

Sandia*Lab*News

Vol. 68, No. 12

June 24, 2016

East Mountain Sandians pitch in to help during the Dog Head Fire. See page 9.

Photo by Randy Montoya



That's that

I've made my living throughout my adult life by writing, by gathering and coalescing my thoughts into sentences that try to convey my impressions about things that catch my interest, things I care about.

But today I am out of words. Nothing I could write would be equal to the scale of the outrage that was visited upon our fellow citizens in Orlando, mostly young members of the LGBT community targeted specifically for who they were.

I am saddened by the deaths, but sadness alone doesn't seem a satisfactory response. Though sadness, anguish, and grief have their necessary place in the healing process, the principle of proportionality demands more. I admit to feelings of anger and a desire for vengeance, that most unhealthy of emotions.

Can any good come out of such horror as we saw in Orlando? It is no comfort – yet – to those who lost loved ones, those who were wounded in this new front in a long war, but I think the answer is yes. We are reminded that, whatever differences we may have as individuals, those differences are trivial when put against our shared humanity. We are reminded, too, that these individuals were targeted because of their sexual orientation or gender identity, yes, but also because they were Americans. Because, make no mistake, this was an assault upon Americans, upon the very idea of America. This killer rejected every value that we embrace and embraced every value that we despise.

I'm not naive: I understand that in practice we haven't always lived up to our best image of ourselves, but the Orlando outrage focuses the mind and demands of us that we be better, too, that we be worthy to call ourselves Americans.

And what does the attack in Florida mean to us as Sandians? In a message to employees, Labs Director Jill Hruby made it clear: "This is a good time to remind ourselves how important diversity and inclusion are to our success as a laboratory," she wrote. "We rely on people with diverse backgrounds, beliefs, and lifestyles to bring different perspectives to the hardest problems we are asked to solve. As an institution and as individuals, we are united in our commitment to providing the best engineering and science to the nation." Exactly.

* * *

You've seen the stories: There's a robot out there somewhere with your name on it. Or, that is, with the name of your job on it. How many of us, particularly those of us who work in places like Sandia, have shrugged off the alarmist headlines, reassuring ourselves that, come what may, no robot could possibly do my job.

Not so fast, there. To me, it's increasingly clear by the month that there's not much that robots won't be able to do, including walking right up to your desk and helping you pack that box of personal belongings and handing you off to the (robot) security guard for escort off the property.

Get real, you say? Well consider this: This week at an AI lab in Perm, Russia, engineers were trying to teach a robot to teach itself how to avoid obstacles in an enclosed space.

These kinds of experiments have been done before, but in this case, the tests took a novel turn when the human handlers broke for lunch. As they headed off for their midday meal, they left the robot untended; the whole idea, after all, was that the robot should learn by doing. Fine, except on the way out of the test area, the engineers left the gate open. And the robot "escaped," causing quite a ruckus on the streets of Perm until its batteries ran out.

Consider this a cautionary tale. The Russian 'bot may yet be primitive, but it and its kin are getting smarter by the day. And they're literally coming for your job. But not my job.

See you next time.

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

Mark Savage wins high-voltage IEEE Dunbar Award

By Neal Singer



2016 IEEE International Power Modulator and High Voltage Conference
San Francisco, CA - July 5-9, 2016



Awards arrive at different levels of intensity, but no one can deny that Mark Savage of the Pulsed Power Sciences Center (1600) has won the highest voltage prize of all — the IEEE William G. Dunbar Award, for work achieved at extremely high voltage.

Asked why he was selected for the honor, Mark quips, "Maybe it was for 30+ years of high-voltage testing without getting electrocuted."



MARK SAVAGE, recipient of IEEE's Dunbar award.

A broader assessment of Mark's worth was offered by Keith LeChien, director of NNSA's Inertial Confinement Fusion program: "It would be difficult to find someone who has had a greater influence than Mark on the design and improvement of large-scale, high-current, high-voltage accelerators," he wrote in his letter of recommendation for the award.

"It would be difficult to find someone who has had a greater influence than Mark on the design and improvement of large-scale, high-current, high-voltage accelerators."

— Keith LeChien, NNSA

He also used terms like "unparalleled" and "revolutionary" to describe Mark's technical contributions, and that Mark "... sets the example of what it means to be a great pulsed power scientist."

Among other achievements, Mark led the electrical redesign and prototype testing for the \$90 million refurbishment of Sandia's 6-million-volt Z machine, completed in 2007. He also made major electrical design contributions to improve the operation of emerging pulsed power machines like Thor. Externally, he helped improve high-voltage technology at the National Ignition Facility at the Lawrence Livermore National Laboratory and the Megajoule Laser Facility (LMJ) in France. He has authored or coauthored nearly 150 publications and conference proceedings.

Mark holds four patents on devices and diagnostics for pulsed power systems, and his name has appeared on six Defense Programs Awards of Excellence and four Sandia Employee Recognition Awards.

The award recognizes individuals "for continuing contributions to high voltage research, development, or testing technology and for transferring that technology to the engineering and scientific community," according to an announcement accompanying notification of the award.

Mark will receive a plaque and monetary prize on July 7 at the IEEE International Power Modulator and High Voltage Conference in San Francisco.

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<http://www.sandia.gov/LabNews>

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On the cover



Lab News photographer and Sandia corporate photo-journalist Randy Montoya captured this photo of the Dog Head Fire just hours after it started on Tuesday, June 14. In the foreground is the solar tower at the National Solar Thermal Test Facility, operated by Sandia for DOE. At press time, the fire had been raging for more than a week, consuming more than 17,000 acres in the Manzano Mountains east of Albuquerque.

LOCKHEED MARTIN

Battling corrosion to keep solar panels humming



STUDYING CORROSION — Sandia researchers, left to right, Eric Schindelholz, Olga Lavrova, Rob Sorensen (1852), and Erik Spoerke examine points that can corrode on photovoltaic arrays. Sandia researchers collaborate to accelerate corrosion under controlled conditions to help industry develop longer-lasting panels and increase reliability. (Photo by Randy Montoya)

By Sue Major Holmes

People think of corrosion as rust on cars or oxidation that blackens silver, but it also harms critical electronics and connections in solar panels, lowering the amount of electricity produced.

“It’s challenging to predict and even more challenging to design ways to reduce it because it’s highly dependent on material and environmental conditions,” says Eric Schindelholz (1852), a Sandia materials reliability researcher who studies corrosion and how it affects photovoltaic (PV) system performance.

Sandia researchers from different departments accelerate corrosion under controlled conditions and use what they learn to help industry develop longer-lasting panels and increased reliability. Work with Olga Lavrova (6112) of Sandia’s Photovoltaic and Distributed Systems Integration department demonstrated, for the first time, a link between corrosion and the risk of fire in PV systems’ electrical connections due to arc faults. Research with Erik Spoerke (1816) of Sandia’s Electronic, Optical and Nano Materials department focuses on developing new nanocomposite films that could dramatically increase reliability.

“One of our primary goals is to predict how fast corrosion will occur and what damage it does, given certain environments and materials,” Eric says. “This, in turn, gives us information to select the right materials for design or to develop materials for corrosion-resistance for a particular environment. It also allows us to assess the health and operational

(Continued on page 5)

Meet 83 distinguished Sandians



Sandia’s special appointments represent employees from all areas of the Labs’ operations. This year, 83 Sandians have been honored with special appointments, including Randy Montoya (3651), left, Sandia’s distinguished corporate photojournalist. See all the 2016 special appointments on pages 6-7.

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Sandia LabNews



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June 24, 2016

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Sandia researchers discover mechanism for Rift Valley fever virus infection

Virus uses known cancer pathway

By Patti Koning

Viruses can’t live without us — literally. As obligate parasites, viruses need a host cell to survive and grow. Scientists are exploiting this characteristic by developing therapeutics that close off pathways necessary for viral infection, essentially stopping pathogens in their tracks.

