



A BETTER FIT FOR PROSTHETICS — Jason Wheeler (6533) demonstrates a liner aimed at helping prosthetic limbs fit better. Sandia's Intelligent Systems, Robotics, and Cybernetics group is developing a liner with sensors that tell what's going on in a limb and a system to automatically

accommodate changes. The project has worked with several different types of prosthetic limbs. Read more about Sandia's work on this project in a story by Sue Major Holmes on **page 5**.
 (Photo by Randy Montoya)

The light fantastic

Fuel cell-powered mobile lights tested, proven, ready for commercial use, broader deployment

By Mike Janes

Mobile lighting systems powered by hydrogen fuel cells are cleaner, quieter, and now have a proven track record in applications such as nighttime construction, sports, entertainment events, and airport operations, making them ready for commercialization and broader use.



That's the conclusion reached by researchers at Sandia and others after a multi-year project sponsored by DOE's Fuel Cell Technologies Office and the Boeing Company. Project support also came from the California Department of Transportation (Caltrans), Alteryg Systems, and 11 other project partners.

WORK LIGHT — Developed by Sandia and several industry partners, the fuel cell mobile light (H2LT) offers a cleaner, quieter alternative to diesel-powered units. As seen here, the system has been used by construction personnel at San Francisco International Airport and in other applications. (Photo by Dino Vournas)

Over the past five years, Sandia and 14 institutional partners have been developing the fuel cell mobile light tower (H₂LT) as a clean, efficient alternative to traditional lights powered by diesel generators.

California-based Multiquip Inc., a leading manufacturer and supplier of rental

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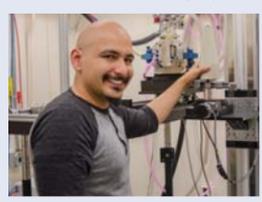
DOE hosts National Lab Day in D.C.



The DOE-sponsored National Lab Day on the Hill highlighted the breakthrough research being done across the department's laboratory system. See **page 4**.



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Family Day 2014

More than 12,000 members of the workforce, their families, and friends enjoyed the first New Mexico Family Day since 2009. See pages 8-9.

That's that

Did you happen to make it out to Family Day 2014, the first one we've held here in New Mexico since 2009? If you missed it, you missed out on something really special. More than 3,000 Sandians and other members of the workforce escorted family and friends around the campus – we had more than 12,000 visitors in all – taking in the sights and sites of one of the world's great research facilities.

If you were around five years ago, you may remember (how could you forget!?) that Family Day 2009 almost got blown away by New Mexico's sometimes-fierce spring winds.

In a move designed in part to avoid that eventuality this time around, the 2014 date was moved to September, when the weather is usually a bit more benign around these parts. As the big day approached, though, it looked for a while like a monster storm that had bashed Baja early in the week leading up to the event might end up wreaking havoc on central New Mexico. Was Family Day going to be snake-bit yet again? Rained out in one of the few places in the country where you can usually plan outdoor activities a year in advance with a pretty high degree of confidence that the weather will be just fine?

As it happened, the storm ended with a whimper before it reached us (but not before slamming the southern part of the state pretty hard). Come rain or shine (or wind) though, the event planners had taken to heart a lesson from 2009: this time there were pretty thorough contingency plans in place if the weather turned sour on us.

Anyhow, Family Day was a huge success – bigger and better in every way – and you didn't have to hold onto your hats this time around. It was gratifying to show off our workplace and facilities. It was a great way for our friends and family to get a big-picture sense of what we do.

I suspect the overarching take-away message for our loved ones after seeing the range of our work was "Boy, you guys do a lot!"

Yes we do. And you didn't see the half of it.

Check out Randy Montoya's Family Day photos on pages 8 and 9.

* * *

Want to hear something pretty impressive? When I started at Sandia in 1995 we were celebrating the fact that Labs employees and retirees had donated \$2 million to the annual ECP campaign. That \$2 million figure was considered a real milestone, something we were rightfully proud of. But consider this: In last year's ECP campaign, members of the workforce and retirees contributed more than \$6 million, some three times the 1995 amount.

You might think that the difference can be explained by inflation, but I wasn't so sure so I looked it up online. Plugging in the numbers in an inflation calculator (is there anything you can't find on the web?) it turns out that our \$2 million donated in 1995 would be worth \$3 million in today's dollars. Which means that in constant, adjusted dollars, we are contributing at twice the rate we were a generation ago. What happened? What explains such a big jump in what was already the most generous corporate giving campaign in the state?

I don't think there's any one answer. A lot probably has to do with more folks taking advantage of the fact that they can target their giving to many of their own favorite causes. Then there's the fact that our retirees are participating at a tremendous rate; if they were a company, our retirees' giving would rank them right near the top of giving institutions statewide. The example provided by our executive leadership; the commitment and creativity of our in-house ECP volunteers, the individuals across the Labs who encourage us to participate. Those are all factors, but, then, too, there's this – Sandians, I think, share that most wonderful value: gratitude. I think we know we're fortunate to work in this remarkable institution, and many of us know that not a whole lot separates us from those less fortunate than us in our community. A wrong decision here, a bad break there, and we know we could easily be on the other side of the giving equation.

At the end of the day, I don't know whether I'm prouder of our mission work or our community spirit. The former is what we do; the latter is who we are. And our success in the former is due in no small part to the latter.

This year's ECP campaign begins Oct. 6.

See you next time

– Bill Murphy (MS 1468, 505-845-0845, wtmurph@sandia.gov)

New CEE website offers tools and resources for engineers and scientists

By Tim Deshler



COMMON ENGINEERING ENVIRONMENT

<http://prod.sandia.gov/cee/>

The Common Engineering Environment (CEE) is a set of preferred engineering tools and software, support services, best practices, processes, and training for all Sandia engineers and scientists. Users can connect with others through communities of practice or tap into MySite and perform a skill search to find colleagues with a particular skill or subject matter expertise.

In furthering the Labs' Strategic Objective No. 4, to "Excel in the Practice of Engineering," the new CEE website has expanded from its origin of sharing IT tools and licenses, and now includes tools, training, and best practices to benefit the broader Labs community.

The CEE was designed on a foundation with four pillars: computing resources, project management, engineering quality, and competencies and training. The new site bundles the latest state-of-the-art tools and resources you need to improve your skills, save time, and standardize your approach. Some of the benefits of CEE include:

- Helping employees excel in the practice of engineering.
- Improving systematic quality approaches through consistent processes, practices, and tools in critical areas such as configuration management, risk management, and project management.
- Sharing training courses for key engineering and scientific disciplines.
- Realizing cost savings through corporate tool purchases including multi-user licenses.
- Enabling flexible workforce mobility with common engineering and science skills.

Visit <https://prod.sandia.gov/cee/> to familiarize yourself with the new CEE tool. Then visit your MySite page on TechWeb and edit your profile to include your specific expertise and interests. Email Janielle Baca (9000) at janibaca@sandia.gov to confirm that you completed these tasks and you will receive a small token of appreciation for your time.

You can access the computing resources available on the CEE through Sandia IT tools (e.g., SAMS, Web-CARS). Many of these Sandia-supported scientific and engineering software applications come pre-installed and configured on remote computing systems that can be accessed by obtaining a CEE account through Web-CARS. Learn more about CEE account options and pricing at the CEE "computing resources" webpage.

The CEE is brought to you by the Common Engineering Environment Steering Committee, the governing body that standardizes Sandia's engineering resources to enable Labs-wide efficiencies, a disciplined approach to engineering, and an integrated engineering environment with easy access to tools and capabilities.



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Fuel cell lighting

(Continued from page 1)

construction equipment, power generation, lighting, and other industrial products, has built six.

Airport equipment and maintenance personnel at San Francisco International Airport and Saunders Electric crews at various Hollywood-area entertainment and awards shows, including the Academy Awards, have already realized the benefits of the clean and efficient H₂LT as part of their regular operations. Other systems have been used by highway construction crews at Caltrans and the Connecticut Department of Transportation. One system was even deployed at NASA's Kennedy Space Center in support of the final space shuttle launch in 2011.

Market transformation and other successes

The goals of the pilot programs were to perform a variety of lighting tasks, assess the operation and reliability of the technology in a variety of potentially corrosive environments, reduce diesel emissions at deployment locations, and help promote hydrogen fuel cell technology in new markets. The project has been deemed a major success in opening up new fuel cell markets that complement broader hydrogen energy markets, including the light-duty vehicle market, says Sandia project lead Lennie Klebanoff (8367). Toyota, General Motors, Honda, and Hyundai have all announced plans for hydrogen-powered vehicles.

"Since San Francisco International Airport and Saunders Electric are now using H₂LTs as part of their regular operations, it is stimulating the demand for hydrogen in those regions and helping to create markets for its production and sale," he says.

A key educational component emerged during the project as well, says Lennie.

"Wherever the H₂LT was used or displayed, we engaged with local fire and building safety authorities and first responders, few of whom had prior knowledge of the physical or safety aspects of hydrogen and fuel cell technology," he says. "After hearing our technology descriptions and seeing the different ways the H₂LT is being used, those groups rapidly welcomed the technology as both reliable and safe."

A paper describing the project, "Fuel cell mobile

lighting: A fuel cell market transformation project," was published in the Aug. 13 edition of *International Journal of Hydrogen Energy*.

Emissions-free, but quiet and tough

In addition to zero emissions, perhaps the most attractive feature of the fuel cell mobile light system is how quiet it is.

"The primary driver of the project from the outset was the lowering of greenhouse gas emissions, and, in fact, the H₂LT system was not designed to minimize noise," says Lennie. "Still, hydrogen fuel cell technology by its very nature is dramatically quieter than diesel generators, and this noise reduction is something that really excites users."

The lack of noise, he said, is highly valued by highway construction crews, airport maintenance personnel, and stage crews on entertainment production sets. Users would rather not deal with the odors and noise of diesel-based equipment.

Another important conclusion was that the fuel cell power system manufactured by project partner Altery Systems is compatible with the rugged world of construction. Caltrans used one unit in rain, wind, and snow in the Sierra Nevada range. The elements — and towing the lights some 1,100 miles up and down bumpy mountain roads — proved to be no problem for the robust fuel cell mobile lighting technology.

Lighting the way ahead

The price tag for a prototype fuel cell-powered mobile lighting system initially was roughly triple that of a traditional diesel-powered system.

Cost-cutting strategies Multiquip is considering include incorporating highly efficient light-emitting diodes (LED), which will allow a reduction in fuel cell size; reducing the size of the hydrogen storage tanks; and decreasing the required tank pressure rating. The cost of the current LED technology used with the system also is expected to decline.

