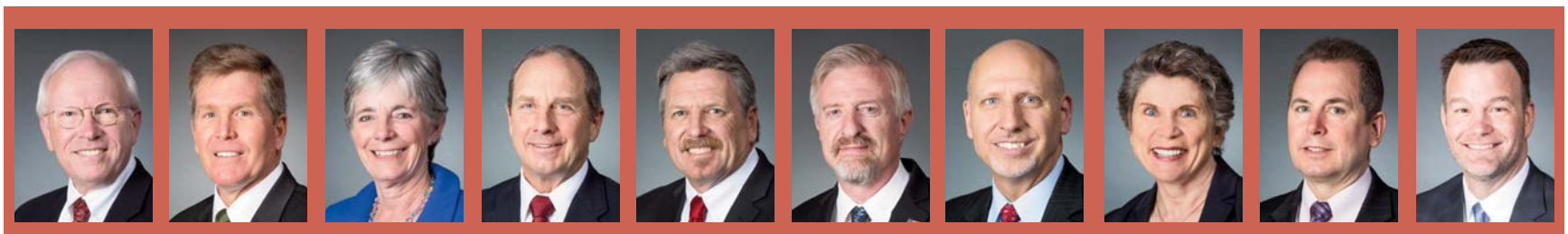


The new Sandia Senior Leadership team

Bios, org chart
See pages 6-7

Fulfilling our vital purpose

A message to all Sandians from Labs Director Stephen Younger

On behalf of the entire Senior Leadership Team, I would like to say how excited we are to join the extraordinary tradition of "exceptional service in the national interest" at Sandia National Laboratories. This is an extraordinary place with extraordinary people. Over the coming weeks we will be sharing more about initiatives to reduce bureaucracy and streamline processes. Sandia has always been among the best run national laboratories. Our goal is to bring proven business practices that will improve our efficiency and our contributions to national security. In the meantime, I would like to share some general thoughts on our approach to management and operations.

Rather than Mission and Vision Statements, I put great stock in *Purpose* Statements. Instead of focusing on capabilities, or what we want to be as an institution or how we want *others* to see us, I like to emphasize what we do. The Purpose Statement that I wrote for the Laboratories is: *Sandia develops advanced technologies to ensure global peace.* There is no mission more important than giving millions if not billions of people the opportunity to live peaceful and productive lives. All Sandians can be proud of the work they do in support of this mission.

Everyone at the Laboratories should take a moment to understand their role in carrying out this vital purpose. If you are designing a new sensor, working on a nuclear weapon life extension program, or analyzing potential threats to our nation, you may see the results of your work in a direct way. However, achieving our purpose requires the talents and energies of *all* Sandians. If you are ordering a large piece of plastic for an experiment on Z, you are not just procuring a part in a compliant manner — you are enabling an experiment to explore the behavior of material at conditions similar to those found in an operating nuclear weapon. If you are maintaining an older facility, you are not just fixing things. You are enabling the manufacture of components in our nation's nuclear deterrent. Neither the experiment nor the components would happen without you.

LABS DIRECTOR STEPHEN YOUNGER

Nothing happens at the Laboratories without teamwork. Engineers cannot design things without tools, fabricators cannot make things without materials, and no one can do anything without a place to do it and resources to support the work. When you come to work in the morning, remind yourself of what you do and how your work fits into the bigger picture.

Working in a large organization can, at times, be frustrating. Rules and regulations, each created for some specific reason, tend to proliferate until they become a bureaucracy unto themselves. That's why it's important to do some occasional housekeeping, to put things in their proper place so that they are easier to find and easier to use. Over the coming months, you will be hearing a lot about the Laboratory Operating System. There is nothing magic about the LOS — it is just a systematic way of renewing policies and procedures to make them more user friendly. Having a safe, secure, efficient, and effective system for performing work sets the foundation for greater technical productivity, and makes the world safer as a result.

We are privileged to be part of a truly noble cause — ensuring peace around the globe. Few people get to have such a purpose, and even fewer people work under the expectation of "exceptional service in the national interest." Take a moment to be proud of Sandia and of *your individual role* in the Laboratories' success. But pause only for a moment — we haven't a moment to lose in fulfilling our vital purpose.

Exceptional service in the national interest
Sandia LabNews
Vol. 69, No. 8
April 28, 2017
Published since 1949
Managed by Sandia Corporation for the National Nuclear Security Administration

Drop of mock B61-12 is first of new flight tests

AN F-16C MAKES A PASS over Nevada's Tonopah Test Range during a test of a mock nuclear weapon as part of Sandia's life extension program for the B61-12. Teams will spend months analyzing the data gathered from the test. (Photo by John Salois)

By Sue Major Holmes

From a distance, the drop of a mock nuclear weapon — containing only non-nuclear components — was a mere puff of dust rising from a dry lake bed at Sandia's Tonopah Test Range in Nevada. However, it marked the start of a new series of test flights vital to the nation's B61-12 weapon refurbishment program.

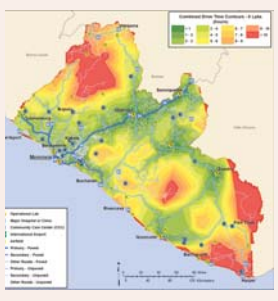
At the 280-square-mile Tonopah Test Range, there's no sense of the typical.

Story on pages 4-5.

Initial data showed the March 14 test was a success. For months, teams will be analyzing a wealth of data they collected from this first of a qualification test series planned over the next three years.

Those watching from the tower of the range's Test Operations Center felt "excitement and pleasure that it all worked as we expected," says Anna Schauer, director of

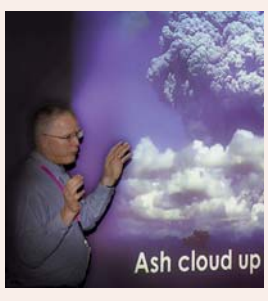
(Continued on page 4)



SANDIANS HONORED FOR 2014 EBOLA OUTBREAK RESPONSE

The work of almost 60 Sandians during the 2014 Ebola epidemic has been recognized by DOE.

See story on **page 8.**



TED-LIKE TALKS AT SANDIA/CALIFORNIA TACKLE BIG IDEAS

Sandians at the California site have been crafting and delivering talks that communicate their big ideas for Sandia.

See story on **page 3.**

MIQUELITA CARRION RECOGNIZED AS A WOMAN OF INFLUENCE

Sandia "change agent" one of 21 women honored in prestigious *Albuquerque Business First* listing.

See story on **page 12.**

That's that

Although the management and operating contract handoff from Lockheed Martin to National Technology and Engineering Solutions of Sandia, LLC officially occurs on May 1 and the date on this week's *Lab News* is April 28, I consider this issue to be the first in the NTESS era. Appropriately, we launch this new beginning with a special message on page 1 by incoming Labs Director Steve Younger.

Getting this newspaper out a couple of days early is very much in character for the *Lab News*. After all, we actually started publishing the *Lab News* (different name, same publication) before there *was* a Sandia, back when we were still part of Los Alamos Scientific Laboratory.

The *Lab News* has been there for a lot of transitions, beginning with that first one when we moved from Los Alamos Z Division to Sandia Corporation, a wholly owned subsidiary of Western Electric/AT&T. We were there when the Atomic Energy Commission, our original government agency, was split into the Nuclear Regulatory Commission and the short-lived Energy Research and Development Administration (ERDA), which became our government sponsor. ERDA in turn became the Department of Energy. Through all the changes, the *Lab News* was there, reporting the latest developments. And we were there when, after a competitive bid process managed by DOE, AT&T handed off management of the Labs to Martin Marietta, which within a year-and-a-half merged with the Lockheed Corp. to become Lockheed Martin.

Now we come to a new day. Over the next few months, we're going to see changes — some we'll like and perhaps some that may take some getting used to — but in the big scheme of things, the changes will be secondary to one larger, unchanging reality: Through every transition, we have always been Sandians. And that won't change.

Steve Younger himself made that very clear in his "Notes from Leaders" item on the NTESS external transition website back in early March:

> *"Names are Important. Several people have asked 'What name should we use when NTESS arrives on May 1?' The answer is: SANDIA. Everyone on the new management team is proud to become part of a long and proud tradition dating back to 1949. We will be Sandia employees just like everyone else, proudly wearing Sandia badges. NTESS is the name of a legal entity that is responsible for management and operations of the Labs, and my intention is to use it only when absolutely required. We are all Sandians."*

Yes, we are all Sandians and the nation will continue to look to us when the chips are down and the stakes are as high as they can get. It will look to us for technical solutions to our thorniest challenges just as it has since our very beginnings. And it will take all of us, each doing her or his part, to deliver on our "noble mission," as both outgoing Labs Director Jill Hruby and incoming Director Steve Younger have called it. The words of Lone Man of the Teton Sioux, said a century and half ago, still ring true: "I have seen that in any great undertaking it is not enough for a man to depend simply upon himself." In our own great undertaking, in our noble mission, we will move into the future and achieve great things . . . together.

* * *

Did you see that item in the *Sandia Daily News* that one of our bicycles had gone missing and was last seen in Tech Area 1?

When I read this, it almost sounded like the bike had willfully gone missing of its own accord. And then I thought, what if that's exactly what happened? What if this errant bike was actually part of a hush-hush effort by Sandia to find a niche in the burgeoning autonomous vehicle arena? Sure, industry heavy hitters have a lock on self-driving car research, but the self-riding bike field is still wide open. And suppose, seeing an opportunity, we jumped in. And suppose, just suppose, our research team succeeded beyond even its wildest expectations: Loaded with all kinds of cool technology — AI, SAR, LIDAR, and GPS, not to mention 3-D multispectral vision capabilities and advanced stability control — our wayward bike started heading off for little jaunts around the Tech Area totally on its own initiative before finding its way back to its lab. And suppose one day, it just didn't come back. My bet is that it's on its way to Moab; it was a mountain bike, after all.

See you next time.

— Bill Murphy, MS 1468, 845-0845, wtmurph@sandia.gov

Recent Patents

Thomas A. Friedmann (1745), Sara Elizabeth Jensen (1745), Michael Wiwi (1745), Todd Bauer (1746) and Blythe Clark (1819): Single Crystal Micromechanical Resonator and Fabrication Methods Thereof. Patent No. 9,525,398.

Brian Thomas Hutsel (1651), Mark E. Savage (1651), Brian Stoltzfus (1651), William A. Stygar (1651), David Justus (1657) and Keven Alan MacRunnels (1673): Solid-State Resistor for Pulsed Power Machines. Patent No. 9,514,864.