Rift Valley fever virus (RVFV) and other members of the bunyavirus family may soon be added to the list of viruses denied access to a human host. Sandia researchers have discovered a mechanism by which RVFV hijacks the host machinery to cause infection. This mechanism offers a new approach toward developing countermeasures against this deadly virus, which in severe human infections causes fatal hepatitis with hemorrhagic fever, encephalitis, and retinal vasculitis.

The results are reported in a paper, “A Genome-Wide RNAi Screen Identifies a Role for Wnt/Beta-Catenin Signaling During Rift Valley Fever Virus Infection,” recently published in

(Continued on page 4)

VIROLOGIST Brooke Harmon led research that found a cellular pathway for Rift Valley fever virus infection, the first step in developing treatment for the highly infectious deadly disease. (Photo by Randy Wong)



10th annual Robot Rodeo Inside . . .

Military and civilian bomb squad teams saddled up their rescue robots at the 10th annual Robot Rodeo, a lively competition that offers first responders some of the best hazardous-device training of the year. See page 8.

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Annual Exercise

More than 200 employees participated in the 2016 Emergency Management full-scale exercise at Sandia/New Mexico. Emergency Management uses the annual event as a self-assessment to verify the effectiveness of its program. See page 12.



A force of nature

Inaugural Walter Bauer scholarship awarded to Livermore students

By Michael Padilla

A scholarship established in memory of former Sandia employee Walter Bauer through the Pedrozzi Foundation has been awarded to two high school students from Livermore. The scholarship honors Walter's leadership in the scientific community and his love of cycling.

Granada High School senior Taylor Lawsen and Livermore High School senior Harry Yee will each be awarded \$1,000

per year for four years. The two scholar athletes received the scholarships at the 2016 Pedrozzi Scholar recognition event on June 2.



WALTER BAUER with his granddaughter. He passed away in 2009.

Lawsen competed on the varsity track and cross country teams, participated in Girl Scouts and the California Scholarship Federation, and earned a 4.24 grade point average. Inspired by her love of learning and literature, she is pursuing a degree in English at Biola University with the goal of becoming a teacher. She plans to continue running and competing.

Yee competed on the varsity water polo and swim teams, participated in the LHS Math and Livermore Yotsukaido Sister City Organization clubs, and earned a 4.4 grade point average. His creativity and critical thinking skills served him well in winning a video game creation competition. He'll continue to use both while pursuing a degree in computer science and electrical engineering at UCLA.

The scholarships are made possible by former colleagues, collaborators, and friends of Walter. They include Jay Davis (Lawrence Livermore National Laboratory), Glenn Kubiak (former 8600 director, now operations/chief operating officer at Lawrence Berkeley National Laboratory), Senior Manager Art Pontau (8360), and retired Div. 8000 VP Rick Stulen. Art, Glenn, and Rick worked with Walter during his career at Sandia/California. Rick remembers Walter as a pure scientist in addition to being a great leader who challenged people to perform their best.

A force of nature and legendary researcher

"Walter was a force of nature and a legend in the Sandia research community," Art says. "A big part of the R&D culture at the site was impacted by Walter's strength of character and commitment throughout his 33-year career at Sandia. He is dearly missed by many of us who had the privilege to work with him."

An avid cyclist, Walter rode more than 10,000 miles a year.

"Walter was a driven bicyclist and his intensity at the lab and on the road was infectious," Art says. "Hard and crusty on the outside, he had a heart of gold. He fought for and demanded quality research and quality of life for staff."

Walter Bauer passed away on April 4, 2009, at the age of 74. Born in Innsbruck, Austria, Walter lived through World War II before moving to the US at the age of 14.

Walter was an early proponent of hydrogen research, which led to the California site creating the Tritium Research Facility and receiving responsibility for gas transfer systems. He was instrumental in pioneering the new field of plasma surface interactions to meet the R&D needs of magnetic fusion energy development and helped found the International Conference on Plasma Surface Interaction.



RECIPIENTS OF THE INAUGURAL Walter Bauer Scholarship Taylor Lawsen and Harry Yee are flanked by scholarship sponsors Jay Davis of Lawrence Livermore National Laboratory, left, and Sandia Senior Manager Art Pontau. Davis and Art are among many friends of Walter Bauer who support the scholarship program in his memory.

Working with DOE and the fusion community, he was an author of the DOE Roadmap for Plasma Materials Interactions in 1978, which is still being followed today.

The Pedrozzi Foundation provides college and vocational scholarships and resources to Livermore students. The Foundation was established by Mario Pedrozzi, a Livermore businessman who left his estate as a gift to the community. Other community members are continuing Pedrozzi's legacy by generously donating to this unique and high-impact community organization.

Rift Valley fever

(Continued from page 3)

the *Journal of Virology*. The work was funded by Sandia's Laboratory Directed Research and Development program.

RVFV uses a cancer pathway

Little is known about the fundamental infection mechanisms and interactions between bunyaviruses and their host cells. Led by virologist Brooke Harmon (8630), the researchers discovered that Wnt signaling is essential for bunyavirus infection.

The Wnt signaling pathway, which regulates critical cell processes such as proliferation and differentiation, is already under heavy investigation by medical researchers because of its association with breast, melanoma, prostate, lung, ovarian, and other cancers and with Type II diabetes. Clinical trials are underway for cancer treatments targeting the Wnt pathway.

"We can take advantage of the work on cancer therapeutics. Inhibitors of this pathway are already being developed for several cancers. As those therapies move through clinical trials, we can apply them to infectious diseases," says Brooke.

Rift Valley a priority pathogen

You may not have heard of RVFV, but it's a familiar threat to anyone working in infectious diseases. The National Institute of Allergy and Infectious Diseases lists RVFV as a category A priority pathogen, meaning it poses the highest risk to national security and public health.

"Rift Valley combines some of the most sinister aspects of

both Ebola and Zika into one virus," Brooke says. "Like Ebola, it can cause hemorrhagic fever and be lethal within days of infection. Like Zika, it's transmitted by mosquitoes, can cause neurological disease in humans, and results in frequent miscarriages and fetal deformities in livestock."

"Rift Valley combines some of the most sinister aspects of both Ebola and Zika into one virus."

— Sandia researcher Brooke Harmon

Today RVFV predominantly affects animals, livestock in particular. Like most viruses transmitted by mosquitos, RVFV circulates predominantly in wild animals but has the potential to spill over into human populations, similar to avian influenza and West Nile virus.

While endemic to Africa, RVFV has spread to the Arabian Peninsula and has the capacity to emerge into further territories. Since the late 1990s, large-scale RVFV outbreaks in eastern and southern Africa, Mauritania, Saudi Arabia, and Yemen have severely affected the health and economy of tens of thousands of humans and infected hundreds of thousands of livestock.

Bunyavirus family uses Wnt

Brooke and Oscar Negrete (8620) began the project about five years ago by using high-throughput RNA interference to screen the entire human genome against RVFV. The researchers looked for genes that were required for virus infection, meaning that the virus cannot infect cells missing that gene.

From that initial screen, conducted at the University of

California, Berkeley, and further screening at Sandia, they narrowed the field down to 381 genes of interest. "When we functionally clustered those genes, we found that the Wnt pathway was the most represented," says Oscar.

To test their hypothesis that the Wnt pathway is critical to RVFV infection, the researchers tested a vaccine strain of the virus. When those results supported their theory, they conducted the same experiments on wild type virus in a Biosafety Level-3 laboratory at Lawrence Livermore National Laboratory.

They expanded the testing to other members of the bunyavirus family like La Crosse virus and California encephalitis virus and found the same results. "This was somewhat unexpected because divergent bunyaviruses typically have their own unique features of infection. The fact that they shared this same pathway is exciting because it indicates Wnt signaling may be necessary to the virus family as a whole," says Oscar.

Getting ahead of the next big outbreak

The next step, says Oscar, is to further investigate the mechanisms of infection. The researchers also plan to look for other mechanisms of RVFV infection using CRISPR, or clustered regularly interspaced short palindromic repeats, which is complementary to RNA interference. This understanding can aid in the design of effective host-directed antiviral therapeutics.

