



Sandia researchers capture three R&D 100 awards

By Neal Singer

Sandia researchers captured three R&D 100 Awards in 2013, competing in an international competition with participants from universities, corporations, and government labs. Since 1976, Sandia has won 104 of these awards. Five Sandia applications were submitted this year to the annual contest.

Trade journal *R&D Magazine* presents the awards to researchers who its editors and independent judging panels determine have developed the year's 100 most

outstanding advances in applied technologies.

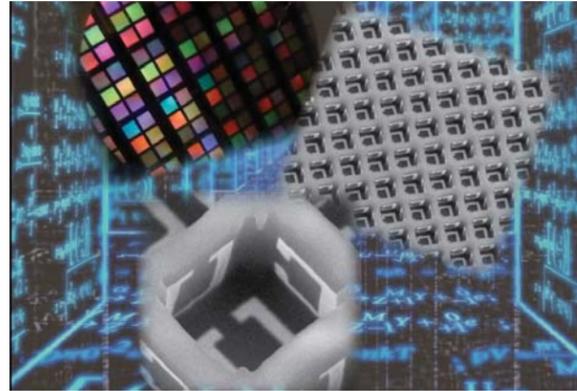
The awards, with their focus on practical impact rather than pure research, reward entrants for the design, development, testing, and production of their innovations. The sole criterion for winning, according to the magazine, is "demonstrable technological significance compared with competing products and technologies." Properties noted by judges include smaller size, faster speed, greater efficiency, and higher environmental consciousness.

(Continued on page 5)

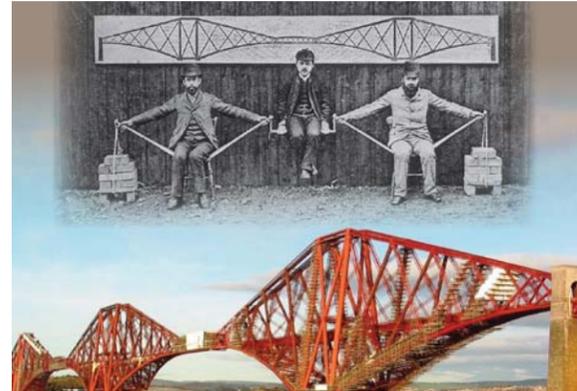
Solar Glare Hazard Analysis Tool



Membrane Projection Lithography



Mantevo Suite 1.0



Meet 66 distinguished Sandians



Sandia's special appointments represent employees from all areas of the Labs' operations. This year, 66 Sandians have been honored with special appointments, including Dawn Abbott (9312), left, who has been promoted to the distinguished level of her job family. See all the 2013 special appointments on pages 6-7.

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Shape memory alloys hold promise



SHAPE MEMORY ALLOYS — Mark Reece (foreground) and Don Susan (both 1831) examine a new shape memory alloy button that they have removed from an arc-melter. Several new alloys have been developed at Sandia. For more about their groundbreaking work, see the story on page 8. (Photo by Randy Montoya)

Research Challenges

open wider time frames for Sandia researchers

By Neal Singer and Sue Major Holmes

A new Sandia strategy that focuses on providing significant long-term support to cross-disciplinary research in 11 designated areas was announced at Sandia on June 27.

Projects might take five to 10 years or more — think Bell Labs in its most productive decades — to mature, but would aim at results that would rock their fields and put on display Sandia's unique national security capabilities.

As Julia Phillips, VP and chief technology officer (7000) put it more formally in announcing the Research Challenges at a CNSAC open meeting, Sandia is looking for "ground-breaking interdisciplinary research challenges that create transformational opportunities in national security." This would be "nurtured by a vibrant, problem-rich research environment sustained as a fundamental element of the Laboratories' strategic plan." The question also needs to be asked, she said, why the work should be done at Sandia rather than at some other laboratory or institution.

(Continued on page 4)

KNOWLEDGE

You and Sandia  Total Health

POWER

Dental Care Program offers the choice to save. See page 9.

Inside . . .

- Students earn Lockheed Martin scholarships 2
- Randy Fellhoelter on the cost of shortcuts. 3
- Training kicks in to save a life. 7
- Ham radio club members prepare for emergencies. . . . 9
- Labs honors Bataan survivors. 10
- Integrated Military Systems open house 12



Citizen Airman

Andy Anderson, seen here on deployment in Iraq, has been honored with the Air Force Reserve Citizen Airman of the Year Award and Sandia has been named the Employer of the Year. Story on page 12.

That's that

Back in the 80s, Blondie sang Call Me. Anytime. Paul Simon sang, "I can call you Betty, and Betty, when you call me, you can call me Al!" Then there was the comedian 30-some years ago who made a good living by telling people, "My name is Raymond J. Johnson Jr. and you can call me Ray or you can call me Jay . . ." Believe it or not, we all got a good laugh out of that shtick for a while.

Anyhow, what prompted these reflections was something I came across in a search of SAPLE, our internal employee directory. The person I was looking for was in there, all right. Let's just say his name was "Michael." (It wasn't but I'm not using real names here.) In parentheses after his name, where some people will list a nickname, it didn't say "Mike." It said "*Not* Mike!" The exclamation point was his. This is someone who is militantly anti-nickname, as is his right as an American citizen.

I, on the other hand, am all for 'em. I see nicknames as sort of the anthropomorphic equivalent of the family room in your home. That's where all the fun is; that's where you spend your time. Your "real" name is like the parlor where you go and sit for two long hours with your hands in your lap when Aunt Matilda comes to call.

I remember the time - this was at least 15 years ago - when I went over to one of the buildings in Tech Area 1 to interview a director (long since retired), whose name, we will say, was "Andrew." When I got to his office I said to his senior management assistant that I was there to talk with Andy. She got this stricken look on her face and whispered, "Don't call him that! Don't ever call him that! He goes by Andrew." I'm sure she was convinced she had saved me from having my hide tacked to his wall. And maybe she did.

* * *

This nickname business reminds me of the scene in *The Right Stuff* where the seven Mercury astronauts, America's newest heroes, are meeting with Henry Luce, publisher of *Time* and *Life* magazines. Luce had just purchased exclusive rights to tell the astronauts' stories and was meeting with them to describe the arrangements. Each astronaut was to work with a professional writer, Luce explained, and would subsequently have his life story published in *Life* under his own by-line, as in *My Life* by Virgil I. Grissom.

At that point, Grissom interrupts Luce and says, "Gus."

"What was that?" Luce says, to which Grissom replies "Gus. Nobody calls me by . . . by that other name."

Luce doesn't like the sound of this. "Gus? An astronaut named Gus? What's your middle name?"

"Ivan," says a deadpan Grissom. (Remember, this was at the height of the Cold War, when one of the generic nicknames for our Russian adversaries was Ivan.)

This sets Luce back on his heels: "Ivan... ahem... Well, maybe Gus isn't so bad, might be something there . . . All right, all right. You can be Gus."

As Gilda Radner used to say, "Never mind."

* * *

Came across an interesting tidbit: Just this week the very last commercial electric telegraph system in the world closed down. It was in India and represented the last vestige of a legendary system that was put in place a century and a half ago to tie together this vast, sprawling, almost continent-sized country.

In its day, the telegraph was a marvel and its global spread transformed the very idea of time and space. Messages that had taken days or even weeks to deliver now took minutes. The laying of the Atlantic cable in the 1860s is perhaps the greatest engineering triumph of the 19th century and is an adventure story, a mystery story, a science fiction story, and a documentary all rolled into one. It may have marked the true beginning of modernity, tying every part of the planet together in a great global network. (Sound familiar?)

