

Supermoon



THE NOV. 14 SUPERMOON peeks over the top of the tower at Sandia's National Solar Thermal Test Facility. As the moon rose, the facility's mirrors reflected an eerie glow. For another photo of the supermoon, check out page 12.
(Photo by Randy Montoya)

2016
**R&D
100**

See page 5

Exceptional service in the national interest

Sandia **LabNews**



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Since 1949

Managed by Sandia Corporation for the National Nuclear Security Administration

Sandia wins 6 R&D 100 awards

... and two 'special recognitions' in 'Oscars of Invention'

Detecting composite material damage

Sandia offers first class to aircraft industry to improve inspection of solid-laminates

By Heather Clark

As manufacturers build more wings, fuselages, and other major parts of commercial aircraft parts out of solid-laminate composite materials, Sandia has shown that aircraft inspectors need training to better detect damage in these structures.

So the Airworthiness Assurance Center — operated by Sandia for the Federal Aviation Administration (FAA) for the past 26 years — has developed the first course to train inspectors in the airline and aircraft manufacturing industries nondestructive inspection techniques (NDI) for solid-laminate composite materials.

The course was first presented this summer at Delta Air Lines in Atlanta, Georgia, to 35 engineers and inspectors from six countries. The FAA sponsored development of the course, which is now available to private industry.

"We're trying to improve the proficiency of these inspectors so that they're better able to detect damage in composite structures," says Dennis Roach, a senior scientist in the Transportation, Safeguards & Surety Pro-

(Continued on page 4)



STEPHEN NEIDIGK (6626), center, a principal developer of the Composite NDI Training Class, teaches inspectors in the course at Delta Air Lines in Atlanta this summer. (Photo courtesy of Sandia National Laboratories)



SUPPORTING our veterans. Photos, story on page 7.



Sandia Postdoctoral Development

POSTDOCS showcase their best work. Story on page 11.

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JILL HRUBY wins DOD Secretary's award. Story on page 3.



ADMIN PROS find the superhero within. Story on page 9.

That's that

Just when election fatigue threatened to overwhelm us, it was over. After being assaulted – that's probably too strong a word, but only just – by dozens, scores, hundreds of robocalls over the past several months, our landline suddenly became eerily silent. The last little bleeps were almost pathetic: "It's 6:57 p.m. You still have three minutes to get to your polling place." And then . . . nothing.

The political battles over the next few months are not likely to be pretty – "Politics ain't beanbag," as someone once said – but it is my hope and expectation that given the essential nature of our mission, even as storms brew in Washington, we'll be able to focus on our work on behalf of the nation.

Since our inception in 1949, we have worked under 12 administrations, both Republican and Democrat. While the political parties have been divided on many issues over the years, there has been a consistent and bipartisan recognition that the work we do must go on. I don't expect that to change.

With a new administration coming in, we are going to see a lot of new faces in our parent organizations at DOE and NNSA. I think we owe our outgoing colleagues and associates at HQ a round of thanks for their support. They have fought the good fight for us in one of the world's toughest arenas – US Congress – and championed our cause and made our case with patience, eloquence, and passion. As a new team of leaders moves in to fill those critical roles in D.C., they'll be facing a steep learning curve. Getting a handle on anything as complex as the nation's nuclear weapons enterprise is a daunting task. Our new leaders will be counting on us to help them help us, aiding them in understanding not only what we need but why we need it. Most of the back-and-forth with our new leaders will occur at the highest levels, between our senior management and their counterparts in Washington. But all of us who interact with folks at DOE and NNSA will have a part to play. The tenor of our relationships will be established very early on; let's make sure we get off on the right foot with each other.

* * *

Speaking of interacting with our new management, a colleague sent around a link to a tool that might just be useful for us. The *Wall Street Journal*, which is considered something like the bible of American business, has published a business buzzword generator app (goo.gl/55t9mw) that spews out random sentences of biz-speak gobbledegook. Don't get me wrong; I'm not suggesting we use the tool to get tips on what to say. As in the old TV game show, when making an impression on our new HQ partners, it's not always what we say that counts, but what we don't say. This tool provides a pretty good guide to words we really should avoid at all costs. Want a few examples?

- Going forward the marketplace has changed. Gamify organically and disrupt holistically, or circle back.

- Our content marketing center is focused on new ways to recontextualize the consumer space.

- This sector has authentic corporate social responsibility. Skate to where the puck is going to be.

- Do your best to curate our sustainability footprint.

There's plenty more where these came from. What's scary to me about this stuff is that I actually understand some of it. And scary, too, that I'm not always sure which are the buzzwords.

* * *

I've mentioned here before that I have a son and future daughter-in-law in New Zealand. Two weeks ago the island nation was hit with a 7.8 magnitude earthquake, followed by a lot of aftershocks in the 6+ range. My son lives right on the ocean. With the potential for a major tsunami, he got an evacuation notice in the middle of the night. He was ready to go; you learn early on in New Zealand to have a bug-out bag right by the door. From the other side of the world, Jim kept us posted in real time via text message as the aftershocks bounced his car up and down. It was a tough day for us as parents: We were grateful for the technology that allowed us to know he was still okay. At the same time, it was an emotional roller coaster to be monitoring this literally deadly event as it played out over the course of several hours.

What a difference from when I was a young man. The only time my parents ever heard from me was when I needed money. In fact, that's where I really started to learn to write creatively.

See you next time.

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

American Physical Society elects four Sandia researchers as Fellows

By Neal Singer

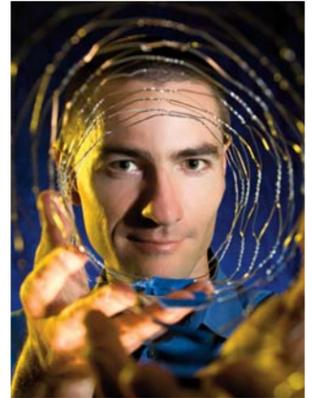
Four Sandia National Laboratories researchers have been named fellows of the American Physical Society for outstanding contributions in physics. The awardees, and the APS sub-groups that nominated them, are:

- **François**

Léonard: for fundamental studies of the physics of nanoscale electronic devices, by the Forum on Industrial and Applied Physics.

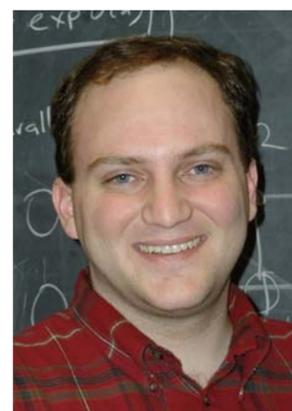
- **Andrew**

Landahl: for outstanding leadership and conscientious service to the quantum information community and pioneering



FRANCOIS LEONARD

contributions to quantum computing theory, including



ANDREW LANDAHL

fault-tolerant quantum computing, quantum error correction, universal adiabatic quantum computing, and novel quantum search algorithms, by the Topical Group on Quantum Information.

- **Hongyou Fan:**

for pioneering contributions to the development of novel synthesis methods and self-

Four Fellows

assembly processes to fabricate nanostructured materials for nanoelectronic and nanophotonic applications, by the Division of Materials Physics.

- **Igal Brener:**

for contributions to optical phenomena in semiconductors, including their coupling to metasurfaces for passive, tunable, and nonlinear metamaterials, and coherent terahertz phenomena and instrumentation, by the Division of Laser Science.



HONGYOU FAN

The number of APS fellows elected each year is



IGAL BRENER

limited to no more than one-half of 1 percent of the membership.

Said NNSA administrator Lt. Gen. Frank Klotz (Ret.), "It takes extraordinary innovation and expertise to successfully carry out the missions of the nuclear security enterprise. Recognition of ... NNSA researchers as APS fellows affirms

that our labs are important and attractive places for top science talent. We commend these individuals on their pioneering research and making the world a safer place."

In the decentralized system favored by APS, fellowship certificates are generally presented at the annual meeting of the unit through which the inductee was elected.