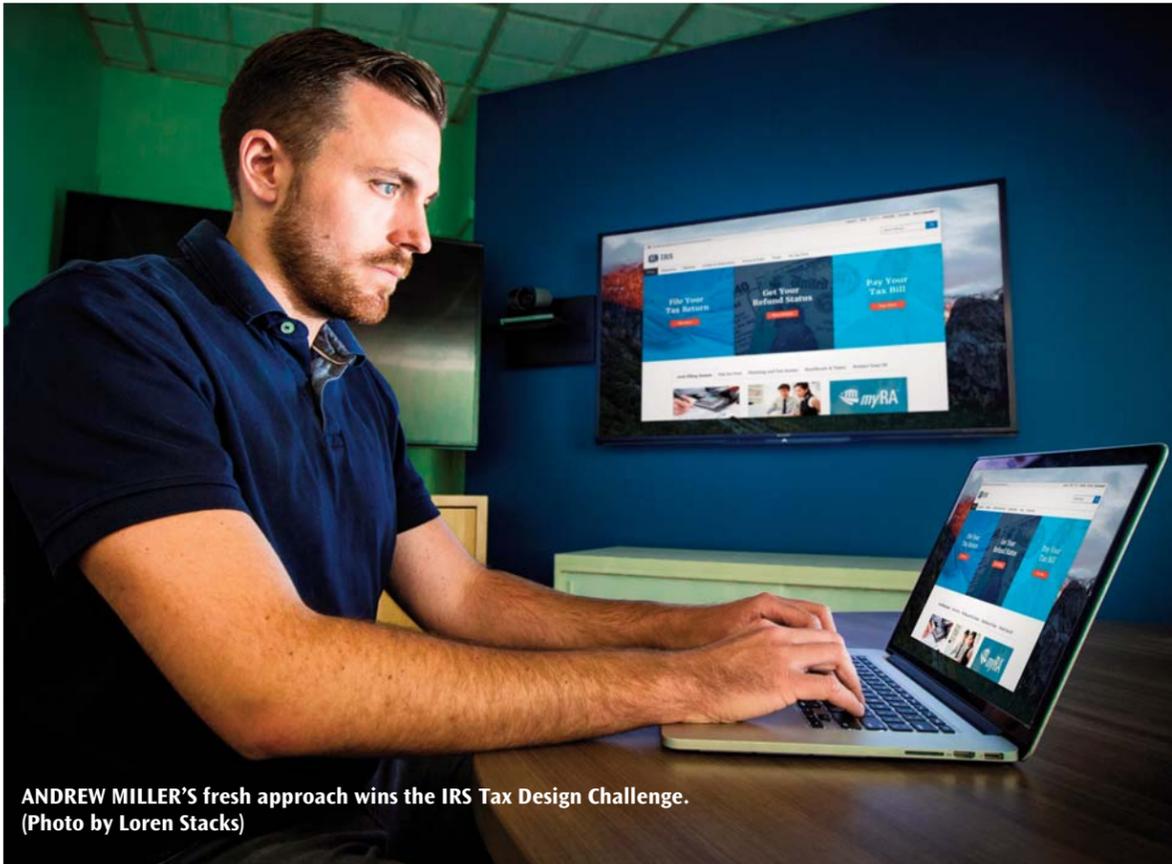
"We keep chasing these viruses. An outbreak like Zika happens and that's when the push begins for a therapeutic. We need to get out in front of the next big one because recent history has taught us that deadly diseases can rapidly spread from animals to humans and beyond endemic zones," says Brooke. "If there is an outbreak of RVFV or another bunyavirus, we hope to already have something in the arsenal."

Sandia *Exceptional service in the national interest*
CaliforniaNews



Meet your friendly neighborhood IRS website

Andrew Miller wins IRS Tax Design Challenge



ANDREW MILLER'S fresh approach wins the IRS Tax Design Challenge.
(Photo by Loren Stacks)

By Michael Padilla

Andrew Miller's (9530) knack for redesigning websites has led him to two first place awards in the 2016 IRS Tax Design Challenge.

Andrew received \$10,000 for best overall design for

his "IRS MyService" page and \$2,000 for being judged as the best design with the "best taxpayer usefulness."

Andrew, a user-interface designer and front-end web developer, designed a web-based dashboard that would allow users to search through their yearly tax history on the IRS website.

Out of 48 design submissions to the challenge, Andrew received the highest combined score in all categories — overall appeal, taxpayer usefulness, financial capability, visual hierarchy, information density, and accessibility.



<http://go.usa.gov/xqKpz>

The goal of this challenge was to reimagine the taxpayer experience and design the taxpayer experience of the future. Andrew took on the challenge in addressing the more than 200 data fields and designed, organized, and presented tax information in a way that makes it easier for taxpayers to manage their taxpayer responsibilities. He also focused on how users could use their own taxpayer data to make informed and effective decisions about their personal finances.

Andrew says he focused on three primary areas when creating the dashboard: transparency, keeping it humble, and keeping it line with national standards. He says he worked on the competition during his free time.

"I wanted the dashboard to be transparent and clear for users," he says. "The main idea was to make it easy to use."

In his free time Andrew serves as the creative director of Model T Digital, a freelance web developing agency. He recently accepted a new position at the United States Digital Service in Washington, D.C.

The grand prize was underwritten by the Mortgage Bankers Association, which also sponsored the challenge.

Corrosion

(Continued from page 1)

risk of systems as they age. This is especially important for solar energy systems, which are susceptible to corrosion but must last for decades."

Corrosion is no small problem. A 2002 study by the National Association of Corrosion Engineers, backed by the Federal Highway Administration, estimated corroding metals in various industries, infrastructure, and manufacturing cost \$276 billion annually.

Researchers simplify complex environmental conditions in labs to study how materials corrode. It's not easy deciding which environmental conditions to reproduce.

"Along the coast of Florida, it's humidity and sea salt in the air. In Albuquerque, we have high ultraviolet [UV] radiation, so UV might be one of the important parameters here. The parameters driving corrosion shift with location and materials," Eric says. "The challenge lies in identifying the important parameters — and then tuning the knobs in the lab to get something that replicates what we see in an outdoor environment."

Eric first studied corrosion as a conservator working to preserve metallic museum artifacts, monuments, and shipwrecks. Eventually he became interested in the fundamentals and causes of corrosion, returned to school for his doctorate, joined Sandia, and began working with Olga and Erik.

Using accelerated aging, forensics to see what's happening

Olga leads projects on the reliability of PV systems, from how aging affects solar cells and components to how everything performs together. Her team currently works with Eric on two projects under the DOE SunShot Initiative, a national effort to make solar energy cost-competitive with other forms of electricity by decade's end.

One project, in collaboration with the Electric Power Research Institute, studies PV modules from different manufacturers to give the makers information on what kind of degradation they might expect over 30 years. That helps manufacturers identify ways to slow it down. Sandia applies accelerated aging principles to speed up studies of slowly

developing effects, including corrosion.

The second project, with Case Western Reserve University, studies corrosion and other degradation from a forensic angle — looking back to see what's already occurred. Olga's team takes a big-data analysis approach to study and analyze information from existing installations worldwide. "Is it 1 percent degradation a year or is it 2 percent? Maybe we'll see some that are a half percent, maybe we'll see some that are 10 percent. Was it a bad original product or was it installed in Costa Rica where the humidity is 80 percent every day?" she says.

"If you build a house, it's not just piling together the drywall and two-by-fours and shingles. You've got to use the two-by-fours to make the frame, set the drywall on the two-by-fours, and assemble the shingles on the roof." — Sandia researcher Erik Spoerke

Inexpensive materials

Erik's team wants to block corrosion altogether. Collaborating with Texas A&M professor Jaime Grunlan, the team is developing nanocomposite films made from inexpensive materials as barriers against water vapor and corrosive gases. The team hopes such composite materials, some 1,000 times thinner than a human hair, will improve ways to protect solar cells from corrosion.