* * *

Don't get me wrong. I don't mean to suggest that all the "old" ways have been made irrelevant by iPhones, iPads, cable news programs, and the Internet. For example, ham radio operators using modern high-tech gear can and do play a vital role in emergency communications. It just so happens that we have a story on page 9 about how members of Sandia's Amateur Radio Club recently participated in an annual, nationwide wireless communications exercise designed to run them through a number of challenging scenarios.

When everything else goes down - power, phone, cable, cell - these folks are equipped and prepared to keep open the lines of communication. They can do voice and in a pinch even tap out messages in Morse code - just like they did in India in 1856.

. . . . / - - - - - / - . . - . - - / - (See you next time.)

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

20 children of Sandians win Lockheed Martin Foundation National Merit scholarships



Twenty high school seniors who are the children of Sandians are among 100 students to win Lockheed Martin Foundation scholarships in the 2013 National Merit Scholarship program. The scholarships are awarded to qualifying National Merit Finalists and to students who scored extremely well on the PSAT/National Merit Scholarship Qualifying Test but did not become Finalists in their states. The winners are academically within the top one-half of 1 percent of all US high school graduates.

In a congratulatory note to the Sandia student winners, Labs Director Paul Hommert wrote, "On behalf of Sandia National Laboratories and Lockheed Martin, I would like to congratulate you on your achievements that have led to this honor! I wish you continued success in all your future academic endeavors."

Only students who are the children of current full-time and part-time employees (working 20 or more hours per week) of Lockheed Martin and its subsidiaries can compete for these scholarships. Eligible children include sons and daughters, stepchildren, adopted children, and the children of domestic partner parents, as well as grandchildren of employees who have legal guardianship. All eligible students may apply for the scholarship program regardless of which parent claims them as dependents or where the children reside.

To be considered for the scholarship, high school students must take the Preliminary SAT/National Merit Scholarship Qualifying Test (PSAT/NMSQT) in the fall of their junior year and must submit an application and essay to the Lockheed Martin Foundation. Of the 1.4 million students who take the PSAT each year, approximately 1,600 students are named as Semifinalists.

The scholarship program awards \$3,000 per year for up to four years of undergraduate study to recipients, who are chosen on a competitive basis and without regard to family financial circumstances. A National Merit Scholarship Corp (NMSC) committee of professionals trained in selection choose the recipients by evaluating several factors about each eligible candidate. These include academic record throughout high school, significant activities and contributions to the school and community, test scores, the school's recommendation of the candidate, and the student's essay about personal characteristics, activities, plans, and goals. All recipients are notified directly by NMSC, prior to any public announcement.

The National Merit Lockheed Martin Academic Scholarship Program is an annual competition conducted by the NMSC, an independent, not-for-profit organization. The program's purposes are to identify and honor exceptionally able high school students and to provide a system of services for corporations, foundations, and other organizations that wish to sponsor college undergraduate scholarships for outstanding students who interest them. All aspects of the selection of recipients and the administration of their awards are handled by NMSC.

* * *

The Sandia scholarship recipients and their parents are:

National Merit Lockheed Martin Academic Scholarship

Tess Arrighi	Gail Bachman(8527)
Iliana Bray	Brian Bray (5448) and Iirena Erteza (5962)
Stephanie Brener	Igal Brener (1712)
Katherine Cordwell	William Cordwell (5635)
Robert Cutler	Robert Cutler (6634)
Elisa Friedmann	Thomas Friedmann (1747)
Emma Johnson	Curtis Johnson (5635)
Simon Mattsson	Thomas (1641) and Ann (1443) Mattsson
Alexandra Porter	James (5741) and Vicki (1542) Porter
Jacob Quintana	Gilbert Quintana (6614)
Justin Sanchez	Reno Sanchez (5719)
Aaron So	Biu So (2956)
Emily Stirrup	Timothy (4126) and Barbara (1741) Stirrup
Gregory Walkup	James Walkup (5638)
Aja Watkins	Randall Watkins (1532) & Sheryl Hingorani (250)

Lockheed Martin Academic Scholarship

Christian De la Pena	Leanne Whittemore (9513)
Mallory Evanoff	Roberta Evanoff (9342)
Thomas Kajder	James (2728) and Cynthia (2913) Kajder
Maria Morrow	James Morrow (5346)
Kaitlin Scholand	Andrew Scholand (5741)



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The true cost of shortcuts

By Patti Koning

What kind of shortcuts do you take every day without even thinking twice — and what is the price you might pay for those shortcuts? That was theme of a powerful talk by Randy Fellhoelter (4122) to kick off the California site's first-ever Disaster Readiness Fair on June 13.

"The reality is we all take shortcuts every day. Most of the time you don't give it any thought," Randy said. "When the car windows are all fogged up, do you take the time to clear them completely or do you start driving with a small window of vision, knowing the windows will unfog as you drive? It's not a right, not a wrong, it's just convenient."

He talked about the minor costs of shortcuts — when the grass is long, not checking the lawn for objects before cutting the grass and then mowing over a claw hammer. You just bought yourself a new lawn mower blade. Working in the garden without gloves, you tear some skin. It's uncomfortable, but it will grow back. "You have gotten to the point that you are paying a price, whether it is money or pain," said Randy. "And the sad part is, you were comfortable with it when it began."

Shortcuts can have much higher costs, like failing to check and change the oil in your car's engine. "Some shortcuts we take in life turn out to be catastrophic," said Randy.

"Remember those windows you didn't defrost all the way? You went ahead and made that left turn and you never saw him coming. He hit you broadside. And someone very dear to you, a loved one, possibly a child, happened to be sitting in that seat. They are now in the hospital, in surgery. This is major and that loved one didn't make that choice. You did."

50 volts can kill

Randy then shared the terrible price that he and his family paid for a shortcut he took on the job. "One day I screwed up. I violated a safety rule, a work procedure, and it damned near killed me," he said.

He also noted that while his was a workplace accident, electrical contact accidents in the home are more common. "The reality is, you are three times more susceptible to electrical contact in your home than in all the general industries combined," he said. "You have the exposure and it doesn't take a lot. Fifty volts can kill."

More than 20 years ago, Randy was working as an electric lineman for the PNM utility company in New Mexico. One night, an underground cable faulted and caused a power outage in a residential neighborhood. Two journeyman linemen responded to the scene, isolated the faulty cable, and restored power. The next morning, Randy and a co-worker were tasked with finding and repairing the faulty cable.

After locating the faulty cable, Randy and his co-worker realized they'd brought the wrong truck to the site and had left behind a piece of test equipment. "Yes, we could have gone back, but it was a 45-minute round-trip drive. There was no one to call to bring it to us because we were shorthanded," recalled Randy. "I decided this was routine work and I'd just proceed. I knelt down and stuck my hand right into 7,200 volts. Wrong cable, mismarked, not tested, not grounded."

The current shot through Randy's right hand but could not exit through his feet because he was wearing neoprene boots. "I was apparently engulfed in an electrical arc, according to a neighbor who saw this from her kitchen window," he said. "I had an electric arc that started through my knees and grew so large I had fire coming over my head, under my arms, and beneath my legs."

Randy's co-worker immediately radioed in the accident and the emergency response came quickly. He was medevac'd to the University of New Mexico Hospital. It was seven days before Randy's body "quit cooking" — before the deterioration and decay resulting from the burns stopped. He underwent five exploratory surgeries in seven days. Doctors later grafted skin from his right thigh to replace the burned skin on his right arm and left thigh.

The next stage in his recovery was the painful

"Some shortcuts we take in life turn out to be catastrophic."



