the health assessment. Funds are available January 1. The HRA is non-taxable.	You fund your HCFSAs each paycheck, with pre-tax dollars. Funds are available Jan. 1.
Eligible Expenses	You can use the money in your HRA to pay your share of eligible Sandia Total Health medical and prescription drug expenses, such as the deductible and coinsurance. You may not, however, use the HRA to pay for dental, vision, and over-the-counter drugs. Note: You may not use HRA and HCFSAs funds to reimburse the same healthcare expenses.	You can use the money in your HCFSAs to pay for eligible healthcare expenses like medical and prescription drugs, and also those eligible expenses not covered by the HRA such as vision and dental. Note: Beginning January 1, 2011, unless prescribed by a physician, over-the-counter medications are not eligible for HCFSAs reimbursement.
Unused Account Balances	Balances left in your HRA at the end of the year will roll over to your HRA for the next year.	You must use your entire HCFSAs account balance during the calendar year and subsequent grace period (January 1 – March 15). Money left in the account does not roll over at the end of the grace period; you will lose this money.

IMPORTANT: HRA and HCFSAs payment order

As you are considering amounts to contribute to your health care flexible spending account, please consider the following:

- For employees enrolled in the Sandia Total Health administered by Kaiser or UHC and a 2011 HRA, your HCFSAs funds must be used first for reimbursements, before your HRA.
 - For employees enrolled in the Sandia Total Health administered by BCBSNM and a 2011 HRA, your HRA funds must be used first for reimbursements, before your HCFSAs.
- Visit www.SandiaTakeCharge.com for a detailed look at how the three vendors process claims for employees with an HRA and HCFSAs, as well as debit card information. Additionally, all employees will be sent a Guide describing how the HCFSAs works with the HRA.

Open Enrollment for Sandia retirees, surviving spouses, and long-term disability termines

During the past few weeks, Extend Health — the company responsible for handling Sandia's retiree health benefits administration — has sent Sandia retirees, surviving spouses, and long-term disability (LTD) termines and their covered dependents a few critical documents related to this year's Open Enrollment. Medicare/preMedicare combo families have been sent documentation for both Medicare and preMedicare.

Open Enrollment for retirees runs Oct. 18-Nov. 16, 2010. Because of the many changes occurring to the preMedicare and Medicare benefits, Sandia and Extend Health have sent retirees the documentation to help them prepare for Open Enrollment and understand their 2011 benefit options.

PreMedicare retirees, surviving spouses, and LTD termines who take no action will be automatically defaulted into the following medical plans:

PreMedicare Retirees	
If your 2010 medical plan is:	Then your 2011 medical plan will be:
CIGNA In-Network Plan	Sandia Total Health administered by Blue Cross and Blue Shield of New Mexico
Kaiser (CA) HMO	Sandia Total Health administered by Kaiser Permanente
UnitedHealthcare Premier PPO	Sandia Total Health administered by UnitedHealthcare
Sandia Total Health UHC	Sandia Total Health administered by UnitedHealthcare



For **Medicare retirees**, effective Jan. 1, 2011, the UHC Senior Premier PPO Plan is being eliminated. Each Medicare individual enrolled in the UHC Senior Premier PPO plan must take action during open enrollment.

Medicare Retirees	
If your 2010 medical plan is:	Then your 2011 medical plan will be:
UHC Senior Premier PPO	You must make a new election with Extend Health as the UHC Senior Premier PPO is being discontinued. If you do not make a new choice you will lose your medical coverage effective January 1, 2011.
Presbyterian MediCare PPO	Presbyterian MediCare PPO
Lovlace Senior Plan	Lovlace Senior Plan
Kaiser Senior Advantage Plan	Kaiser Senior Advantage Plan
In waived status	Will remain in waived status

The *Benefits Choices 2011 Guide* was mailed the week of Sept. 20. PreMedicare and Medicare retirees should have each received their own version. About a week later, Medicare retirees received a *Getting Started* guide. This worksheet was meant to help Medicare retirees and Extend Health best understand the medical needs and preferences of our retirees so they can help find a plan that matches your needs. Next, beginning the week of Oct. 11, Sandia retirees began receiving an *Enrollment Guide*. Again, preMedicare and Medicare

retirees should have each received their own version. The *Enrollment Guide* provides a step-by-step look at what retirees need to do this Open Enrollment. All Sandia retirees should have received the following items:

- *Benefits Choices 2011* guide (preMedicare and Medicare)
- *Getting Started Guide* (Medicare only)
- Enrollment Guide (preMedicare and Medicare)

You may also view/download/print all the above documents from www.SandiaTakeCharge.com. Video recordings and PowerPoint

presentations have also been posted from the recent retiree pre-Open Enrollment sessions in Albuquerque and Livermore. These documents are critical for retirees to have a good understanding of their 2011 health benefits choices, and to make an informed decision. If you have not received any of these documents, or you have questions about your Open Enrollment process, call Extend Health at 1-888-598-7809 (TTY: 1-866-508-5123). Benefits advisors are available Monday-Friday, 7 a.m. - 7 p.m. MST

'You're walking good today, mom'

By Iris Aboytes

Rebecca Burt (3502) has two children, 9-year-old Austin and 7-year-old Katy. Her husband Todd is an engineer. She has a job that she enjoys, and she has multiple sclerosis (MS).

Multiple sclerosis is an autoimmune disease that affects the brain and spinal cord. Symptoms vary, because the location and severity of each attack can be different. Episodes can last for days, weeks, or months. These episodes alternate with periods of reduced or no symptoms. Twelve years of MS have left Rebecca with lasting weakness in both legs, and occasional numbness and weakness in her hands. She uses a mobility scooter or a cane to get around.

"I think I started having episodes when I was about 15 years old," Rebecca says. "I experienced some weird numbness in my legs and my hands felt like they were burning. I was very active and did not think it was anything major."

Two days after her undergrad graduation, she lost feeling and function in her right leg. She had fallen on a patch of ice earlier, and thought that was the cause.

"I went to a chiropractor and he told me it could just be sciatica [pain, weakness, numbness, or tingling in the leg that is caused by injury to the sciatic nerve]," Rebecca says. "After several weeks of treatment went by with limited improvement, he indicated it was not sciatica and might be MS, and I went to a neurologist. I had a magnetic resonance imaging test [MRI] and spinal tap. I had MS. I had not gotten treated, but my symptoms were gone by the time of the diagnosis, and I went back to normal. It was amazing."



REBECCA BURT, seen here with daughter, Katy, and son, Austin, maintains a positive outlook and an active lifestyle that isn't dampened by a longtime fight with multiple sclerosis.

Her next major episode was while she was on a Disneyland trip. She was given a series of high-dose steroids through an IV. "It was a very emotional time for me and my family," she says. "After that there were a few quiet years with no major relapses."

Rebecca married her high school sweetheart. "Todd is great in how he handles things," she says. "He is very supportive and lets me be me. He lets me do what I gotta do. His cleverness with gadgets has helped me stay independent. He had both of our cars outfitted with hand controls so I can drive even on bad days, and he makes sure that I can get my scooter in and out of the cars on my own."

"For our wedding anniversary, he got me a beautiful silver necklace. The best part is that the clasp has magnets, so that even when my hands are not up to par, I can get it on by myself."

Three months after Austin was born Rebecca had an episode. "As a new mother, I was emotional anyway, but not being able to hold my baby was almost unbearable," she says.

"Austin is all grown up. He loves football. Katy is an up-and-coming gymnast. Life in our household is just as it is in other households, busy and fast-paced."

Rebecca had a bad month last year. She could not drive. She could not get onto her scooter. "My managers and colleagues understand and have always been very supportive," she says. "But my MS is not an excuse not to treat me like a normal person. Things could be a lot worse. There are a lot of people who have horrible and much greater obstacles. I am very thankful that I have a great support system and together we can deal with whatever happens."

Rebecca works out when she can and goes to physical therapy when necessary. She loves the water and enjoys getting in the pool.

"I have a very deep faith and commitment. MS will not stop me. I have no fear. I will be OK. Besides, I know things are good when Austin tells me, 'You are walking really good today, mom.' I love those days."

**Sandia observes
Disabilities Awareness Month
every October**

Shadow Woman takes him to places he has never been

By Iris Aboytes

The first time I saw him he was sitting on a park bench reading. How nice, I thought to myself. All he needs is coffee. It was a crisp spring Saturday morning, and I was coming home from my weekly walk. I said good morning and I walked on by.