Juan M. Elizondo-Decanini (2151), Ronald P. Manginell (8634) and Matthew W. Moorman (8634): Varactor with Integrated Micro-Discharge Source. Patent No. 9,472,689.

Patrick V. Brady (6220): Waterflooding Injectate Design Systems and Methods. Patent No. 9518449.

Robert W. Brocato (1711): Zero-Power Receiver. Patent No. 9,460,321.

Lab News Reader Service

The *Sandia Lab News* is distributed in-house to all Sandia employees and on-site contractors and mailed to all Sandia retirees. It is also mailed to individuals in industry, government, academia, nonprofit organizations, media, and private life who request it and is posted online.

Retirees:

To notify of changes in address, contact Benefits Dept. 3332, Customer Service, at 505-844-4237, or Mail Stop 1021, Sandia National Laboratories, Albuquerque, NM 87185-1021.

Retiree deaths

Rex Myers (age 86)	Jan. 14
Emily Karfs (88)	Jan. 27
Kenneth Weidner (93)	Feb. 3
Peter Duran (62)	Feb. 3
John Ayala (83)	Feb. 5
Lewis Dayton (77)	Feb. 6
George Seely (78)	Feb. 9
Michael Taylor (65)	Feb. 15
Ronald Allen (73)	Feb. 18
Jacob Bernal (93)	Feb. 18
Alvin Farmer (88)	Feb. 20
W. Paul Roper (90)	Feb. 21
Nadine Wittwer (85)	Feb. 22
Christine Andresk (67)i	Feb. 25
Robert Lucas (82)	Feb. 25
Orval Jones (82)	Feb. 25
Victor Sirwinski (97)	Feb. 26
L. Roger Edwards (76)	March 2
Roy Ellison (86)	March 3
Donna Mitchell (64)	March 4
Susana Derado (86)	March 4
Donald Perrette (91)	March 5
William Ryan (93)	March 6
Albert Hodapp (77)	March 8
Whitley Scrivner (94)	March 9
Naomi Funk (91)	March 15
David Wesley (75)	March 16
Robert Peurifoy (86)	March 19
Naomi Myszkowski (90)	March 21
Ruth Tucker (90)	March 23
C. Herman Mauney (85)	March 29

Exceptional service in the national interest

Sandia LabNews

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

Sandia National Laboratories

Albuquerque, New Mexico 87185-1468
Livermore, California 94550-0969
Tonopah, Nevada • Nevada National Security Site
Amarillo, Texas • Carlsbad, New Mexico • Washington, D.C.

Sandia National Laboratories is a multiprogram laboratory operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corp., for the US Department of Energy's National Nuclear Security Administration.

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), Mollie Rappe (844-8220), Kristen Meub (845-7215), Michael Padilla (925-294-2447), Julia Bernstein (925-294-3609), Valerie Smith, manager, (844-6167)

Classified ads. 505/844-4902

Published on alternate Fridays by Internal & Digital Communications Dept. 3651, MS 1468

LOCKHEED MARTIN

Lab News rack locations

Bldg. 802, elevator lobby
Bldg. 810, east lobby
Bldg. 822, south entrance
Bldg. 858 EL, lobby
Bldg. 880, Aisle D, north lobby
Bldg. 892, lobby
Bldg. 894, east entrance, lobby
Bldg. 898, east lobby
Bldg. 887, lobby
Bldg. 891, lobby
Bldg. 836, lobby
Bldg. 831/832 north lobby
Bldg. 861, Cafeteria lobby
Bldg. 870, lobby
Bldg. 823, lobby
Bldg. 701, next to elevator
IPOC, lobby
CGSC, lobby
CRSI, lobby
M.O. 308, lobby
Bldg. 960, lobby
Bldg. 962 (TA III), lobby
Bldg. 6585 (TA V), lobby
Bldg. 905, lobby
800(A), outside of Vicki's

Sandians deliver TED-like Talks

Focus on core message, facts, resonating story, call to action

By Michael Padilla

Sandia Exceptional service in the national interest
CaliforniaNews

CHRIS SHADDIX (8351) presents a geoengineering talk titled "The Potential of Direct Climate Action" at the April Quad-Level meeting. (Photo by Michael Padilla)

Great ideas need great stories.

More than a dozen Sandians at the California site have been crafting and delivering TED-like talks that effectively communicate their big ideas for Sandia. The ideas were pitched in response to a site-wide solicitation made last November for an 18-minute or less talk to various internal audiences on new ways Sandia can have an impact on the nation.

The solicitation asked volunteers to provide talks that highlighted an idea around a strategic priority, technology, issue, new approach to an existing idea, or scientific discovery.

Submitted ideas ranged from the impact of California's legalization of the recreational use of marijuana to how the site can leverage its expertise in chemical defense strategies. Other topics included how geoengineering can help climate change, solving physics problems with computers, and establishing an on site visitor services office as a pilot program.

The primary guideline was that each talk had to consist of a core idea, revealing facts, a resonating story, and a call to action.

A panel led by Craig Tewell (8005) and composed of members of the site's Communications department (8524) provided input to the speakers. The panel, which included Emmeline Chen, Krissy Galbraith, and Michael Padilla (all 8524), offered graphics support, advised on delivery and body language, and promoted the use of personal stories during the talk. The panel provided feedback during three practice runs, including one videotaped practice talk.

Prop. 64 education

Tamara Cagney (8527) presented the first TED-like talk during a Quad-Level meeting in January and at an 8900 all-hands meeting in February. Her talk, "When a Weed-Friendly World Collides with Sandia," addresses the impacts to Sandia concerning the passage of Proposition 64, which allowed California to legalize the recreational use of marijuana.

Tamara stressed the importance of introducing Sandia management to the future recruitment and retention challenges caused by legalizing recreational marijuana in California. The talk brought attention to the need for educating all hiring managers and recruiters about the impact of Prop. 64's passage.

Tamara pointed out that all Q- and L-cleared individuals are considered to hold drug-testing-designated positions. All cleared members of the workforce are placed in a random drug testing program and selected at a 30 percent rate per year. Between 2011 and 2015, there were 35 test failures throughout Sandia. The concern now is that number may increase because of Prop. 64.

JASMINE KING-BUSH (8533) and Katheryn Barker (8362) talk about their vision for a visitor services office to be piloted at Sandia/California. (Photo by Krissy Galbraith)

"The concern now is that number may go up because of the shift in California, which treats marijuana like alcohol in social situations," says Tamara. "Sandians will need a new level of awareness since increased exposure will result in increased risk for all Sandians in California."

Smart computing

Machine learning was the topic of Jeremy Templeton's (8253) talk during the site's LocalScape meeting in February. Jeremy focused on understanding why all physics problems cannot be solved with computers. He provided the history of computational research in trying to answer that question and explained how machine learning may help turn the vision of the 1940s and '50s into reality.

"The biggest thing I learned about presenting my TED-like talk was how to focus down all the information and thoughts to their simplest essence, which could then be broadly communicated," he says. "Normally in science, we spend a lot of time on the details and speaking to an intentionally limited audience. But to have a wider impact requires thinking in the opposite sense such as what can I take away and how can I communicate this idea more succinctly."

Jeremy says he's grateful for the assistance he received during the talk prep. "I got the opportunity to work with a diverse group of people providing feedback on multiple iterations of the talk," he says. "It ended up feeling more like a collaborative experience."

Jeremy says the best outcome of presenting was realizing his talk was interesting to a wide audience. He says there has been interest in presenting the talk to several groups spanning the technical areas he discussed. The talk also led to connections with managers who have interest in finding collaborative opportunities.

One-stop shop

Katheryn Barker (8362), Jessica Matto (8522-1), and Jasmine King-Bush (8533) worked on their vision for a visitor services office to be piloted at Sandia/California. Katheryn and Jasmine presented the talk at a Quad-Level meeting in March, highlighting the importance of enabling all Sandians to engage in impactful partnerships.

The proposed office would incorporate all the aspects and steps needed to conduct a visit to Sandia. One key point made was that not all site visits use protocol services. During fiscal year 2016, Sandia/California had 2,294 visitors. Of that number, 2,070 visitors were unsupported. The office would offer support to all visits to the California site.

The talk was considered an overwhelming success.

"The best outcome of our TED-like talk was receiving provisional funding for our idea, which is to create a visitor services office so that all Sandians have the opportunity to collaborate," says Katheryn. "The second best part was receiving support and encouragement from managers across the site that I don't normally interact with."

Following the talk, Jasmine says she is grateful that Sandia invests in employees and has tremendous resources available to help develop employee skill sets.

"I was able to work on public speaking and creating relationships between what is important to me and what is of interest to my audience," she says. "I'm grateful for the fantastic support and coaching we received from the Communications and deputy team and the warm reception we received from the listening audience."

Direct climate action

Chris Shaddix (8351) presented a geoengineering talk titled "The Potential of Direct Climate Action" at the April Quad-Level meeting. Chris emphasized that Sandia, with its diverse and deep engineering expertise, is qualified to make major contributions to geoengineering research. Chris says the predominant geoengineering method under consideration is sulfate particle production or injection in the upper atmosphere, mimicking the oft-observed worldwide cooling phenomenon following major volcanic eruptions.

"A crucial question is how to produce and inject very small sulfate particles in the upper atmosphere in an economically feasible manner," Chris says. "One of the proposed approaches is for aircraft to burn sulfur-rich fuel, at least once they reach a suitable cruise altitude, and thereby inject SO_2 into the upper atmosphere."

Concerning preparation for the talk, Chris says, "The key thing I learned from this process was the value of preparing a presentation explicitly with an eye to grabbing the attention and having an impact on the audience through the use of dramatic elements. This included providing large images against a dark background and pauses in oral delivery. This isn't something we commonly think about when making technical presentations to colleagues."