THE COST OF SHORTCUTS — Sandia occupational safety engineer Randy Fellhoelter recounted for a Sandia/California audience at the site's first-ever Disaster Readiness Fair how an ill-advised shortcut when he was working as a lineman for PNM more than 20 years ago affected his life and the lives of those he loves. (Photo by Randy Montoya)

Sandia California News

debriding process in which dead, damaged, and infected tissue is removed to allow the remaining healthy tissue to heal. Every day Randy soaked in a large tub and then doctors and nurses removed all of the scabs with washcloths, scalpels, tweezers, and scissors. "Severe burn victims cannot heal with scabs. If they did, they would never move again," he said. "Folks, it hurts."

You're not the only one who pays a price

So that he could leave the hospital in time for Thanksgiving, Randy's wife learned to debride his scars and apply fresh dressings. "You are not the only one who pays the price for your decisions. That I know," he said.

Randy lost his right arm to the elbow. He uses a mechanical hook because he does not have sufficient forearm muscle to operate an electronic hook.

"I didn't ask one question to my co-worker. Did you test that? If I'd just asked, it would have changed my whole mindset and the outcome," he said. "That's my fault and my family has paid a dear price ever since."

Randy challenged audience members to question how comfortable they have become in their own lives and to consider the shortcuts they are taking and the cost of those shortcuts. "Today, tomorrow, next week, six months from now. What price are you willing to pay? Physically, monetarily, emotionally. This is your choice, solely your choice. What are you going to do? It's your choice."

California site hosts first annual Disaster Readiness Fair

On June 13, the California site hosted its first annual Disaster Readiness Fair to help members of the workforce better prepare for the next emergency. Randy Fellhoelter (4122), an occupational safety engineer at the Albuquerque site, gave the keynote speech, "Shortcuts." He shared the high personal cost he and his family paid for a shortcut he took and challenged audience members to reconsider the shortcuts they take in their daily lives.

In the Livermore Valley Open Campus, vendors Alhambra, Coast Fire Equipment, Grainger, ICE Safety Solutions, and Ready America displayed information on disaster preparedness and sold items like fire extinguishers and emergency supply kits. The Stanford Blood Center had information about donating blood and advertised an on-site blood drive scheduled for July 25. A scavenger hunt for disaster preparedness-themed raffle prizes encouraged attendees to spend time at every booth.

Gerald Vincent (8152) organized the Disaster Readiness Fair along with committee members Janet Chandler (8516), Laurie Farran (85154), Leticia Longoria (8515), Jamie Mcleod (8511), Dave Paoletta (no longer with Sandia), and Mike Roth (8516). Gerald says the idea for the fair came to him after witnessing the experiences of his family in Louisiana in the aftermath of Hurricane Katrina.

"A lot of my family members were unprepared for Hurricane Katrina. And then after Superstorm Sandy, I thought, 'What if those were my coworkers at Sandia standing in food lines?'" he explains. "So we organized this event with the goal of helping everyone become better prepared so they can lessen the impact of the next disaster."

Just over 100 people turned out for the fair, a number that Gerald is happy with. "This year we reached about 10 percent of the workforce. So hopefully next year we can reach 20 percent or more," he says.

Sandia lays out bold new research initiative



“Instead of a time duration of three years at most, the Research Challenges could go on for more than a decade. But they will need intermediate deliverables, be well-managed to stay on the critical path, and will always need to answer the question: ‘Do we still need to go there?’”

— Sandia Chief Technology Officer and VP Julia Phillips

(Continued from page 1)

Sandia President and Labs Director Paul Hommert, who opened the meeting, said he found the overall proposal “immediately invigorating” and “providing a very real mechanism” for moving into new areas. But just to be sure, he asked for feedback and then drew chuckles when he urged the personnel in the jammed auditorium “not to let Rob [Leland, 1400 director] and Ann [Campbell, 5900 director] blow any smoke by you” when they described the first two areas of research on which Labs leadership wants to focus: “Beyond Moore Computing” and “Data Science.”



“[The research challenge] is to develop scalable techniques for data analysis that enable human analysts to rapidly identify, characterize, and respond to key signatures buried in complex, heterogeneous data and information.”

— Ann Campbell

The Research Challenges are bigger than LDRD Grand Challenges, Julia went on. “Instead of a time duration of three years at most, the Research Challenges could go on for more than a decade. But they will need intermediate deliverables, be well-managed to stay on the critical path, and will always need to answer the question: ‘Do we still need to go there?’”

The research challenges will require road maps and analyses of resource and investment needs, as well as plans for dissemination and deployment of the results. They also will require internal and external red teaming because “If you want to find out how good you are, you have to ask people who haven’t been drinking from the same well as you have,” she said.

Other research areas delineated were Trusted Systems and Communication, First to High-Yield Fusion, Quantum Limited Detection, Cyber Resiliency, Multi-Physics and Multiscale Materials Knowledge to Create Engineered Solutions, Power on Demand, Embedded Annual Assessment, Resiliency in Complex Systems, and Integrative Biological Systems Analysis and Engineering.

Each will be discussed in broad terms in sessions like that for Beyond Moore Computing and Data Science. Sessions will be followed by workshops on each specific topic at which Sandia staff can help hone the focus of

the research.

The video and slides from the inaugural session can be viewed at <https://cto.sandia.gov/>. Sandia’s Chief Technology Office expects to post two-page descriptions of each challenge area on a page being created for the challenges on the CTO site.

Taking on big challenges

Rob, speaking for the **Beyond Moore Computing Research Challenge**, said Bell Labs’ discovery of the transistor was part of Sandia’s heritage. “We were part of Bell Labs. They had good people, equipment, and time. We have the potential to achieve something like that again.”

Here, the idea would be to revitalize Moore’s Law. “The laptop frequency of a few gigahertz hasn’t changed since 2005,” he said, “and the increase in transistors for the past nine years has not given commensurate improvement in performance.”

Areas of possible interest, he said, include supercomputing above the exascale and embed-

ded computing, with applications in stockpile stewardship, scientific research, space assets, industrial computing, data analytics at scale, and cloud services with dramatically lessened power consumption.

Despite difficulties, all these areas can be improved, he said: “Betting against the engineers is almost always a bad bet.”

The capabilities of at least three research foundations — materials science, nano devices and microsystems, and computing and information sciences — will be required to tackle Beyond Moore problems. All three are already investing LDRD resources in the challenge, and the amount of their investment is likely to increase over time. Laboratory investments are also expected to attract investments from customers as momentum in the research challenge builds.

“Sandia is a small player compared to the

forces at work here,” Rob said, “but because of our culture, we could help create the next revolution in computing technology.”

Ann, speaking on the **Data Science Research Challenge**, said there has been an explosion of data and that analyzing large amounts is increasingly important to Sandia’s missions.

The question, she said, is “how do you get insights that are predictive and actionable from data?”

Data science can find new insights by detecting anomalies, modeling patterns of life, identifying leading indicators, characterizing threat signatures, and so on, she said.

There also is a need to help analyst teams become more efficient because it’s impossible to hire enough analysts to meet the future demands of a flood of data, she said.

The research challenge, she said, “is to develop scalable techniques for data analysis that enable human analysts to rapidly identify, characterize, and respond to key signatures buried in complex, heterogeneous data and information.”

Another problem, she said, is “to develop and assess novel data analysis methods to counter adversarial influence.”

Sandia is used to working with heterogeneous data to support various missions, has deep computer science capabilities, works in multidisciplinary teams, and can handle classified data and information, she said.

She expressed interest in big data — large amounts of information that can detect patterns that aren’t apparent in smaller amounts of data. But she didn’t discount other types of data. An accompanying slide read, “Sparse data matters too!” Sparse data refers to making predictions and decisions based on relatively little data.