Inorganic components and organic polymers that make up thin films must be designed and mixed carefully. "It's about assembling those structures in the right way so that you can use inexpensive materials and still get the benefits you want," Erik says. "If you build a house, it's not just piling together the drywall and two-by-fours and shingles. You've got to use the two-by-fours to make the frame, set the drywall on the two-by-fours, and assemble the shingles on the roof."

Thin films aren't the sole answer, but "I can envision that a technology like the one that we're developing could be part of a collaborative materials system to help replace glass in next-generation PV applications," he says.

How environmental factors influence corrosion

Sandia has studied corrosion for decades, analyzing the problem in all kinds of systems because anything containing metal is susceptible. Electrical components in solar cells are protected from corrosion by encapsulating polymers, sealants, and glass, but water vapor and corrosive gases can permeate as materials and packaging degrade.

Studying the effects of environmental factors on how materials corrode gives researchers insights into the real world. "By isolating singular environmental parameters under rigorously controlled laboratory conditions, we can deconstruct how these parameters affect corrosion behavior," Eric says. "Understanding the singular effects gives us a basis for understanding corrosion behavior in more complex environments."

Materials, for example, typically corrode faster in the higher temperatures and humidity of tropical coastal regions than they do in coastal Antarctica.

Researchers accelerate these real-world conditions in environmental chambers to examine corrosion of electronics and other PV system components. Accelerated tests artificially speed up the corrosion effects of temperature, humidity, pollutants, and salt water. For example, salt on icy winter roads or near oceans corrodes cars over time. Since automotive manufacturers can't wait decades to see how their products resist that, accelerated laboratory tests might spray salt continuously on a surface to qualify coatings and body materials to ensure they'll be safe and reliable over a product's lifetime.

Engineers use corrosion chambers to study different materials in systems that must meet set corrosion requirements, or to expose an electronic component to the environment to see what happens over time.

"Instead of waiting for 30 years of operation outside under the sun, we bring our PV panels inside to expose them to much higher concentrations of light or put them in thermal chambers to simulate the equivalent of years of temperature cycles," Olga says. Accelerated lifetime experiments show in six months what could happen over decades, she says.

Sandia also studies the mechanisms underlying corrosion. "That's a greater challenge," Eric says. "In atmospheric corrosion we have the chemistry of the atmosphere, the particles landing on surfaces, relative humidity, temperature, and so on. We have to understand the interplay of these factors and their interaction with the metal surface."

83 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 populated with a few exceptional employees who have distinguished themselves in their careers while at Sandia. It is different from the other levels in that it is subject to a 10 percent population limit 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*. Also pictured here are individuals appointed to the very select title of senior scientist/engineer or senior administrator, a unique recognition of professional accomplishment.

Photos by Stephanie Blackwell (New Mexico) and Randy Wong (California)

Senior Scientists/Engineers/Administrators



Mark Ackermann 150
Systems Engineering



Stephen Attaway 1500
Mechanical Engineering



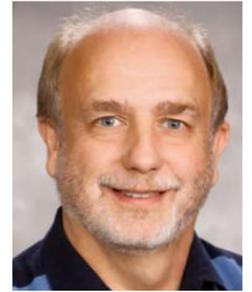
Michael Heroux 1400
Computer Science



Michael H. Johnson 5600
Cybersecurity



Michael Kaneshige 2500
Materials Science



Thomas Kulp 8100
Chemistry



Katherine Simonson 5500
Mathematics



LeRoy Whinnery 8200
Materials Science



Mark N. Allen 8500
Project Manager



Waylon Ferguson 10500
Business Management



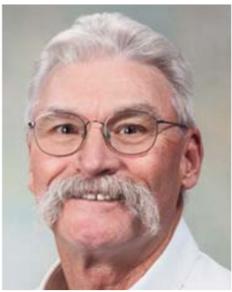
Orgs. 100/400

George Backus 150
Systems Research & Analysis



Philip Huffman 420
Computer Science

Division 1000



Patrick Archer 1740
Microelectronic Equipment Technologist



George Bachand 1130
Materials Science



Patrick Sean Finnegan 1850
Microelectronic Technologist



Thomas Gurrieri 1750
Electronics Engineering



Richard Ivey 1530
Electromechanical Technologist



Peter Andrew Jones 1650
CAD/Drafting Technologist



Becky Loviza 1720
Microelectronic Technologist



Lonnie Martin 1380
Nuc. Reactor Engineer/Operator



Richard Muller 1420
Computer Science



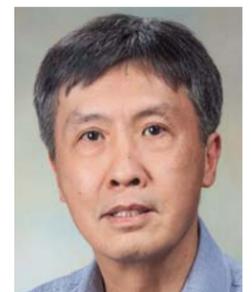
Mark Reece 1830
Laboratory Support Technologist



Joseph A. Romero 1520
Nondestructive Inspection Technologist



Ronald Shaw Sr. 1740
Solutions Architect



Paiboon Tangyunyong 1750
Electrical Engineering



D. Gregory Tipton 1520
Mechanical Engineering



Jack Wise 1640
Physics



Division 2000

Stephen Artho 2550
Electromechanical Technologist



Jay Bennett 2520
Laboratory Support Technologist



Marcia Cooper 2550
Materials Science



Douglas Deming 2240
Systems Engineering



Jeffrey Downs 2720
Industrial Hygienist



Donald Gallup 2620
Cybersecurity



Christopher Garasi 2550
Computer Science



Gregory Guidarelli 2520
Laboratory Support Technologist



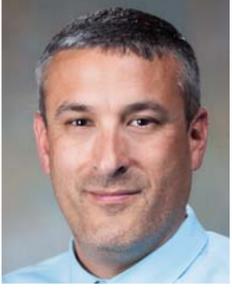
Matthew Kerschen 2120
Electrical Engineering



Paul Lemke 2620
Electronics Technologist



Seethambal Mani 2730
Materials Science



Jack Martinez 2120
Mechanical Engineering



Alex Robinson 2630
Electrical Engineering



Anita Lorio Schreiber 2620
Cybersecurity

Division 2000



Roger Smith 2910
Environment, Safety & Security



Anthony A. Trujillo 2630
Electromechanical Technologist



Divisions 3000 & 4000



Joan Luciano 3500
Strategy Analyst



Debra Menke 3330
Health Educator



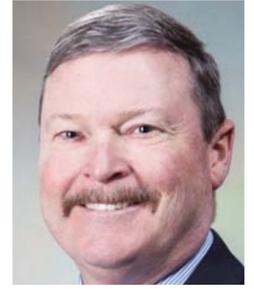
Randy J. Montoya 3650
Corporate Photojournalist



John M. Garcia 4820
Facilities Technologist



Chad Hjorth 4120
Industrial Hygienist



Walter Nickerson 4020
Environment, Safety & Security



Mark Mcnellis 5500
Safety Engineer



Todd Pitts 5770
Electronics Engineering



Divisions 5000 & 6000



Robert Abbott 6910
Geosciences Engineering



Stephen Buerger 6530
Mechanical Engineering



Melissa Finley 6820
Systems Research and Analysis



Vipin Gupta 6120
Physics

Division 8000



DeAnna Agosta 8530
Financial Support



Teresa Antolak 8520
Materials Management Support



Dorian Balch 8240
Materials Science



Kurt Berger 8250
Systems Engineering



Patricia Koning 8520
Corporate Communications



Jeffrey Koplow 8360
Systems Engineering



Todd Lane 8630
Biological Sciences & Engineering



Cheryl Lari 8250
Systems Engineering



Dorrance McLean 8530
ES&H Technologist



Mark Musculus 8360
Mechanical Engineering



Adrienne Phillips 8540
Administrative Support



William Richmond 8940
Information Enterprise Systems Technologist



Tracy Volger 8340
Mechanical Engineering

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Tod Tracy Amon 9520
Computer Science



James Brandt 9320
Computer Science



Steven Feador 9310
Information Enterprise Systems Technologist



Cathy Vortolomei 9510
CAD/Drafting Technologist



Rogulja Wolf 9320
Communications Technologist



Not pictured

- Victor H. Chavez 1130
Laboratory Support Technologist
- Sean Kearney 1510
Mechanical Engineering
- Travis Bauer 5630
Computer Science
- Tammy Towndrow 5780
Manufacturing Operations Technologist
- Kevin Brown 5550
Systems Engineering
- Celeste Drewien 150
Sr. Scientist/Engineer, Systems Research and Analysis