Upcoming talks

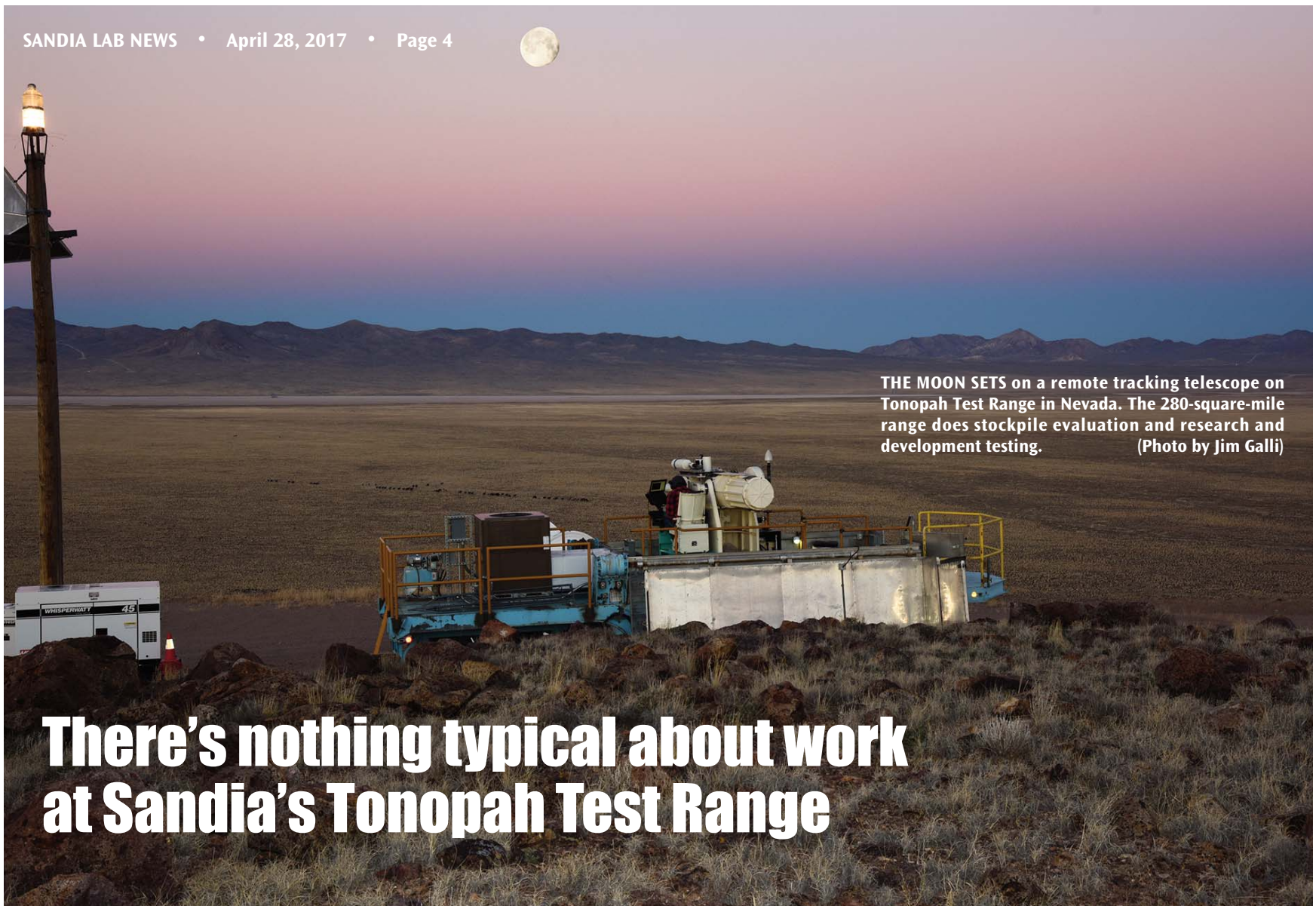
Later this year, Brandon Heimer (8112) will deliver a talk on techno-economic analysis. He will focus on helping researchers determine how much technology and research is worth and how much does it cost. Historically, Brandon and his colleagues have answered these questions in the context of biofuels, solar, and energy-water nexus projects.

Another TED-like talk speaker, Trisha Miller (8112), plans to present a talk on chemical defense and provide a history of chemical warfare and terrorism from World War I to today. She will discuss how Sandia has an opportunity to apply its systems analysis expertise to develop a tailored, balanced chemical defense strategy.

Advice for future TED-like talks

Jasmine encourages anyone interested in participating in the TED-like talks to take full advantage of the opportunity. She suggests reviewing other TED and TED-like talks to see how different speakers approached their talks.

"Be different," she says. "Assume that your talk is the best, and convey that through your body language, your preparation efforts, and your delivery."



THE MOON SETS on a remote tracking telescope on Tonopah Test Range in Nevada. The 280-square-mile range does stockpile evaluation and research and development testing. (Photo by Jim Galli)

There's nothing typical about work at Sandia's Tonopah Test Range

By Sue Major Holmes

Tonopah Test Range's Mark Gonzales is in the field before the sun ever peeks over the mountains that flank the range, readying equipment — some of it older than he is — for a flight test in the B61-12 weapon refurbishment program.

Test morning is a bit like riding a roller coaster: "You wake up bright and early just to wait in line. Once it's finally your turn to ride and the roller coaster is beginning its climb, there's a buildup of anticipation," Mark says. Anticipation doesn't come from a roller coaster's clacking; rather, it builds with radio calls from the range controller and the pilot of a plane carrying a mock nuclear weapon.

Then the weapon releases, followed by a long, adrenaline-inducing moment as it falls.

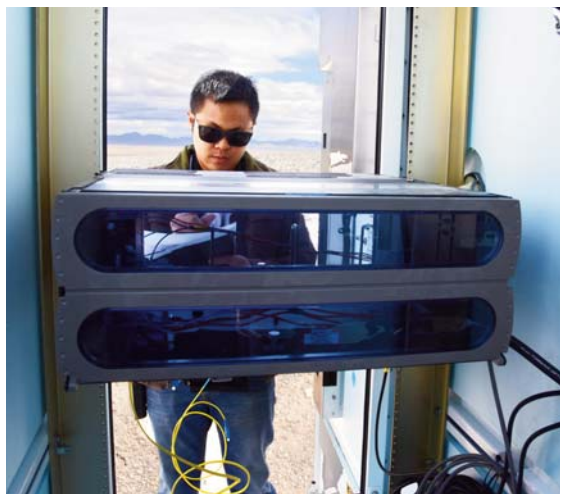
"For that minute, everyone's attention is on keeping their system — camera, telescope, radar, antenna — focused on that unit. Once that unit hits the ground, all that anxiety and excitement is swept away," Mark says. "Just like that, it's all over."

At the 280-square-mile Tonopah Test Range, there's no sense of the typical. Some days Mark might work on tasks for specific programs, like the latest flight test in March. Other days he might splice cable or fix damage done to remotely placed equipment by the hooves of wild horses and by the teeth of rodents who love Kevlar yarn insulation in fiber-optic cables to line their nests.

Tonopah: far from everything

"The biggest thing is how remote we are," he says. The range is 255 highway miles, most of them two lanes, from Las Vegas. The closest community is 40

(Continued on next page)



MARK GONZALES, an electromechnical technologist at Tonopah Test Range, takes measurements at one of the range's remote fiber optic field cabinets as part of his duties at the Nevada range. For workers at Tonopah, there is no typical day. (Photo by Jim Galli)

B61-12 drop test

(Continued from page 1)

Sandia's Stockpile Resource Center.

The B61-12 consolidates and replaces four B61 variants in the nation's nuclear arsenal. The first production unit in the weapon's life extension program is scheduled to be completed in 2020.

Test day dawned cloudless and wind-free, perfect weather at the range, an area of 280 square miles with two main target areas on flat lake beds sitting between mountain ranges. Workers from Sandia and contractor Navarro Research and Engineering operated tracking telescopes, remote cameras, and other instruments in the field to gather information on the reliability, accuracy, and performance of the weapon under conditions meant to replicate operations.

An F-16C from Nellis Air Force Base near Las Vegas, chosen to drop the test unit representing a B61-12, began with a dry run over one of the lake beds. But during his next pass for the planned release, he had to roar off after a small group of wild horses ambled onto the lake bed.

A video feed from a remote camera in the area showed the horses trotting away to safety, herded by wranglers: security officers in a white pickup, its headlights and rack lights pulsing. "That's a first for us," says test director Joe Simile of Sandia. "We've never had to chase horses away from the target."

The extra pass meant the F-16 carrying the test unit and a companion wingman F-16 would have to refuel in flight from a tanker airplane circling the area before returning to base.

F-16 final pass: 'Commence run'

Then, horses cleared off, the pilots circled back. The test director queried those responsible for the various aspects of the test, from telemetry to the pilot of the drop plane. One by one they gave the test a go and a disembodied voice over the intercom announced, "Range is green. Cleared to release."

The announcement, "Commence run," galvanized dozens of people watching and listening to live feeds of preparations at the tower. Most dashed out to the balconies to watch — a natural reaction despite knowing the lake bed was miles away and they'd see nothing more than dust rising from the high-altitude drop. The

AN F-16C from Nellis Air Force Base in Nevada releases a mock nuclear weapon for a March test at Tonopah Test Range. The test is the first in a series planned over the next three years. (Photo by Jim Galli)

video feed, a much closer look, showed the F-16 release the test unit, the unit's spin rocket motor ignite, and the mock weapon fall through the air.

"It's great to see things all come together: the weapon design, the test preparation, the aircraft, the range, and the people who made it happen," Anna says.

After the drop, the two F-16s turned to scream past the control tower about a half mile away, giving observers a closer look at the planes.

On the lake bed, the only sign of the drop was a surprisingly neat hole. An hour or so after the test, Joe stood near the hole, describing plans to recover the weapon, his discussion punctuated by a warning beep-beep-beep from a truck backing up to unload recovery equipment. Crews were back later to dig the mock weapon out of the dirt.

"The test unit recovery went very well, with the unit packaged up for return to Albuquerque," says Lee Post, B61-12 flight test lead. "We can only hope our future tests go this well."

Tonopah Test Range

(Continued from preceding page)

TONOPAH TEST RANGE Headquarters, Area 3, with the main dry lake in the background.

miles, the town of Tonopah, population not quite 2,500. Everything else between the isolated range and the glitter of Las Vegas is even smaller.

"There's no Home Depot if you need something," Mark says. "You make do with what you have to get the mission completed."

A few dozen workers from Sandia, which runs Tonopah, and contractor Navarro Research and Engineering tackle whatever needs to be done. Sometimes the range's Sandia staff members take extra schooling in areas outside their background because, as Mark points out, "there is no one else."

Testing for the B61-12 Life Extension Program is accelerating, and range manager Brian Adkins predicts weeks of multiple tests. He has 22 people assigned to him, including five matrixed from other Sandia organizations. Extra people come in for tests, generally about 20 mission essential and 15 mission support staff.

But here's the deal: Tonopah has one radar operator and three radars; one primary tracking telescope operator and three telescopes; one cinetheodolite operator and about a half-dozen of the optical instruments that track accuracy along a trajectory.

Brian gets extra operators from some of Navarro's roughly 35 plumbers, carpenters, and electricians who are cross-trained for range duties that include helping position instruments, running a cinetheodolite, or operating recovery equipment when it's time to dig a test unit out of the dirt.