The next challenges to come on line will be “First to High-Yield Fusion” and “Trusted Systems and Communication,” to be explained at the next workshop on July 31 from 11:30 a.m.-1 p.m. in the CNSAC auditorium.

“Sandia is a small player compared to the forces at work here, but because of our culture, we could help create the next revolution in computing technology.”

— Rob Leland



Sandia researchers win 3 R&D 100 awards



Cliff Ho, right, and Cianan Sims were recognized for the Solar Glare Hazard Analysis Tool.



Bruce Burckel headed a team that was recognized for the Membrane Projection Lithography team.



Mike Heroux led a large team of people at Sandia and elsewhere that was recognized for Mantevo Suite 1.0.

(Continued from page 1)

Previous winners over the contest's 60-year history include inventions important in their time but fading — the flash cube (1965) and the fax machine (1975), for example. Others present with more vigor include halogen lamps (1974) and HDTV (1998).

The winners of the awards, sometimes referred to “the Oscars of invention,” will receive plaques at a formal banquet at the Renaissance Orlando Hotel at SeaWorld, Orlando, Fla., on Nov. 7.

DOE Secretary Ernest Moniz said, “My sincere congratulations to the winners of this year's R&D 100 Awards. The scientists and engineers who developed these award-winning technologies at the cutting edge facilities across our national labs are keeping Americans at the forefront of the innovation community and assuring our nation's economic competitiveness and national security.”

This year's Sandia winners are:

Bruce Burckel (1712), representing the Membrane Projection Lithography team [John Anderson (1716), Igal Brener (1712), Rob Ellis (5331), Rick McCormick (1110), Bonnie McKenzie (1819), Paul Resnick (1719), Sally Samora (1728), Mike Sinclair (1816), Greg Ten Eyck (1718), Joel Wendt (1728) and Mike Wiwi (1746)].

This microfabrication technique started as a cartoon drawn by Bruce in 2009 while working on the Metamaterials Grand Challenge LDRD. “The team converted the cartoon into reality,” says Bruce.

The cartoon showed that by using suspended patterned membranes as stencils, three-dimensional microscopic structures of almost any geometry can be created. While traditional microfabrication methods require horizontal surfaces on which to pattern, the stencil method permits patterning materials in three-dimensional cavities — whether these be cubes, cylinders, hemispheres, or more. These patterns can be vertical or, in corners of the host object, in several dimensions at the same time.

Because the method uses standard microfabrication materials and equipment, the membrane projection technique could be used to create 3-dimensional integrated circuits. If successful, this next step in the evolution of 2-dimensional microprocessors could resurrect the fading Moore's Law. (Further exploration of the technique will be the subject of an LDRD, also led by Bruce, just coming on line.) The lithographic technique also is capable of creating structured electromagnetic materials with components so small that they allow interaction with and control over thermal infrared wavelength radiation. This offers the possibility of creating thermal antennas that can control the direction of heat emitted from an object, potentially easing cooling and heating needs for satellites or perhaps even buildings and cars. Discussions with industry are in progress.

Says Bruce of the team's methods, “You create a cavity, backfill it with sacrificial material, polish it flat, then deposit material as a thin film that you want for a membrane, and pattern it with standard lithography methods. After you've etched the pattern you want, you dissolve out the backfill sacrificial material.

“It's compelling technologically because it's simple.”

Mike Heroux (1426) (who led a large team of people at Sandia and elsewhere) for Mantevo Suite 1.0, an integrated collection of small software programs (miniapps) that model the performance of full-scale applications, yet require code only a fraction of the size of the full application. The Mantevo project pioneered the miniapp concept, and Mantevo Suite 1.0 is the first integrated collection of full-featured miniapps. Miniapps have emerged as central components of computer system co-design in an era of rapid architectural changes. Major companies like Intel, IBM, NVIDIA, AMD, and Cray, along with universities and national laboratories, use miniapps for rapid design-space exploration in the development of the next generation of high-performance computers. The miniapp work was done in collaboration with, among others, Los Alamos and Lawrence Livermore national laboratories and Santa Clara-based NVIDIA Corp.

Cliff Ho and Cianan Sims (both 6123), for Solar Glare Hazard Analysis Tool (SGHAT). Solar energy installations are popping up across the country at record rates. In the first quarter of 2013, 723 megawatts were installed, a 33 percent increase over the same quarter last year. But while installers naturally want the best configuration and panel angles to produce maximum power year-round, government agencies are raising concerns about the impact of glare on pilots, air traffic controllers, motorists, and even neighbors.

“SGHAT quickly and easily addresses both concerns,” says Cliff.

By using an interactive Google Maps interface and a few user-specified parameters — among them, elevation, orientation, and tilt of the panels — the web-based tool, available to the public at www.sandia.gov/glare, can be used quickly to locate a site, outline the proposed array, and calculate the potential glare's intensity and size, predicting ocular hazards on a minute-by-minute basis throughout the year. The tool also can predict annual energy production of proposed arrays so that alternative designs, layouts, and locations can be optimized to maximize energy production while mitigating glare impact. More than 200 users from 16 countries have already registered to use SGHAT. Contributors to SGHAT include Julius Yellowhair, Evan Bush, and Brian Ehrhart (all 6123), James Yuan (1514), Siri Khalsa (former student intern, 6123), and Andrew Sharp (1353).

“It's especially rewarding to produce a technology that has an immediate impact,” says Cliff.

The US now has more than 8,500 MW of cumulative installed solar electric capacity, enough to power more than 1.3 million average American homes, according to the Solar Energy Industries Association.



66 Sandians move into Distinguished ranks

Sandia's special appointments represent employees from all areas of the Labs' operations. According to Corporate Policy System documentation, placement in the Distinguished level signifies a promotion to the fourth level of the job. This level is to be populated with a few exceptional employees who have distinguished themselves in their careers while at Sandia. This level is different from the other levels in that it is subject to a 10 percent population limitation to preserve the distinction of the level. Divisions are not obligated to fill all their distinguished "slots."



Employees selected for the new levels have been recognized with a special plaque and a nonbase salary award, in addition to this special mention in the *Lab News*.

As has been its tradition for many years, the *Lab News* presents photographs of Sandians who have received special appointments this year. Not pictured here are Jill Wheeler (1816) and Michael Olbin (2501).

Photos by Lloyd Wilson (New Mexico) and Randy Wong (California)



Dawn Abbott 9312
Cybersecurity



Christopher Applett 2546
Materials Science



Matthew Blain 1725
Electronics Engineering



Sabine Boruff 9547
Solutions Architect



Igal Brener 1712
Optical Engineering



Linda Carrillo 10586
Financial Support



Theresa Chacon 10678
Financial Support



Dennis Clingan 2617
Electromechanical Technologist



Mary Ann Cordova 2128
Tech Writer/Editor



Angela Cotinola 3335
Human Resources Support



Byron Demosthenous 1535
Test Photo Support Technologist



Thomas Dewers 6914
Geosciences Engineering



Robert Dooley 4241
Project Manager



Rex Eastin 8135
Electronics Engineering



David Ek 6811
Eng. Program/Project Lead



Kevin Fox 1755
Lab Support Technologist



Jonathan Frank 8351
Mechanical Engineering



Wendy Friedt 6815
Eng. Program/Project Lead



Ramona Gauna 9542
Solutions Architect



David Gelet 2144
Electronics Engineering



Anna Thimakis Gibson 10011
Prime Contract Administrator



Dolores Gonzales-Limon 10245
Strategic Contracting Rep



Michael Greutman 4126
Safety Basis Engineer



Ann Hodges 5212
Technical Systems Analyst



Alex Horvath 2917
Health Physics Technologist



Adam Jimenez 2554
Electromechanical Technologist



Gregory Kirsch 4844
Regulatory Compliance Analyst



Roger Kite 10242
Strategic Contracting Rep.