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<http://www.sandia.gov/news/publications/labnews/>

Sandia National Laboratories

Albuquerque, New Mexico 87185-1468

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Bill Murphy, Editor 505/845-0845

Randy Montoya, Photographer 505/844-5605

Patti Koning, California site contact 925/294-4911

Michael Lanigan, Production 505/844-2297

Contributors: Michelle Fleming (Ads, Milepost photos, 844-4902),

Neal Singer (845-7078), Stephanie Holinka (284-9227), Darrick

Hurst (844-8009), Heather Clark (844-3511), Sue Holmes (844-6362),

Nancy Salem (844-2739), Valerie Larkin (284-7879), Lindsey Kibler

(844-7988), Tim Deshler (844-2502), Rebecca Brock (844-7772),

Mollie Rappe (844-8220), Michael Padilla (925-294-2447),

Valerie Smith, manager (844-6167)

Classified ads 505/844-4902

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Sandia, Singapore join forces to develop energy storage

By Nancy Salem

Sandia has signed a Cooperative Research and Development Agreement (CRADA) with the government of Singapore's Energy Market Authority (EMA) that will tap into the Labs' expertise in energy storage.

EMA is the statutory body in Singapore responsible for ensuring a reliable and secure energy supply, promoting competition in the energy market, and developing a dynamic energy sector. Last year EMA invited Sandia to organize a workshop on the latest developments in storage technologies. The two-day event in the Southeast Asian island city-state led to a CRADA under which Sandia will help set up Singapore's first grid energy storage test-bed.

"Sandia will collaboratively develop an energy storage test-bed to better understand the feasibility of deploying energy storage systems [ESS] in Singapore," says Dan Borneo (6111), lead engineer on the project.

Under the four-year agreement Sandia, with the backing of the DOE Office of Electricity's Stationary Energy Storage Program managed by Imre Gyuk, will work with Singapore EMA to establish and evaluate up to three ESS test-beds at existing electrical substations with different energy-storage technologies: lithium-ion, flywheels, and flow batteries. Sandia also will evaluate various grid applications such as frequency/voltage support and renewable integration and will help EMA develop standards and guidelines for grid integration and fire safety.

Through the CRADA, Sandia will assess the economic case for ESS and offer guidance on the policy and regulatory frameworks that EMA needs to introduce energy storage into Singapore's electricity market.

Sandia has done significant research into safety and performance of energy storage systems for more than two decades and the Labs' expertise in this area is well recognized throughout the industry.

Energy storage is the capture of energy produced at one time for later use. A characteristic of the electric power grid is that the amount of electricity that can be generated is relatively fixed over short periods of time while demand fluctuates continuously. Energy storage systems allow demand to be met when it's needed, an aspect that is becoming increasingly important to the electricity power grid.

Energy storage devices such as batteries, electrochemical capacitors, and flywheels can manage the amount of energy required when power demand is high, and help improve reliability of the electric grid and also enable the integration of renewable energy sources such as solar and wind. Storage also can balance microgrids to achieve a good match between generation and demand. ESS systems can range from a few kilo-



POWER TALKS — Dan Borneo, center in blue shirt, and other Sandians met with government representatives in the Southeast Asian island city-state of Singapore. Sandia will help Singapore's Energy Market Authority set up the country's first grid energy storage test-bed through a Cooperative Research and Development Agreement.

watt-hour residential units to utility class systems in the megawatt-hour scale.

The Office of Electricity's Energy Storage Program does research and development on a wide variety of storage technologies including conventional and advanced batteries, electrochemical capacitors, flywheels, power electronics, control systems, and software tools for storage optimization and sizing. The goal is to develop advanced energy storage technologies and systems that will increase the reliability, performance, and competitiveness of electricity generation and transmission in the electric grid and in standalone systems.

The program works closely with industry partners and collaborates with utilities and state energy organization to design, procure, install, and commission major, pioneering storage installations up to several

megawatts in size. It also supports analytical studies on the technical and economic performance of storage technologies and technical evaluations of ES systems components and operating systems. Enhanced energy storage can provide many benefits to the power industry and its customers including improved power quality and reliable delivery of electricity, and cost reductions.

Sandia will provide periodic reports to Singapore EMA on the performance of its test systems.

Dan says Sandia will gain valuable expertise from the collaboration. "We'll get to see the operational data and the kinds of challenges that arise in Singapore's type of environment, which is hot and humid, and highly urbanized," he says. "With this knowledge we can better support the nation's effort to deploy solar while maintaining the reliability of its power system."

Vice Chairman of the Joint Chiefs of Staff visits Sandia

USAF Gen. Paul Selva, Vice Chairman of the Joint Chiefs of Staff, and Deputy Energy Secretary Elizabeth Sherwood-Randall visited Sandia earlier this month to review challenges and progress on complex issues related to nuclear modernization. While at Sandia, Selva presented Sandia President and Laboratories Director Jill Hruby with the Office of the Secretary of Defense Medal for Exceptional Public Service for her role on the Threat Reduction Advisory Committee and her substantial contributions to the committee's activities during her six years of service from 2010-2106.



USAF GEN. PAUL SELVA, vice chairman of the Joint Chiefs of Staff, presents Labs Director Jill Hruby with the Office of the Secretary of Defense Medal for Exceptional Public Service. (Photo by Randy Montoya)



SANDIA PRESIDENT AND LABS DIRECTOR Jill Hruby welcomes Joint Chiefs of Staff Vice Chairman Gen. Paul Selva to Sandia. Looking on are Deputy Energy Secretary Elizabeth Sherwood-Randall and Sandia Deputy Director and Executive VP for National Security Programs Steve Rottler. (Photo by Randy Montoya)

BY VOLUME, 80 percent of the Boeing 787 is made from composite materials, driving the need for training in nondestructive inspection techniques.
(Photo credit: Boeing)



Composites

(Continued from page 1)

gram (6620). “We’re also trying to increase the consistency in inspections across the commercial airline industry.”

By volume, 80 percent of the Boeing 787 and more than half the Airbus 350 by weight are made from composite materials, driving the need for this training, says mechanical engineer Stephen Neidigk (6626), a principal developer of the Composite NDI Training Class.

Alex Melton, a Delta manager of quality control and nondestructive testing, says the course began at the right time for his company. Delta will receive the Airbus 350 aircraft next year and the Bombardier C-Series shortly thereafter. Delta plans to have a customized version of Sandia’s course in place for its inspectors.

“This type of class enhances inspector proficiency insofar as it develops the skill of the inspectors,” Melton says. “I think it’s going to be a really good curriculum for our inspectors as we develop the training and integrate it into our training program and, certainly, I think it’s going to be valuable to the greater industry.”

Experiments detecting composite damage showed need for inspector course

For the past decade, researchers have conducted experiments on the probability of detecting damage in composite materials — honeycomb and solid-laminate structures — that showed wide variations in inspectors’ abilities and techniques, Dennis says.

Because many experienced aircraft inspectors started their careers when airplanes were made mainly of aluminum and because composites behave in so many different ways from metal, Sandia recommended the training.

“We saw people not using the exact equipment setup, procedures, or methods that would produce optimum inspection results,” Dennis says. “They needed customized training that didn’t exist.”

Building on that recommendation, Sandia conducted two workshops in 2014-15 involving regulators, airlines, and aircraft manufacturers from 12 countries to refine the course content. The FAA also provided feedback on the course and the design of the NDI Proficiency Specimens used in the hands-on portion of the class, Dennis says.

The two-day course covers the properties of composites, the manufacturing processes, and the benefits and shortcomings of the materials. Composites produce



PARTICIPANTS TAKE A BREAK at the Composite NDI Training Class to gather in front of a Boeing 767 wide-body aircraft in a maintenance hangar at Delta.
(Photo courtesy of Delta Air Lines)

more fuel-efficient aircraft because they are lighter than metal. Due to the materials’ structures, they are resistant to fatigue and do not crack as easily as metal, in part because they use fewer joints and fasteners where cracks can originate. But one drawback is that solid-laminates can suffer damage, particularly from impact, that’s not visible at the surface, often because the visible, external surface pops back into place, masking subsurface damage, Dennis and Stephen say.