Juggling duties is the norm

Mark illustrates how those at Tonopah juggle duties. He works communications and network issues, and Brian says he's also learning new skills in telemetry. He's part of two teams, communications IT and telemetry.

Born in New York, Mark at 27 has lived in Nevada half his life, since his family moved after his mother "went on vacation to Las Vegas and returned with a deed to a house." He attended West Virginia University and later joined the Nevada Army National Guard. There, he got training on satellite communications, a natural background for signal acquisition and telemetry work at Tonopah. He picked up additional skills in information technology during a 2011 deployment to Afghanistan. Mark was still with the guard when he came to the range three years ago. His six-year enlistment was up last year.

On non-test weeks, Tonopah staff members work long hours crammed into a few days. On test weeks, they work even more days before getting a long weekend at home, which for most of the staff is Las Vegas. Since that schedule makes it impractical to drive home after work every night, Sandia and Navarro employees stay at a cluster of Tonopah dorms known as Man Camp. Working at the range, Brian says, is like being on travel every week.

Employees have their own permanent dorm room with a basic desk, bed, television, microwave, and small refrigerator, and they try to make it homey by rearranging the furniture or bringing books, their own sheets, perhaps a guitar. Mark keeps car magazines, pictures from home, a case of energy drinks, and a wardrobe that stays at the dorm since there's a laundry room. Man Camp residents can eat at a range cafeteria a few miles away.

On a test day in March, Mark is up at 4 a.m. and in the communications shop an hour later, checking that a half dozen air-to-ground radios are functioning. That doesn't take long, so it's still dark when he drives a quarter-mile to Sandia's Test Operations Center. The short distance is off Tonopah's main two-lane road, meaning less worry about the potential road hazards of wild horses, pronghorn antelope, rabbits, and coyotes.

Moving from job to job during tests

At the center, he prepares the telemetry ground station — powering up and logging into antenna control computers, receivers, and other systems.

TONOPAH TEST RANGE'S JIM GALLI tracks a test unit with a telescope during a recent test at the Nevada range. Sandia workers at the range often do multiple jobs. (Photo by Dale Green)

Then much of the time until the test begins is spent on communication and integration checks by a team that includes the test director, range communications, telemetry, and others, Mark says. Communications checks verify that critical voice communications come in loud and clear. Integration checks make sure everything from telescopes to radar works and is synchronized with the Tonopah Range Acquisition and Control System, computers that collect and record radar information and retransmit it to the field so operators can orient their systems and focus cameras.

During the test, Mark works from the center's telemetry lab, remotely operating antennas that track the mock test weapon from release to impact. Another operator runs another antenna from a mobile trailer miles away.

By 9:30 a.m., the test over, Mark remotes into a weather station about three miles away to track a small weather balloon carrying a radiosonde that collects information. Knowing the temperature, wind speed, humidity, and other conditions at various altitudes helps engineers correlate any anomalies in test data that could be weather-related, he says.

TONOPAH TEST RANGE MANAGER Brian Adkins, hand raised, stands on one of the range's dry lake beds after the drop of a mock nuclear weapon on the range. Sandia Stockpile Resource Center Director Anna Schauer, left, senior management assistant Betty Clayton, and safety officer Roger Smith were part of a group that went to the lake bed after the test. (Photo by Jim Galli)

Weather balloon taken care of, he moves on to post-processing telemetry work, helping extrapolate and correlate data from instruments around the range for initial reports that indicate how the test went.

Mark's day ends at 3:30 p.m. Since he's not on the recovery team, his next job is working on legacy communications systems. Some equipment dates from the 1950s, and manufacturers no longer make or support it. The Tonopah staff must keep the system working and do upgrades when possible.

Improvements include fiber-optic network

Last year, the range laid fiber-optic cable that replaced a wireless network that couldn't handle data demands anymore and copper cable that had been in place since Tonopah's early days six decades ago. Mark likened the change to the computer world going from an old, slow modem to a gigabyte on the Ethernet.

Tonopah's Lee Goodrich coordinated with the Air Force to bury the fiber-optics in trenches starting last spring. After the 2016 test season, Mark and communications/network technologist Chris Childers began splicing fiber-optics, laboriously connecting section after section. They worked from October through December, largely from a specially designed trailer towed from site to site. The March test was the first to use the new network.

Brian says the range has about five times as much work now as in 2012 and three fewer people. That's why everyone takes on multiple jobs.

During the March test, chief engineer Glen Watts, Tonopah's technical lead, ran a field sensor that was being tested for remote operation. Range photographer Jim Galli manned a tracking telescope. Sandia emergency medical technician Rob Elliott and Joe Leigh of Environmental Safety and Health prepared and launched the weather balloon that Mark tracked. Optical systems technologist Mark Skobel, who ran the remote antenna trailer, also helped run telemetry operations.

Brian says the technologist volunteered for special schooling, got training from experienced colleagues and found a mentor in Gary Kirchner. Gary is from Sandia/California but spends most of his time at Tonopah during test season.

Brian calls Tonopah a national asset for the nation's nuclear stockpile.

"We test it here, analyze the data, and provide reports for the engineers to analyze. Eventually that all gets sent through the Department of Defense and Department of Energy chains," he says. "We're kind of the final exam to send a grade to the president."

EQUIPMENT IS POSITIONED on a dry lake bed at Tonopah Test Range to begin operations to recover a mock nuclear weapon dropped from an F-16C from Nellis Air Force Base in a test for the B61-12 Life Extension Program. (Photo by Jim Galli)

Sandia Senior Leadership Team

Stephen Younger

Laboratories Director

As Sandia Labs Director, Stephen Younger provides leadership and management direction for the safe, secure execution of all Sandia missions.

Prior to joining Sandia, Steve contributed 34 years of distinguished service at the Nevada National Security Site (NNSS), Los Alamos National Laboratory (LANL), Lawrence Livermore National Laboratory (LLNL), and the Defense Threat Reduction Agency (DTRA). He was Vice President and Chief Technologist for Northrop Grumman Technology Services, and served on the Board of Managers for National Security Technologies LLC (NSTec), the M&O contractor for NNSS. From 2006 to 2012, as President of NSTec, he led NNSS through evolving and broader nuclear security missions. From 2001 to 2004, he was the Director of DTRA, a component of the Department of Defense whose mission is to reduce the threat of weapons of mass destruction.

Before his government service, Steve was Senior Associate Director for National Security at LANL, responsible for ensuring the safety and reliability of most of America's nuclear deterrent. From 1982 to 1989, he was a nuclear weapons designer at LLNL, where he developed and oversaw testing of several new concepts in nuclear explosives. He also served as Computational Atomic Theorist at the National Bureau of Standards.

Steve, a Fellow of the American Physical Society, has published extensively in atomic theory, plasma physics, anthropology, and national security.

David Douglass

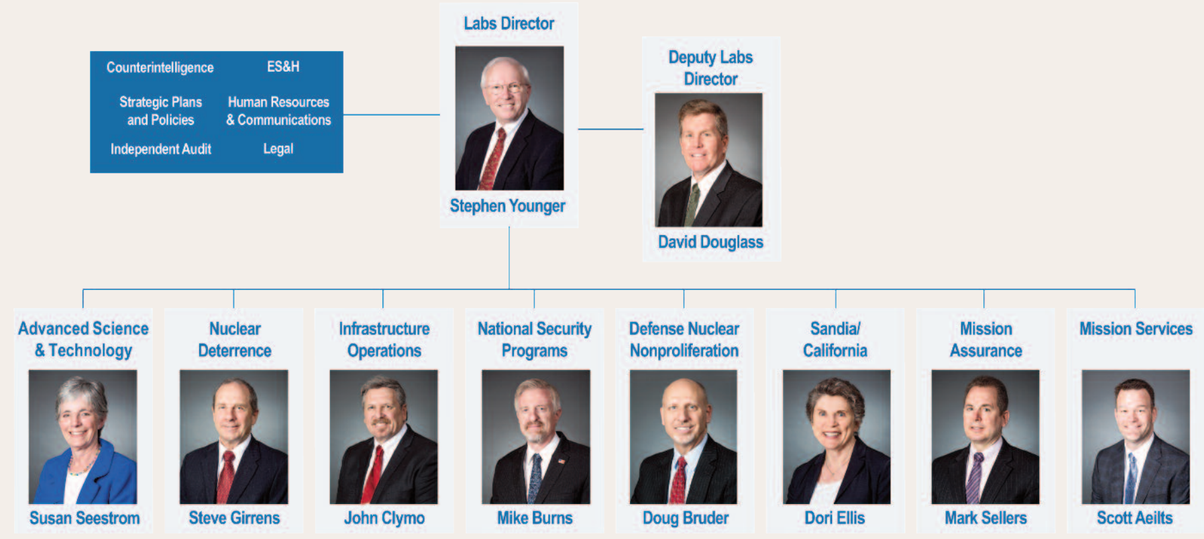
Deputy Laboratories Director

As the Deputy Labs Director for Sandia, David Douglass provides leadership, oversight, management direction, and execution to implement the Labs Director's strategic vision for safe, secure operations at Sandia.

Dave's pre-Sandia career includes 35 years working in national security, commercial aerospace, and defense businesses. At Honeywell, he served as Vice President - Boeing Business ($700 million/year, 13 locations); Vice President - Space, Missiles & Munitions ($1 billion/year, six locations); and Vice President - Marketing and Product Management ($4 billion product line, 12,000 staff, 30 locations globally).

Dave spent most of the first 23 years of his career in a variety of engineering and management roles at the National Nuclear Security Administration's (NNSA) Kansas City Plant (now known as the Kansas City National Security Campus), serving as President of the plant from 2001 to 2004.

Under his leadership, the Kansas City Plant was recognized for implementation of commercial processes and meeting commitments, earning Honeywell recognition as NNSA's top-rated contractor, with ISO 9001/14001 certifications and Voluntary Protection Program STAR status. While at the Kansas City Plant, Dave collaborated frequently with Sandia and other National Security Enterprise sites.



Susan Seestrom

Advanced Science & Technology Associate Labs Director

As the Advanced Science & Technology Associate Labs Director for Sandia, Susan Seestrom manages multiple science programs, environmental technologies, computing, modeling and simulation, Laboratory Directed Research and Development, user facilities, and education programs.

Prior to joining Sandia, Susan spent 30 years at Los Alamos National Laboratory. Her research in nuclear physics ranges from studies of nuclear structure with medium energy probes to studies of weak interaction using neutrons. She initiated efforts to develop a source of ultra-cold neutrons (UCN), measurement of the beta asymmetry in neutron decay using UCN, and has worked as part of a collaboration measuring the neutron lifetime using UCN. She has co-authored more than 140 publications.