"We had great customer feedback and interaction from these prototype units and most importantly all deployment has proven the dependability of fuel cells in the rough environment of the construction industry," says Torsten Erbel, vice president for Product Management, Engineering, and Customer Support for Multiquip Inc. "With this knowledge and the deployment of fuel cell-powered vehicles, the hydrogen infrastructure will quickly develop to support our commercial plans for the fuel cell mobile light, allowing us to bring



THE H₂LT DEVELOPED by Sandia and its partners was deployed in 2011 at the site of the final space shuttle launch and observed by visitors, shuttle astronauts, and members of the international media. (Photo by Lennie Klebanoff)

the environmental benefits of hydrogen to the construction business."

"Overall, end users have been pleased with the performance of the hydrogen fuel cell mobile lighting system," says Lennie. "We're confident that the technology can now be commercialized and widely used in any application needing large area lighting."

Sandia has decades of experience in hydrogen and fuel cell systems and leads a number of other hydrogen research efforts, including the Hydrogen Fueling Infrastructure Research and Station Technology (H₂FIRST) project, a maritime fuel cell demonstration, a development project focused on hydrogen-powered forklifts, and a recent study of California gas stations that can safely store and dispense hydrogen.

Sandia California News

More California news on page 11

Celebrating Division 8000's innovation

By Patti Koning



MARK ALLENDORF (8600), right, shown here with Malin Young, director of Biological and Materials Science Center 8600, was one of the 124 Sandians from Div. 8000 honored at the Innovation Celebration. Mark was part of the Triplet-Harvesting Plastic Scintillators team that won an R&D 100 award. (Photo by Jeff MacMillan)

Div. 8000 recently hosted its 17th annual Innovation Celebration. Held under a beautiful grape arbor at Concannon Vineyards, the celebration recognized inventors of patents, authors of copyrights, contributors to classified intellectual property (IP), license royalty recipients, and special award recipients.

"This is the perfect place to raise a glass and celebrate our innovation champions — those that have generated IP, patents, software, copyrights," said Carrie Burchard (8539), manager of the Business Development group. "We are honoring 124 people — a quarter of the research staff in Div. 8000. Thank you for all of your hard work, creativity, and innovation."

The evening was also an opportunity for family and friends to learn more about Sandia and the accomplishments of their loved ones. Special guests included Livermore Mayor John Marchand; Louis Stewart, deputy director of innovation and entrepreneurship for the Governor's Office of Business and Economic Development (GO-Biz); Cheri Greven, district director for Rep. Eric Swalwell, D-Calif.; Daniel Sanchez, senior program manager of the NNSA's Sandia Field Office; Peter Atherton (7930), senior manager of Sandia's Industry Partnerships organization;

Brandon Cardwell, vice president of the i-GATE Innovation Hub; Dale Kaye, CEO of the Innovation Tri-Valley Leadership Group; and Greg Sommer, former Sandian and CEO of Sandstone Diagnostics.

Science and technology at the heart of DOE

Peter also spoke, recognizing Triplet-Harvesting Plastic Scintillators, which won an R&D 100 Award, and SpinDx as especially innovative projects. Sanchez told the audience about a recent conversation he had with US Secretary of Energy Ernest Moniz.

"He reminded me that science, technology, and engineering lie at the heart of DOE," Sanchez said. "I know this is something we all try to strengthen each and every day. It can become routine and a hassle to get through bureaucratic hurdles; please never give up. We are relying on you. We need your spirited innovation to continue to execute on all of our national imperatives."

Div. 8000 VP Steve Rottler then spoke about innovation, referencing the book *The Idea Factory: Bell Labs and the Great Age of American Innovation* by Jon Gertner. Bell Labs was the research and development subsidiary of AT&T, which operated Sandia from its inception until 1993. Steve read *The Idea Factory* after hearing Gertner discuss the overuse of the word "innovation" in an interview. Each Innovation Celebration honoree received a copy of the book.

"I think it's critically important that we never forget our connectivity to Bell Labs. Much of what we are today as an institution — our values; our culture; the emphasis on innovation, entrepreneurship, and national service — all of that came from Bell Labs and has been further strengthened by our relationship with Lockheed Martin," he said. "The book describes five characteristics that made Bell Labs what it was: a flat organization structure, laser-like focus on hiring people who are among the best and brightest, an interdisciplinary focus, challenging work for a worthy cause, and good financial support."

"I invite you to take stock of what made Bell Labs such a great institution and think deeply about those characteristics and how they relate to our lab. Or consider what might be missing from our lab and should be added to our culture. I ask each of you to rise to the challenge as leaders and help nurture a culture like Bell Labs so our lab can experience the same level of greatness and impact."

The Innovation Celebration was preceded by an all-day Entrepreneurship Seminar at Sandia. Led by Anup Singh (8620), the event featured as speakers Steve; Peter; Cardwell; former Sandian Eric Cummings, president and CEO of MaxOut Renewables and the founder of Cool Earth Solar and LabSmith; former Sandian Daniel Neal, director of R&D at AMO WaveFront Sciences and a research fellow at Abbott Medical Optics; Mark Bünger, research director at Lux Research; Bill Shelander, business development guru at Lawrence Berkeley National Laboratory; and Brian Atwood, managing director at Versant Ventures.

Rob Leland named Chief Technology Officer and VP of Science & Technology Div. 1000

Pam Hansen Hargan retires as VP of HR & Communications Div. 3000

By Neal Singer

Rob Leland has been appointed VP of Science and Technology Div. 1000, as well as Chief Technology Officer (formerly Div. 7000). The division is being folded back into Div. 1000.

Those vice-presidential positions had been filled on an acting basis for the past 20 months by Duane Dimos and Julia Phillips, respectively.

In announcing the transition, Sandia President and Laboratories Director Paul Hommert said, "Rob brings a distinguished scientific background and a proven ability to develop new strategic directions that will enable him to bring strong leadership to our research agenda."

In another executive transition, Human Resources and Communications Div. 3000 VP Pam Hansen Hargan, announced her retirement.

Sandia is conducting a search for a replacement. Becky Krauss, General Counsel and VP of Legal and Prime Contract Div. 11000, will serve as the acting VP of Div. 3000, and Marianne Hill, Deputy General Counsel, will serve as the acting VP of Div. 11000 and General Counsel.

Rob joined Sandia in 1990. With a background in electrical and mechanical engineering, as well as applied mathematics and computer science, Rob has held leadership positions in several major Sandia efforts. He served most recently as director of Sandia's Computing and Information Sciences research foundation and as director of Computing Research (1400). He was awarded the 2014 "Test of Time" award by the Supercomputing 2014 conference for his seminal 1995 paper with Bruce Hendrickson that put graph partitioning — a method used in many supercomputing efforts today — on a solid basis. (The annual Supercomputing conferences are the largest in the world in that field.) He was a leader in Sandia's dramatic effort to help Cray Inc. develop and manufacture the seminal supercomputer known as Red Storm.

His most recent external assignment was to the



ROB LELAND

White House Office of Science and Technology Policy, where last year he worked as a part of a White House-led interagency team to develop a new national strategy for high-performance computing

"We looked at responding to major strategic challenges," says Rob. "We examined the increasing foreign investment in high-performance computing technology, which has cut into the US technical lead. We familiarized ourselves with erosions of Moore's Law, the rise of big data, the offshore movement of the US micro-electronic industry, and the coming end of the current paradigm for supercomputing."

Says Duane Dimos, who moves to acting director of Pulsed Power Sciences (1600), "Since February 2013, when we made the organizational change that created the current Divisions 1000 and 7000, there were many questions about how the split responsibilities would work. I would like to thank my friend and colleague Julie Phillips for partnering to ensure that we managed those changes carefully and efficiently, especially to keep critical efforts moving forward. Julie and I also agreed to keep our two divisions closely aligned so they could be reintegrated relatively easily, which is what we'll do now. I know that recombining Division 1000 with the Chief Technology Officer role is the right path forward for the organization and the lab. I feel that we are currently very well positioned for the future and I would like to thank the center directors and all of the great folks in the division office for the key roles they've played. I look forward to my next role as interim director of Center 1600 and whatever adventure is beyond that assignment."

Says Julia, who will be retiring after a short stint as Deputy Chief Technology Officer, "I think we made a good start on identifying and developing Research Challenges, and I'm looking forward to seeing them become an essential tool for integrating from research to mission areas impact. Sandia research is in a good place because of what we've done in developing and implementing a long-term strategy for research. Under Rob's leadership, I look forward to seeing Sandia's research become even

Jeff Isaacson will leave Labs to take new position

In another leadership transition announced at Lab News press time, Sandia President and Labs Director Paul Hommert announced that Jeff Isaacson, VP of Defense Systems and Assessments Div. 5000, is leaving Sandia to take a position as president and CEO of Universities Space Research Association, a nonprofit research corporation.

Jeff came to Sandia in 2011 and has been responsible for accelerating the development of innovative systems, sensors, and technologies for the national security community and the warfighter. In his Labs-wide announcement of the transition, Paul said of Jeff that "his leadership has advanced important mission areas to rapidly mature technologies for real-world applications."

Jeff's departure will be effective Oct. 9. While Sandia conducts a search for a replacement, Jerry McDowell, Deputy Laboratories Director and Executive VP for National Security Programs, will serve as acting VP of Div. 5000, as well as the Defense Systems and Assessments program lead. During this period, Jerry will also remain in his current EVP role for National Security Programs.

stronger and better linked to our mission."

After retirement, Julia says, "I'm going to chair a National Academy of Sciences committee examining the status of and progress toward eliminating highly enriched uranium (HEU) use in fuel for civilian research and test reactors.

"The trick in retirement," she says, "is to stay active enough that you still have opportunities to do interesting work but not so active that you forget you retired."

Pam spent nearly 25 years of her career with Sandia and Lockheed Martin. She joined Lockheed Martin in 1990 and served in a variety of leadership roles including leading Lockheed Martin's workforce strategy and planning and serving as the vice president of Human Resources for Integrated Systems & Solutions. She joined Sandia in 2011 and led Sandia's human resources, health, benefits and employee services.

Kim Sawyer, Deputy Labs Director for Mission Support, says, "Pam brought to Sandia a wealth of HR experience and knowledge." She was passionate about employee development and instrumental in development programs such as Sandia's Executive Roundtable Mentoring. Pam played a key leadership role in improving the availability of quality wellness program offerings.

DOE National Lab Day on the Hill a big success

Sandia played key role in organizing well-attended event



SANDIA FELLOW Jerry Simmons, right, discusses energy efficient light-emitting diodes (LED) lighting with a congressional staff member at Lab Day on the Hill in Washington, D.C. Jerry provided examples of LED lights and their growing use to replace the inefficient incandescent lightbulb. Jerry noted that between 2010 and 2030, LED lighting is expected to decrease US electricity lighting consumption by 46 percent, saving about 2,700 terawatt hours and \$250 billion at today's energy prices. These savings would reduce greenhouse gas emissions by 1,800 million metric tons of carbon, the equivalent of taking nearly 19 million of today's vehicles off America's roads.