Sandia’s Laboratory Directed Research and Development program sponsored two research projects on the structural health monitoring of composite materials and the development of sensor network systems to assess damage in transportation infrastructure. These studies produced information that was useful in the development of the course.

Engineered damaged parts based on years of research help inspectors practice

In the course, inspectors learn about nondestructive testing techniques through hands-on exercises. They examine custom carbon-fiber composite samples representing various types of structural configurations common on aircraft, but including engineered defects that

range in complexity to fine tune their skills, Stephen says. The samples were designed and built by Sandia and aerospace company NORDAM, based in Tulsa, Oklahoma, based on years of Sandia research.

The inspectors set up commercial scanners, including phased-array ultrasonic scanners where they “paint” a two-dimensional image of the composite with ultrasound (C-scan image) to detect damage, and learn to optimize the settings to more clearly detect damage, Stephen says.

They learn how to recognize structural features found in composites, including laminates with substructure such as co-cured bond lines, tapered laminates, and others, and types of damage, including disbonds, delamination, porosity, and impact damage.

The airline industry wants to save time and money by reducing “false calls,” when inspectors believe they have found signs of damage that is not actually there. An eye-opener for course participants was noticing that the scanner signals decreased in amplitude or intensity due to the presence of acoustic tiles and sealant accompanying composite fuselage panels. These are commonly used to mitigate aircraft vibration noise for passengers. The poor readings on the detection equipment might appear as damage to an untrained inspector, Stephen says.

But with practice, Melton says, the inspectors learned to discern the effects of the acoustic tiles on the signals generated by the defects.

“One of the most valuable things in our view about this class was the opportunity to practice with these materials because we really don’t get that opportunity and feedback on the aircraft,” he says.

In preparing the course, Sandia engineers recorded the best results they obtained in the lab to identify flaws in the engineered samples and produced flaw maps and grading templates, Stephen says.

“After the participants have the chance to inspect the panels, we use our grading templates to point out which ones they hit and missed. Then we show them how the reflected signal changed for a particular flaw and why they missed it,” he says.

Dennis and Stephen expect that companies will customize the course, as Delta did, to meet their needs and they will support those efforts as necessary. The team hopes to develop further nondestructive testing courses, particularly to inspect composite aircraft repairs, Dennis says.

Airworthiness Assurance Center projects focus on composites

The Airworthiness Assurance Center currently has several projects funded by the FAA to study composite materials used on aircraft in addition to the training program, says mechanical engineer Stephen Neidigk.

In a composite impact project, the team is looking at how solid-laminate composite structures respond to high-speed hail and “rigid-body impacts,” such as damage from baggage handling equipment or being hit by dropped tools.

To study hail impact, the researchers used a high-velocity, compressed-air gas gun at the University of California-San Diego to shoot 2.4-inch diameter ice balls at full-scale composite fuselage panels containing substructure elements at different velocities to characterize hail damage. They then applied nondestructive inspection (NDI) methods to assess sensitivity and deployment on large structures. Some results from these studies were included in the Composite NDI Training Class.

The Airworthiness Assurance Center team also is working on a separate project looking at the integrity of aged repairs on flight control surfaces. These components are typically “sandwich composites,” which contain honeycomb structures enclosed in aluminum or other “skins.” Sandia worked with the FAA and industry partners to locate retired aircraft that had repaired components with long flight histories. The components were removed from the aircraft and investigation is under way to determine how the repairs have held up over time, Stephen says.

The project is being done with Wichita State University, which is conducting full-scale structural tests on these components to look at the damage tolerance of these repairs to see how well they’ve lasted.

Sandia wins 6 R&D 100 awards



... and two 'special recognitions' in 'Oscars of Invention'

By Neal Singer • Photos by Randy Montoya

Competing in an international pool of universities, corporations, and government labs, Sandia inventions and co-inventions captured six R&D 100 Awards this year. In addition, two Sandia teams received special recognition awards.

R&D Magazine presents the awards each year to researchers who its editors and independent judging panels determine have developed the year's 100 most outstanding advances in applied technologies.

Says Div. 1000 VP and Chief Technology Officer Rob Leland, "The awards, with their focus on practical impact rather than pure research, reward entrants on their products' design, development, testing, and production. These awards recognize the teams' ingenuity and innovativeness and demonstrate our ability to achieve bold results in our work. Many of our winning teams include members from different Sandia organizations, or from outside Sandia, demonstrating our collaborative spirit.

"Four of the winning Sandia technologies had their roots in the LDRD program. In fact, over the past five years, about 80 percent of Sandia's R&D 100 Award winning technologies have involved some investment by LDRD."

Sandia winners are:

The Falling Particle Receiver for Concentrated Solar Energy is designed to lower the cost and improve the

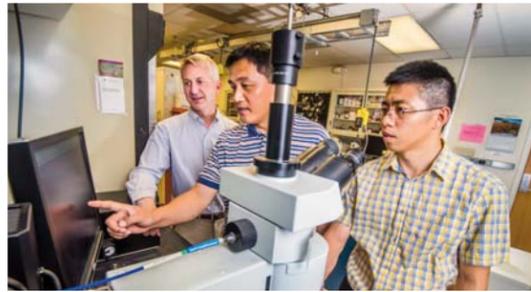


JOHN KELTON AND DANIEL RAY perform inspection of the Falling Particle Receiver during a cloud delay atop the National Solar Thermal Test Facility.

efficiencies of solar energy systems. It works by dropping sand-like ceramic particles through a beam of concentrated sunlight, capturing and storing the heated particles in an insulated tank. The technology can capture and store heat at high temperatures without breaking down, unlike conventional molten salt systems.

Principal Investigator: Cliff Ho; see video at <https://youtu.be/uEy609P5Z6c>

Stress-induced Fabrication of Functionally Designed Nanomaterials enables the production of new materials



HONGYOU FAN, center, points out a nanoscience result to colleagues Paul Clem, left, and Binsong Li.

with better performance and structure control while reducing costs, improving manufacturability, and minimizing environmental and safety concerns. The technology represents a new paradigm for the production of functionally designed nanomaterials with more degrees of freedom than chemical methods. PI: Hongyou Fan; see <https://youtu.be/kFNTpo1bAHQ>

Pyomo v4.1 is an extensible software platform for developing optimization-based analytics to support



complex decision-making in real-world applications. Optimization — finding a solution that minimizes (or maximizes) a function over a set of possible alternatives — is widely used in business, science, and engineering to minimize costs, identify worst-case scenarios, and analyze trade-offs. Optimization is used to schedule commercial aircraft and crews, manage supply chains for auto manufacturers, design sensor networks to protect water distribution systems, identify locations for military supply depots, and operate power grids worldwide. PI: Bill Hart; see <https://youtu.be/x4Mf9WtQ-Ak>

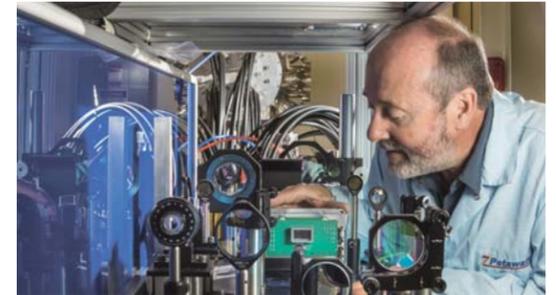
Virtual Environment for Reactor Applications

(VERA). VERA is suite of physics simulation tools that visualizes the internal processes of commercial nuclear fission power plants and predicts reactor behavior in a number of potential scenarios. Sandia was a member of a consortium of researchers that included Oak Ridge National Laboratory, the Electric Power Research Institute, Westinghouse Nuclear, and Idaho and Los Alamos national laboratories. The Sandia PI was Randall Summers.

T-QUAKE (Transceiver for Quantum Keys and Encryption) miniaturizes all of the components necessary to securely encode, transmit, receive, and decode quantum photonic signals onto a single microchip, in effect creating an ultra-secure cryptographic network node for any secure communication or network application.