Susan served in several leadership positions at LANL over 13 years, including Associate Laboratory Director for Experimental Physical Sciences, Associate Laboratory Director for Weapons Physics, Physics Division Leader, and Deputy Group Leader for Neutron Science and Technology.

In 1994, Susan was named a Fellow of the American Physical Society. She has been an active member of the society, chairing or serving on nine committees. She also served as Chair of the Nuclear Science Advisory Committee for the Department of Energy and the National Science Foundation (2009-12).

Steve Girrens

Nuclear Deterrence Associate Labs Director

As Sandia's Nuclear Deterrence Associate Labs Director, Steven Girrens leads the Labs' nuclear weapons program, which includes stockpile management and stewardship, research and development, systems planning and integration, manufacturing of assigned components, and technical support for National Nuclear Security Administration (NNSA) weapon production plants.

Before joining Sandia, Steve spent nearly 40 years working at Los Alamos National Laboratory (LANL) in nearly all facets of engineering, including preliminary design, computational analysis, prototype testing, and transition to manufacturing. As Associate Director for Engineering Sciences, he guided engineering capability advancement and programmatic delivery that emphasized applied engineering technology, accelerator operations and technology, and prototype fabrication in support of LANL's national security missions. He has expertise in mechanical engineering design and analysis, fracture and thermo-mechanics analysis, computational mechanics, project and personnel management, and technology transfer.

Steve also worked in NNSA's Office of Defense Programs on matters of policy, planning, and analysis, and served on the LANL Director's Red Team for Stockpile Annual Assessment and Certification. He is a Fellow of the American Society of Mechanical Engineers and a registered Professional Engineer in New Mexico.

John Clymo

Infrastructure Operations Associate Labs Director

As the Infrastructure Operations Associate Labs Director for Sandia, John Clymo provides leadership to effectively and efficiently manage infrastructure operations, including safeguards and security, environmental restoration and waste management, laboratory facilities and construction, and emergency management.

Prior to joining Sandia, John spent more than 30 years in facility and infrastructure operations, maintenance, and construction for Department of Energy (DOE) contractors, university-run laboratories, Department of Defense military installations, and a college campus. He was the Director of Infrastructure Programs at the Idaho National Engineering and Environmental Laboratory, where he led physical assets maintenance and operations activities.

John served for two years as Senior Manager of Business & Operations for Lawrence Livermore National Laboratory and five years as Deputy Manager for Operations at the Nevada National Security Site. While engaged in DOE work, he served eight years in leadership positions with the Energy Facilities Contractor Group facilities subgroup.

Prior to his DOE work, John spent 18 years with Johnson Controls/Pan Am World Services as General Manager and in other management roles. He also served on the board of directors for three different international facility management companies operating in the Asia/Pacific region.

Mike Burns

National Security Programs Associate Labs Director

As the National Security Programs Associate Labs Director for Sandia, Mike Burns manages Department of Homeland Security programs, Strategic Partnership projects for the Department of Defense and other federal government departments and agencies, Strategic Intelligence Partnership projects for the US intelligence community, programs for the Department of Energy Office of Intelligence and Counterintelligence, industrial partnerships, and technology transfer programs.

Before joining Sandia, Mike spent more than 32 years in the national laboratory system, most recently as the Integrated Weapons Experiment (J) Division Leader at Los Alamos National Laboratory (LANL), managing high-explosives and energetic materials experiments. Previously at LANL, he was Deputy Principal Associate Director for Global Security Programs, Director of the Field Intelligence Element, Deputy Principal Associate Director for Capital Projects, Acting Associate Director for the predecessor organization to Global Security, Acting Principal Deputy Associate Director of the Weapons Physics Directorate, and Acting Associate Deputy Director for National Security.

Prior to LANL, Mike served in the White House as Special Assistant to the President for Nuclear Defense Policy on the Homeland Security Council staff. Earlier, with the DHS, he was the founding Director of the Office of National Laboratories and Director of Stewardship Planning within the department's Science and Technology Directorate. He also worked with the International Atomic Energy Agency's Iraq Nuclear Verification Office as a nuclear weapons inspector in Iraq.

Doug Bruder

Defense Nuclear Nonproliferation Associate Labs Director

As the Defense Nuclear Nonproliferation Associate Labs Director for Sandia, Doug Bruder leads the defense nuclear nonproliferation portfolio, including global threat reduction, nuclear risk reduction, and nonproliferation and international security programs.

Prior to joining Sandia, Doug spent 34 years leading technology-driven national security programs across weapons, sensor, and information technologies applied to operational support, intelligence, special operations, and nuclear deterrence. As Vice President of Leidos, a national security technology company with more than 30,000 employees, he served as Senior Account Executive and Chief Strategist for the weapons of mass destruction (WMD) and chemical, biological, radiological, nuclear, and explosives portfolio.

Previously, Doug served as a member of the Department of Defense's Senior Executive Service for 13 years, most recently as Director of Research and Development for the Defense Threat Reduction Agency (DTRA), overseeing counter-WMD research. Other executive assignments included DTRA Associate Director for Combating WMD, Department Director for Counter-WMD Technologies, and Liaison and Special Assistant for the Office of the Assistant to the Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs.

Doug has received the two highest awards for government executives: the Presidential Rank Award, Distinguished Executive (Barack Obama, 2011); and the Presidential Rank Award, Meritorious Executive (George W. Bush, 2007).

Dori Ellis

Associate Labs Director for Sandia/California

As the Associate Labs Director for Sandia/California, Dori Ellis provides leadership and management direction for the site, with primary responsibility for energy technologies, biosciences, the Department of Homeland Security, and support to weapon systems engineering.

Prior to her current role, Dori spent nearly 40 years working with government (federal, state, and foreign), industry, and academic customers, including 33 years at Sandia National Laboratories, with programmatic responsibility across four mission areas. Most recently, Dori served as Executive Director, National Laboratories Operations, for the University of California, Office of the President. She also served as Director, Strategic Development Office for Lawrence Livermore National Laboratory.

During her tenure at Sandia, Dori served as Principal Staff Director; Chief Operations Officer for Defense Systems & Assessments; Director of the Global Security Line of Business/International Security, Transportation Surety, Nuclear Waste Management, and Nuclear Reactor Technology Centers; and in a variety of manager and senior manager positions.

In addition, Dori served as the US representative to the International Atomic Energy Agency Advisory Board on Nuclear Security and as an adviser to the US and Russian Academies of Science.

Mark Sellers

Mission Assurance Associate Labs Director

As the Mission Assurance Associate Labs Director for Sandia, Mark Sellers leads and manages quality assurance systems, contractor assurance systems, and cybersecurity.

Prior to joining Sandia, Mark spent 30 years gaining professional experience, including more than 12 years in mission assurance.

He led quality, safety, and mission assurance for Northrop Grumman, with nine years of managing Department of Energy projects and 16 years leading mission assurance and system engineering organizations in support of Department of Defense (DoD) and Intelligence Community projects in Cyber, Defense & Technologies, Missile Defense, and Intelligence Divisions.

Most recently, as Mission Assurance and Programs Manager, Mark established missions assurance and programs functions for a newly created $500 million/year business unit focused on cyber, command and control, and information technology services for DoD customers. He has led mission assurance for large, complex, high-consequence, high-visibility programs in geographically dispersed locations.

Mark is a certified Six Sigma Black Belt, with $15 million in documented savings, and an SAE-certified Lead Auditor, with a proven history of improving mission assurance engagement, which in turn improves operational performance.

Scott Aeilts

Mission Services Associate Labs Director

As the Mission Services Associate Labs Director for Sandia, Scott Aeilts leads financial management systems, business excellence and process improvements, work authorization systems, information technology, purchasing, and other administrative services.

Scott's 25-year pre-Sandia career includes 17 years of business management experience on defense-related government contracts. Most recently, he was Senior Director at Honeywell Federal Manufacturing & Technologies, which manages and operates the Department of Energy's Kansas City National Security Campus. He has led Honeywell Operating System Gold activities, including strategy deployment, Six Sigma, enterprise business operating systems, and product development improvement processes and initiatives to deliver continuously improving value to all customers. Previously, Scott served as the Chief Financial Officer at the Kansas City National Security Campus. As a Certified Public Accountant since 1992, he brings expertise in generally accepted accounting principles, Federal Acquisition Regulations, and other relevant standards. He is also a Six Sigma Green Belt.

Before joining Honeywell, Scott spent 13 years working for Aerospace and Defense contractor Alliant Techsystems. As the Chief Financial Officer and Director of Business Operations at a government-owned contractor-operated facility, he led all financial, contractual, information technology, and business system activities, executing $1 billion/year in funding.

Fighting Ebola and analyzing emerging biotechnologies

Secretary of Energy Appreciation Awards

By Mollie Rappe

The work of Sandia at the intersection of biology and national security, including lifesaving efforts during the 2014 Ebola epidemic, has been recognized by DOE.

On April 11, Dmitri Kusnezov, chief scientist and senior adviser to the Secretary of Energy, visited Sandia to honor nearly 60 Sandians for work to mitigate the effects of the Ebola epidemic and the work of the Technology Convergence Working Group.

DOE established the working group in 2015 to provide technical insight and assess national security implications of emerging biological technologies. The group is composed of representatives from DOE headquarters and Sandia, Lawrence Livermore, and Los Alamos national laboratories, including Sandians Jim Carney (8631) and Duane Lindner (8100).

"The Technology Convergence Working Group will continue to assess national security implications of these emerging technologies and to help define and plan national preparedness measures," says Duane. "Sandia is well positioned to play a leadership role in this arena and with the group."

Reducing the amount of time Liberians who suspected they had Ebola spent waiting in large, open waiting rooms called Ebola treatment units was critical to controlling the outbreak. Sandia modeled and analyzed the West Africa nation's blood sample transport system from the treatment units to diagnostic labs and made recommendations to improve turnaround time.

Sandia's solution minimized the amount of time that people were together in these open Ebola treatment units, so that somebody with a less serious illness wasn't infected by an Ebola victim, says Sandia infectious disease epidemiologist Monear Makvandi (6825), who traveled to Liberia in 2014 to gather information for the models and was recognized during the ceremony.

JEN GAUDIOSO washes her hands in bleach before entering a hotel for meetings with US aid organizations in Liberia. (Photo by Monear Makvandi)

Sandia also was involved in modeling the potential need for quarantine, the effects of various changes to the global air transportation network, even modeling the resilience of the US hospital system to Ebola cases. In addition, Sandia continues basic scientific research to understand how Ebola was transmitted in West African clinics.