Division 10000



Alicia Cloer 10590
Business Management Professional



Rosemae McKillip 10660
Business Management Professional

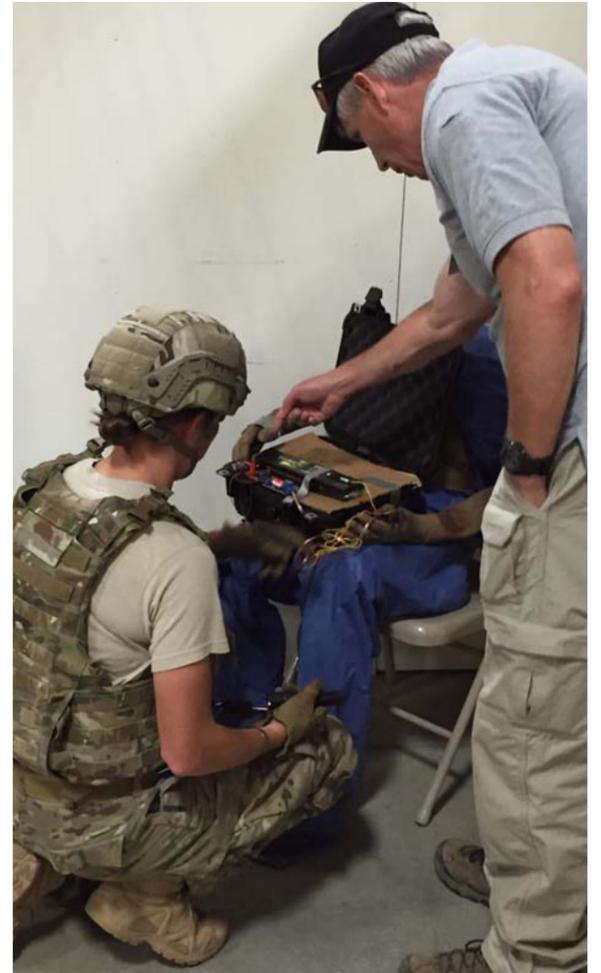


Anne Hennie Rimbart 10220
Procurement Policy Analyst



Laurel Jean Taylor 10610
Business Management Professional

Robot Rodeo



Sandia partners with LANL for 10th annual event

Story by Rebecca Brock • Photos by Jake Deuel

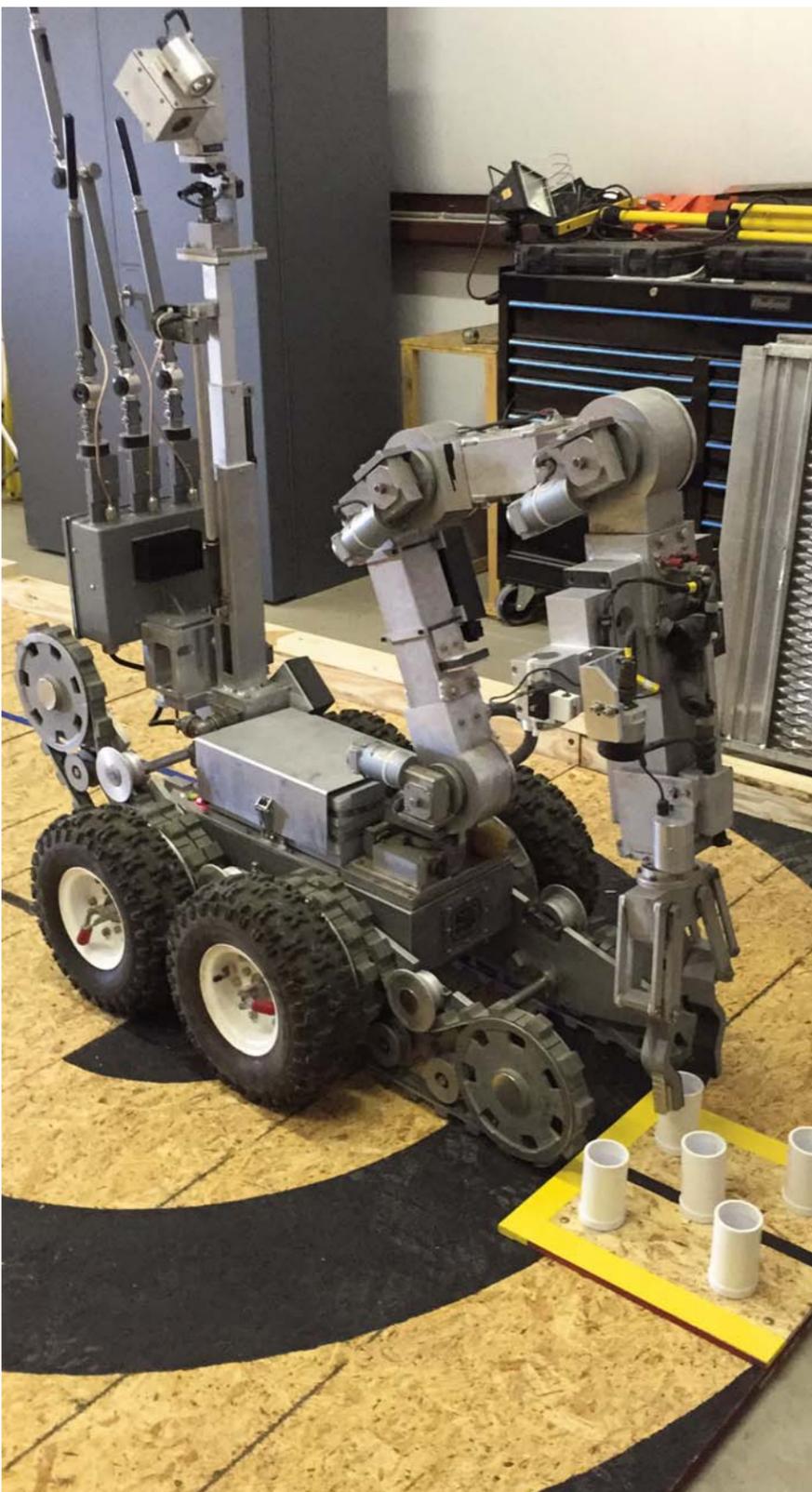
Military and civilian bomb squad teams from across the Southwest saddled up their rescue robots at the 10th annual Robot Rodeo, a lively competition that offers first responders some of the best hazardous-device training of the year. The rodeo was hosted at Los Alamos National Laboratory (LANL) June 14-17 in partnership with robotics researchers from Sandia.

The competition was co-designed by Sandia robotics manager Jake Deuel (6530) and Chris Ory from the emergency response group at LANL. The challenging scenarios are developed to give hazardous-device teams a chance to practice real-world events in a low-risk setting. The simulations included using robots to recover stolen radioactive materials, navigate difficult obstacle courses, operate in con-

finied spaces, and deal with suicide bombers.

Celebrating 10 years of a competition that has grown substantially in popularity, Jake says, "The real value of the Robot Rodeo is to protect and train our local first responders. If we can help make them better robot operators for life-like emergency scenarios, we have done a great service. The rodeo has been a 10-year example of Sandia Labs and Los Alamos National Laboratory working together in an outstanding partnership."

Hazardous-device teams participating in the 2016 Robot Rodeo included Albuquerque Police Department; Doña Ana County Sheriff's Office; Farmington Police Department; Los Alamos Police Department; Military Explosive Ordnance Disposal teams from Kirtland AFB, Holloman AFB, Davis-Monthan AFB, and Fort Carson; New Mexico State Police; and a Southern California Regional Team.