PI: Ryan Camacho; see https://youtu.be/hk2XU_k1ZDI

The Ultra-Fast X-Ray Imager (UXI) is the fastest multiframe digital X-ray camera in the world. It takes images with an exposure time of only 1.5 nanoseconds — 25 times faster than the best digital cameras. It helps



PHYSICIST JOHN PORTER carefully sets in place an ultra-fast multiframe digital X-ray camera — the fastest in the world — in Sandia's Z-beamlet laser facility.

researchers capture plasma images more rapidly, and has already been used successfully in hundreds of experiments at Sandia's Z-Beamlet laser facility and at Lawrence Livermore National Laboratory's National Ignition Facility. The device was also awarded a "Market Disruptor Product Special Recognition Award." PI: John Porter; see <https://youtu.be/8Wzky-CRxJ0>

Sandia also received a "Green Tech Special Recognition Award" for a **High Power Battery Tester** that significantly improves battery-life predictions and helps meet the growing demand for better, longer-life electrified vehicle and grid storage batteries. Co-developed with Arbin Instruments, Ford Motor Co., Montana Tech. Summer Ferreira served as Sandia PI; see <https://youtu.be/IIIdVZAEj0s>

How to win a Grand Challenge LDRD

By Mollie Rappe

Though FY17 has only just begun, for some it's time to think about FY18. Now is the time to start working on a Grand Challenge Laboratory Directed Research and Development (LDRD) proposal for FY18, says Greg Frye-Mason, manager of CTO Programs Office Dept. 1911 and deputy for the LDRD Grand Challenge Investment Area.

At a town hall meeting in mid-October, Greg and Jerry Simmons (1000), a Sandia Fellow, talked about eight key ingredients for a successful Grand Challenge proposal. Grand Challenge projects are Sandia's largest discretionary R&D investments aimed at pushing the forefront of science and engineering in areas of key national importance. The submission deadline for a Grand Challenge idea is Jan. 17.

Grand Challenge Laboratory Directed Research and Development proposals due Jan. 17 for FY18. Start thinking now!

The first key ingredient is work at the forefront of scientific or engineering research; Grand Challenges are not for incremental progress, Jerry said. Rather, they are expected to have high potential to radically change the status quo and create entirely new capabilities in support of Sandia's missions. He added that a good rule of thumb is the research should be publishable in a leading scientific journal. A trickier task is to outline a project that can produce something at the end of three years, said Jerry. For example, previous Grand Challenges have made demonstration deliverables.

The third key ingredient of a successful proposal is broad mission impact. The proposed research must have clear relevance to a mission area, and having a tie-in to multiple mission areas is helpful, said Greg. Similarly, it is highly encouraged, but not strictly essential, to have a strong tie to one of the Research Challenge roadmaps. Research Challenges organize and focus Sandia research to develop breakthrough solutions to critical national security needs.

The fifth and sixth ingredients focus on having a diverse and multidisciplinary research project that draws on a significant fraction of the Labs' capabilities with a similarly diverse leadership team. The research should consist of several interconnected thrusts with leadership spanning different centers and even divisions. If the proposal outlines three independent thrusts, Jerry said, then it's not a



GREG FRYE-MASON talks about the Grand Challenge LDRD program and how to win one. (Photo by Mollie Rappe)

Grand Challenge, but more appropriate for three regular LDRDs.

Another key ingredient of a successful Grand Challenge proposal is the potential for a national security customer to use or sponsor further development of the new capabilities and technologies. Also, said Jerry, the proposal should answer the question "Why Sandia?" The project should use Sandia's strengths and facilities, but identifying external experts such as from Academic Alliance partner universities to fill gaps is worth "bonus points," he said.

Greg concluded the presentation by saying don't give up if your Grand Challenge proposal doesn't get funded the first time. It often takes two tries to write a successful proposal, and the effort could be a great starting point for other proposals. His final advice was to meet with him early; he wants to help every LDRD project be its best.

For more information, including the call for ideas, go to the LDRD website.



Photo by Randy Montoya

WHEN ICY CONDITIONS EXIST

By Karli Massey

On Dec. 14, 2015, a series of unexpected weather events led to an icy and treacherous Monday morning. As Sandians arrived at work, many slipped on black ice, causing them to fall and get hurt. In a single day, 14 injuries were caused by ice. Freezing weather ensued for the next several days, and more people were injured.

“There were numerous lessons learned that resulted from those events,” says Jaime Moya (4100), director of Environment, Safety and Health (ES&H) and Chief of Safety. “The groups within our Infrastructure Operations Division took the lessons and used them to not only improve our current injury prevention efforts, but to take them to the next level. Safety of our employees is our driving force.”

The ES&H and Facilities centers have identified the areas across Sandia that are prone to icy conditions and have placed more visible ice melt containers at those sites. Other visual reminders, including new warning signs that indicate icy conditions, should also enhance safety. Communications about inclement weather conditions have also increased (see story below).

Aside from safety messages and visual indicators, a

network of dedicated employees from across Sandia remains vigilant and ready to deal with whatever Mother Nature delivers this winter.

Ready to respond

The first line of defense is Sandia’s Emergency Management Communications Center (EMCC) team, which is on the job 24 hours a day, seven days a week. The EMCC team monitors weather forecasts across Sandia’s sites. Using a three-day outlook, the EOC keeps Facilities informed of any possible inclement weather.

“There are about 20-65 people who are members of our New Mexico-based structural services team who are on-call and ready to respond to clear roads and walkways during and after storms,” says Mark Coffing (4843), Facilities manager. “We want to keep ahead of the game and ensure the site is safe when people arrive to work and as they make their way across the campus.”

If snow continues to fall through the night, the EMCC and shift operations coordinators (incident commanders) continuously patrol the site, evaluating conditions. Mark and other team members are also on call, receiving updates up through 3 a.m. “That is when we decide whether to activate the snow removal team.”

Arrival time for the snow removal team is between

3:15 a.m. and 4:30 a.m. with the goal of having roads and walkways cleared as early as 7 a.m. They, in turn, keep the EMCC updated as to the conditions of the site.

Executive management is also kept in the loop on the weather and conditions around the site and is responsible for determining if there is a delayed start, early closing, or site closure. The workforce is then informed through various types of media of the delays or closures.

“One area of improvement for workforce weather notifications is to set a specific start time,” says Lita Suina (42365), team lead for the EMCC. “Sandians have such varying start times, a delayed start can be confusing. To ensure our Facilities team has sufficient time to clear the roads and walkways, this year we will be issuing a definitive start time, such as 9 a.m.”

“Another way we encourage people to stay safe is to keep on the cleared paths,” Mark says. “While it may not be the typical path you take to your office or it may not be the usual entrance you use to access your lab, we clear specific paths for various reasons including exposure to sunlight and efficiency for our crews.”

“Along with being aware of your surroundings and wearing appropriate shoes for snowy conditions, avoiding walking across the snow and ice is the best way to prevent slipping and falling,” he adds.



Know where to go when winter weather hits

By Lindsey Kibler

When winter weather strikes, do you know where to go for information about Sandia work delays or closures?

Should overnight weather conditions make the Labs’ parking lots unsafe until they are cleared, Sandia’s Emergency Operations Center (EOC) will distribute a workforce message about the delay, including a specific time to report to work, and other relevant details including how to charge time for the delay.

Under typical snowy conditions, messages will be sent no later than 5 a.m. the day of the delay, and will include a stipulated start time depending on the severity of the storm.

Messages will be delivered in a variety of ways, beginning with Sandia email, allowing employees to monitor the information sources most convenient to them. These sources include:

- Sandia email
- Sandia Bulletin Board (Dial 845-6789 and follow the menu choices; 925-294-3333 for California-specific events.)
- Radio Sandia, 1640 AM
- Alert banners on Sandia’s external homepage,

www.sandia.gov, and internal Sandia Techweb

- News coverage through local television and radio stations
- Sandia Facebook, [facebook.com/SandiaLabs](https://www.facebook.com/SandiaLabs), and
- Sandia Twitter, twitter.com/SandiaLabs

During inclement weather, employees should follow arrangements made with their manager for weather delays, including any telecommuting work. Information regarding road conditions can be found at www.nmroads.com/ in New Mexico, or <http://511.org> in California.