DOE's National Lab Day on the Hill on Sept. 16 highlighted several notable research projects from across the department's national laboratory system. DOE Secretary Ernest Moniz, joined by Sen. Dick Durbin, D-Ill., and Sen. Jim Risch, R-Idaho, kicked off the event. The senators also formally launched the Senate National Laboratory Caucus, which aims to increase awareness of the reach of the national labs as leaders in developing breakthrough technologies and discoveries to address some of the

nation's most pressing challenges.

In the Dirksen Senate Office Building, representatives from across DOE's laboratory system set up 14 displays to illustrate the work they do across five key mission areas: high-performance computing, energy and the environment, scientific discovery, manufacturing, and national security. Members of Congress, their staffs, and other attendees got a firsthand look at 3-D printers, mock-ups of proteins that make up the H1N1 virus, and a supercomputer called "Tiny Titan." Moniz kicked off the event, moderated a panel on the role of the labs in American innovation, and even tried on a pair of 3-D glasses.

Sandia played a key role in organizing the day. Julia Phillips, serving in her then-role as acting Div. 7000 VP and Chief Technology Officer, led the multilab team that organized the event, drawing from

research & development activities across the 17 national laboratories to develop a set of compelling hands-on demonstrations. Julia also participated in a House Caucus Breakfast Panel discussion co-hosted by the House Science and National Laboratory Caucus in conjunction with National Lab Day. Julia was asked to speak about the national laboratory system's work in national security and how that translates to innovation and economic growth.



LAB DAY LAUNCH — On Sept. 16, DOE Secretary Ernest Moniz provided opening remarks at National Lab Day on the Hill at the US Capitol in Washington, D.C.



USING 3-D TECHNOLOGY FOR MEDICAL SCIENCE — Scientist Dave Bushnell presents 3-D models of the H1N1 virus to Rep. Eddie Bernice Johnson, Sen. Lisa Murkowski, and Secretary Ernest Moniz, each wearing 3-D glasses. Bushnell is one of many scientists that uses SLAC Lab's X-ray light source user facilities to determine the 3-D structures of proteins, atom by atom — a technique called protein crystallography. Determining the structures of proteins lets researchers design optimal drugs, which are molecules that have to fit into particular locations on each protein.

A better prosthesis

Sandia invents sensors to learn about fit; systems to make the fit better

By Sue Major Holmes

As an amputee walks on a prosthetic leg during the day, the natural fluid in the leg shifts and muscles in the calf shrink slightly.

Now imagine the problem that can pose for the fit of the prosthesis.

There's a growing need for a solution. The national Amputee Coalition says nearly 2 million people in the United States live with limb loss, and about two-thirds have lost a lower limb. That could double by 2050 because diabetes is increasing. Diabetes is the leading cause of limb loss, accounting for more than 65,000 amputations a year nationwide. In addition, a Congressional Research Service report in February lists 1,558 major limb amputations from US battle injuries in Iraq and Afghanistan in 2003-2013.

Sandia researcher Jason Wheeler (6533) has been studying prosthetics at the Labs for a decade. He is part of an Intelligent Systems, Robotics and Cybernetics group working to develop a sensor to tell what's going on with a limb and a system to automatically accommodate the body's changes. After additional testing and some refinements, he hopes to find a company that wants to market the sensor system.

The interface, or socket, between a prosthesis and a limb is custom-made, starting with a cast of the area. The socket follows that contour, and a clinician adjusts it for the best fit.

In the case of a leg, the prosthesis bears the weight of the wearer when standing or moving. But Jason says tissues in your leg, unlike tissues on the bottom of your foot, aren't well-suited for that pressure. In addition, a limb doesn't stay the same shape during the day because of fluid fluctuations, and, of course, people gain or lose weight. Thus, a custom-fit socket doesn't always fit.

Detecting pressure in three directions

Robotics researchers developed a small sensor, about the size of a quarter, for inside the socket to monitor fit and detect deviations. Sandia has filed a patent application and has presented papers at conferences about the work.

Jason says Sandia's sensor is unique because it detects pressure in three different directions: normal pressure, like when you push your finger down on your thigh, and shear forces on the skin — think of sliding your finger down and across your leg. Shear forces are important because they cause such problems as rubbing, blisters, and abrasions, but no appropriately sized commercial sensing system can monitor them, he says.

So Sandia invented the three-axis pressure sensor, incorporated into a liner that slips into the socket of a prosthesis. Sensors can be placed in various spots, measuring three directions at each site. Other designers have placed pressure sensors in sockets but those measured only normal pressure, Jason says.

"The thing that prevents people from wearing a prosthetic or being satisfied with their prosthesis is comfort," he says. "Even if you've got a high-technology limb, if it's not comfortable, people won't wear it."

Shear pressures in a socket haven't been well studied, and Sandia wants to understand them better to use that information in developing systems that adjust socket shape to changes in limb shape. "This extra information gives you better ability to know when you need to make modifications because the shear pressures tend to be a little more sensitive to changes in socket shape than normal pressures," Jason says.

Sandia's system automatically adjusts socket shape by moving fluid into bladders inside the liners that amputees normally wear to improve a socket's fit and comfort. Standard liners are like a stretchy, cushiony sock a few millimeters thick, made of a



JASON WHEELER (6533) demonstrates a special clamp-on socket with an artificial foot that helps him test a liner Sandia is developing for prosthetics. The two-piece socket shifts the load from Jason's foot to his leg. (Photo by Randy Montoya)

gel-like material that's a bit sticky to help hold everything in place.

Since modifying a custom socket would be expensive and cumbersome and could require several fittings, Sandia adapted its technology to fit inside a liner made of elastomeric material similar in thickness to a gel liner.

"With the liner, you just take out your old one and drop in the new one and you're good to go. That's a very important component of this technology," Jason says.

The system adjusts to limb changes by using bladders inside the liners, and filling the bladders using valves and pressurized liquid on the outside of the liner. Prototypes have been developed to fill and empty the bladders automatically, but Jason says more research is needed to determine when it's best to add and remove fluid.

A liner can accommodate both sensors and bladders, depending on the need. "Sometimes you might just want to sense, sometimes you might just want to fill a bladder, sometimes you might want to do both, so the system is flexible enough you can create a liner that does any of those functions," Jason says.

Amputees currently add special fitted socks on their limb to deal with fluid loss and shrinkage. It's an imperfect solution, forcing them to always have socks on hand and to take off the prosthesis to change them.

It's also imperfect because the leg loses volume in muscles but not where it's largely bone, such as the front of the tibia. A sock adds volume everywhere, distributing pressure unevenly. In contrast, a bladder system adds volume only where needed. "Being able to put additional fluid volume locally, where you lost it, is an important component," Jason says.

More work planned

Sandia, through a partnership with the University of Washington, has done limited testing with a prototype sensor liner. Jason also tested it, using a liner cut out at the bottom so he can slip it on his leg. Then he uses a clamp-on two-piece socket with an artificial foot so he walks on the artificial foot underneath his own foot, which shifts the load to his leg. Amputees also have

tested prototype liners with the integrated bladders.

The sensor and bladder systems have not yet been tested together as a closed loop system.

"Right now, we don't really understand the right method to control the fluid movement," Jason says. "When you walk you have all these different signals and they're telling you something, but due to limited research in this area it's not entirely obvious what the signals mean. We need to do more studies to learn what those signal changes mean about how to adjust the socket shape."

Other institutions have worked on closed loop systems, but Jason says Sandia's development of liners with both sensors and automatic fluid adjustment is unique. "That capability to construct liners with things built right into them should be of a lot of interest to the orthotics and prosthetics community," he says.

Sandia's robotics group began prosthetics research more than a decade ago through DOE's proliferation prevention programs, initially collaborating on humanitarian projects with Russian companies. Jason, who has a background in mechanical engineering and assistive robotics, worked on some of those programs when he joined Sandia in 2004. The robotics group has continued prosthetics research with funding from the Department of Defense Peer Reviewed Orthopaedic Research Program, which develops technology for veterans. "We have the expertise here and it relates to our national security missions," Jason says. He says prosthetics research and development is an ideal way to combine his expertise in mechanical design and biomedical engineering with his desire to help injured people.

Development is continuing and more amputee testing is needed, but the technology "is getting mature enough where before too long, if we want it to be successful, we're going to have to hand it off to a commercial entity to market it," he says.

Strength in numbers



ECP kicks off Oct. 6 with greater participation the goal

By Nancy Salem

Culture of giving is not an empty cliché at Sandia. Since the Labs' Employee Caring Program (ECP) was launched in 1957, Sandia has been the single largest supporter of the United Way of Central New Mexico's (UWCNM) annual campaign.

Sandia staff and retirees have given more than \$82 million to hundreds of agencies serving tens of thousands of people needing help. The Labs' per capita giving ranks in the top among companies of its size nationwide. "Sandia really does drive this campaign," says Randy Woodcock, UWCNM's vice president and chief strategic officer. "We couldn't do it without you."

Sandia employees and retirees in 2013 increased donations by 8.2 percent over the previous year, giving \$6,050,426 to the charitable organization. The total eclipsed the goal of \$5.75 million and set a record. The retiree share was \$809,128.

Of the total giving, \$1,575,949 was designated to the Community Fund, up \$66,347 from the previous year. The fund supports a range of nonprofit agencies and programs that help people in Bernalillo, Sandoval, Torrance, and Valencia counties.

Total Labs participation was 75 percent, up 1.4 percent from the previous year, and 75 percent of divisions increased participation. New employee participation rose 4.6 to 63.2 percent, and 121 organizations reached 100 percent participation.

Community Fund in mind

Building on that success, the 2014 ECP kicks off Oct. 6 with four goals. Campaign chairman Grant Heffelfinger, director of Physical, Chemical and Nano Sciences Center 1100, says Sandia's objectives continue to raise the bar.

"Sandia is amazing," he says. "The United Way of Central New Mexico is a national leader in the philanthropy movement, and Sandia has had a huge role in making that happen. Our United Way has innovated and been copied. We are part of that success."

Grant says his personal goal as campaign chair is to help build the Community Fund. "The United Way began in 1887 with people pooling their money to help people in need. They created a mutual fund. That's a powerful history," he says. "Over time, people have turned more to designated giving and neglected the fund."