Christopher Knight 4847
Facilities Technologist



Shannon McConkey 10622
Project Controls Specialist



Gary McGovney 2622
Electronics Engineering



Quenton McKinnis 8231
Eng. Support Technologist



Mark Mitchell 8949
LAN/WAN Support Technologist



John Moleres 9548
Solutions Architect



Jason W. Morris 9311
Info. Enterprise Systems Tech.



Bill Murphy 3651
Corp. Communications Spec.



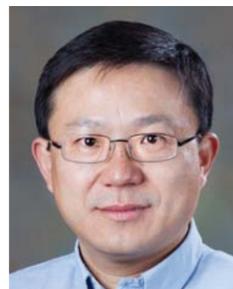
Kelly Nykodym 8522
HR Business Partner



Nancy Orlando-Gay 5952
Technical Analysis



David Osborn 8353
Chemistry



Wei Pan 1121
Physics



Lyle Pickett 8362
Mechanical Engineering



Mark Poiles 2726
Lab Support Technologist



Thomas Polachek 4121
Calibration Technologist



Jaideep Ray 8954
Computer Science



Robin Reeves 10678
Business Mgmt. Professional



Allen Roach 2735
Mechanical Engineering



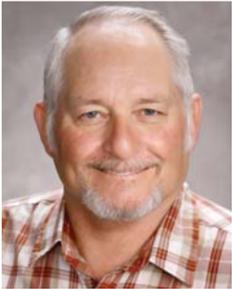
Constance Rush 9544
Software Eng. Technologist



Carlos Sanchez 1747
Microelectronics Technologist



Mark Savage 1671
Electrical Engineering



Jimmy Scott 8945
Info. Enterprise Systems Tech.



Seema Singh 8634
Materials Science



Rob Sorensen 1818
Materials Science



Kevin Stamber 6132
Computer Science



Scott Stephens 9329
Solutions Architect



Joel Stevenson 9326
Computer Science



Mary Ann Sweeney 1600
Physics



Laura Painton Swiler 1441
Computer Science

66 Sandians move into Distinguished ranks



Alexander Tappan 2554
Materials Science



Veena Tikare 6225
Nuclear Engineering



Jerilyn Timlin 8622
Bio Sciences & Engineering



David Urrea 1832
Lab Support Technologist



Paul Vrabel 1735
Electromechanical Technologist



Eric Vugrin 6921
Systems Research & Analysis



Michael Wanke 1118
Physics

Quick response by Security, emergency personnel, paramedics, saves a life

Thanks to the quick response, emergency training, and cool heads under pressure by Sandia employees, Sandia Security, Emergency Response Team (ERT) personnel, and paramedics, a Sandia employee is alive and back at work today.

When the 60-year-old Sandian in Bldg. 860 collapsed with a heart attack, a coworker, Colin McConnell (1527), recognizing the severity of the situation, immediately called 911 while coworker Charles Kahwajy (1528) started CPR.

Sandia's ERT, paramedics, and Security were dispatched immediately by Sandia's Emergency Management telecommunicators. While en route to the incident, the telecommunicators reported the Medical Priority Dispatch System coding as a 31D1: The patient was unconscious. Time was a critical factor.

Here's where the patient caught a break: It so happens that two Sandia Security personnel, Capt. Frank Delgado (4237-1) and Lt. Diego Trujillo (4237-3), were on their way to Bldg. 860 on unrelated business when they heard the medical dispatch call go out. They understood this to be a life-and-death situation that demanded an immediate and urgent response. Both men had received the Heart Saver First Aid CPR and Automated Electric Defibrillator (AED) training, which was just what they needed to know in this case.

On arriving at the scene, Frank had Diego grab the AED from their vehicle. When they reached the patient, Frank took over CPR from Charles and then Diego defibrillated the patient with the AED. The patient started to breath and regained a carotid pulse, but then went back into cardiac arrest. Frank immediately resumed CPR and Diego administered another shock with the AED, this one witnessed by

the arriving ERT members and paramedics. On the scene, the medical responders took over responsibility for the patient, administered basic and advanced life support (BLS/ALS) procedures, and were able to secure a sustained pulse and respirations. The patient was transported to Presbyterian Hospital for evaluation and treatment.

With their quick on-the-spot actions, Frank, Diego, Charles, and Colin are being credited with saving the patient's life, buying time for the more advanced treat-

ments by paramedics and ERT members.

Protective Force Dept. 4237 Manager Bill Boling had high praise for his fast-acting colleagues.

"The effort displayed by Capt. Frank Delgado and Lt. Diego Trujillo in this life-and-death situation," Bill says, "is indicative of the dedication to mission mindset shared by all Protective Force and Emergency Management first responders. As our VP, Mike Hazen, and our management team like to affirm, 'People First — Mission Always.'"



LIFESAVERS — Thanks to quick actions by Capt. Frank Delgado (left) and Lt. Diego Trujillo and by fellow workers, a Sandia employee who suffered a life-threatening heart attack on the job is back at work today. (Photo by Randy Montoya)

Shape memory alloys hold promise

By Sue Major Holmes

Imagine untwisting a finger-size spring, then holding the flame from a lighter underneath the unraveled section. Like magic, it twirls itself into a spring again because it's made from a metal alloy that remembered its original shape.

Sandia researchers think such shape-memory alloys could be used to improve safety in weapons components in a fire or other accident. A thermal device made of a high-temperature shape-memory alloy might, for example, close or open a switch or lock a gear to prevent it from turning, says materials scientist Don Susan (1831).

"It's almost unlimited what you can think of, what you can do with shape-changing alloys," he says.

Don is principal investigator for a Laboratory Directed Research and Development (LDRD) project, now in its third and final year, aimed at creating high-temperature shape-memory alloys for weapons components. Accomplishments so far:

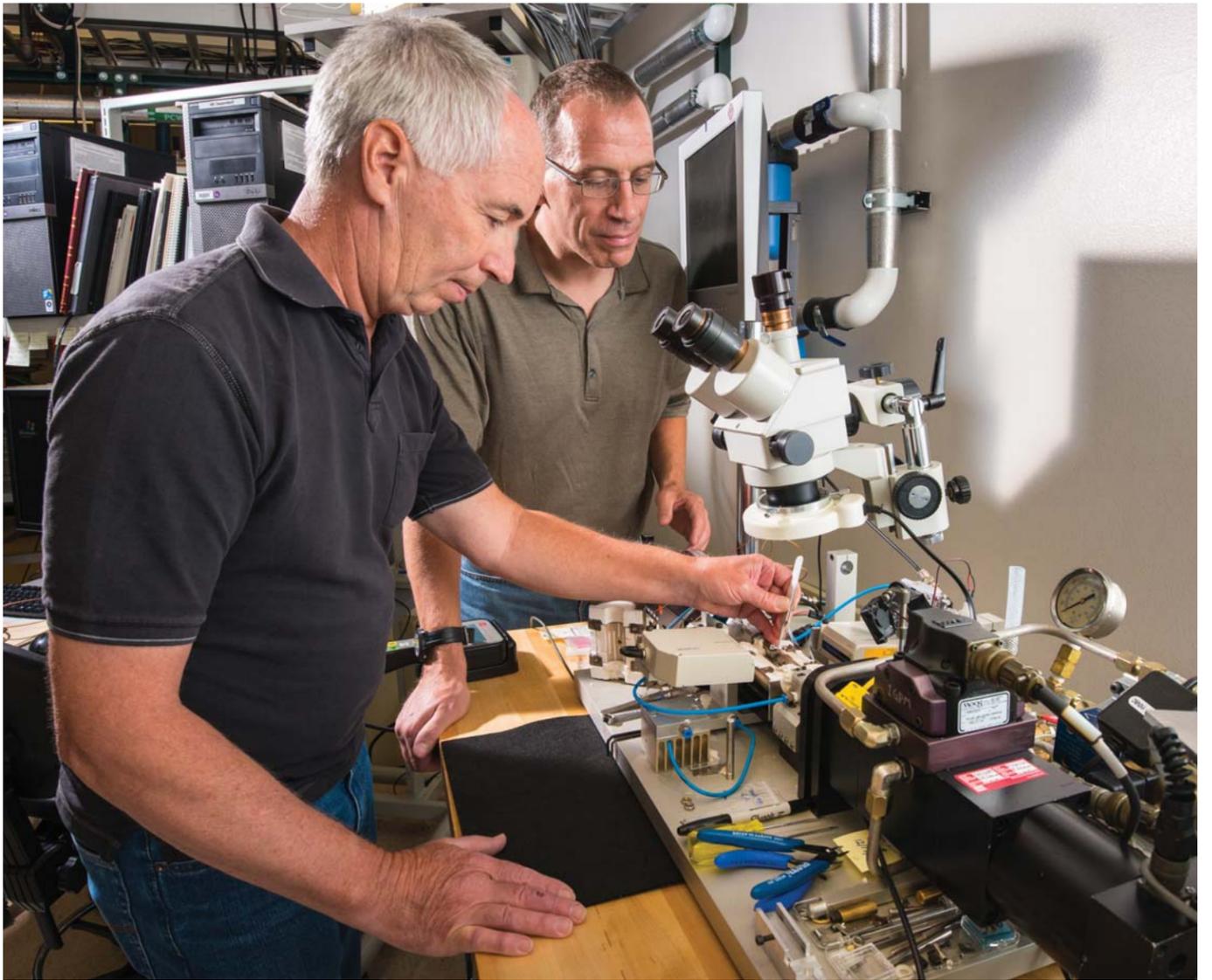
- Researchers made new alloy compositions, including nickel titanium platinum, nickel titanium palladium, and nickel titanium hafnium, and filed technical advances for those compositions, a first step in documenting an invention for a later patent application.
- The team has characterized such key properties of the materials as the way they change shape, strength, and ductility.
- Team members have produced prototype parts that show shape change at desired temperatures.
- Sandia is the first to demonstrate a property called super-elasticity in higher temperature shape-changing alloys, and filed a technical advance for that. Super-elasticity is a rubbery sort of behavior in metals, such as eyeglass frames that twist without snapping. Don says Sandia doesn't currently intend to exploit this property but it could provide future design options.

Alloys remember original shape

Shape-memory alloys work somewhat like the thermal sensor in a building's fire sprinkler system. That thermal sensor is made of a liquid that expands and breaks a glass enclosure, triggering a switch that turns on the sprinklers. Shape-memory alloys work in a similar way, but change shape instead of expanding.

"If you bend a wire, it'll go back to straight if it was originally straight," Don explains. "If it was originally bent and you made it straight, it will go back to bent. It will remember a shape when you heat it up."

Such an alloy can trigger a process simply because it's able to change shape, says project manager Jim McElhanon (1835), who started the LDRD with weapon safety engineer John Debassige. Don, part of the team from the start, became team lead when Jim became a Sandia manager after the project's first year. Other members are Tom Buchheit (1814), Jordan Massad (1526), Don Bradley (1833), and Mark Reece and Tom Crenshaw (both 1831). Sandia also collaborates with



CHARACTERIZING SHAPE MEMORY ALLOY BEHAVIOR — Tom Buchheit (1814) looks on while Tom Crenshaw (1831) mounts a small shape memory alloy sample into a hydraulic test frame for mechanical testing. Sandia researchers have been focusing on creating high-temperature shape-memory alloys. (Photo by Randy Montoya)

Ron Noebe and his colleagues at NASA's Glenn Research Center in Ohio.

"I truly believe this research on [high-temperature] shape-changing alloys will allow us to create new devices that significantly impact nuclear weapon safety. The shape-memory alloys we are developing can passively change shape via exposure to a particular temperature or actively change shape by passing current, which generates heat, through the material," Jim says.

Shape-memory alloys have been around for decades and various types are sold commercially. They're commonly used in the human body in medical appliances such as stents that change shape at body temperature. A tiny stent, stored at below-body temperature, can be squeezed small enough to fit into an artery, then opens up the artery when warmed to body temperature, Don says.

"It's almost unlimited what you can think of, what you can do with shape-changing alloys."

— Don Susan (1831)

Shape change needed at specific temperatures

The Sandia alloys can change shape at temperatures below room temperature to greater than 500 degrees Celsius, or about 930 degrees Fahrenheit.

Commercial alloys change shape at temperatures that don't meet Sandia's needs, Don and Jim say. Sandia built upon recent research into higher temperature shape-memory alloys to create its own alloys.

"Folks at Sandia were studying these alloys decades ago, but the temperatures were always too low to be useful for our parts until these new alloys came along

over the past 15 years or so," Don says.

Any shape change has to take place above the temperature at which components are manufactured, Don says.

"You don't want this to happen when you're making the parts," he says. "You don't want it to happen when it's sitting out in the sun either. It has to be higher than that."

In April, the Consortium for the Advancement of Shape Memory Alloy Research and Technology (CAS-MART) voted to add Sandia as a member. Government, academic, and industry experts in the field started CASMART in 2006 to share applied research on shape-memory alloys.

"Joining the consortium is a huge step forward for the Labs," Jim says. "We are collaborating with the world experts in the area."

Computer models to show behavior

In addition to its cooperation with NASA's Glenn Research Center, Sandia also is working with Texas A&M University in College Station on shape memory alloys. NASA and Texas A&M are both consortium members. NASA is interested in the alloys for flight applications, while the university works on materials processing — turning the alloys into specific shapes, Don says. In addition, he and Jim say Texas A&M researcher Brian Lester is working with Sandia this summer on computer models of shape-memory alloy behavior.

"Our computer models can't handle something that changes shape like that," Don says. "When you heat something up, it expands a little bit and when you cool it down it contracts. We can handle that in the computer codes, but not this more dramatic shape change."

Don envisions Sandia eventually studying shape-memory alloys for wind and solar energy and perhaps satellites.

"They are really interesting materials," he says. "Most of what we work on at Sandia is stainless steel, aluminum, the kinds of things we've worked on forever and that most of our parts are made of. So it's interesting to work on something different and explore the possibilities."

Sandia Dental Care Program offers the choice to save

The Sandia Dental Care Program, like the Sandia Total Health medical plan, offers you multiple choices and options that will save you on out-of-pocket costs. We know that choice and savings are two things you value in your health and medical plans — and the Sandia Dental Care Plan has both.

The Delta Dental PPO and Delta Dental Premier Provider Networks

Sandia's Dental Care Program has two in-network provider network options:

- Delta Dental PPOSM
- Delta Dental Premier[®]

Delta Dental Premier is the nation's most extensive panel of dentists, with more than 139,000 dentists and more than 248,000 locations across the country. Delta Dental PPO is a second, smaller network (a subset of Delta Dental Premier) which includes more than 80,000 dentists in more than 166,000 locations nationally.