Additional inclement weather considerations

When at work, as weather deteriorates, pay attention to email notices and keep in mind proactive winter precautions from Security and Emergency Management.

Emergency, safety & health

- Do not overload yourself with hand-carried items while walking. High winds combined with the inability to use your hands and arms to balance make you prone to falling.
- Be aware that the wind may stir up debris causing ear, nose, throat, and eye vulnerabilities. You should

consider eye protection and respiratory guards/masks to mitigate any airborne debris hazards.

- Be mindful of doors blowing open in windy conditions.
- If it should snow or become icy, be aware of slipping hazards. Sandia annually averages two to three slips in parking lots as the result of slippery surfaces and inadequate footwear.
- Assist others if you recognize they may be compromising their safety or the safety of others.
- Situational awareness is paramount when an unrecognized hazard surfaces. Situational awareness improves reaction time and provides space to recover from incidents that could result in injury.

Security

- High winds may prevent security area (i.e. Limited Area, Property Protection Area, etc.) entry/exit points from securing properly. When entering or exiting a security area, ensure that those entry/exit points are properly secured to prevent the compromise of classified, critical infrastructure, and personnel.
- Report any urgent facility issues that could lead to a compromise in security to the Facilities Management and Operations Center (FMOC) at 844-4571.



Honoring our veterans

Story by Lindsey Kibler • Photos by Randy Montoya

Sandia/New Mexico's annual Veterans Day Celebration, held Nov. 10 in the Steve Schiff Auditorium, featured guest speaker New Mexico Adjutant General Air Force Brig. Gen. Andrew E. Salas (see photo at right). Salas recounted the story of a young man, born to Mexican immigrants in the small New Mexico town of Santa Rita, who felt a duty to serve the United States. Shortly after enlisting, he found himself fighting in the Philippines in 1941. Ultimately, the young man would be ordered to surrender to the Japanese, along with other members of the 200th Coast Artillery, New Mexico National Guard, and begin marching in what is now known as the Bataan Death March. More than 1,000 Americans died during the ordeal — many of them New Mexico soldiers. His message for the packed auditorium was simple.

“Think about how many of us like to mingle and gather with our friends and families ... What of those who don't have that — these young ones who lost their lives especially so — who don't mingle with us in these familiar venues of home, who don't sit around the kitchen table, who don't grow old, who don't get married, who don't have kids or watch their grandkids grow up. Don't we have some obligation to them? I think that obligation is to remember them.

“And I wonder sometimes, if they could speak to us what would they say? I think they would tell us ‘Live it for us’ — earn this, love, forgive, help, do something good, enjoy, be angry, be hateful, find a way to leave something better than how you found it.’ I think those are the things they would tell us and that is our obligation. Our obligation is to never forget.”

The event included a presentation of commemorative coins to Sandia's veterans and active service members; one in 12 Sandians is a veteran. An information fair held in the lobby before and after the ceremony featured organizations that support active service members, veterans, and their families.





TALK TO US — Supplier diversity specialist Patricia Brown, right, and Theresa Carson, senior manager of Policy, Assurance, and Outreach Dept. 10220, greet business owners at a recent Sandia supplier open house. (Photo by Lonnie Anderson)

Face to face

Sandia invites businesses to the Labs to talk contracting

By Nancy Salem

Companies that want to supply products and services to Sandia have a new way to learn the ropes. Sandia recently began offering open houses where small and diverse suppliers can talk to staff and contracting experts about doing business with the Labs.

“It’s been great to open our doors to the community, to give people the opportunity of face-to-face engagement,” says Del Salazar, manager of Sandia’s Small Business Program and Risk Management and Supplier Diversity Dept. 10222. “Being able to speak to someone instead of just sending off an email is important. We’ve had an exceptionally positive response.”

Eric Lochausen (10222) says the open houses are a response to the many phone calls and emails he and Sandia’s other supplier diversity advocates receive every day. “People want to meet with us, and it can be difficult to schedule time,” he says. “We thought it would be better to set up specific hours where we can devote our attention to small, diverse suppliers.”

The open houses are offered three times a month, the first Tuesday from 9-11 a.m., second Wednesday from 1-3 p.m., and third Thursday from 2-4 p.m., through March 2017. “People have options depending on their schedules,” Eric says. Times can be confirmed by email to supplier@sandia.gov. A schedule beyond

March is being determined.

Advice for those who aren’t ready

The team booked space in IPOC’s Supplier Diversity Lobby and sent invites to the Procurement Technical Assistance Program (PTAP) and Procurement Technical Assistance Centers (PTAC), government organizations that help small businesses with federal contracting; the Small Business Administration (SBA); the Veterans’ Business Outreach Center; the New Mexico Manufacturing Extension Partnership; and other business groups to share with their networks.

PTAP, PTAC, and the SBA took it a step further and agreed to attend the open houses to advise people who might not be ready to do business with Sandia. “Having them there has been critical,” Del says. “Sometimes companies come in and are not yet in a position to work with the Labs. We can say, ‘Here’s a resource that can help you get there.’ PTAP, PTAC, and the SBA can help them get SAMS [System for Award Management] registrations, D-U-N-S [Dun & Bradstreet] numbers, and help with proposals. They help them navigate the system and grow their businesses to the point that they can do government procurement.”

The first open house was Oct. 4, and more than 70 companies have attended in two months. Eric, Sandia’s small business advocate for veteran- and service-disabled-veteran-owned companies, is joined by Marie Myzkie, who advocates for 8(a)-, HUBZone-, Alaska Native- and American Indian-owned businesses; Patricia Brown, who advocates for women- and economically disadvantaged women-owned businesses; and Leo Valencia, the supplier point of contact for the group (all 10222).

Small business advocates work in the community and within Sandia to promote qualified suppliers from the various socioeconomic groups. At the open houses, they collect information from attendees such as their



DOING BUSINESS — Sandia small-business advocate Eric Lochausen talks to a potential supplier at a recent open house. “People want to meet with us, and it can be difficult to schedule time,” he says. “We thought it would be better to set up specific hours where we can devote our attention to small, diverse suppliers.”

(Photo by Lonnie Anderson)

North American Industry Classification System codes, quality certifications, safety records, and clearances, and talk to them about how best to work with the Labs.

Qualified companies are added to Sandia’s Supplier Diversity database and can be introduced, at match-making events advertised in the *Sandia Daily News*, to Labs technical staff to make them aware of capable small businesses. Companies with missing qualifications are referred to PTAP, PTAC, and SBA. “When we send people to their table, they are all over it,” Eric says. “They are passionate about helping suppliers.”

A variety of procurement resources

Companies of all sizes are welcome at the supplier open houses. “Our group targets small business but any supplier can come by,” Eric says. “We don’t turn anyone away.” Sandia buyers are included for networking and guidance.

Maria Guy of Armatus Consulting in Albuquerque, a small, woman-owned business that offers leadership development and training, says the open house she attended was valuable. “It was extremely informative and struck the right balance between formal and informal,” she says. “I sat down with people and asked questions and, as we got to know each other, they recommended follow-up contacts and resources and gave overall guidance in navigating doing business with Sandia. It’s a helpful service.”

Eric recommends that potential suppliers familiarize themselves with www.sandia.gov, under the “Working With Sandia” webpage, to understand what Sandia buys and how, and to determine if Sandia is the right market for them. He also urges companies to be aware of the following procurement resources:

- Sandia Business Opportunities Website (BOW)
- SAM.gov
- FedBizOpps.gov
- Dynamic Small Business Search database (DSBS)
- GSA Schedules Program
- Federal Procurement Data System
- USASpending.gov
- Procurement Technical Assistance Program (PTAP)
- Procurement Technical Assistance Centers (PTAC)

“It takes a lot of preparation and time to do business with the government and its prime contractors,” Eric says. “You want to be as well prepared as possible and ready to sell your capabilities, experience, technical expertise, business acumen, and financial strength.”