Fire Break

East Mountain Sandians step up to help each other, their community

By Bill Murphy • Photos by East Mountain Sandians

If you happened to look south from Sandia on Tuesday, June 14, around lunchtime, you saw a pillar of smoke rising from the Manzano Mountains. It wasn't a big column; your first thought, given the angles and perspective, was that you were looking at the results of some sort of burn test in Coyote Canyon.

But the column didn't disperse; as the afternoon wore on, it grew bigger and angrier and more ominous, and you knew — this was no Sandia test, this was a full-blown forest fire and a lot farther away than you first thought. You were seeing the birthing moments of what became the Dog Head Fire.

As the inferno grew, the email activity on the Sandia East Mountain Commuters distribution list started heating up, too. The distribution list was created years ago as a grassroots initiative where Sandians who live on the East Side keep each other posted about weather conditions, traffic backups, and emergency situations — like forest fires.



BRIAN PRUETT got this picture of the Dog Head Fire while flying home from a business trip on June 16.

The Dog Head Fire, which has been determined to be human-caused, broke out during what could be considered “perfect storm” conditions: high winds, record-breaking temperatures, and Atacama-level humidity. Once it sank its fiery teeth into the tinder-dry trees in the Manzano Mountains, this pit bull of a fire wouldn't let go.

Bringing out the best in Sandians

Dog Head grew through a day and night, another day and night, and another: an unstoppable force. On Wednesday, the day after the fire started, New Mexico Gov. Susana Martinez declared a state of emergency and officials began ordering mandatory evacuations from communities centered around Chilili. That order affected a number of Sandians, who grabbed ready bags and whatever other belongings they could and headed for emergency shelters, the homes of friends, or motels in town.

The fire emergency brought out the best in Sandians, who kept in touch via the East Mountain Commuters email



EX-FIREFIGHTER Dave Fuller was ready for the worst, preparing his property for potential burnover by removing as much combustible ground cover as possible. (Photo by Dave Fuller)

distribution list.

Several offered to take in families forced to flee; others said they had stables, corrals, and pastures to take in livestock. Many heeded the call to donate items for the emergency shelters, collecting coloring books, blankets, and toys for kids and toiletries for the grown-ups. Still others stayed behind in the evacuation zone to fight to save their own homes and the homes of friends and neighbors. Equipped with chainsaws, axes, picks, hoes, and tractors, they raced against the clock and the volatile conditions to build firebreaks around critical properties.

'They would do the same for us'

John Ball was typical of many who stepped up. He wrote in an email to the *Lab News*: “Out of an abundance of caution, we helped a couple from our church pack up and get out; they have been staying with us since Thursday.”

Cheryl Atkins opened her home to a fellow Sandian and his family. “Friends of ours — one is a Sandian — found out late on the evening of Wednesday, June 15, that their home was in danger due to the fire and that they needed to evacuate. We are fortunate that being empty-nesters we had room for their entire family. We were more than happy to open our home to them and it has been great to have them with us. They would do the same for us,” she says.

The Dog Head Fire brought up difficult memories for Richard Barrett. He lost his home, his entire neighborhood, in



Photo by Deborah Jensen June 14



Photo by Michael Tachias June 16

the Cerro Grande fire in Los Alamos in 2000. Richard offered the East Mountain Commuters a unique perspective. After sharing some helpful and thoughtful advice about what to save and what to leave behind, he concluded, “A wildfire is in reality beyond anyone's control, so it's only an attempt by some brave people to try manage it. And believe it or not, although we wish it on no one, losing our home turned out to be one of our most valued life experiences, in spite of loving our home and neighborhood. It was a special opportunity to discover what you truly value, and who your true friends are.”

'Bugging out'

Not everyone in a crisis is a friend. Lisa Snyder was surprised to see a National Guard Humvee pull up to her house, asking her to keep an eye out for looters. As is always the unfortunate case in natural disasters, the problem of looting was a concern in evacuated areas. John Reynolds took the looting warning seriously. After loading up a trailer with some 60 fowl of all kinds along with other personal property, John left a note on his door that read: “Bugging out, 6/16 at 12:30 p.m. Smile, because you're on camera!”

Sandians, even those who aren't East Siders, lived up to the Labs' reputation and heritage of supporting the community in a time of need. Mary Chavez, who lives on the East Side, says, “I sent out a late afternoon request to the

folks in our department [2981] last Thursday [June 16] around 3 p.m. for any help with donations or items I had heard were needed. Within one hour — again, at the end of the day — I had \$150 plus my own contribution, and delivered a car full of drinks and snacks to Los Vecinos [the emergency shelter in Tijeras].”

Sandia management was on top of the situation, with contingency plans in place should the fire crest the Manzanos and race onto Sandia property. Workers in remote locations of the Labs were sent a to-do checklist to minimize the impact any fire might have on personnel, operations, and facilities. And managers across the Laboratories were asked to check on the status of employees who reside on the

East Side to ensure that they were safe.

'They know what they're doing'

For responders, the fight was relentless, remorseless. Sandian Jeff Young was particularly impressed with the caliber of people risking their lives to tame the fires. Echoing comments made by many Sandians, Jeff wrote, “I have been to all three of the information meetings in Tijeras. Honestly, the Southwest Coordination Center (SWCC) that

oversees and manages the fire is absolutely awesome.” [The SWCC is a collaborative effort among the US Forest Service, the US Bureau of Land Management, US Fish and Wildlife, and other state and federal agencies.]

“The firefighters and those who manage it are totally on top of it, very knowledgeable, and amazing,” Jeff added. “It is unbelievable how hard they are working. They know exactly what they are doing.”



JOHN REYNOLDS loaded his trailer with 60 fowl of all kinds. Before driving off, he left a sign on his door: “Smile, because you're on camera!” (Photo by John Reynolds)



Photo by Lynda Snyder June 16

Mileposts



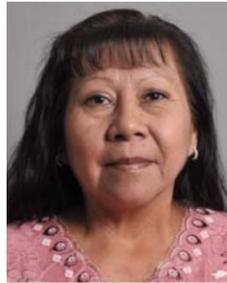
New Mexico photos by Michelle Fleming
California photos by Randy Wong



Ken Lee
40 8231



Lucille Forster
35 9517



Carmela Gallegos
35 10653



Karen Krafcik
35 8344



David Goy
30 2723



David Sawayda
30 2956



Ricardo Del La Rosa
25 4843



Carol Marable
20 10513



Julio Marchiondo Jr.
20 2634



Tedd Rohwer
20 250



Mark Cannell
15 2626



Paul Crozier
15 1541



Jeff Dabling
15 2614



Chris DiAntonio
15 2734



Liz Encinias
15 10511



John Fulton
15 6232



Cedric Hawkins
15 9344



Russell Hooper
15 1446



Tameka Huff
15 9545



Janice Leach
15 6835



Jennifer Long
15 6931



Alfred Lorber
15 5531



Steve Moya
15 2153



Larry Musson
15 1355



David Peters
15 1765



Yvonne Petrova
15 10504



Jerry Smith
15 9329



Joshua Stein
15 6112



Doug Thompson
15 5342



Pamela Ann Ulibarri
15 10264

Mileposts



New Mexico photos by Michelle Fleming
California photos by Randy Wong

Women in STEM+A unite at UNM's international program

By Rebecca Brock

Women engineers from Sandia shared their passion and real-life experiences with undergraduate women studying science, technology, engineering, math, and architecture (STEM+A) as part of a new program hosted by the University of the New Mexico. The Innovation Academy for Women of the Americas offered more than 20 students from both Mexico and UNM the opportunity to grow their research and leadership skills, and to network with women leaders in established STEM+A careers. The month-long program encourages the academic advancement of underrepresented minority women in the Americas into STEM+A careers.

Sandia engineer Sandra Begay (6121) hosted the undergraduates on a tour of the renewable energy facilities at Isleta Pueblo (see photo at right). At the pueblo's government building, Sandra offered insight into the challenges, benefits, and cultural implications of fitting solar installation systems on native land.

Blanca Sofia Cervantes, an engineering student from Torreon Coahuila, Mexico, says she was encouraged by spending a day with an accomplished Native American woman engineer. "Sandra is a role model for us. I am passionate about renewable energy and this experience will help me decide my future and not limit my views. Renewable energy is a brand new major at my university and I hope to bring knowledge back to my school," she says.