"I encourage people take a minute and look at the way the Community Fund is managed and what it does, and give it a shot, think about it. You don't have to choose between your own charities and the Community Fund. You can choose to add more to the fund. It does good work. Think about how you invest in the community."

This year's ECP goals are:

- Increase participation rates in every division to greater than 75 percent.
- Continue to engage newer employees (<5 years) in Sandia's culture of giving, with greater than 65 percent participation.
- Increase contributions to the Community Fund by 10 percent.
- Exceed \$6 million in total contributions.

Something to be proud of

The campaign gets underway Oct. 6, 11 a.m.-1 p.m., in the Steve Schiff Auditorium lobby and courtyard with a barbecue and the opportunity to meet representatives of nonprofit agencies where Sandia employees volunteer.

It runs through Oct. 24. Fundraising events include book fairs Oct. 7-9 at the Thunderbird Cafeteria from 10 a.m.-2 p.m., Oct. 14-16 at the Steve Schiff Auditorium from 10 a.m.-2 p.m., and Oct. 21-23 in the IPOC second floor break room from 10 a.m.-3 p.m.

Ed Rivera, president and CEO of UWCNM, says Sandia's generosity inspires the community and changes lives. "The spirit of giving at Sandia has never been stronger and we offer our heartfelt thanks for your continued generosity," he says. "We and all those who benefit from what you do thank you from the bottom of our hearts."

Grant says Sandians have a tremendous amount to be proud of. "It makes me proud to work here," he says. "It really does."



THE CAREER GUIDANCE INSTITUTE, which receives support from the United Way of Central New Mexico's Community Fund, administers the Albuquerque Reads program in partnership with the Albuquerque Public Schools. It helps kindergarten students at Title 1 schools through one-on-one tutoring and mentoring.

A better place: Community Fund builds stronger cities through collaboration

By Nancy Salem

The United Way of Central New Mexico (UWCNM) Community Fund is deepening its impact by encouraging social service agencies to work together to improve lives through systemic change.

"It's the best way to help the most vulnerable in our area," says Jim Novak, senior manager of Tailored Operational Support Dept. 5950 and chairman of the UWCNM Community Impact Council (CIC). "We're pooling funds to accomplish foundational changes in the community to address root causes in addition to symptoms."

The Community Fund supports a range of nonprofit agencies and programs that help people who are struggling to better themselves in Bernalillo, Sandoval, Torrance, and Valencia counties.

Incentives to collaborate

Last year the CIC implemented the UWCNM board's strategic plan calling for unified approaches to addressing community needs. Over the summer of 2013, teams representing a broad range of community partners developed Strategy Maps in self-sufficiency, health, and education. The maps became the foundation for awarding grants based on how effectively a program addresses a desired outcome.

This year the council structured the granting process to encourage individual agencies to collaborate. "We shaped the call for proposals to incentivize agencies to apply through the grant process as teams to address community solutions that are greater than the sum of the parts," Jim says. "Applicants for Community Fund grants can be more successful if they demonstrate they are collaborating with other agencies."

Jim says the move follows a national trend that shows synergies between social service organizations can both address immediate needs and produce fundamental positive change in communities. "The CIC is moving another step toward transforming the Community Fund by engaging volunteers, agencies, and subject

matter experts in collaborative efforts," he says. "We intend to be held accountable for our activity and are creating metrics against which our success will be evaluated by the community and our donors."

Volunteers, including many Sandians, work on behalf of the CIC to oversee the Community Fund allocation process. They structure the call for proposals in the fall and lead the evaluation process starting in January. Several dozen volunteer panels assess applicants — who under the new strategy apply in issue areas, and can collaborate — and decide how to allocate funds.

Quality control

Jim's message to Sandians is to consider the Community Fund seriously as they decide how to allocate their United Way donation. "We've made changes to enhance long-lasting impact, and have a social action policy in place that focuses on self-sufficiency, health, and education, while avoiding other controversial programs," he says. "You can think of it as quality control."

Last year the fund allocated \$4.2 million to 107 programs serving more than 150,000 children and adults in central New Mexico. This year's goal is that the fund reaches \$6 million to support local agencies as well as United Way led programs like 2-1-1, affinity group initiatives, Tax Help New Mexico, the Center for Non-profit Excellence, and Mission: Graduate. Last year Sandians donated \$1.57 million to the fund, or 26 percent of the Labs' total \$6.06 million campaign.

"The programs supported by the Community Fund grants are vetted for effectiveness and efficiency and reach a wide range of our neighbors who are working to educate their families, improve their lives and maintain their health," says Randy Woodcock, UWCNM's vice president and chief strategic officer. "Programs that receive Community Fund dollars are held accountable by United Way's volunteers to make and track progress toward goals. We think it's important to remember that Community Fund dollars support programs, not agencies as a whole, so donors are supporting work that will directly impact lives."

Every penny you give helps people in need

The United Way of Central New Mexico established the Corporate Cornerstone program in 1997 to cover administrative expenses. All those costs are paid by companies that choose to direct their gifts to the program.

Because of those corporate gifts, 100 percent of money donated by individuals goes directly to help people in need. When Corporate Cornerstone donations exceed administrative expenses, the excess goes to the Community Fund. Lockheed Martin/Sandia is among the more than 70 Corporate Cornerstone companies.

The program originated in New Mexico and has been adopted by United Ways across the country.



ECP Kickoff Event

October 6th

11:00 a.m. – 1:00 p.m.

Steve Schiff Auditorium Lobby & Courtyard

ROYING BARBECUE
AVAILABLE 11-1

United Way – Community Fund Display
Adaptive Sports Program New Mexico
Albuquerque CASA Program, Inc.
Animal Humane New Mexico
ALS Association New Mexico Chapter
Boy Scouts, Great Southwest Council
Camp Rising Sun
CareNet
Catholic Charities
Cibola Search and Rescue
Children's Grief Center
Creative Programs of New Mexico
Diaper Bank of New Mexico
Festival Ballet Albuquerque
Girl Scouts of New Mexico Trails
Greater Albuquerque Habitat for Humanity
Healing the Children SW Chapter
High Desert Cat Rescue and Adoption
June's Senior Cat Rescue
Junior Achievement of New Mexico
La Familia – Namast

Lap Dog Rescue of New Mexico, Inc.
Loving Thunder Therapeutic Riding Inc.
Meals on Wheels of Albuquerque
National Society of Black Engineers
NewLife Homes
New Mexico Wilderness Alliance
New Mexico Water Collaborative
NM Animal Friends
NM Jazz Workshop
NM Ride for Kids/Pediatric Brain Tumor Fdn.
Project Linus
Project Share
Relay for Life/American Cancer Society
Roadrunner Food Bank
Samaritan's Purse, Operation Christmas Child
Sandia Performing Arts Company
Senior Citizens' Law Office
Southwest Creations Collaborative
Supercomputing Challenge
Make-A-Wish Foundation of New Mexico
YMCA of Central New Mexico

Top 10 reasons to give to the ECP

10. It's easy. With handy payroll deduction, you don't have to write checks.
9. Your donation is tax deductible. You'll be grateful on April 15!
8. You have the power to choose where to make a difference — the Community Fund, a favorite nonprofit, or both!
7. Animals, schools, and churches are included. Your gift can connect you to your passion.
6. A little goes a long way. Sharing even an hour's pay per month can make a big difference in someone's life.
5. Kids will look up to you.
4. Karma. Pay it forward.
3. It's good for you. Philanthropy boosts the immune system and releases endorphins.
2. Because once upon a time, someone helped you.

And the No. 1 reason is:

1. Together we can create a vibrant and vital community by improving lives. A strong community is a good place to call home.

The origin of the United Way can be traced to 1887 when a woman, a priest, two ministers, and a rabbi in Denver recognized the need to work cooperatively to address the city's welfare problems. They organized the first united campaign to help health and welfare agencies and later established an organization to collect funds for local charities, coordinate relief services, and make emergency assistance grants.

The first campaign raised \$21,700 for 22 agencies and launched a movement that would spread across the country. Community Chest organizations were founded in the first half of the 20th century to jointly collect and allocate money based on a model of "federated giving." Community Chest and other charities merged in 1948 to form the United Foundation.

The name United Way was adopted in 1963 after several name changes. The goal has remained consistent: to pool efforts in fundraising and support to address needs and improve communities, particularly in education, income, and health.

I give . . .



"I've been supporting United Way and I've been active in helping with the campaign for more than 10 years. I started working at Sandia one month ago and I'm thrilled to be working for a company with employees who are so giving and active in the community. My daughter was diagnosed with cancer when she was 6 and I have been on the receiving end of the services United Way supports. It's a privilege and an honor to work for a company that believes in helping the community. Thank you, Sandia, for being so generous. Let's have a great campaign!"

— Arlene Sanchez (10661)

"I am a new Sandia employee and when I came here and learned about United Way, it was not a difficult decision to donate. For me this is an opportunity and privilege. Service is helping and taking care of someone other than yourself, and United Way is an organization that shows how this is done. I don't know the people who are recipients of my contributions but I do know it's filling a need and, hopefully, brightening someone's day in the process."

— Seth Nelson (1100)



"I have been a Sandia employee for just six months and the energy I have felt already from the Labs culture has been amazing. Sandia's performance in supporting the United Way through the Employee Caring Program perfectly exemplifies how the quality of the people here goes well beyond their technical brilliance. Sandia employees and retirees have a record of providing about 20 percent of the annual funds raised for the United Way agency that covers nearly half the population of New Mexico. These funds provide services for real people in our community who have nowhere else to turn; it is very powerful to see. I am proud to be a Sandian."

— Zack Cashion (6916)

Fair skies, smiling faces: Family Day 2014

The clouds and rain that some forecasts had predicted several days before this year's Sept. 20 Family Day 2014 never materialized and that might be the reason why attendance at the sun-filled event was somewhat more than the 10,000 hosts and guests that had been expected.

Pam Catanach (3652), overall lead for Family Day 2014, reported that attendance probably topped 12,000.

The Family Day 2014 Planning Team, which began work in January, consisted of representatives from Safety, Security, Facilities, Communications, Protocol, and Community Involvement organizations.

There also were division representatives responsible for identifying and organizing all the activities, exhibits, and displays. Their work resulted in more than 70 located throughout many buildings and sites.

Anna Gibson, a member of the Family Day planning team, probably expresses the views of most of the thousands of attendees: "My family had a terrific time. Our older grandchildren were amazed by the Antenna Farm and Robotic Vehicle Range. Our 3-year-old granddaughter loved riding the elevator (which she pronounces as 'alligator') and taking a few rotational spins in my office chair. It was perfect! Thank you also to LMC for the delicious lunch."

"We focused on attractions designed to promote the health of our workforce, to encourage students to become excited about STEM [science, technology, engineering, and math] careers and, mostly to provide families a better understanding of and appreciation for what we do at Sandia," Pam says.