"It is a great honor for Sandia's wide-ranging biological work to be recognized by the Secretary of Energy. I personally appreciate this recognition of our contributions to the nation," says Duane.

Effective models need recent and accurate data

For the initial Liberia project, Sandia developed performance requirements for a new nationwide sample delivery system, which was adopted by the Liberian Ministry of Health and a nonprofit organization that transported samples by motorcycle, says Jen Gaudioso, senior manager of Sandia's International Biological and Chemical Threat Reduction group 6820. The project was sponsored by the Defense Threat Reduction Agency and United States Command Center for Combating Weapons of Mass Destruction.

Sandia's work was important to help control the epidemic because patients received care faster. The sooner public health professionals identified Ebola carriers, the sooner they located people outside the clinic who had contact with a carrier and might have been infected, says Pat Finley (6131), who led Sandia's modeling effort.

Operations research analyst Jared Gearhart (6131) and his team developed algorithms to determine the optimal locations for labs and the best transportation routes, while accounting for such obstacles as a national curfew, poor infrastructure, lack of lab capacity, and other factors.

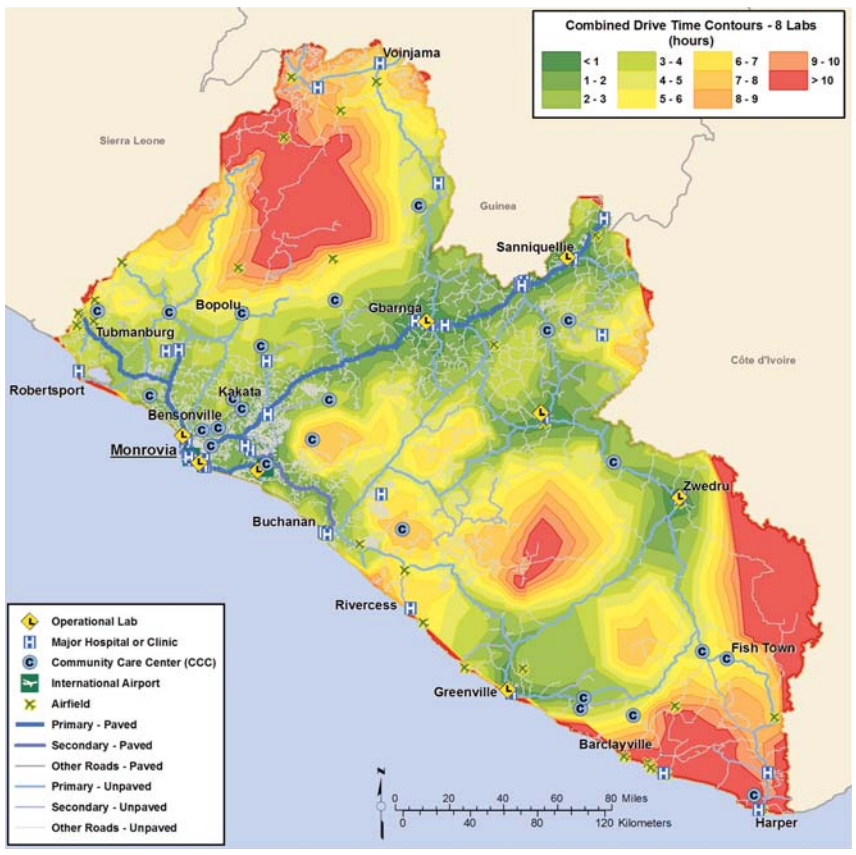
Pat and his team created a computer model of Ebola treatment in Liberia that aimed to reduce travel times of the samples from the Ebola treatment units to the testing labs, thus decreasing the time uninfected patients spend with Ebola sufferers.

Leo Bynum (6924), the geospatial analytics lead, and his team collected data and transformed it into maps, a task made more difficult by incomplete, anecdotal and, at times, incorrect data.

Jen and Monear travelled to Liberia in November 2014 to interview health care workers in the field, international agencies working in the country, and Ministry of Health representatives to get the latest data for Sandia's model. The markets had just reopened and the curfew had lifted, but people were fearful of physical contact and would flinch if you came too near, Monear says.

MOTORCYCLES are the fastest option for transporting samples from patients to diagnostic labs.

Prior to Sandia's project, samples were taken to labs that were thought to be the closest or just because healthcare workers knew someone there, with little thought to lab capacity, travel difficulties, or other factors, Jen says. In one case, Sandia learned of samples carried on foot to a waterway, then brought by canoe to a bridge that connects with a "highway," which is similar to a US hiking trail.



SANDIA RESEARCHERS mapped Ebola treatment units, diagnostic labs, routes, and drive times across Liberia to reduce the time it takes for patients' blood samples to reach labs for testing. The information in this map helped inform the analysis used to recommend a sample transport system so Liberia could more quickly diagnose patients.

Models improved lab location, rapid transportation, and turnaround time

Sandia's analysis helped influence where new diagnostic labs could be located, including one in Greenville in southeastern Liberia. "That's been the area where we've had the most impact by helping Liberian stakeholders become aware of and overcome the challenges of providing lab results quickly in the remote region," Jared says.

PAULA AUSTIN (6825) stands outside an Ebola treatment unit in Sierra Leone.

Sandia's modeling also showed the fastest options for transporting blood samples from patients, many in remote jungles, to diagnostic labs. Motorcycles are the vehicles of choice because they can move through traffic in more populated areas and are more easily pulled out when stuck on muddy roads, says Monear.

Sandia was uniquely suited for the project due to its experience in global health security combined with its computer modeling capabilities. While in Liberia, Sandia's team reached back to the rest of the team to provide updated analyses, says Jen. When the three attended meetings, the Sandia researchers communicated questions back to the modeling team in New Mexico. The time difference worked in their favor. While the travelers slept, their colleagues at Sandia answered the questions and incorporated changes into the model before work started in Liberia the next day.

With so many organizations involved in the response, it's difficult to say exactly how Sandia's sample transport system affected wait times in the Ebola treatment units, but the team had anecdotal evidence that the project reduced the travel time from two days to a same-day or overnight diagnosis, Jen says.

Though the World Health Organization declared the most recent epidemic over in 2016, Jen says Ebola and other diseases could always re-emerge. "The epidemic brought a lot of aid and attention to the public health systems in West Africa. Sandia hopes to help build on that momentum to provide a sustainable and resilient health infrastructure that is ready for future infectious disease outbreaks," she says.

In the years since the epidemic, Sandia's expertise in laboratory safety and security has been requested for a number of other public health projects in West Africa.

Also a part of the Ebola task force team and recognized by Kusnezov are Christopher Frazier and Katherine Jones (both 6131); Katherine Cauthen, William Fogleman, and Louise Maffitt (all 6132); Eric Vugrin (6613); Adrienne Greene, Sean Kinahan, Danielle Rivera, Andres Sanchez, Joshua Santarpia, and Steve Storch (all 6633); Elaine Hinman-Sweeney (6813); William Arndt and Benjamin Brodsky (both 6824); Paula Austin and Lisa Astuto Gribble (both 6825); Eric Cook, Cecelia Williams, and Linda Winona (all 6826); Munaf Aamir, Nancy Brodsky, Robert Jeffers, and Sarah Walsh (all 6921); Walter Beyeler and Daniel Pless (both 6924); Patricia Pacheco and Todd West (both 8114); Stephanie Ball (8527); Anthe George (8614); Chung-Yan Koh (8621); Corey Hudson and Kelly Williams (both 8623); Komandoor Achyuthan, Bryan Carson, Jason Harper, and J. Bryce Ricken (all 8631); Michael Kent (8635); Meghan Peterson (8971); Kevin Leung (1131); Joshua Hubbard (5754); Richard Anderson and Adrianna Woltman (both 4127); Gregory Richardson (9535); Theresa Wilson (10667); Madelynne Farber (11500); and a handful no longer at the Labs.

New cloud services at Sandia launched

By Phyllis Teague

Forty hours or 30 minutes? The answer is easy when the question is, "How long will it take for me to acquire and deploy a new server?" How has Sandia achieved this nearly 99 percent time savings? By introducing "Infrastructure as a Service (IaaS)," an on-site cloud solution with a self-service portal.

What is Infrastructure as a Service?

IaaS is an industry-standard term that simply means the ability to "spin up" virtual computers and servers. At Sandia, it means an entire system and portal-based service that lives onsite (in a private cloud, that is) with which system administrators can deploy or decommission one or more virtual servers nearly instantly.

Why this is important?

According to Program Manager Jeremy Banks, "Sandia's Enterprise Cloud Computing Team developed and implemented an Amazon-style ordering system with shopping cart [that allows] Sandia's over 1,000 Certified System Administrators to rapidly deploy Red Hat Linux and Microsoft Windows servers into our enterprise IT environment."

System administrators make all their configuration choices — including operating system, number of processors, size of RAM, and so on — right in the request form, submit the request, and the new virtual server is ready to go in about 30 minutes.

What it took to get to this place?

"We began in 2012," says project lead Brandon Showers. "A cross-disciplinary team from Sandia's Div. 9000 developed an extensive Cloud Strategy document. From there we engaged General Dynamics IT to update the strategy both to be more comprehensive and to fine tune it into a strategy we could execute.

"Sandia's Cloud of Cloud cross-organizational team evaluated various cloud vendors and selected a cloud management system."