Fernanda Salazar, a chemical engineering student from Mexico City, says, "The major benefit of this program is that it is helping us build a strong network of



women engineers."

Sandia President and Labs Director Jill Hruby gave the keynote address to the students at the program's inaugural event on June 7 at UNM's School of Architecture and Planning. Encouraging the women to embrace the challenges ahead, Jill said, "STEM+A allows you to reach for the skies, for something bigger than yourself in your career. You can make the world a better place."

Innovation Academy co-founder Danielle Gilliam from UNM's Global Education Office says, "By meeting inspirational women from Sandia such as Jill Hruby and Sandra Begay, these undergraduates have learned what it will take to go on their journey. We see it as opening doors."

SANDIA CLASSIFIED ADS

MISCELLANEOUS

- REFRIGERATOR, 1950s, GE, w/separate freezer, perfect for man-cave, or authentic mid-century look. Trujillo, 268-0144, ask for Jim.
- TENNIS BALLS, clean, 5/\$1; golf balls, clean, 7/\$1. Murphy, 797-8779.
- THICKNESS PLANNER, w/folding stand, Porter-Cable; Wixey digital depth gauge; all excellent condition, \$200/all. Suppona, 899-8459.
- OFFICE DESK, Thomasville British Gentry, dark oak, pecan burl top, 36" x 72" x 30", \$1,200 OBO; office chair, red leather, casters, \$100 OBO; photos available. Dawson, 281-1235.
- GOLF CLUBS: ladies, full set, Judy Rankin, Northwestern, bag, pull-cart, \$100; men's, full set, Palmer, RH, bag, pull-cart, \$140 OBO. Summerlin, 275-3703.
- FLOWER POTS, various sizes, plastic & ceramic, free; 2-seat swing set, dark green metal & décor, unassembled, w/all parts, \$100. Lewis, 505-323-7268.
- RV CAMPING ITEMS, lounge & folding chairs; 5-gal. gas cans, 2, \$10 ea.; 7-gal. plastic water can, \$15; natural gas extension hose, \$20; more. Garcia, 554-2690.
- DLP TV, Mitsubishi, 92-in., WD-92842, low lamp hours, compare at <http://www.ebay.com/bhp/mitsubishi-dlp-tv>, \$999 OBO. Lujan, 299-2218.
- TREADMILL, AFG 7.1AT, heavy-duty, gym quality for serious runners, <http://pulse.treadmill.com/reviews/afg-7.1at/>, \$900. Dempsey, 505-221-6698.
- DUMBBELLS, TSA brand, solid metal: 2, 45-lb., \$75; 2, 35-lb., \$55; \$120/all. Babilonia, 505-554-4420.
- TIRES, 4, 31x10.50R15, mounted on 6-bolt steel wheels, aggressive tread w/minimal wear, \$250. Manko, 505-835-1213.
- CEDAR CHEST, nice, old, \$125; hand-capped walker, like new, \$35; old hard suitcases, cheap. Marchi, 265-6211.
- ARTIFICIAL CHRISTMAS TREE, 7-ft., slender balsam fir, new-in-box, \$25. Steiner, 401-8114.
- CORNER COMPUTER DESK, w/built-in file cabinet, cherry finish, photos available, \$75. Elmazi, 505-856-2197.
- GLASS TERRARIUM, Exo Terra, for reptiles/amphibians, 18" x 18" x 12", low/double door, like new, \$60. Willis, 505-440-9703, ask for Becky.
- SECTIONAL SOFA, tan colored, call for photo, \$1,000 OBO. Gonzales, 505-864-9809.
- CHIPPER/SHREDDER, Kemp, 5-hp. Engine, takes limbs up to 3-in., \$500 OBO. Mozley, 884-3453.
- CAMERA LENS, Canon 500 mm f/4 vll, 1.4xIII, 2.0xIII, w/lens coat, hoodie & Arca foot, \$8,500/set. Palavicini, 954-540-2896.
- ARMOIRE & HUTCH, dark cherry finish, \$600/both. Hennessey, 505-269-6243.
- CLAW-FOOT TUBS, steel, 2, both in great working condition, you pick up, \$7,000 ea. OBO. Carmona, 505-610-4273.
- FABULOUS FABRICS, 60"W x 2-4 yrd. panels, sewing notions (tape, elastic, etc.), \$60/all or make offer on selections; portable sewing machine, \$80. Joseph, 822-0536 or 480-521-4989, after 7 p.m.
- ADMIRAL WASHER, older model, works great, \$40; heavy-duty large wheelbarrow, \$40. Vigil, 575-386-6377.
- WASHER & ELECTRIC DRYER, GE, older set, works great, asking \$250. Shaffer, 505-554-4723, call or text.
- SOFA & LOVE SEAT, La-Z-Boy, beautiful, gold tones, almost new, Bosque Farms, excellent condition, \$650 OBO. Rutten, 869-6381, ask for Elaine or Johan.
- DOUBLE BATHROOM VANITY & SINK, white cabinet, warm white marble top, brand new, \$800 OBO. Low, 379-0441.
- QUEEN MATTRESS, & frame, \$100; off-white sofa & chairs, \$300; outdoor chair & table set, \$100. Greene, 802-578-2056.
- BASSINET, white, w/mobile & sound machine, great condition, \$40. Marquez, 401-6525.
- ROB GONSALVES ARTWORK, 'Chess Master' framed, 32" x 40", 14/200, <http://incredibleartgallery.com/product/the-chess-master-limited-edition/>, gallery price, ~\$1,900, asking \$900. Harkins, 702-467-5678.
- GUN SAFE, 2001 Liberty LT-23, 60"H x 32"W x 23"D, 20-min. fire rating, excellent condition, delivery not included, \$800. Sandoval, 505-480-9116.
- KNEE SCOOTER, AdirMed 901, 1-mo.-old, yellow, w/basket & knee pad, \$99. Prior, 239-9586.
- PATIO FURNITURE: 4 high-back swivel/rock chairs, lounge, dove grey/white flower pattern, 48-in. glass table, new winter covers, like new, \$450 OBO/set. Hagerman, 505-401-1402.

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.

END TABLE, w/magazine compartment, Ethan Allen, unique, vintage, solid construction, dark stain, cool find, \$100. Thomas, 505-977-6880.

DRUMSET, Ludwig Accent CS, primo condition, Sabian cymbals, hard-shell cases, nylon cymbal/hardware cases, foldable stool, \$600 OBO. Powell, 919-368-2626.

VINTAGE BARBER'S CHAIRS, 2, circa 1940, 1 is a Koken, both in good condition. Rivers, 720-4701.

EXTENSION LADDER, aluminum, 28-ft., type III, 200-lb. rating, excellent condition, \$80. Dockerty, 828-0745.

COFFEE TABLE, black, wrought iron, \$350; matching end table, \$250; both w/brown granite tops. Drebing, 293-3335.

GAS STOVE, Kenmore, excellent condition; microwave, Frigidaire, over-the-stove type, excellent condition; \$325/both. Montoya, 505-342-0043.

LIGHTING FIXTURES: 2, 8-ft. fluorescent, w/4 bulbs, \$40; 1 ceiling, \$5; 4 exterior, black, \$40; all OBO, email for photos. Harvey, 242-1619, mah0mdk@aol.com.

WALL BED, Bergman, full size, birch, almost new, you haul, \$990. Murphy, 891-0288.

TRANSPORTATION

'15 CHRYSLER 200, 24K miles, \$15,000. Calzada, 505-366-4777.

'05 LEXUS ES330, 139K miles, runs great, excellent condition, \$7,500 OBO. Vigil, 505-553-9596.

'08 PRIUS, extras, white, service records, original owner, clean, 61K miles, well below book, \$7,995. Caskey, 291-3445

'09 HYUNDAI SANTA FE GLS, 4-dr., hatchback, AC, 118K miles, good cond., \$5,900 OBO. Ruelas, 379-6548.