"We also had more than 170 volunteers sign up to present activities. Family Day would have been impossible without them. I was working at the information booth and many people said 'thank you to Sandia for letting us enjoy this day.' That was the best part, seeing our employees have such a wonderful time with their families."

Photos by Randy Montoya



Up, up, and away

Sandia driver hits it big with balloon fiesta poster



By Nancy Salem

SEMIRAMIS NOVAK (102641), named for an aunt and a legendary queen of Assyria, is as comfortable with a paintbrush as with the wheel of a big rig. Her painting was named the official poster of the 2014 Albuquerque International Balloon Fiesta.

(Photo by Randy Montoya)

Semiramis Novak can drive a semi tractor-trailer, run a forklift, and tame a jackhammer. She has the presence of a model and a voice bred on the streets of Philadelphia.

She's tough, but beneath lives the soul of an artist. Semiramis (pronounced Sim-merm'-mis), who drives heavy trucks for the Reapplication Team (102641), is one of New Mexico's premier watercolorists. The official poster of the 2014 Albuquerque International Balloon Fiesta opening Oct. 4 is her painting, a major recognition.

"I am psyched about it," she says. "It has given me exposure I didn't have before."

Semiramis loves to operate machinery but says her passion is painting. Her first artworks, at age 7, were car-sized drawings of Batman chalked on the streets. "I would come home and my mom would say, 'Are you chalking again?' I'd say 'No, ma, not me.' And she'd say, 'You're lying, your knees and elbows are black.' So I cleaned up my knees before going home," she says. "I could draw really well."

Semiramis took art classes in Pittsburgh but when she needed a job found one operating a forklift. "I've always enjoyed driving. I drove tractors in the country, snowmobiles. Anything to drive was exciting to me," she says. "I liked equipment and learning about it."

A flyer changed everything

Semiramis got married and moved to Colorado. There her artwork took a back seat as she worked in the Coors brewery plant, divorced, got a job driving trucks for DOE at Rocky Flats, remarried, and had children.

One day a small flyer came in the mail announcing a watercolor class by artist Don Cohen at Red Rock Community College. "I signed up and ended up taking four semesters," Semiramis says. "Besides hav-

ing a great teacher, there were other teachers in the class and I picked up ideas from them. They taught me a lot and I'm still friends with them today. Don Cohen is still my mentor."

The class helped Semiramis blossom as an artist. "Prior to that I was just drawing and sketching. I never tried to exhibit or sell art," she says. "I started entering shows and selling paintings. My art just boomed and from then on I was painting all the time."

Semiramis works in a small studio next to her garage. She paints in layered colors in large format, with many pieces measuring 4 feet by 6 feet, from photos she draws in graphs onto sheets of watercolor paper. "Under every great painting is a great drawing," she says.

Her subjects range from landscapes to cityscapes to close-ups of cacti and flowers. A large painting can take 100 hours to complete. She shows around the world, including exhibits of the American Watercolor Society, Rocky Mountain National Watermedia, and the MasterWorks of New Mexico. She is a member of the New Mexico Watercolor Society, and was invited to join the elite Wet Brush Group of artists who critique each other's work.

The chosen poster

She did the balloon fiesta painting in 2004 shortly after her family moved to New Mexico from Colorado. She and her husband Frank Novak (102651) both joined Sandia within a few years of arriving in

Albuquerque.

"I loved being in the midst of all those people and balloons. I told my kids and husband to walk ahead and I took pictures," she says. The painting, at more than 6 feet wide, was too big for shows so it moved over the years from a hotel to a restaurant.

Last year Semiramis decided to do more to promote her artwork, and thought about the balloon fiesta poster and her big painting. She called the orga-

nizers in July and was told entries were being accepted that week. "I dropped it off and a week goes by, then two, then three, then a month. I called to see when they wanted me to pick it up and they said it had been chosen as the poster," she says.

The fiesta bought the original and sells the posters for \$150 each with signature and \$50 without. Semiramis will sign posters

in a booth at the fiesta. It is selling well so far and is expected to sell out. "The notoriety is great," she says. "Now friends and neighbors want to buy my originals."

Semiramis paints every weekend and is grateful for her success. She gets to work early and walks in the Reapp yard to watch the sunrise. "It's my walk of thanks," she says. "I love art. My paintings are like my children. You build a relationship as you create a painting. Even when I was 7 there was something about drawing and getting it right. I put my heart and soul into it."

"I love art. My paintings are like my children. You build a relationship as you create a painting."

— Semiramis Novak

Back to Work, Earthquake-Safe

By Patti Koning

As of Friday, Sept. 12, all 110 occupants of the Combustion Research Facility's (CRF's) Bldg. 905 are working in their own offices with their furniture, computer equipment, and files close at hand.

At any point in the last two years, this wouldn't have been the case. A recently completed seismic retrofit project to ensure that the building could meet the newest earthquake codes entailed moving all occupants out of their offices and back into their offices in two different phases.

Now that the dust has settled, Blake MacDonald (8515-1) of Facilities Projects and Engineering, who served as the project manager for this major effort, has taken some time to review the process. His thoughts offer both an overview of the project and insights into lessons learned for future retrofits across the California site.

It All Started with a Study

"As part of its scheduled seismic studies, the Facilities Planning group learned that Bldg. 905 could sustain life-threatening damage in an earthquake," says Blake, "and that repairs after the fact would be expensive and require removal of all occupants."

Conceptual planning began in August 2011, led by Anne Yang (8512) in Sandia/California's Physical Operations Planning & Studies department. When the plans were approved, Sandia engaged Overaa Construction, a firm from Richmond, Calif. Before Overaa could start, however, occupants in Bldg. 905's south and east wings had to move to temporary quarters, primarily in a trailer, in June 2013.

Phase 1 construction progressed smoothly to completion in March 2014, triggering a more complicated move. Staff in the temporary offices returned to Bldg. 905, and occupants of Bldg. 905's north and west wings relocated to the temporary spaces. Last month, construction ended and the dislocated staff took possession of their offices.

The main achievement of the retrofit — strengthening Bldg. 905's structural integrity — is readily apparent: huge concrete and steel buttresses now envelope the exterior walls. Other changes are less striking. "The interior of 905 looks much the same as before, except for new carpet, ceilings, and paint," says Blake.

The low-profile changes are significant. In addition to securing utilities hidden by the interior ceilings, the retrofit fixed a leaking skylight and upgraded the fire



THE INSTALLATION OF NEW EXTERIOR concrete/steel seismic buttress walls, which are attached to the building steel framework. They reinforce the building structure so the building acts like one "box" during an earthquake.

alarm system, passenger elevator, and egress lighting.

Also low-profile was the planning behind the two-phase construction, which was chosen over a single-phase plan for its cost-effectiveness. Seeing the potential for logistical nightmares, Blake separated the project into two phases for construction and the move. This level of organization was essential, as Blake, along with CRF leadership, was well aware of the toll that the moves would take on CRF personnel.

Despite the hardships imposed during the construction, Blake says the building occupants were extremely cooperative and understanding. "That's largely due to the Bldg. 905 OMAs [office management associates]. They did an incredible job of socializing information and helping plan through the move issues. They were extremely important to the process."

Meeting the Challenges

Lessons learned from previous construction in Bldg. 905 proved helpful. "In the past, we relied on large plastic sheets to shield occupants from the construction. But these let too much noise and dust through," says Blake. For the earthquake retrofit, the team installed temporary sheetrock walls to completely seal off construction.

Blake also worked hard to meet Sandia's high expect-

tations for safety. "We had to make sure that everyone could get in and out of the CRF safely during all construction phases," he says.

CRF senior manager Art Pontau (8360) took weekly walks with members of Blake's team to check pathways, fencing, and signs. Whenever they found shortfalls, they worked with the construction team on a solution, such as moving a fence line, or paving, or lighting a pathway.

Although staff changes on the construction team sometimes caused difficulties, Blake says the construction went well overall. "They delivered a quality product. Sandia received what we required."

Team Effort

"Many, many people were involved in this project," says Blake.

"It would be really difficult to name them all. But several people were instrumental."

These instrumental individuals include Anne; Gary Hux (8537), an environment, safety, and security professional in the Division Assurance department; and Patrice Sanchez (8523) and Devon Powers (8533), who at different times served as a point of contact for the project management team, representing all the building occupants. Also key were Andy McIlroy (8310), the liaison between the team and the sponsor during planning, and CRF deputy director Dawn Manley (8350), who assumed Andy's role after he accepted a new assignment.

For future retrofits, Blake recommends communicating with the construction firm about safety needs in detail and asking that work pauses be built in to allow for occupant moves. Partnering with OMAs to communicate with occupants and address their concerns is also essential, says Blake.

"All in all, this project went very smoothly and safely," says Dawn. "I would like to thank everyone who helped make this happen, including our DOE sponsors who supported this retrofit, as well as our facilities team and CRF staff who accepted many inconveniences with grace. The good news is that we've done what was needed to help ensure the safety of our people."

Mike Maguire's earthquake — The view from the epicenter of a 6.0 temblor

By Mike Maguire (1831)

At 3:21 a.m. on Sunday, Aug. 24, there was no doubt as to what had woken me up — a strong earthquake. It almost knocked me and my wife out of bed. There was a good 10 seconds of sharp, loud banging along with the shaking.

As a resident of Napa, I was within four miles of the epicenter of the 2014 South Napa earthquake, which measured 6.0 on the moment magnitude scale. This was the largest earthquake in the San Francisco Bay Area since the 1989 Loma Prieta earthquake.

In the moments after the shaking stopped, I found my bearings, located a flashlight that I keep near the bed, and performed a quick check of my house. My wife and I were still trying to figure out if this was a local event or if we were on the outskirts of a much bigger catastrophe, when I received a text from my manager, Joe Puskar (1831), asking if everything was okay.

It turns out that Joe subscribes to the US Geological Survey's earthquake alerts, a subscription that he started when he was living in the Bay Area. Over the next few hours, several other Sandians emailed and texted, but Joe was way ahead of the pack. I was amazed and truly



MIKE MAGUIRE repairs damage done during the 2014 South Napa earthquake. Fortunately, most of the damage to his home was superficial.

thankful for the folks I work for and with.

Next, I went outside to see if any of my neighbors needed help. I noticed water running down the street, so I assumed a water main had broken. But I found out later that the water was from a water heater that had been knocked over and burst. One of my neighbors hadn't secured his water heater.

That was just one of several lessons learned from the earthquake. In the garage, I noticed that my wife's car had moved forward about 18 inches, despite being in park mode with the parking brake engaged. Another few feet of travel and the car would have been in our hallway. A few of my neighbors experienced the same thing. So I've already purchased parking blocks for both of our cars.