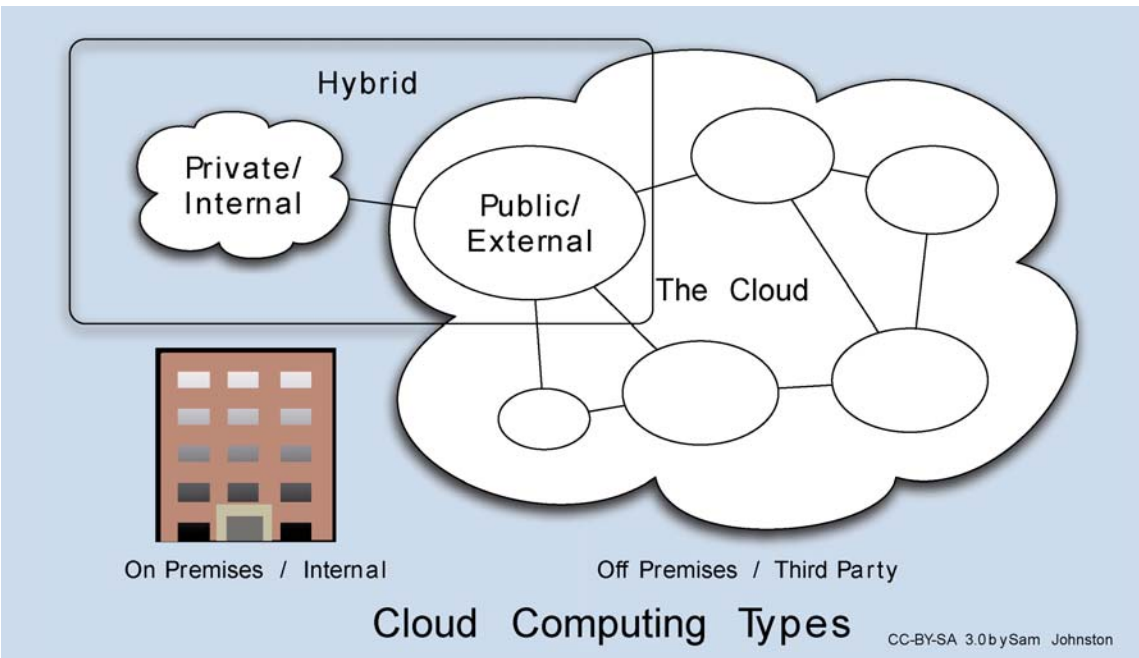
Says Jeremy, "This five-year journey took executive and management stakeholder sponsorship and cross-organizational teamwork — led by the IT organizations in Center 9300 — among IT organizations in Centers 9300, 9500, and 8900 in California.

The team that developed the Cloud Strategy included Lawrence Arellano, Steven Arroyo, Gerald Giese, Phillip Cox, and G. Kelly Rogers.

Time and cost savings

Not only is this a dramatic time savings over the old request system, it represents a dramatic cost savings as well when factoring in the costs of heating/cooling, space, hardware, maintenance, and personnel costs of physical systems in the Data Center, says Jeremy.

"A good analogy," he says, "is purchasing a 1,000-gallon tank of water versus turning on the tap and getting only the amount of water you need at the moment. Applying this utility model to servers, you spin up what you need at the time and destroy [decommission] them when you're done."



Sandia's cloud management portal is an example of a private cloud, where a server owned by Sandia and sitting in Sandia's data center offers the virtualized services. What are the typical cloud types*?

* * *

Private cloud: Used by a single organization; owned, managed, and operated by that organization; and usually — but not always — hosted on premises.

Public cloud: Cloud services by third parties over an open network. Service providers such as Microsoft (Azure), Amazon (Amazon Web Services), and Google operate the infrastructure on their own premises and in their own data centers. Users access any applications in a public cloud via the internet.

Community cloud: The infrastructure that provides the cloud services is collaboratively owned by several organizations with common missions and/or concerns (security, compliance, and jurisdiction, for example).

Hybrid cloud: A cloud service consisting of two or more private, community, or public clouds from different service providers. These remain distinct clouds but are bound together in offering their cloud services.

** Sources: US General Services Administration (https://www.gsa.gov/portal/content/150766), NIST Special Publication 800-145, and Cloud Computing page on Wikipedia — (https://en.wikipedia.org/wiki/Cloud_computing)*

Benefit of self-service

With self-service, Sandia organizations can control their server needs in real time. Since the new server "build" is automated, people can commission, decommission, and reconfigure servers on the fly. This effectively automates the many mundane, repetitive tasks of the system administrator.

Pete Warner, Sandia's Information System Security manager, says, "This on-demand service initiates a system that meets security requirements and controls without interacting with a dedicated system administrator."

Imagine this scenario: A group needs 50 virtual machines to run a simulation for a short-term project. They request and configure those 50 machines through the IaaS portal, receive them in less than an hour, run the simulation, and then decommission them once the simulation is done. It's not quite "Beam me up, Scotty," but it's close.

And the potential uses are vast. "One option is to spin up replication (redundant) servers and database mirroring," Pete says. "This system can also provide DEV/QUAL/PROD (development, quality testing, and production) systems, a one-off server to run a unique database, and so on."

A few challenges still exist

• **Workforce wariness** of cloud technology. Sandia has trained its workforce to be wary of external cloud-based services, and this can translate into slower adoption of internal cloud-based server technology. "People are very cautious about the security of systems and sharing physical hardware with other [virtual] systems," says Brandon.

• **Additional complexity**. IaaS also adds a layer of technical complexity, particularly with scripting and exchanging data with other apps. There's also around a 20 percent performance overhead. "It takes a little more computer," Brandon says, "to achieve the same performance as a physical computer. But the benefits well outweigh the costs."

• **Still-emerging cloud strategy** at Sandia. "We haven't yet finalized our cloud strategy," Pete says. "We are currently operating under an approval to test. That is, we have approval to process information inside the present system without revisiting the security requirements. But we are trying to let the Labs know we want to get there, but we're not staffed yet to deal with the onslaught [of requests]."

What the future looks like

Jeremy and Brandon say Sandia anticipates moving existing systems onto the IaaS platform in the near future, and ROSTRA is a logical first effort. ROSTRA is a homegrown Platform as a Service solution that provides middleware tools and services to Sandia's web application developer community. "Our vision," says Jeremy, "is to put these two together as a Labs-wide service." We are also looking at the possibility of moving Desktop as a Service virtual desktops into IaaS.

"Eventually," he says, "we hope to be using the Government Cloud or even a Hybrid Cloud for Sandia solutions. In any case, security requirements remain the top factor in how swiftly or prudently we move to cloud-based solutions."

Gen. Klotz visits Labs, NNSA Sandia Field Office

NNSA ADMINISTRATOR GEN. FRANK KLOTZ visited the Sandia/New Mexico site earlier this month to meet with NNSA Sandia Field Office leaders, receive an update on the status of the M&O contract transition, and conduct an all-hands meeting for local NNSA personnel. He also toured Sandia's Neutron Generator Facility, where he was hosted by Center 2700 Director Cliff Renschler. Here, Cliff, at left, shows Klotz a sample neutron generator manufactured at the facility. (Photo by Randy Montoya)

Mileposts

New Mexico photos by Michelle Fleming
California photos by Randy Wong


Wendy Amai
30 2955


Ted Parson
30 2632


Sheryl Hingorani
30 8110


Ted Bujewski
25 2734


Ross Miller
25 4128


Chuck Salazar
25 424


Michael Strosinski
25 6811


Marlene Brown
20 2981


W. Gary Rivera
20 6626


Daryl Stephens
20 9543


Roger Suppona
20 9317


Justin Childs
15 5636


Jane Hillman
15 10617


Bill Lawry
15 5567


Tom Mannos
15 1757


Stephanie Portillos
15 754


Margaret Sanchez
15 2546


Kevin Santistevan
15 2663


Hartono Sumali
15 1851


Susan Wilson
15 5568


Edmund Yu
15 1684

www.sandia.gov/about/community

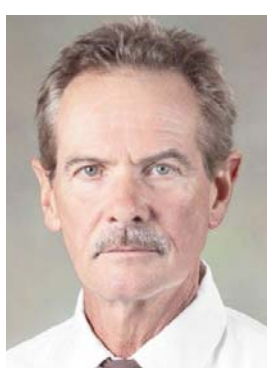
Recent Retirees

New Mexico photos by Michelle Fleming
California photos by Randy Wong


Dahwey Chu
40 1718


Bryan Burns
38 5300


Jose Lopez
38 2137


John Saylor
35 2913


Cliff Loucks
32 2557


JF Nagel
32 400


Terry Garino
30 1816


Peter Davies
28 6900


Susan Pickering
28 6200


Michelle Fauteck
15 10623

SANDIA CLASSIFIED ADS

MISCELLANEOUS

'THE ILLUSIONISTS' TICKETS, 2, Popejoy, May 7, 6:30 p.m., great orchestra seats, east side, row P, inside aisle, $52.25 ea. Hoyal, 505-823-1421.

SECTIONAL, beige, w/2 ottomans, $500; beige & white storage ottoman, $50; chandelier, new, never used, $100. Martinez, 505-274-2787.

BED SLIDE FOR TRUCK, 1,000-lb. capacity, 5' x 4', hardly used, from Accessories Unlimited in Albuquerque, $400 OBO. Morrison, 506-8437.

TELESCOPE, Celestron Super C8, Oculars: 10 mm, 17 mm, 26 mm, $600, email for more info. Follingstad, 505-604-8469, jfollingstad@gmail.com.

METAL ENTRY DOOR, 3-panel, w/tempered glass, all hardware, photo available on request, $250 OBO. Sanchez, 505-980-3532.

BACKYARD PLAY SYSTEM, glider, 2 swings, slide, sandbox, play area, monkey bars, $100. Graham, 293-7302.

HOME GYM, BlowFlex Sport, leather & tension bars, excellent condition, fold-up storage, owner's manual, workout guide, $200. Kush, 505-975-5692.

TRAVEL PKG., 3-night/4-day stay, 7-night/8-day cruise, 7-night/8-day condo stay, $200 in restaurant vouchers, $900 OBO. Garcia, 505-280-5815.

TRANSPORTATION

'13 GMC TERRAIN SLE-2, AWD, 4-cyl., white, 71K miles, text for more info/photos, $15,500 OBO. Loya, 505-362-9860.

'11 SCION tC, excellent condition, $8,000, call for more info. Tafoya, 505-264-7510.

RECREATION

'04 MOBILE SUITES, 37-ft., 3 slides, washer/dryer, king bed, 2 TVs, excellent condition, $19,995. Johnson, 505-803-8388.

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.

BICYCLE, Bianchi Vertigo, 54-in., brand new, never ridden, photos & specs available, $1,200. Galbraith, 505-269-2889, ask for Kate.

'15 BMW G650GS, low suspension, heated grips, center stand, Givi top case, 2,230 miles, $6,250. White, 238-2437.

'10 KAWASAKI NINJA ZX10R, many extras, 9,403 miles, excellent condition, serious buyers, no trades. Sanchez, 505-720-2340.

'96 FLEETWOOD JAMBOREE RV, sleeps 6, 20K miles, excellent condition, $13,500. Pierce, 505-294-0871.

REAL ESTATE

5-BDR. HOME, 3 baths, 4,280-sq. ft., swimming pool, separate in-law quarters, Four Hills. Ramos, 972-951-0290.

Sandia welcomes back new graduates from special degree programs

By Kristen Meub

Sandia welcomed back its 2016-2017 Master's Fellowship Program (MFP) and Critical Skills Master's Program (CSMP) graduates with a celebration and networking event on March 30. Michael Cassady (3520), senior manager of talent management and development, congratulated the graduates and spoke about Sandia's mission and culture, and Pablo Garcia, senior manager and chief of staff, gave a keynote address about his career journey at Sandia. The event included opportunities to network with program alumni, mentors, managers, and the human resources team.