I saw him the following Saturday, and several Saturdays after that. He was always in the same spot, always reading.

I began to wonder who he was and paid closer attention. He was tall and slender with a thick black beard and black curly hair. His bright eyes and smile revealed his white teeth as he said good morning. There next to

him on the bench was a dark travel bag, a small paper sack, and what looked like a sleeping bag.

The peacefulness and curiosity I had felt was replaced with an unshakeable sadness. I kept on walking but the thought of him being homeless permeated my every step. Why had I looked?

In the following weeks, I saw him off and on. I always looked for him, but sometimes he wasn't there. I began to feel disappointed when I did not see him. The summer came and he disappeared, or rather he just wasn't at that spot. Occasionally I saw him walking in the area, always carrying his bags.

One Saturday I was happy to see him again. There he was, in a different part of the park. Impulsively I walked over to where he was. I wished him a good morning, and asked what he was reading.

"Shadow Woman," he responded. I asked if he liked to read.

"Yes, I do," he answered.

"There are some powerful words in those pages," I said.

"You can go to many places, without going anywhere," he added.

I have heard those words many times before from my teachers, friends, and now I hear myself saying them to my grandchildren, but I had never heard them before with such conviction. He told me he reads three to five books a week and the library is one of his favorite places. Imagine all the trips he has taken.

We talked about the beauty of the park, and I asked him if he was from around there. "I live over there with some others," he pointed. "I came here from up north when it got cold."

"Up north, where?" I asked.

"From Denver," he responded.

We visited some more, then like an involuntary reflex, I lost control as my mouth uttered words I did not have the right to say.

"Are you homeless?" I asked.

"Yes, I am," he responded.

"I am so sorry," I said. Instead of being angry at me for asking, he seemed relieved. There it was. He was homeless. So what? We talked about the economy and how it had taken us for a loop. I asked him what his previous career had been.

"I worked with computers," he said. I told him about Sandia and Intel. Perhaps there would be employment possibilities there. I informed him about several churches in the area that might be able to help.

I also told him about services that might be available through our United Way. He listened and nodded.

I asked if there was anything I could do to help. "No," he responded.

What seemed like a long time was actually just a few minutes. I had invaded his privacy long enough. I thanked him for letting me interrupt his reading and told him I would visit with him next time.

He wasn't holding a sign. He wasn't asking for money. He wasn't dirty. He just did not have a home. Now that I knew all that, what was I going to do? How could I help?

I have seen and visited with him several times since then. On rainy days, I have hoped he finds shelter, maybe in the

library. Early mornings as I am headed to the bus stop, I see him headed to the park.

Riding the bus after seeing him, I have wondered how he survives. There are so many questions and what ifs. But those same questions and what ifs are what we ask of ourselves.

I have been privileged to write about the many people helped by United Way because of your generosity. I am glad they are trained to help. My feeble attempt to help one single solitary man was fruitless.

I keep thinking of something he said when I asked if I could help.

"Maybe you could help me, if I knew why I am homeless."

Oh, I know he is homeless because he doesn't have a home, but what was he really trying to tell me? Do you know?

Through their ECP contributions, Sandians support many community organizations that provide services for the homeless. The 2010 ECP campaign runs through Oct. 22.

**In Honor of our
Reservists, Guards,
and Veterans**

Join us for

Information Fair and Presentations
Thursday, November 4
Steve Schiff Auditorium (Bldg. 825), 10:00 am to 2:00 pm

Legacy of American Veterans Presentation
Wednesday, November 10
Steve Schiff Auditorium (Bldg. 825), 11:00 am to 12:00 noon

**Tribute to Reservists, Guards, and
Veterans and Celebration of
American Indian Heritage Month**
Wednesday, November 10
Hardin Field, 12:00 noon to 2:00 pm

**Sandia Guard and
Reservist Employee Luncheon**
Tuesday, November 16
Air National Guard Hangar, 11:30 am to 1:00 pm

For more information contact:
Marie Brown 284-3171, fmbrown@sandia.gov or Machelie Karler 844-8274, mkarler@sandia.gov