Much damage could have been prevented

The damage to my house was superficial — broken dishes and glassware, ruined food, and minor breakage to furniture — but much of it could have been prevented. Everything in the house that wasn't strapped down jumped about 18 inches. And I was surprised that things I never expected to topple over did — like credenzas and low dressers.

Almost everything inside our cabinets came tumbling out. All of the food in the pantry fell to the floor, creating a mess so dense that I could barely wedge the door open. Our gas kitchen range jumped out of the tip anchor and only stayed upright because of the gas line attached to the wall. Fortunately, we didn't lose any wine because a well-placed sink prevented the wine refrigerator from toppling over.

Some preventive steps we had taken in the past paid off, saving us from further damage. Our water heater was secured, and I had tools ready to shut off the gas and water line. In addition, the areas around the beds in our house were clear, meaning there was nothing that could potentially crash onto the beds, and all of

our televisions were anchored to the walls. (Two weeks after the earthquake, a Napa woman died from injuries sustained when she was struck by a cathode-ray-tube television in the first moments of shaking.)

So what would we do differently? For starters, along with the flashlight I keep by our bed, I now have a simple checklist I keep by our bed, I now have a simple checklist: check the water heater, check the gas shutoff valve, and then check on the neighbors. At 3:30 in the morning, in the first 15 minutes or so after the earthquake struck, I wasn't thinking clearly. A checklist would have helped me focus.

We are also installing latches on all of our cabinets to keep the drawers shut and am strapping all of the furniture, including that wine refrigerator, to the wall. We now have a 45-gallon drum of fresh water. We didn't lose water, but with 144 water main breaks throughout the city of Napa, we easily could have.

I don't want to complain about the damage because it was all superficial. About a day and a half later, we had pretty much cleaned up everything. But at the same time, a lot of the damage in our house could have been prevented. A month ago, I would have thought using parking blocks in our garage was crazy. But on Aug. 25, it seemed pretty sane.



ALMOST EVERYTHING in the Maguire pantry ended up on the floor.

Storyteller, horseman, husband, father, friend: colleagues remember Russell Mickey

Russell Mickey grabbed life in both arms and regaled his friends and colleagues with stories about his many adventures. Russ always had a story — a story for everything — because he looked on the world each day with fresh eyes, the eyes of a man forever young at heart. Each day, everything was new, every day a new adventure.

Russ passed away unexpectedly at home on Sept. 10 at age 57. He was a 24-year veteran of the Labs' Protective Force and also served in the US Navy, which was a great source of stories for this natural storyteller.

Protective Forces Manager Bill Boling (4237) recalls Russell as a man who was full of life, a team member always looking for ways to make Protective Forces a better organization.

"He took pride in his work and was very proud to wear the uniform," says Bill. "He bragged about being a member of one of the finest Protective Forces in the complex."

Russ's good friend, ProForce Capt. Dave Seabrook, says Russ "always came to work with a positive attitude and let very little bring him down; he was a pleasure to work with. He was well-liked by his supervisors and peers."

Russ loved horses, loved working on his ranch, a passion that once almost got the best of him. Dave remembers the time a horse fell on Russ, injuring him very seriously.

"He really worked hard to overcome his accident so he could return to full duty at Sandia," Dave says.

Russ was devoted to his wife, Renee, whom he always called "my sweetheart" when he talked about her with colleagues at work. He loved his kids and looked forward to spending as much time with them as possible. He had a grandchild on the way.

Colleague Naomi Baros, OAA in ProForce Dept. 4237, says it didn't take long for Russ to make a deep and enduring impression.

"In the short time that I knew Russell," Naomi says, "I came to find that he truly was a genuine person. In



RUSSELL MICKEY "took pride in his work and was very proud to wear the uniform. He bragged about being a member of one of the finest Protective Forces in the complex." Russ died in September at age 57.

addition to his big smile, he had eyes that radiated a gentle, kind heart. Russell will be missed."

Russ is survived by his wife, Renee; several children and step-children; his mother and mother-in-law; siblings and in-laws; and several nieces and nephews.

In the last several months of his life, as he became

ill, Russ never gave in to adversity, facing the challenge with characteristic courage. He would beat the illness that tried to claim him and then, boy, would he have some stories to tell. It was not to be, but his stories live on in the hearts of those who love him.

— Bill Murphy

Colleagues remember 'fantastic friend and neighbor' Rob Trujillo and his 'infectious positivity'



ONE OF ROB TRUJILLO'S passions was hot air ballooning. Friends recall that the very active Rob "always seemed to be happy, no matter the situation." He died on Aug. 31 at age 48.

"Edwina, is there anything I can do for you?"

That, in a nutshell, may capture the essence of Robert Trujillo (414) who passed away on Aug. 31 at age 48 after a protracted illness.

Edwina McGovern (1350) worked with Rob for nearly two years when she served as the OAA in Dept. 414. She recalls that almost every morning Rob would stop by her desk and ask what he could do to make her workday better.

"His kindness didn't stop there," Edwina says. "When I accepted a position in Tech Area 5, I mentioned to him that I had no idea how to get there. He

sure to ask about the previous and upcoming weekend activities."

Sam Felix (10650), who considered Rob a "fantastic friend and neighbor," remembers him as a man with "a very easy way about him." Rob and Sam rode motorcycles together at rallies and did other short rides. "He was always in a great mood and he loved his Harley," Sam says.

Rob, Sam recalls, "was really happy to be married to JoAnna and they stood by me when I went through some personal tragedy. I will remember him fondly and know that he has gone to a far better place."

Steve Wimpy found that he and Rob hit it off right away when they met at Sandia 15 years ago. "We were

both hired in at about the same time and were assigned to the same project. Neither of us had clearances, so we both had to be escorted everywhere we went.

"You really get to know someone when you spend five days a week, eight hours a day with them," Steve says. "We found that we enjoyed a lot of the same things, such as balloon crewing, fishing and, at a later time, golfing."

Steve says "Rob had a smile that was huge and could light up a room. He always seemed to be happy, no matter the situation and he could tell story after story, which always started with 'So...'"

At one point Rob introduced Steve to one of his true passions: ballooning. "We became crew-mates for the same hot air balloon, which continued to build our friendship. Rob really enjoyed crewing. We had a lot of fun Balloon Fiestas together. This year's Balloon Fiesta is going to be tough without him."

Teri agrees. "Rob's love of ballooning had us talking about events around the state, which ones he would participate in and what follies happened at previous events," Teri says.

Steve loved the way Rob was able to use his many connections to get things done.

"He was the type of person you wanted as a friend because he was the guy who knew a guy who knew another guy who could get you what you wanted or find what you needed," Steve says. "He was a good colleague, engineer, but most of all, he was a great friend. He will be truly missed by all who knew him. R.I.P. Rob T."

Teri says working with Rob was a constant education. "His stories of the other groups he worked with around Sandia always kept me on the edge of my seat," she says. "I learned a lot about previous coworkers and job tasks — again with his caring for others being at the forefront of the stories. I will miss Rob's outstanding personality; his positivity was infectious."

Rob is survived by his wife, JoAnna; parents Ben and Inez; brothers Donald and Tim and sister-in-law Angela; stepdaughter Nicole Sandoval; granddaughter Alexandria Sandoval; and several nephews, nieces, great-nephews, and -nieces.

— Bill Murphy

Rose Gottemoeller visits Sandia with an eye toward nonproliferation and treaty verification

By **Stephanie Holinka**

U.S. State Department Under Secretary for Arms Control and International Security Rose Gottemoeller recently visited Sandia to get an update on the Labs' work in the areas of nonproliferation and high-consequence security.

Her visit also sought to raise awareness of the Comprehensive Nuclear Test Ban Treaty (CTBT). CTBT was considered by the Senate nearly 15 years ago, but was not ratified.

One of the stumbling blocks to ratification was concern over the capabilities of the verification and monitoring technologies available at the time. Now, new technologies for arms control verification and monitoring may make ratification more possible.

"Parties need to know whether clandestine nuclear testing could be detected, in order to truly enforce any treaty," says Gary Laughlin, senior manager for R&D Sciences and Engineering Dept. 6020.

Gottemoeller toured Sandia's Facility for Acceptance, Calibration, and Testing (FACT), where researchers develop and test seismic proliferation detection sensor systems deployed around the world for the United Nations' CTBT detection systems at International Monitoring System (IMS) sites.

FACT researchers also test infrasound sensors, for very low-frequency sound, which detect nuclear explosions hidden underground or near the Earth's surface. Signals from these large events can travel thousands of miles through the Earth or the atmosphere until they are picked up by a monitoring station.

In recent remarks, Gottemoeller said, "The ability to monitor and verify compliance with the CTBT is

"The ability to monitor and verify compliance with the CTBT is stronger than it has ever been."

— **Rose Gottemoeller**

stronger than it has ever been. The IMS, the heart of the verification regime, was just a concept two decades ago. Today, it is a nearly complete, technically advanced, global network of sensors that can detect nuclear explosions."

At Sandia, Gottemoeller also looked at hand-held monitoring devices that could be used for verifying the absence of nuclear weapons.

Improvements in monitoring technologies could

also raise possibilities for new arms control agreements, such as treaties that could include warhead verification, where the warheads themselves will be verified, as opposed to the way verification has, in the past, relied on elimination of delivery devices such as missiles.

Other verification concerns include ways that parties could verify the presence of warheads without revealing design details, using "information barriers" that Sandia researchers are developing.



US DEPARTMENT OF STATE Under Secretary for Arms Control and International Security Rose Gottemoeller, right, is joined by Energy, Nonproliferation, and High-Consequence Security Div. 6000 VP Jill Hruby, center, Alexandra Bell, director of Strategic Outreach in Gottemoeller's office, and Sandia researcher Randy Rembold (5752), during a tour of Sandia's Facility for Acceptance, Calibration, and Testing site. In the photo here the delegation peers into a vault used to isolate instruments from environmental effects such as wind, temperature, and pressure changes. (Photo by Randy Montoya)

Changes to outside consulting for Labs' technical staff to boost tech transfer

By **Chris Miller**

In an effort to stimulate tech transfer and provide growth opportunities for researchers, Sandia is making it easier for technical staff to consult for companies that have licensed Labs' technologies.

The change allows technical staff to work outside the Labs in the same technical areas as their current Sandia work, a practice that had not been allowed. The enhancement includes strict requirements to ensure the consulting work provides a clear benefit to Sandia and creates no conflict of interest for Sandia or staff.