"These programs help us attract diverse talent to the Labs," says MFP/CSMP lead Tally Lobato (3555). "They also bring in students with specialized skill sets that we as a laboratory have identified as critical."

The *Lab News* had an opportunity to talk with three of this year's graduates about their experience with the program and Sandia. Ellen Voegtli (5561) attended University of Michigan, Jonathan Gallegos (2955) attended University of Texas at Austin, and Matt Kagie (5792) attended Georgia Institute of Technology.

***Lab News:** What was the best part about participating in the program?*

Ellen: The best part was not having to worry about finding and working a part-time job while pursuing my degree. Many other students I knew grappled for opportunities to make a little extra money for living expenses. Being in CSMP meant I could focus completely on my coursework and not stress about anything else.

WELCOME BACK — Sandia's 2016-2017 Master's Fellowship Program and Critical Skills Master's Programs graduates attended a celebration and networking event to mark their completion of the program.

NETWORKING AND CELEBRATING — Mya Hartley (2718), Jennifer Naylor (2719), and Leslie Munyao (2719) were three of this year's 31 program graduates. Mya attended Stanford, Jennifer attended Carnegie Mellon, and Leslie attended Cornell.

Jonathan: Perhaps the most advantageous component of the program was becoming acquainted and working with my fellow CSMP students in the courses at UT as well as with the excellent staff members at the Labs who have become not only my coworkers but also mentors and friends. My management and mentoring team truly made the entire program memorable and exciting.

Matt: The best part about the CSMP program was the guidance from my mentor and manager. It was nice to get feedback regarding what possible careers would consist of in different areas of my field, and to discuss how my thesis topic and class choices could help prepare me.

***Lab News:** Why did you want to work at Sandia?*

Ellen: Sandia is huge, diverse, and challenging. I don't hear about any of my friends in industry working on problems quite as interesting as the ones we work on here. I'm also getting to dip my feet into areas I want to keep learning more about, and I may not have gotten the chance to do that somewhere else. The project and team mobility is also nice — being able to take on multiple projects at a time and move around keeps things interesting.

Jonathan: The biggest draw to Sandia is my desire to work on challenging problems with brilliant coworkers.

Matt: The work here covers a wide spectrum of interesting topics. There is a lot of room to move around and grow, as well as a large number of very qualified individuals and teams to learn from.

***Lab News:** What is your favorite thing about Sandia?*

Ellen: How much Sandia values and encourages learning. Everyone I have worked with is so intelligent and willing to help you understand or provide the right resources — brown bags, SFU [Sandia Free University] courses, technical talks, etc. — it constantly motivates me to keep learning and branching out.

Jonathan: I have truly enjoyed being part of the mission and am honored to have contributed to making a difference for our great nation.

Matt: My favorite thing about Sandia is that academic curiosity is a huge part of the corporate culture. While we still have deadlines and deliverables, people get excited about tackling difficult and technically challenging problems in novel ways that push the edges of the field.

***Lab News:** What did you study and why?*

Ellen: I studied computer science and engineering. I took computer science 101 on a whim and ended up being really engaged by it: Everything was a challenging puzzle that I could interactively work my way through, and the applications are essentially endless. I have a lot of different interests and hobbies, so that multidisciplinary nature of computer science heavily appeals to me. I'm looking forward to a diverse and exciting career.

Jonathan: In my early circuits classes for electrical engineering I was fascinated to learn how broadly my abilities in mathematics could be applied to build applications and see instant results. During graduate school I continued on this path by selecting a track in Integrated Circuits and Systems with a focus on analog circuit design. Getting to work on the entire process of designing, building, and testing countless circuits was enjoyable and I am energized to continue this work back at the Labs.

Matt: I studied digital signal processing in the school of electrical and computer engineering. DSP is a rapidly advancing field that has applications across the board and it prepared me well for the work I do at Sandia.

Miquelita Carrion recognized as a Woman of Influence

A force for change at the Labs and in the community

CHANGE AGENT Miquelita Carrion was recognized as a 2017 Woman of Influence based on her professional achievement, leadership, and community involvement. As part of the award application, she chose a six-word memoir: "Never underestimate your power to inspire." (Photo by Randy Montoya)

By Kristen Meub

Miquelita Carrion (753) is passionate about giving back and being a catalyst for change both at Sandia and in the community.

"I thrive with the challenge to understand where an organization or project has been and where it is trying to go," Miquelita says. "I look at the challenges, the risks, and the goals — it's storytelling with data."

Miquelita was named a 2017 Woman of Influence by *Albuquerque Business First*. She was one of 21 women to be recognized out of a pool of 250 nominees based on professional achievement, leadership, and community involvement. She was honored at an awards luncheon at the Women's Summit on April 3 and featured in a special section of the paper on April 7.

"I'm humbled and really honored to receive this recognition, especially when you look at the other women selected — there are executives, women holding public office, and then there's me," Miquelita says. "I give back and mentor not for recognition at all, because that's where my heart is, and that's what I enjoy."

Creative leadership

Miquelita has worked in business, project management, and quality assurance roles at Sandia for 27 years, saying she has "grown up here." She is widely recognized as a natural leader and specializes in working on challenging projects.

"Miquelita demonstrates leadership, mentorship, and organization, so much so that I appointed her as the lead of my top program within the first few months of her coming to work for me," Ann Marie Ryder, manager of Quality Assurance Monitoring and Partnerships Dept. 753, says. "Her caring leadership style compels the entire team to follow her direction into successful results."

One example of Miquelita's leadership in action is a re-planning activity that she led during her role as a project manager for the nuclear weapons stockpile program. She needed to redevelop the workflow but had minimal time and access to the engineers in the program. She needed their buy-in with the new processes, so she took a creative approach and started scheduling walks, lunches, coffee and donuts, and other activities to learn more about each of the roles and processes in the program while developing relationships with the team.

"Little by little, I pieced together a process flow on the wall, and that was my way of letting everyone be part of it and see what I was doing," Miquelita says. "This process really engaged the team and provided transparency to all. In the end we had a successful re-plan in a very short period of time and successfully passed an integrated baseline review with the customer. Challenges like that are what I thrive on — it's motivating to me."

'Never stop paying it back'

Miquelita also is known for being creative in her community outreach efforts. She recently met with a group of at-risk children to explain her job as a quality assurance professional. To make quality assurance relatable, she partnered with McDonalds to use their "spec" cards for a cheeseburger. She gave each child a cheeseburger and a "spec" card and asked them to look for deviations from the standard, like an extra pickle. Miquelita says she is passionate about working with youth because she owes her career at Sandia to the inspiration and encouragement she received in high school when someone from Sandia came to talk to her Business Professionals of America club about internships at Sandia, and to the many mentors she has had throughout her career.

Miquelita is constantly looking for ways to inspire and support youth in the community and "never stop paying it back." She volunteers with Sandia's MANOS program and was the program coordinator for more than 16 years. She also serves as a United Way Ambassador, is a member of the United Way's Hispano Philanthropic Society and the Women in Philanthropy group, is a member Sandia's Hispanic Leadership Outreach Committee, volunteers for Habitat for Humanity, has served as a high school mentor for Big Brothers Big Sisters Mentor 2.0 program, and has been a Project Linus "blanketeer."

"Words like humble leader, effective communicator, and successful collaborator accurately describe Miquelita," Ann Marie says. "However, she is also so much more. While Miquelita has clearly demonstrated huge success at work, she is infectiously passionate about giving back to individuals and her community."

Problem solver

Miquelita served as Sandia's 2016 loaned executive for United Way and had the opportunity to visit a variety of community agencies and learn about their needs. Many times she felt called to help in whatever way she could. She says it started after she had visited an agency that needed towels.

"I told my husband, we don't need all these towels — let's donate some of them," Miquelita says. "The next day it was clothes for a men's shelter to help them transition back into the workforce, and then it was bicycles to help them get around. I kept donating all these things we had at home to different agencies, and my husband told me he had dreamed there was nothing left. He told me, 'You're always trying to help solve all the problems in the world, but you can't solve everything.' I told him, 'I can try.'"

Miquelita stays organized by keeping a lot of lists, keeping her calendar full, and incorporating giving back into everything she does, including office parties and personal hobbies. If her team is having a holiday party, she'll suggest they do a project to give back instead of exchanging gifts. She's also developed a way to pair her crafting hobby with community service.

"I've always had a passion for crafting and party planning," Miquelita says. "So now I coordinate weekend crafting events for about 30 attendees five times a year. With each event, I select a non-profit agency or two and have them come in to speak with the group and the group pulls together to give back to our community."

While enjoying fellowship through crafting, her group has completed a number of community service projects, including donating crafting supplies to UNM Arts and Medicine to support its mission of healing through creating, holding book drives, collecting and bagging toiletries for the women and children at Barrett House, writing letters to soldiers for Veterans Day, and collecting items for Safe House. Miquelita says giving back is part of who she is — she was inspired by seeing her family always pull together to support each other while she was growing up.

"Going forward, I want to continue my passion of giving back, continue to influence others, and continue to build my network," Miquelita says. "For many years I was told I'm a 'change agent' in my performance reviews. When I started receiving more challenging assignments, I understood. To me, being a change agent is really about the ability to influence others. Whether you are trying to change direction or a process, I think it goes back to thinking outside the box while having everyone being part of the process instead of having just one person making the decision. And it's also about paying it back — I always ask people: 'Who helped you get where you are, who motivated you, and how are you paying it back?'"

ALBUQUERQUE BUSINESS FIRST

From the Albuquerque Business First website:

Women selected for this year's Women of Influence Awards were from a wide variety of industries and their roles are just as varied. They are CEOs, corporate executives, entrepreneurs, nonprofit leaders — and now they are 2017's Women of Influence.

The selection process began with a call to the public for nominations of New Mexican women who are leaders, role models, mentors, and innovators. From there, the nominees submitted applications and letters of recommendation. A panel of judges evaluated applicants on professional achievement, leadership, and community involvement.

More than 250 nominations were submitted by the public. Judges reviewed more than 120 applications to select the 21 Women of Influence.

The judges were: NAIOP New Mexico President Lynne Andersen; Native American Community Academy Executive Director Kara L. Bobroff; Briones Business Law Attorney Thomas R. Briones; Southwest Women's Law Center Executive Director Pamelya Herndon; and Janice Torrez, divisional vice president, external affairs and chief of staff, Blue Cross and Blue Shield of New Mexico. Judges recused themselves from voting on any nominee with whom they had close ties.