When you enroll in the Dental Care Plan, you may visit any provider in either Delta Dental network (Premier or PPO). The same benefit levels apply in each of these two networks, as shown here:

Services	Delta Dental PPO Network		Delta Dental Premier Network	
	Sandia pays	You pay	Sandia pays	You pay
Diagnostic and Preventive Services	100%	0%	100%	0%
Basic and Restorative Services	80%	20%	80%	20%
Major Services	50%	50%	50%	50%

For more detail on the types of services which fall into the benefit categories shown above, consult the Sandia Dental Care Program (DCP) Program Summary at <http://tiny.sandia.gov/uqkib>

Dentists who participate in Delta Dental PPO, however, have agreed to charge you less than Delta Dental Premier dentists for the services they provide. Because you pay a portion of the costs for most services (as shown above), when the total cost of care is reduced, your out-of-pocket costs are also lower.

To save you the most money, select a Delta Dental PPO provider whenever possible. Select a Delta Dental Premier provider when a more expansive panel of dentists is needed or desired.

If you elect to use a dentist who does not participate with Delta Dental, your out-of-pocket expenses will be even higher because those providers can charge you amounts that would otherwise be disallowed by Delta Dental.

Delta Dental Networks by the Numbers

Some dentists — particularly specialists — may not participate in Delta Dental PPO because of the level of fee reductions in that network. Other dentists participate in both Delta Dental PPO and Delta Dental Premier. When a dentist participates in

both networks, the lower cost of care with Delta Dental PPO automatically applies.

Although the selection of specialists is generally broader with Delta Dental Premier, in the Albuquerque and Livermore areas many specialists participate in both networks (as illustrated below). To be sure you capture all savings possible, when searching for a dentist online at DeltaDentalNM.com, select the Delta Dental PPO network instead of Delta Dental Premier when establishing your search criteria.

Specialty	Albuquerque Area		Livermore Area	
	Delta Dental Premier	Delta Dental PPO	Delta Dental Premier	Delta Dental PPO
Endodontics	22 providers	5 providers	91 providers	91 providers
Oral Surgery	25 providers	14 providers	115 providers	98 providers
Orthodontics	43 providers	24 providers	144 providers	95 providers
Pedodontics	24 providers	18 providers	71 providers	11 providers
Periodontics	17 providers	2 providers	118 providers	113 providers

The number of specialty providers shown above was accurate as of the date of this article. The most current provider network data is always available at DeltaDentalNM.com.

Out-of-Pocket Cost Savings Example

The table below shows how using a dentist in the Delta Dental PPO network can help reduce your out-of-pocket costs. The example assumes the actual dentist charges that would be allowed in New Mexico as of the date of this article. Charges shown are illustrative and actual charges allowed vary by location and date of service.

	Single crown procedure (CDT code 2790)	
	Delta Dental PPO Provider	Delta Dental Premier Provider
Dentist submitted charge	\$1,142	\$1,142
Delta Dental maximum allowed charge	\$809	\$1,025
You pay 50% (co-payment for Major Services)	\$404.50	\$512.50

As you can see, you can have substantial savings — more than \$100 in a single procedure — by selecting a Delta Dental PPO dentist.

If you have any questions about your Dental Care Program benefits, review the Dental Care Program (DCP) Summary or contact HBE Customer Service at 505-844-HBES (4237) or Delta Dental at 800-264-2818.

Sandia amateur radio club members join nationwide exercise to test emergency capabilities

By Brian Milesoshky

"CQ Field Day, CQ Field Day, this is Whiskey Five Mike Papa Zulu."

Several members of the Sandia National Laboratories Amateur Radio Club (SNLARC) joined thousands of individuals, clubs, and emergency organizations on the airwaves during the weekend of June 22 for an annual, nationwide wireless communications exercise known as Field Day.



Sponsored by the American Radio Relay League (ARRL), the national association of US amateur (aka "ham") radio operators, Field Day has many objectives, chief among them being to contact as many other ham operators as possible across the US and Canada in a 24-hour period using portable stations in non-ideal conditions.

Last year nearly 2,700 individual and club Field Day stations made more than 1.4 million contacts under those conditions.

Field Day is designed to mimic some realities found in a disaster-stricken community: damage to existing communications infrastructure; limited or no cellular, landline, Internet, or commercial electricity service; and a real possibility that the very government and relief agencies the public counts on are unable to communicate with each other wirelessly due to lack of interoperability.

Such was the case during and after the Cerro Grande fire in 2000, the attacks of September 11, Hurricane Katrina, and numerous other natural/man-made disasters, all of which benefited from effective wireless communications augmented by ham operators at the request of various agencies.

SNLARC, chartered in 1947 originally as the Sandia Base Radio Club with the FCC-issued call sign of W5MPZ, participated in this year's Field Day from the cooler Zuni Mountains near Fort Wingate.

The 17-member team assembled and operated two portable, self-contained stations capable of communicating to others globally via voice, digital, and Morse code on portions of RF spectrum extending to 300 GHz that is federally allocated for amateur radio communications. The entire station, which also included a portable satellite ground station to make Field Day contacts via low earth orbiting comm satellites designed and launched into orbit by amateur radio organizations, was powered by deep-cycle batteries and solar panels. During the 24-hour period W5MPZ made 596 radio contacts to other stations in all 50 United States, and five Canadian provinces/territories.

"To us," says Chris Aas NB5T* (2136), "Field Day is an opportunity for Sandia colleagues and friends to gather, assemble stations from scratch in a remote location, use them to communicate across the globe with-



WORKING THROUGH THE NIGHT — Members of the W5MPZ team making voice, Morse code, and satellite contacts around the nation under a June supermoon. (Photo by Jeff Bach)

out any need for utilities or infrastructure, hone our operating skills, and turn loose some competition by contacting as many stations as we can. And it's fun pairing a fascinating hobby with a capable service to our community and nation."

In addition to Chris, other participating Sandians included ARRL New Mexico assistant section manager Ed James KA8JMW (2136), ARRL Rocky Mountain Division director Brian Milesoshky N5ZGT (5355), Jeff Bach AESKZ (5964), Rick Naething AE5JI (5344), and Bruce Draper AA5B (1748). For more information about SNLARC, or amateur radio in general, contact Ed or Brian.

*The number/letter combinations after individuals' names are their ham radio call signs.