"This will serve as one more tool to provide the technical support needed to bring Sandia's licensed technologies to maturation and contribute to the economic public good of the nation," says Pete Atherton, senior manager, Industry Partnerships. "This is something Sandia carefully studied for some time. It includes a clear conflict-of-interest mitigation plan to ensure it doesn't interfere with Sandia's interests."

Sandia has long allowed outside consulting. However, most technical consulting has been low risk, such as web design and mobile apps, and is not related to staff members' Sandia jobs. Pete says Sandia studied the programs of other labs that already allow similar outside consulting before approving the enhancement.

At Sandia, each request for outside consulting must be approved by a new Conflict of Interest Committee overseen by the Labs' chief technology officer and consisting of representatives from Legal, the Ethics Office, Human Resources, Industry Partnerships, the program

lead for Entrepreneurial Separation to Technology Transfer, and the relevant line management.

Before the request goes to the committee, it must be approved by the staff member's line management with a strong mitigation plan. Program Management Units are also consulted to verify that another mechanism like a CRADA or WFO agreement would not be more appropriate and to further ensure that Sandia's interests are protected.

Sandia customers support changes

The committee recently conditionally approved the first request to come before it from a technical staff member seeking to consult for a biotechnology company that has licensed a Sandia-developed technology for applications in cancer and rare diseases.

The benefit to Sandia, Pete says, is the deployment of the technology for the public good through the advance of cancer and rare disease therapeutics. Pete notes that the committee's approval includes a detailed mitigation plan to minimize conflict of interest.

The desire to expand outside consulting is supported by Sandia customers, including licensees, incubator leaders, and venture capitalists, who welcome the direct assistance in developing technologies for commercialization.

Steve Rottler, VP of Sandia/California Div. 8000, and Julia Phillips, deputy chief technology officer, helped lead the change, providing both guidance and leadership to help ensure it provided benefit to Sandia and its customers and adhered to strict legal and ethical standards.

Julia says the benefits of expanding outside consulting have the potential to benefit Sandia in multiple ways, helping to attract and retain technical staff, giving staff a better understanding how research moves from research to commercialization, providing staff more opportunities to engage with businesses and uni-

versities, and ultimately stimulating tech transfer opportunities by getting more Sandia-developed technologies into the marketplace.

"I truly think this should benefit everyone involved as long as due diligence is made to ensure each case is thoroughly reviewed and a mitigation plan is put in place to alleviate risk," Julia says.

Information about outside consulting is available from Industry Partnerships or the Entrepreneurial Separation to Technology Transfer office. Information is also posted in Corporate Governance policy, CG100.4.7, Manage Personal Conflicts of Interest. A link to the policy can be found on the Corporate Investigations website.

Key requirements for expansion of outside consulting

- Company engaging consultant has licensed intellectual property (IP) from Sandia.
- A cooperative research and development agreement (CRADA) or work for others (WFO) to support mission goals is determined not to be appropriate.
- Good Sandia job performance.
- Receiving company understands that government might own any created IP.
- Employees must submit invention disclosures for all inventions discovered in connection with outside consulting.
- Sandia will review and approve the contractual agreement between the employee and the outside company.
- Employee must disclose the extent of exposure to competitors' third-party proprietary information in the review-and-approval process.

Mileposts

New Mexico photos by Michelle Fleming



Len Duda Jr.
35 5782



Penny Jones
35 2216



Guillermo Loubriel
35 1755



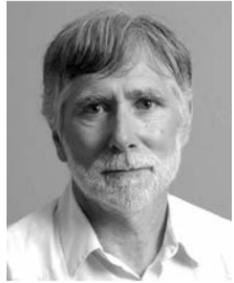
Mark Snell
35 6833



Buddy Anderson
30 1833



Chuck Andraka
30 6123



Steve Casalnuovo
30 1714



Jeff Cherry
30 2159



Dean Dobranich
30 1514



Diana Gonzales
30 9532



Orlando Griego
30 4826



Thomas Henderson
30 2995



Sam Jones
30 9342



Jann Levin
30 9549



Dorothy Meister
30 2624



Bill Miller
30 5900



Tia Reid
30 10507



Albert Romero
30 2731



Peggy Schroeder
30 9538



Jo Cunningham
25 1101



Cathy Anne Ehgartner
25 4122



Jane Farris
25 10520



Tom Grasser
25 1512



Scoti Hagerman
25 2155



Ray Lemke
25 1641



Timothy Meisenheimer
25 5953



Michael Ross
25 6525



Mark Savage
25 1651



Kent Shelton
25 2553



Jose Torres
25 1677



Heather Christ
20 10501



Kelly Gomez
20 110



John Lopez
20 2735



Gabrielle Sarfaty
20 3334



Patti Sawyer
20 1835



Warren Strong
20 1386



Chad Twitchell
20 10598



Divina Calderon
15 2134



Christi Forsythe
15 9517



Brian Franke
15 1341



Victor McLane
15 9324



Leanne Fay Whittemore
15 9523

Hispanic Heritage Month

October 10 Latin Night — 6-10 pm

Mountain View Club

Includes dance instruction

This is a free event open to all ages! Food is available for purchase. Cash bar open to those 21+

October 14 Finale Diversity Celebration — 11 am-1 pm

Hardin Field (east)

- Keynote speaker: Brig. Gen. Andrew Salas, New Mexico National Guard
- Cultural music provided by The Abel Lucero Band
- Student art contest display

Food & drink provided by Garcia's Kitchen

\$10 Advance tickets only

Includes: Red Cheese & Green Chile Chicken Enchilada, Taco, Refried Beans, Spanish Rice, Biscochitos, Tortillas and Passion Fruit Tea

Tickets for Oct. 14 Finale Diversity Celebration must be purchased before Oct. 9

CONTACT: Valerie Salim-Meza @ vnsalim@sandia.gov

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

MISCELLANEOUS

BAND SAW, Skill, 10-in., w/stand, \$50; MacGregor Irons, 2 thru 20, \$50; 1,3,4,5 woods, \$35. Fenimore, 298-8052.
 HANDHELD HAM RADIO, Yaesu FM Transceiver, model VX5R, w/tons of accessories & books, \$240. Johnson, 505-967-7992.
 TWIN BED, w/mattresses, Ethan Allen, \$150 OBO. Willis, 505-304-5034.
 AQUARIUM, w/metal mesh cover, black iron stand, 120-gal., 4' x 12" x 18", \$300. Voegel, 273-3579.
 TOOLS, table saw; radial arm saw; band saw; drill press; joiner & planer, \$1,700/all or sell individually. Konkel, 235-8085, ask for Marty.
 TREADMILL, Welso Cadence 4250, 8-mph, programmable, auto incline, 1.25-hp DC motor, free. Stevens, 505-293-5704.
 FURNITURE: oak china closet, \$400; Mikasa Lexington, 12 place-settings, \$500; leather couch & loveseat, \$200; custom flowered couch, \$100. Papp, 977-3909.
 DESIGNER SHOES, Louis Vuitton, Cole Haan, L.A.M.B., Tory Burch, size 6-1/2-8-1/2, \$30-\$150; Michael Kors watch, \$175; photos available. Gonzales, 977-4955.
 PING PONG TABLE, kept indoors, great shape, \$100 OBO. Schoenherr, 920-655-1577.
 GARAGE SALE, Oct. 10 & 11, 9 a.m., 6716 Carney Ave. NW. Lucero, 926-1086.
 LED TV, Sharp, 50-in., new-in-box, retails at Best Buy for \$529+tax, asking \$500. Rahimian, 385-5638.

QUALITY ALFALFA, barn stored (no rain), 60-65-lb. bales, \$6.50/bale. Barnard, 220-4427, ask for Jason.
 HOLIDAY DINNERWARE, Nikko Christmas Time pattern, many sets & pieces, call for complete list. Plummer, 301-3457.
 COUCH, brown, faux leather, very comfortable, high back, cushiony, great condition, \$280. Brewster, 238-4704, ask for Julie.
 GOLF SET, Tour Pro, w/bag, \$40; Adams 9-degree driver, \$40; Edimax wireless bridge, \$20; 2-drawer filing cabinet, \$20; exercise ball, \$10. Garcia, 280-5815.
 SIDE-BUFFET TABLE, rectangular, ornate, light/medium golden brown, excellent condition; Desk wristwatch, Timeworks Clock Co. de la Fe, 903-0717.
 TIMESHARE, 2-bdr. condo, Nov. 1-8, Hyatt Wild Oak Condos, San Antonio, \$230. Polonis, 823-2471.
 ALL-IN-ONE PRINTER, HP Envy 4502e, duplex, print, copy, scan, photo capabilities, used <1 mo., \$40. Ashby, 281-1573.
 ARTIFICIAL CHRISTMAS TREE, 7-ft., pre-lit, turns, new condition, \$75; older photographic equipment, good home; horse tack, equipment, clothing. Siegrist, 293-4148.
 PING PONG TABLE, Kettler Topstar, weatherproof, blue tabletop, 9' x 5', very lightly used, w/cover. \$300. Adams, 821-0899.

TRANSPORTATION

'09 GMC SIERRA 2500, diesel, white, 4-dr., 34k miles, ready-to-tow, many options, \$39,900. Shope, 505-908-6691.

How to submit classified ads
DEADLINE: Friday noon before week of publication unless changed by holiday. Submit by one of these methods:
 • EMAIL: Michelle Fleming (classads@sandia.gov)
 • FAX: 844-0645
 • MAIL: MS 1468 (Dept. 3651)
 • INTERNAL WEB: On internal web homepage, click on News Center, then on Lab News link, 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 Sandia members of the workforce, 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 any ad that may be considered offensive or in bad taste.

'04 MAZDA RX-8, standard transmission, red, 107K miles, excellent condition, \$4,500. Kirschner, 866-0232.
 '11 JEEP LIBERTY, 4WD, silver, 58K miles, good condition, \$16,000 OBO. Christopher, 933-1268, ask for Sean.
 '12 HYUNDAI ELANTRA LIMITED, fully loaded, Bluetooth, iPod control, GPS, leather, full warranty, 48K miles, \$16,100. Rudys, 235-5602.
 '05 HONDA CIVIC COUPE, AT, silver, well-maintained, 165K miles, economical, \$4,950. Harding, 977-0897.
 '05 MERCEDES C230 KOMPRESSOR SPORT EDITION, silver, black leather, 92.5K miles, excellent condition & fuel efficiency. Morales, 505-400-1715.