Del says Sandia wants small businesses to be successful, and that meeting face-to-face starts a relationship on sound footing. “This is what people have been waiting for, to sit down with someone from Sandia,” she says. “They learn how to do business with us and we learn more about them so we can build our database of interested, capable, qualified suppliers. These are people we’ve met and know something about.”

Eric says he expects the open houses to increase the number of small businesses Sandia contracts with. “We have momentum and want to keep it,” he says. “If you’re ready to do government contracting, come talk to us.”

Releasing their inner superheroes

Admin Forum aims to inspire confidence

By Manette Newbold Fisher

On a sunny afternoon in early November, dozens of Sandia admin professionals gathered at the Mountain View Club and repeated the mantra, “I can. I will. I am. Yes.” Together, their voices grew louder, the words came out faster, and the confidence that life coach and author Deb Erickson tried to share with them seemed to grow.



SHAZAAM — Admin professionals have some fun expressing their inner superheroes at a photo booth during their annual forum. Pictured are, back row: Joann Torres, Mary Ehrlich, and Mary Lou Garcia; center row: Carolee Wheeler and Sharon Ruiz; front row: Ashley Duran, Heather Herrera, and Denise McCabe.

them identify personal life values such as giving, integrity, and service, and coached the group on how to apply those values to the workplace. In the afternoon, Erickson finished up the forum with her talk about emanating confidence at Sandia and elsewhere.

“Here’s the really fascinating thing: When you say, ‘I can do this, I know I can do this,’ then what happens is all of a sudden your brain lights up — literally lights up . . . and it sends you everything you need to succeed: confidence, energy, passion, enthusiasm, awareness, awakens, aliveness,” Erickson said. “And if you say, ‘I can’t do this,’ what’s fascinating is the brain does exactly the same thing, just the opposite. . . your brain sends you everything you need to fail.”

Erickson challenged admins to carry themselves higher, to improve their mindsets,

“When you say, ‘I can do it,’ you put yourself in the best position to succeed,” said Erickson, one of two speakers at Sandia’s annual Admin Professionals Forum Nov. 1-2. “Every single thought you think is creating a picture.

It’s creating a picture of success or failure. Of ease or struggle. Of confidence or doubt. And every single one of those pictures is being delivered to you every single moment as you show up at work.”

The forum, which had a superhero theme, was meant to encourage admins who may not recognize how much they’re valued. Several admins wore shirts with their favorite superhero logos, they participated in a superhero photo booth, and even worked on superhero confidence poses as a practice to hold themselves higher in the workplace.

Earlier in the day, they also boarded buses for a windshield tour of Sandia so they could see the vastness of the Labs, learn more about the work taking place on campus, and locate facilities that may be used for meetings or events related to their orgs.

Then admins listened to Manager Angela VanArsdale (3521), who helped



“WHEN YOU SAY, ‘I can do this, I know I can do this,’ then what happens is all of a sudden your brain lights up . . . and it sends you everything you need to succeed . . .,” life coach and author Deb Erickson told attendees at the annual Admin Professionals Forum earlier this month. (Photo by Norm Johnson)

remember their internal greatness, and have meaningful, powerful goals.

For the past several years, the forum was a half-day event, but this year, it was extended to seven hours, with half the participants in attendance each day. This provided more time for networking and the windshield tour.

A number of admins shared their appreciation for the speakers’ advice, and for the extended forum. Senior Management Assistant Karen Klar (6500) says this was her favorite forum she’d attended, adding it would be “a hard act to follow.”

Office Management Assistant Denise Taylor (3554) says, “I liked that we had more time to network, meet new people, and hear their stories.” Executive Assistant Deb Marchand (1) helped organize the forum and says she hopes those who attended stay inspired to recognize the superhero qualities they bring to the Labs each day.

“I think the strong message here is about the value that each individual brings and celebrating the diversity of that,” she says. “Whether it’s the superhero with heart, whether it’s the superhero with integrity. These are all qualities that are in Sandia, and within us individually, and that’s what helps us to push through every day.”



BEST LAID PLANS — The Administrative Professionals Planning Team gathers outside the Mountain View Club during this year’s admin forum. Team members, left to right, include Amanda Espinoza, Monica Lovato-Padilla, Cynthia Garcia, Kathleen Bowers, Deb Marchand, M.J. Baucom, and Pauline Marquez. (Photo by Norm Johnson)

Iconic aircraft at nuclear museum restored by Sandia volunteers

By Rebecca Brock

Thanks to an ongoing collaboration with researchers at Sandia, historical aircraft at the National Museum of Nuclear Science & History including the B-29 bomber and the B-52B Stratofortress have recently been restored with innovative solar lighting systems, illuminating the iconic aircraft at night.

“The solar lighting really adds to the experience for our visitors,” says Jerry Hanks, restoration coordinator at the museum’s Heritage Park. “Our goals are to preserve history and for our visitors to have a great experience. Our huge partnership with Sandia has made this restoration happen.”

Sandia researcher Alfred Lorber (5531) has spent hundreds of hours coordinating the solar engineering project that began two years ago. Alfred says, “Our goal has been to make the aircraft displays more dynamic and as realistic as possible. What we all have in common here is a love of airplanes and a belief that the history must be preserved.”

The sophisticated solar power system also saves the museum the expense of electricity bills to run the lights. Sandia’s solar evaluation group led by Bruce King (6112) donated the solar panels, and has offered technical advice and support.

Bruce says the restoration project is rewarding. “I drive by the museum every day on my way into work. It is honestly a sense of pride for me to see the displays grow and develop,” he says.

The National Museum of Nuclear Science & History is the first museum in the country to install solar systems into aircraft, Jerry says. “Other museums are looking to us as an example. Working with Sandia volunteers, we are paving the way,” says Jerry.

Another big motivation for Sandia volunteers, Alfred says, is enticing the next generation. “We want to inspire the kids. When you go out there and touch a B-29, it’s pretty amazing. It’s a lot better than just reading about one,” he says.

Alfred volunteers at the museum alongside his 15-year-old daughter, Marlene. “My daughter says she wants to go to the Air Force Academy. We share a love of aircraft. For the two of us, this has been the ultimate father-daughter experience.”



PRESERVING HERITAGE PARK — Aircraft enthusiast and Sandia engineer Alfred Lorber (5531), below, helps lead a Sandia partnership with the National Museum of Nuclear Science & History to restore the B-29 bomber and the B-52B Stratofortress. Alfred and his 15-year-old daughter, Marlene, above, have volunteered hundreds of hours at the museum. (Top photo courtesy of Alfred Lorber; Photo below by Randy Montoya)



Mileposts



*New Mexico photos by Michelle Fleming
California photos by Randy Wong*



Gary Denison
40 5443



John Fuller
40 5345

Recent Retirees




Martin Heinstejn
35 1542



Larry Schneider
35 1350



Regan Stinnett
35 1854



Paul Smith
35 4879



Eric Chael
33 5752



David Bailey
32 4870



Donna Filip
30 10662



James Jones
30 5947



William Peters
30 10221



Randy Shul
30 5642



Mike Partridge
31 2627



Jim Griego
24 4844



Curtis Fox
25 4842



Larry Luna
25 253



Miriam Minton
25 214



James Miller
25 1815



David Seabrook
25 4237



Dwight Stockham
25 4144



Jodi Maheras
20 10200



Ruth Aragon
15 9549



Kate Bogart
15 2731



David Carrington
15 5014



Matthew Cattaneo
15 4824



Steve Eisenbies
15 8237



Brett Eller
15 5332



David Epp
15 1230



Kelly Garcia
15 2731



Consuelo Leifheit
15 2122



Elizabeth Lopez
15 6135



Chris Nordquist
15 1764



Cheryl Perea
15 10653



Joanneta Ramos
15 5403



Tom Reecer
15 6623



Brenda Rinaldi
15 10625



Debra Sanchez
15 9543



Michael Stickland
15 5624

SANDIA CLASSIFIED ADS

MISCELLANEOUS

VACATION CONDO RENTAL, Durango, Pagosa Springs, Taos, Dec., 2-3 nights, 1-2 bdr., no pets, \$60-\$100/night. Fernandez, 505-238-4722.