Mileposts

New Mexico photos by
Michelle Fleming
California photos by
Dino Vournas



Patricio Abeita
35 10265



Joel Groskopf
35 8123



Dean Mitchell
35 6633



Yolanda Aragon
30 10613



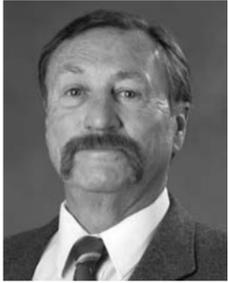
Wes Baca
30 2547



Dennis Bateman
30 9338



Earl Creel
30 5416



Robert Dooley
30 4241



Stephen Foiles
30 1814



Greg Poulter
30 1814



Sharon Trauth
30 2136



George Yonek Jr.
30 857



Keith Bauer
25 5544



Sabine Boruff
25 9547



Greg Conrad
25 9533



John W. Kelly
25 2915



Eric Klamerus
25 5431



J. Dixon Patrick
25 6815

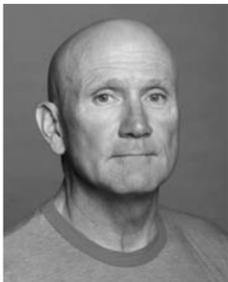


Frank Hansen
25 6910

Kathryn Knowles
20 2552



Brett Redmund
25 2140



George Sartor
25 8256



Allen Sault
25 5572



Eric Thulin
25 9311



Duane Vermeire
25 9538



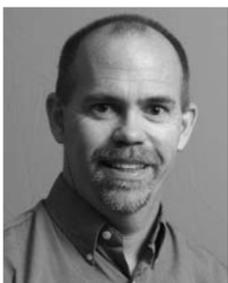
John R. Williams
25 413



Patrick V. Brady
20 6910



Rich Detry
20 5348



Kevin Harrison
20 5514



Basil Hassan
20 5422



Sidney Lee
20 10653



David Moore
20 1522



Becky Hunter
35 10660



Michael Ulrickson
20 1352



Roger Billau
15 1734



Michael Hutchinson
15 2718



Rebecca A. Lopez
15 10597



Howard Passell
15 6926



Emily Wright
15 754

Recent Retiree

Sandia honors Bataan survivors



A PLACE IN THE HISTORY BOOKS — Bataan survivors Pete Gonzalez, left, and Bill Overmier share their experiences at the July Diversity Cinema, which was a showing of the documentary *The Tragedy of Bataan*. The movie chronicles the fall of the Philippines and the Bataan Death March in April 1942, when between 7,000 and 10,000 American and Filipino prisoners of war died during the 55-mile forced march. Gonzales and Overmier want to make sure their story is told in America's history books. Joining the two Bataan veterans in a post-movie discussion are Jody Thomas (2995), next to Overmier, and Esther Hernandez (3010). The event was co-sponsored by the Diversity & Inclusion Office and the Sandia Military Support Committee. (Photo by Randy Montoya)

Air Force Association names Anderson, Sandia 2013 Citizen Airman, Employer of Year

By Sue Major Holmes

Sandia's Andy Anderson (6815) and the Labs have been chosen as the Air Force Reserve 2013 Citizen Airman and Employer of the Year.

"This is an incredible way to end a career," says Andy, who retired May 1 from the Air Force Reserve as a colonel after 37 years of service, including four on active duty. Citations accompanying the award recognize Andy's service, particularly his most recent deployment to Afghanistan, and Sandia's support to him and his family.



ANDY ANDERSON, joined here by his wife Ellen (1500), has been honored with the Air Force Reserve Citizen Airman of the Year Award and Sandia has been named the Employer of the Year. (Photo by Randy Montoya)

The Air Force Association (AFA), which sponsors the awards, will present plaques to Andy and Sandia on Sept. 16, the opening day of its Air and Space Conference and Technology Exposition in National Harbor, Md. The nonprofit AFA is a professional military and aerospace education association that promotes public understanding of the role aerospace plays in the nation's security.

"Sandia is profoundly honored by this recognition and proud of Andy Anderson and his service to our

nation," says Infrastructure Operations Div. 4000 VP Michael Hazen, the executive champion of Sandia's Military Support Committee and himself a lifetime member of the Air Force Association. "We feel privileged to receive such a significant award. It is special both for Col. Anderson and for Sandia, which values our veterans, reservists, and members of the National Guard."

Dan Briand (6811), who was Andy's manager when he was nominated this spring, responded, "Outstanding, and well deserved," when he heard Andy and Sandia had won.

Andy says he was honored to be chosen, but points out it was a joint award Sandia shares.

"It is a tribute to the outstanding support Sandia has provided me, my wife and family, and the many other Sandia military members," he says. "I am pleased that this is an opportunity for Sandia to be recognized nationally for all it does to support our military personnel and their families."

He says he was "hugely appreciative" of his military unit and command that nominated him, and singled out Rick Bacon and Rod Simmons of the Air Force North National Security Emergency Preparedness (NSEP) directorate at Tyndall Air Force Base, Fla. Andy was based at Tyndall but attached to his home state as emergency preparedness liaison officer for New Mexico, coordinating with state officials during disasters to support them with requested Air Force resources.

Bacon, NSEP regional director for the Federal Emergency Management Agency's Region 6, nominated Andy. Bacon, then Andy's military supervisor, says the nomination was "the least I could do, knowing the sacrifices Andy made for his country serving in the military and the support Sandia gave him. Andy is definitely a true patriot, serving both in the military and in



DEPLOYED TO AFGHANISTAN — Sandia's Andy Anderson (6815) poses outside the Afghan Army Logistics Headquarters in Kabul in 2011 during his deployment as a colonel in the Air Force Reserves. Andy, who recently retired from the Reserves, and Sandia have been named the Air Force Reserve 2013 Citizen Airman and Employer of the Year. (Photo courtesy of Andy Anderson)

his civilian position with Sandia, and this award validates Andy's and Sandia's contributions."

Andy's most recent deployment was to Afghanistan for nine months beginning in July 2011 as senior military adviser to the Afghan National Army's general staff. Other deployments include the Persian Gulf in 1991 for Desert Storm and Qatar in 2005-2006 with the 302nd Maintenance Group from Peterson Air Force Base in Colorado Springs, Colo.

Andy and his wife, Ellen (1500), a senior management assistant, were among three Sandians who nominated Sandia last year for the Secretary of Defense Employer Support Freedom Award. Sandia was a finalist in 2012 and 2013 for that award, the highest Department of Defense recognition for employers who support their employees in the National Guard and Reserve.

Integrated Military Systems holds Open House

By Heather Clark

A group of stainless steel and titanium Precision Actuated Non-Electric (PAN) gun barrels sparkle in the sunlight in the Bldg. 962 courtyard as student interns and researchers gather round to ask Eric Bloomquist (5433) about Sandia's work on the bomb disablers.



ATTENDEES at the Integrated Military Systems open house examine a "witness plate," a physical barrier (metal, wood, paper, etc.) used in weapon tests. (Photo by Lloyd Wilson)

Eric says PAN disruptors, developed at Sandia in the 1990s, are now in bomb squads' toolkits across the country. In the past, .50-caliber rifles were used to destroy suspicious packages, but they sometimes ignited the bombs. The PAN disruptors shoot slugs of water or projectiles at suspected bombs, disabling them.

The PAN disruptors were just the tip of the iceberg at the recent Integrated Military Systems' (IMS) Open House. Attendees saw videos and talked to researchers about how IMS supports the warfighter by addressing their most challenging strategic and tactical problems. Attendees learned about saving the lives of the military's Explosive Ordnance Disposal teams, protecting against ballistic missile threats, and holding targets at risk with hypersonic weapons.

"IMS is the place where your imagination can take root," said Director David Keese (5400).

IMS researchers innovate, problem-solve, develop their inventions, build them, validate them in the field, and sometimes train others how to use them, David said.

IMS held the open house to interest students and researchers in its work and to encourage engagement with other organizations across the Labs, says event organizer Danielle Perchert (5403).

Speaking to the audience were Jordan Carnahan (5415) on Missile Defense; Paul Yourick (5430) on Target Defeat; Eric Schindewolf (5420) and George Leuenberger (5425) on Strike Systems; and Vance Behr (5440) on Military Systems.

"I want to talk with you about the diverse nature of the work we do," Vance said. "The iconic symbol out here is rockets and missiles, but there's a lot more that we do."



OPEN HOUSE — Eric Bloomquist (5433) explains Sandia's Precision Actuated Non-Electric (PAN) disruptors to participants in the recent Integrated Military Systems' Open House. Eric says the PAN disruptors like those displayed are now in bomb squads' toolkits nationwide. (Photo by Lloyd Wilson)

Vance said IMS also is about laser applications, military systems analysis, such as the Capability Portfolio Analysis Tool, electromagnetic launch systems, cognitive science that addresses the human dimension of defense, military robotics systems, and sensor exploitation applications, which are helping military analysts extract the trends or patterns in data that provide them with the knowledge they need to do their jobs.

David ended the formal presentation with a thank you to the entire Labs for its support of IMS's work.

"We cannot do what we've seen today without the full engagement of the Labs," he said.