RECREATION

'84 BAYLINER CAPRI BOAT, 16-ft., open bow, 85 Force OB, trolling motor, good condition, \$1,500 OBO. McLane, 505-220-0798.
 '00 PACE ARROW MOTOR HOME, 37-ft., 2 slides, lots of power for towing, \$39,000 OBO. Hibray, 821-3455.
 '85 HONDA SCOOTER, 150 cc, red, needs vacuum pump & new seat, has new battery, \$500 OBO. Abeyta, 505-573-8195.
 TREK 7100 HYBRID BIKE, good condition, \$100. Dinger, 505-818-8933.
 ADULT BIKES, 2, 1 female, 1 male, ridden twice, like new, photos available, \$50 ea. Reeder, 553-4786.

REAL ESTATE

4-BDR. HOME, 3 baths, 3-car garage, 4,000-sq. ft., on 0.4-acre cul-del-sac, near Sandia Labs. Dybwad, 270-5888.
 2.9 ACRE LOT, gorgeous view, electric, located in Zamora Heights, Cedar Crest, \$45,000. Smith, 505-620-8798, ask for Marie.
 3-BDR. HOME, 1 bath, 1,266-sq. ft., new tile, cabinets, carpet, landscaped & more, shed, Morris/Constitution, \$139,900. Bonaguidi, 505-306-4571.
 2-BDR. HOME, 2 baths, 2-car garage, 1,760-sq. ft., office/den, desirable Countrywood neighborhood, \$250,000 OBO. Wickliffe, 619-616-9855.

WANTED

FEMALE HOUSEMATE, share 3-bdr. home, 2 baths, Rio Rancho, nearby bus commute to Sandia, available immediately. Axness, 505-796-8776, ask for Laura.
 ROOMMATE(S), Unser & I 40, 10 mins. to downtown, nice neighborhood, \$600/mo. +1/2 utilities. McCarty, 617-869-0897.
 FLIP FLOP HUB FIXED GEAR BIKE, large frame, any color. Hill, 246-9019.
 BRIO/THOMAS TRAINS, & track, especially track. Carroll, 292-5436.

2015 Open Enrollment is coming soon!

- Active Open Enrollment runs Monday, Nov. 3, through Thursday, Nov. 20
- PreMedicare Open Enrollment runs Wednesday, Oct. 15, through Friday, Nov. 21
- Medicare Open Enrollment runs Wednesday, Oct. 15, through Saturday, Dec. 6



Fair information is as follows:

Sandia/New Mexico Active Open Enrollment Benefit Fairs				
Date	Tuesday, Nov. 4	Tuesday, Nov. 11	Saturday, Nov. 15	Monday, Nov. 17
Location	Steve Schiff Auditorium Building 825	IPOC — 2 nd floor break room and Thunderbird Conference Room	Sandia Laboratory Federal Credit Union at 3707 Juan Tabo Blvd	Steve Schiff Auditorium Building 825
Audience	Employees	Employees	Employees and Spouses	Employees
Fair Time	9 a.m.-2 p.m.	10 a.m.-2 p.m.	9 a.m.-2 p.m.	9 a.m.-2 p.m.

Sandia/California Open Enrollment Benefit Fairs			
Date	Thursday, Nov. 6	Thursday, Nov. 6	Thursday, Nov. 6
Location	904 Auditorium, 7011 East Avenue, Livermore, CA		
Audience	Employees and Spouses	PreMedicare Retirees	Medicare Retirees
Fair Time	12:15-2:30 p.m.	8:30 a.m.-noon	8:30 a.m.-noon
Presentation Time	N/A	10:15 a.m.-noon	9-10 a.m.
Presenters	N/A	Towers Watson/OneExchange, BCBSNM, Kaiser Permanente, UHC	Towers Watson/OneExchange, Kaiser Permanente

SNL-NM Retiree Open Enrollment Benefit Fairs				
Audience	PreMedicare Retirees	PreMedicare Retirees	Medicare Retirees	Medicare Retirees
Date	Tuesday, Oct. 28	Wednesday, Nov. 12	Tuesday, Oct. 28	Wednesday, Nov. 12
Location	UNM Continuing Education Building, 1634 University Blvd., Albuquerque, NM 87102			
Fair Time	9-11:30 a.m.	1-3:30 p.m.	1-3:30 p.m.	9-11:30 a.m.
Presentation Time	10-11 a.m.	2-3 p.m.	2-3 p.m.	10-11 a.m.
Presenters	Towers Watson/OneExchange, BCBSNM, UHC	Towers Watson/OneExchange, BCBSNM, UHC	Towers Watson/OneExchange, Lovelace, Presbyterian	Towers Watson/OneExchange, Lovelace, Presbyterian

The look of a scientist

Math skill leads a cool kid to career success, HENAAC award

By Nancy Salem

Growing up in the southern California farming community of El Centro, the time came when Edward Jimenez had to fess up to his pals. He was good at math. Not only that, he liked it.

"I lost some friends. They said I changed, that I wasn't the same guy anymore," he says. "But I didn't worry about it. You have to find what makes you happy. It sounds clichéd but it's the absolute truth."

And just as his high school friends were surprised, so were his peers at San Diego State University. He interviewed with the dean of the College of Sciences for a spot in the Minority Access to Research Careers, or MARC, program. At the orientation the dean walked straight past Edward and into her office. "She said she had to ask her secretary who I was," Edward says. "When she first interviewed me I was in a suit with my hair pulled back. At orientation I wore long hair, earrings, black shorts, and an Ozzy Osbourne T-shirt. She thought I was an academic probation student."

But Edward knew who he was. "I can look however I want and it doesn't mean I have to be a certain type of person," he says. "Not a whole lot of scientists I know have the goatee, shaved head, and earrings. But I don't feel I'm disregarded in any way. I and others know

"I love Sandia. It's exciting every single day. Management is supportive. The culture is just great."

— Edward Jimenez

what I'm capable of."

Edward (9525) was recently named a 2014 HENAAC Award winner as Most Promising Engineer/Advanced Degree by Great Minds in STEM. He joins other honorees at the 26th annual HENAAC conference in New Orleans Oct. 2-4.

HENAAC, formerly the Hispanic Engineering National Achievement Awards Corp., honors the best STEM minds in the country. Each winner is peer-reviewed and chosen by representatives of industry, government, military, and academic institutions. Great Minds in STEM promotes those fields to underserved and under-represented communities.

A mother's firm hand

The award makes Edward a role model for young people, but he says he wasn't always a great student. "There were peaks and valleys from daycare through high school," he says. "I didn't do well as a freshman because I was obsessed with what my friends thought of me."

A constant was his mother's emphasis on science, technology, and math. "She showed me how to add and subtract before kindergarten," he says. "I loved all the science shows like *Mr. Wizard's World* and *Bill Nye the Science Guy*."

He was interested in everything from biology to astronomy to physics, and wanted to be an astronaut or scientist when he grew up. But in high school, friends and girls got his attention.

His mom pulled him back.

"She was very tough on me," Edward says. "I was grounded on a weekly basis. But what she was saying eventually stuck. I realized I wasn't trying. I set small goals. Let's see if I can turn in my homework for all my classes this week, then for a month. Let's see if I can get As on the exams for all my classes. Little things like that."

Slowly but surely he quit goofing off and focused on what he wanted to do in life. "As a senior I looked back and saw that I consistently had an A in math. It came easy to me," he says. "When I told my pre-calculus teacher, who was in his 70s, that I had declared math as my college major, he did cartwheels he was so happy.



HENAAC AWARD WINNER Edward Jimenez (9525) says applied mathematics lets him look for challenging problems in areas that don't necessarily overlap. "The common language between them is math," he says.

There weren't a lot of math majors."

How to be a college student

Edward says he didn't know what he was getting into and had no intention of going to graduate school. He was the first member of his family to go to college. "I had the mentality of 'Cs get degrees,' in college," he says. "I thought I would just get a job after I graduated."

But then he was contacted by the Louis Stokes Alliances for Minority Participation, a national STEM outreach program that offered him the chance to enroll in a calculus introduction course the summer before his first semester at SDSU. "They paid you to participate and gave you a graphing calculator, the most advanced technology I had ever used. That program played a huge role in putting me on the right path, to plan past a bachelor's degree. It put me in touch with people who showed me how to be a college student."

Edward carried a 4.0 grade-point average his first two years and caught the attention of the McNair Scholars Program, a US Department of Education initiative to increase the number of PhDs among groups historically underrepresented in graduate programs. McNair placed Edward in a summer program that allowed him to do research under faculty guidance. "I did scientific research as an undergrad on a new way to distill petroleum to make gasoline, and had the opportunity to publish in journals and present at conferences," he says. "It was a great experience. I was so eager to do research. It prepared me for graduate school in terms of what's expected of a researcher and how to be a scientist."

In 2004, Edward earned a bachelor's degree in mathematics with an emphasis in computation science from SDSU followed in 2010 by a PhD in applied mathematics from the University of Arizona. He interned at Sandia starting in 2007 and was hired after graduation from Arizona.

"I love Sandia," Edward says. "It's exciting every single day. Management is supportive. The culture is just great."

He says applied mathematics lets him look for challenging problems in many areas. "I can work in high-performance computing one day, radiography and tomography the next, and follow up with holography," he says. "Areas like these don't overlap, but the com-

mon language between them is mathematics."

Edward is a team member on a Laboratory Directed Research and Development (LDRD) project in radiography, leading an effort to develop a way to identify the composition of a material from an X-ray image. The three-year project has produced several papers and patents. A previous Early Career LDRD, in which Edward was the principal investigator, developed ways to reconstruct big data using computer tomography and multiple processors, cutting a process that can take years down to less than a day, and conserving energy. The project, which has four patents pending, wrapped in 2013.

"Early Career LDRD helped me dive into the research at Sandia as an entry-level employee," Edward says. "It let me take advantage of the skill sets I had while gaining others more in line with Sandia's mission and values."

A message to young people

He hopes to stay in research for at least another decade. "The type of work I do is intriguing," he says. "I tackle problems nobody else in the world gets to do."

Edward was nominated for the HENAAC award by Sandia President and Laboratories Director Paul Hommert, who described him as "continually demonstrating integrity, technical knowledge, innovative research, excellent communication skills, and superb leadership and teamwork, especially in nurturing the development of future scientists and engineers while making his own impressive accomplishments."

Edward, who says winning the HENAAC was humbling and a high point in his career, reaches out to high school students in Albuquerque through programs including Sandia's Manos. "I tell them that the fact you're sitting here interested shows you have some level of potential, and you need to pursue that," he says. "Yes, some of my friends didn't want to hang with me anymore once I started doing well in school, even though nothing about me changed. But what's more important to you, having a friend now or being successful the rest of your life?"

Edward, who is married with a 3-month-old son, found what makes him happy. "It's science. I'm motivated by finding problems people have either never thought of or have not been able to solve. I try to instill in scientists of the next generation that to make any contribution is great. At Sandia we push boundaries, increase capacities, decrease limitations, and advance science."