'11 AUDI A4, w/Quattro AWD, 62K miles, original owner, excellent, \$17,500. Maschoff, 897-0605.

RECREATION

YOUTH MOUNTAIN BIKE, Diamond Back Octane 24, red, good shape, brakes need work, \$75 OBO. Eanes, 505-459-3933.

'07 PIAGGIO/VESPA BV250 SCOOTER, 244 cc, 16-in. tires, 68-mpg, 7.2K miles, great for highway, excellent condition, \$2,150. Colborg, 604-4915.

'07 TRIUMPH BONNEVILLE T100, 30K miles, runs perfect, \$4,250. Schanning, 328-2320, ask for Don.

'06 KYMCO PEOPLE 150 SCOOTER, windshield, Givi top box, owner's & service manuals, excellent condition, \$1,400. Harrison, 505-897-0658.

'10 CARBON FELT F5, barely ridden, Shimano 105 group, SPD, Cateye computer, 54 cm, \$750. Kunstadt, 505-270-3707.

'97 SCAMP TRAVEL TRAILER, 16-ft., new refrigerator, water heater, AC furnace, microwave, TV, refinished interior, extras, excellent condition, \$11,500. Kercheval, 505-266-5833.

'09 KAWASAKI KLR650, 21K miles, mechanically good, some cosmetic defects, \$2,800. Starbuck, 274-1191.

'00 WANDERER 5TH WHEEL TR, w/modified towing for truck, sleeps 6, excellent condition, \$9,850. Vega, 505-275-7146.

'05 SPRINGDALE KEYSTONE TRAVEL TRAILER, 28-ft., sleeps 7, flat screen TV, excellent condition, \$10,499. Polachek, 270-6525.

SUNFISH SAILBOAT, w/trailer, sail, rigging, tiller, centerboard, good condition, call for photos. Roberts, 275-2941.

GIRL'S BIKE, pink, Trek Mystic, 20-in., great for ages 7-10, needs tubes, photos available, \$60 OBO. Czuchler, 359-8241.

'10 JAYCO JAY FLIGHT TRAVEL TRAILER, G2 32BHDS, great condition, well maintained, sleeps 9, \$23,000. Pope, 505-228-9610.

'15 ARCTIC CAT 500 ATV, new, call for photos, in Bayfield CO, \$6,200 OBO. O'Hare, 970-759-8993 or 970-799-1631.

REAL ESTATE

1.6 ACRE VIEW LOT, Petroglyph Trails, Placitas, community well, call for details. Leonard, 502-905-1677, ask for Michele.

4-BDR. HOME, 4-car garage, refrigerated air, many upgrades, move-in ready, 5 mins. to Sandia, \$199,999. Rogulich, 459-6241.

WANTED

ROOMMATE, share 3-bdr. home, 2 baths, w/2 people, 2 cats, beginning in July, \$350/mo. without utilities. Pruitt, 505-385-4094.

ROOMMATE, nonsmoking, near Copper & Juan Tabo, small dog on site, call w/questions. Galbraith, 505-269-2889.

MAGIC THE GATHERING PLAYERS, for local Friday Night Magic or old unwanted card collections. Horowitz, 505-750-3781, Abqttechguy@gmail.com.

WORK WANTED

HOUSE SITTER, >3 yrs. experience while attending college, references available. Montanez, 916-806-2760, fmontane@unm.edu.

Sandia microwave imaging expert Armin Doerry honored as SPIE Fellow for radar work

By Heather Clark



ARMIN DOERRY

SPIE honored Armin Doerry (5349) for his technical achievements in imaging microwave radar technology development, design, and analysis. Armin is one of 32 new Fellows honored this year by SPIE, an international society for optics and photonics established in 1955 as the Society for Photo-Optical Instrumentation Engineers.

Armin's work — conducted with many teams over his 29 years at the Labs and with industry and academic partners — has produced radar systems that today are finding military targets, gathering intelligence, helping with maritime search and rescue, and protecting borders.

"I'm very gratified for the recognition that the larger radar community has given me," Armin says.

Synthetic Aperture Radar improvements grow out of early research

Armin's Sandia career coincides with radar projects that cover much of the growth of synthetic aperture radar. SAR was first developed in the 1950s and Sandia has been at the leading edge in this technology since at least the 1980s, undertaking a variety of research and development projects that lowered costs and decreased weight, while increasing SAR's effectiveness.

An early project called Foliage Penetrating Synthetic Aperture Radar (FOPEN SAR) was the first airborne ultra-wideband, low-frequency radar of its type to perform with nearly three octaves of bandwidth that could see through trees with unprecedented resolution.

Though Sandia's FOPEN radar was never operationally fielded, the research and development on the performance of wideband systems enabled Sandia to more quickly address similar problems and improve performance in subsequent radar systems, he says.

Armin also brought his math and systems analysis skills to teams that developed the first real-time, 10-centimeter resolution MiniSAR and the high-

performance Lynx SAR system.

"If you need a radar math problem solved, that's the part I like to work," he says.

Technologies combined for MiniSAR

From 2000-2006, the Sandia team combined several technologies together for MiniSAR to reduce the size, weight, and volume of high-performance radar systems.

The team's MiniSAR research was instrumental in a variety of radar applications, like a highly modified MiniSAR that has been detecting improvised explosive devices in Afghanistan since 2009 and is now used by the US Army.

Sandia's efforts decreased the size and cost of the systems, allowed them to fly on unmanned aerial systems, and allowed engineers to add more features, such as adding two radar receiver channels in the same system, Armin says.

"With two channels, I can now detect and track individual people rather than just fast-moving cars," he says. "Every time we add a dimension to the data, it's like giving the viewer a second eye. The user can discriminate and tell things apart that formerly they were not able to see. Before, radar echoes of people might have blended in with the surroundings. Now, we have an ability to separate them by this additional measurement." In another configuration, for example, now we might start seeing depth rather than just a flat world.

Armin was on the original development team for the Lynx SAR system and has watched and assisted over the years as Lynx has added tools so it can be applied to more missions. Working with industrial and military partners, researchers improved Lynx's performance for moving targets and added new modes. An example is a maritime mode used in search and rescue missions over the Mediterranean Sea.

Armin holds a doctorate in electrical engineering from the University of New Mexico (UNM), a bachelor's from the University of Kansas, and a master's from Stanford University in the same field. He has 20 patents, 19 of them in radar, and has authored 56 publications in SPIE journals and proceedings.

In addition to working at the Labs, Armin taught as an adjunct professor at UNM for five years and volunteers with universities and small businesses to advise on technical issues. Since 2008, he has been chairman of SPIE's Radar Sensor Technology Conference and a committee member and session chairman for this and other SPIE conferences for 10 years.

Annual Exercise

Story by Lindsey Kibler

Photos by Randy Montoya

More than 200 employees from across the Labs participated June 15 in the 2016 Emergency Management full-scale exercise at Sandia/New Mexico. Emergency Management uses the annual event as a self-assessment to verify the effectiveness of its program in accordance with the site's plans and procedures and the DOE order covering the comprehensive emergency management system. This year, two NNSA site field offices and emergency management personnel from Pantex, Oakridge, and Central New Mexico Community College observed and evaluated the Labs' response efforts.

The exercise began on a seemingly typical work day at the Hazardous Waste Handling Unit Facility (Bldgs. 958/959) that soon turned grave. In the scenario, a forklift driver handling four 55-gallon drums of sulfuric acid was negotiating a loading ramp when he realized a bee was in the forklift. Being deathly allergic to bee stings, he immediately jerked the wheel in panic. The forklift and its contents flipped off the ramp and onto a pallet of potassium cyanide that was waiting to be loaded. A coworker attempted to extract the driver, who sustained a hand injury and contamination. The coworker was subsequently contaminated and both required immediate assistance.

Emergency response teams were dispatched the area to assess the casualties. The patients were triaged, decontaminated, and "sent" to an area hospital for additional care. After ensuring the safety of the workforce, responders resolved the incident and the exercise ended successfully.