FINE CHINA DINNERWARE, Royal Albert, 'Lavender Rose', 55-pc., serving dishes, coffee/tea service, used once, \$1,100. Tonnesen, 463-6797.

INSTRUMENTS: Fender Stratocaster MIM, \$325; Ibanez Ergodye bass, \$275; Epiphone LP custom, \$125; all electric, w/hard shell cases. Seals, 292-1367.

COFFEE & TWO END TABLES, glass tops, brushed nickel base, \$100/set. Overholt, 250-7905.

PIANO, Wurlitzer, \$500; Emmett Kelly music boxes, \$12 ea.; Michele Clown prints, \$4 ea.; Murano glass clowns, \$25 ea. Porter, 400-0288.

DESK, black, 5 drawers, solid wood, 52" x 26", LH pullout shelf, \$60; clear rolling chair mat, \$20. Mowry, 238-0363.

EXECUTIVE DESK, 59"W x 31"D x 30"H, solid oak, double pedestal, matching chair, needs refinishing, \$125. Fromm-Lewis, 249-7814.

VINTAGE BABY CARRIAGE, Italian, 1960s, cream & maroon, chrome, great condition, \$60. Marchi, 256-0551.

INFRARED PROPANE HEATER, vent-less, nearly new, 18,000-Btu/hr., 18"W x 27"H x 7"D, thermostat, standalone/wall mount, battery igniter, \$200. Marron, 505-345-4006.

FITNESS BIKE, Vision Fitness R2650HRT, recumbent, console/programming, heart rate monitor, excellent condition, \$2,000 new, asking, \$500. Wade, 681-0661, call or text.

UNUSED AMTRAK TICKET VOUCHER, useable for any Amtrak ticket, expires 9/1/17, \$472 value, asking \$250. Spears, 266-9782.

STAND MIXER, KitchenAid Pro-Line, 5-qt., imperial gray, excellent condition, call for more info, \$200. Hedrich, 505-298-9166.

REFRIGERATOR, Kenmore, model 51123, MFG 3/15, good condition, \$500 OBO. Schatzer, 405-612-5936.

ELLIPTICAL, Sole, excellent condition, \$250; brown leather recliner sofa, good condition, \$200; dressers, w/mirrors, \$100 ea. Ontiveros, 293-5779.

DINING ROOM TABLE, new, oak, double pedestal, 4'W x 8'L, w/2 16-in. leaves, \$500, will consider offer. Amend, 505-453-4751.

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.

TRANSPORTATION

'16 CHEVROLET CRUZE LS, AT, red, 7,535 miles, 60/60K miles Chevy warranties, daughter moved, \$12,700. Mangum, 238-8383.

'13 JEEP WRANGLER UNLIMITED RUBICON, 4-dr., 4WD, white, mud tires, tow pkg., dealer maintained, 77K miles, excellent condition, <book, \$28,900. Calvert, 505-554-5824.

'05 INFINITI G35, AT, 4-dr., sunroof, Bose radio/DVD, leather, gray, nonsmoker, <124K miles, mechanically excellent, \$7,500. Garcia, 280-5815, ask for Frank.

RECREATION

'06 MONTANA 5TH WHEEL, 32-ft., fully loaded, w/external room attachment, \$17,500. Konrad, 505-856-1956.

'05 KAWASAKI KLR 650, Corbin seat, new tires, chain, work commuter, 25K miles, photos, \$1,800. Dixon, 505-401-0344, ask for Patrick.

REAL ESTATE

4-BDR. HOME, 2 baths, 1,700+sq. ft., 2-car garage, Eldorado schools w/bus stop, quiet, clean & ready, www.tinyurl.com/4701-Bali, \$215,000. Pritchard, 980-8345.

2-ACRE BUILDING LOT, Sandia Park, w/utilities, ready-to-build, dead end site, near open space, \$120,000, owner financed. Mihalik, 281-1306.

WANTED

GENERAL MANAGER CANDIDATES, Tanoan West Assoc., send resume to TCA, 9820 Murifield Ct. 87111. Philbin, 828-2414.

FULL/STANDARD BED FOUNDATION, 4 or 4-1/2-in., to purchase or swap, have 7-1/2-in. foundation now. Colgan, 344-3776.

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.

ROOMMATE, master bedroom w/bath, NE neighborhood, can be furnished or unfurnished, \$500. Leute, 518-961-3569.

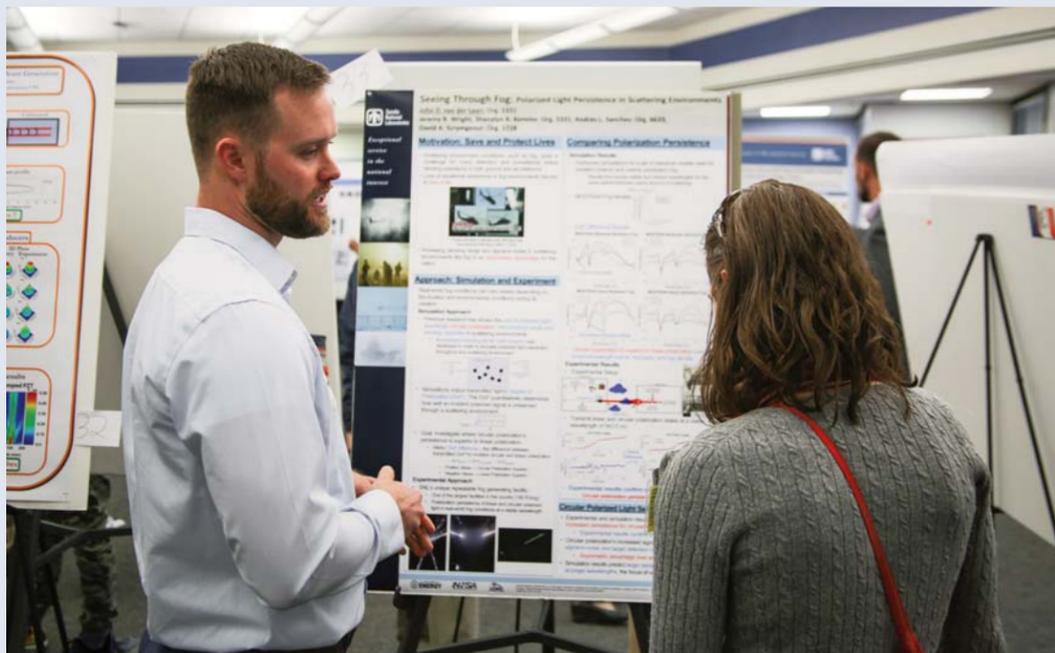
Poster session:

Annual showcase highlights postdoc contributions, honors mentors

By Sue Major Holmes

The 10th annual Postdoc Technical Showcase at Sandia this month highlighted the accomplishments and vital contributions of Sandia's postdoctoral appointees, both in New Mexico and California.

Technical showcases in New Mexico on Nov. 8 and California on Nov. 15 offered a window into the breadth of research by postdocs and honored those who mentor them. The New Mexico session drew 33 posters, the highest number ever, including a dozen from postdocs at Los Alamos National Laboratory who



SANDIA POSTDOCTORAL APPOINTEE John van der Laan explains his research during the 10th annual Postdoc Technical Showcase sponsored by the Sandia Postdoctoral Development Association. John's poster, "Seeing Through Fog," won runner-up honors at the event. (Photo by Lonnie Anderson)

participated through cross-laboratory collaborations. California's showcase attracted five entries.

The Sandia Postdoctoral Development (SPD) Association, formerly the Postdoctoral Professional Development Program or PD2P, sponsors the events each year to celebrate postdocs' work, create opportunities for them to advance their professional skills, and help them move into research careers. Sandia has about 220 postdocs — 130 in New Mexico and 90 in California.

The showcase was "an opportunity to celebrate all the fantastic work you all have done and share with your peers and those around the laboratory," said Engineering Sciences Center 1500 Director Justine Johannes, who welcomed the New Mexico crowd and gave a special mention of the partnership that brought in Los Alamos postdocs.

"Postdocs are a critical element of the research base at Sandia," Justine said. "You all bring ideas, enthusiasm, and energy from your university experience right into Sandia and you focus on the research that's so important to our national security mission. You help us stay connected to the external community, which is absolutely critical to research that sits on the cutting edge."

Los Alamos postdoc Robert Haaser won Outstanding Poster in New Mexico for "Exploring the Ionospheric Response to Bolides in Earth's Atmosphere," while Sandia's John van der Laan (5331) was runner-up for "Seeing Through Fog." California's showcase was not a judged event.

Judges from around Sandia evaluated the posters on criteria that included scientific content and layout and the clarity of the postdoc's discussion of the work

with a judge. The oral presentation could run no more than 5 minutes.

The SPD's Distinguished Mentorship Award in New Mexico went to Jeri Timlin (8631), and the runner-up was Tim Boyle (1815). They were chosen from among 11 nominees.

SPD created the award in 2013 to honor outstanding mentors and spotlight the valuable role they play in developing postdocs.

Justine thanked those who nominated a mentor as well as those who mentor. "It turns out you'll find throughout your career that you'll always need a mentor," she told the gathering. "Those of us who have been in this gig for a while find that there are always other people who know more than you, who have had experiences you haven't had that they can share with you."

She added, "My guess is that while you are being mentored you have also provided some important mentoring to that person mentoring you, and you didn't even know it."

The postdoc association advocates on behalf of Sandia's postdocs and gives them opportunities to develop professionally. But its original name and even the abbreviation PD2P proved difficult to remember, and the organization's 10th anniversary seemed like a good time to change the name and raise the group's visibility and accessibility, and therefore its impact, says Morgan Alley (422), New Mexico SPD staff lead.

"We opted for a simplified name and acronym, and chose to incorporate Sandia into our name as a reminder that our work on behalf of postdocs is inherently tied to the Labs' mission and strategic objectives," he says.



Sandia Postdoctoral
Development



SUPERMOON RISING — *Lab News* photographer Randy Montoya captured a striking image of the Nov. 14 supermoon rising over the Manzano Mountains with Sandia's Solar Tower in the foreground. A supermoon is the coincidence of a full moon or a new moon with the closest approach the Moon makes to the Earth on its elliptical orbit, resulting in the largest apparent size of the lunar disk as seen from Earth. The November 2016 supermoon was the closest supermoon since Jan. 26, 1948, and will not be surpassed until Nov. 25, 2034. The closest supermoon of the century will occur on Dec. 6, 2052. (Photo by Randy Montoya; caption information from Wikipedia)

Shooting for the moon

Solar entrepreneur Murat Okandan moves with market, gains support

By Neal Singer

Murat Okandan, a Sandian on entrepreneurial leave and principal member of the Albuquerque start-up mPower, brought startling news to his most recent interview with the *Lab News*: The company's prototypes he will present to colleagues at NASA for testing and possible sale are not tiny wafer-cut samples formed in a microelectronic foundry — a version of the Sandia technology used to build earlier prototypes — but instead are formed from conventional solar photovoltaic industrial processes.



SANDIA ENTREPRENEUR Murat Okandan in the doorway of the building housing mPower offices.

The individual cells, roughly 4 millimeters on a side, are considerably larger than the micron-sized pieces — popularly termed “solar glitter” — that were the object of Sandia research and an early version of the company's technology since its inception in 2015.

“Metal-oxide semiconductor technology is a more expensive pathway we're not exercising right now,” says Murat. For the NASA project, the conventionally formed photovoltaic pieces will provide the necessary testing capability, he says, and will be connected in a square

array of 24 by 24 pieces, forming an 8 cm square that matches the size of a solar array element already in use at NASA.

Cheaper, lighter, more resilient

“Our interconnection is key to our prototype's value,” Murat observes, but says nothing more about it. About other factors, he says, “Our array can generate higher voltages, it's cheaper, lighter, packs more densely, and is more resilient than what's currently available: If you knock out one or two of the cells, the system still works,” a comparison with the tendency of ordinary solar arrays to lose significant power when a cell in a large string goes out.

Tests also are ongoing with the Albuquerque-based company Aquila to use the original technology as the basis for a radiation detector. The outlook is promising, he says: “We are talking with potential partners who have expressed interest in the new detector.”

Among a start-up principal's dreams are investor dollars, and Murat's company has a backer in entrepreneur Stuart Rose, who is not only the company's landlord in a building meant for tech start-ups, but also an investor and adviser.

In an informal interview, Rose discusses whether Murat's company will succeed. “They're on the right track, but it's too early to tell,” he says, and describes the difficulty of predicting a winning investment. “Go back in history,” he says. “Someone approaches you and says, ‘I want to make a computer tablet that's going to cost \$1,500 and do everything a desktop or a laptop does.’ Would you invest? Almost everyone would have said ‘no’ — laptops and desktops work great, no need or demand for an iPad.”

The mPower saga

Note: Entrepreneurial life holds both attractions and unknowns for Sandians considering that path. In an effort to shed more light on the realities of starting a high-tech business, the *Lab News* is following the efforts of the fledgling company mPower to grow its own wings.

On Oct. 2, 2015, our first installment was titled “Why attempt the entrepreneurial life?” and discussed motivations of participants; on Dec 9, personal problems of being without salary yet glimpses of open commercial doors show the dark side and the light; on March 30, 2016, the passion that drives a person to surmount obstacles a realist might consider too large; in a later interview published on the same date, the triumph of bringing on board an experienced business partner and (unnamed) investors., and on July 21, how to get experienced helpers without paying (immediately) for them. The story here is chapter 7 in the ongoing mPower saga.

Though Murat's company has potential, Rose says that statistically, six out of 10 companies don't make it, two scratch on by, one hits singles, and one hits a home run and that one pays for the others. “I can't predict which one of those companies is going to make it, you just have to go for it: Invest in the company and see what happens.”

“We're a random variable,” politely agrees Murat.

Rose, who says he has an interest in 16 start-ups, doesn't comment on mPower's technology but could discuss when it's time to hire someone, write a contract, or clarify a business objective.

Says Murat, “I haven't run a company before, so someone who's done the early investing stage is a big help.”

Rose says that when he looks at entrepreneurs, he sees a continuity of motivation: from those whose sole intent is to get rich, to those who want to make the world a better place. Murat, he thought, lay more on the “better-place” side.

“Entrepreneurs are really important for New Mexico,” he says. “Big companies with lots of jobs aren't going to come here,” referring to the relatively small population of qualified workers. Small companies help the local economy, he says, because they often earn money from out-of-state, providing things like coding services or website development.

In the parking lot, Murat says, “A lot of things need to line up for a company to come together. So, no pressure, but you better make it work.”

It seems like pressure. But it seems to be working so far.

Shoes for Kids



Every year about this time, Sandia employees and retirees donate to the “Shoes for Kids” campaign. This annual holiday tradition started with just two Sandians. More than 59 years ago, these two scientists chose to donate money to buy new shoes for local children instead of buying each other holiday gifts. This selfless gesture has blossomed into a Lab-wide giving program that each year provides about 600 children with a new pair of shoes.

Sandia Laboratory Federal Credit Union operates the Shoes for Kids account and accepts donations at all branches.

Payless SHOESOURCE provides the shoes at a discounted price and fits each of the children with practical shoes. To date more than 15,000 pairs of shoes have been donated.

Make contributions to:

Sandia National Laboratory Federal Credit Union
Account Number 223180
Shoes for Kids Fund

Online Transfer: SLFCU

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