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Lean method drives innovation Page 10

Supercomputer Stout brews breakthroughs

Sandia secures top spot on global computing stage

By **Neal Singer**

Stout, a new Sandia supercomputer, secured its place on the Top500 computers list that was released Nov. 13. Boasting a performance of 8.9 petaflops, Stout claimed the No. 87 spot on the renowned benchmark list of the world's fastest computers.

Brewed from the NNSA's Advanced Simulation and Computing program, the Stout supercomputer is set to significantly enhance Sandia's high-performance computing capabilities, according to Steve Monk, Sandia manager and leader of the effort.

"Stout and its twin cluster, Amber, will provide Sandia with performance that is two to five times our current capabilities, directly benefitting our nuclear deterrence and national security missions," Steve said.

The announcement, coinciding with the opening of the SC23 Conference in Denver, highlighted the collaborative effort under the NNSA's Commodity Technology Systems program, with Lawrence Livermore National Laboratory and Dell Technologies as key partners.

STOUT SUCCESS — Sandia supercomputer Stout has earned the 87th spot on the Top500 computers list that was released Nov. 13.
Photo illustration by Craig Fritz

Creating a more accessible Sandia

AT YOUR SERVICE — Kristin Adair, a research and development manager, and her new service dog in training, Barf, pose in an Albuquerque park on Oct. 24. **Photo by Craig Fritz**

By **Maggie Krajewski**

In 2018, Kristin Adair experienced a catastrophic stroke that would permanently limit the mobility on the left side of her body and leave her with a near constant feeling of fatigue.

One of the first people to visit Kristin in the hospital was her manager, Jozelyne Gallegos.

"The kindness and support my manager and team showed me at that time made a huge difference in my recovery," Kristin said. "Once I was moved to an inpatient facility, my staff and managers all came at various times to have lunch and just visit with me."

Once Kristin returned to work, the support continued.

"Sandia allowed me to choose the schedule I needed to accommodate my outpatient rehabilitation, I was able to work remotely when I needed, and they arranged for a co-worker to drive me into the tech area, so I didn't have to walk as far," Kristin said.

Kristin's occupational therapist worked with the team at Sandia to arrange for workplace accommodations including a speech recognition software, as Kristin could no longer use her left hand to type.

"The support here really comes from the top down," Kristin, a research and development science and engineering manager, said. "Sandia doesn't just pay lip service to caring about their employees, they're committed."

Disability Equality Index Score

In 2023, Victoria Morrison and other members of the Abilities Champions

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EDITOR'S NOTE: Please send your comments and suggestions for stories or for improving the paper. If you have a column (500-800 words) or an idea to submit, contact Katherine Beherec at kgbeher@sandia.gov. This is the last edition of 2023. The first edition of 2024 will be published on Jan. 11. Thank you for reading Lab News!

Society of Women Engineers celebrates Sandians

Different paths lead to two individual awards; patents abound

By **Luke Frank**

Women engineers at Sandia achieved significant recognition from the 2023 Society of Women Engineers. These accolades included Distinguished New Engineer, Advocating Women in Engineering and 10 patent recognition awards.

The society's awards program celebrates high levels of achievement among individuals who identify as women and allies in engineering, engineering technology or science related to engineering at all career stages.

Leslie Phinney — Advocating Women in Engineering

Leslie is the manager of Sandia's Thermal Sciences and Engineering Department, where she has worked since August 2015. "I arrived at Sandia in 2003 as an experimentalist qualitatively examining laser interactions and the heating of polycrystalline silicon microdevices," she said. "Over the years, that work progressed into developing modeling and computations for improved diagnostic techniques to quantify the temperatures of the materials.

"Now I'm a manager," Leslie said. "So, I meet with staff, marshal resources and approve all the things that need to be approved. I'm also a program manager for several advanced simulation and computing projects. I don't do modeling and simulation myself, but I get to support others and then report on the great work that they do."

Leslie grew up in a family of generations of teachers. "My parents both have

ADVOCACY AWARDEE — Leslie Phinney, manager of Sandia's thermal sciences and engineering department, was awarded a 2023 Advocating Women in Engineering by the Society of Women Engineers. **Photo by Lonnie Anderson**

master's degrees. My great-grandfather was a teacher in Indiana and really believed in education for women, which at the time wasn't common," she said. "I also had a great aunt who graduated in the late 1920s with a university degree in math, which was pretty unusual at the time. It took her 10 years to get a job teaching due to the Great Depression and only after men began enlisting for service in World War II."

Math quickly became Leslie's passion in school but astronaut Sally Ride, the first American woman to fly in space, was her inspiration. She locked into aerospace engineering as her college major at the University of Texas, where she enjoyed fluid mechanics and heat transfer courses. "That directed me more towards mechanical engineering," she said. Leslie went on to earn her master's degree and doctorate in mechanical engineering.

As she delved deeper into her engineering pursuits, Leslie noticed the ranks of women dwindling. "While earning my degrees, there were fewer women as I went along," she said. "I knew I was a minority, but I didn't feel like a minority because I was supported."

After receiving her doctorate in mechanical engineering at the University of California, Berkeley, in 1997, Leslie joined the mechanical and industrial engineering department at a Midwest university as a junior faculty member. "I was the first woman mechanical engineering professor hired at the university and one of two women in a department of 50," Leslie said. "It was a bit of an isolating experience."

Six years later, Leslie moved from academia to Sandia in 2003 as a technical staff member and is now a department manager, a position she has held since September 2020.

Leslie's life experiences — support from her family, fellow students, colleagues and friends — have compelled her to improve the engineering journey for those who follow.

"My true desire at this point in my career is to make things better for those who are coming after me," she said. "I see engineering as a good career choice for everyone, and I don't want anyone to be excluded from the opportunities that are available."

And she's been busy over the years encouraging young people, especially young women, to pursue engineering by establishing scholarships for women in engineering and mentoring engineering students through numerous professional and technical societies. Leslie provides leadership and activities for the Sandia Women's Action Network, the American Society of Mechanical Engineers and the Society of Women Engineers. She also engages in local K-12 outreach activities that expand the concepts and appeal of engineering.

"I've often heard the phrase, 'You can't be what you can't see,' so over the years I've tried to empower women engineers to be visible and involved in their communities," Leslie said. Part of her core mission is her belief in the potency of diversity. "Having people from different fields of study, life experiences, cultures and beliefs boosts creativity and innovation, versus a more homogeneous team that is likely to fall into groupthink. Engineers are in the business of solving difficult problems, and we need the best people and most innovative teams to solve them."

About the award

"I see this award as meaningful recognition that I'm trying to make an impact. I think there's still more work to be done."

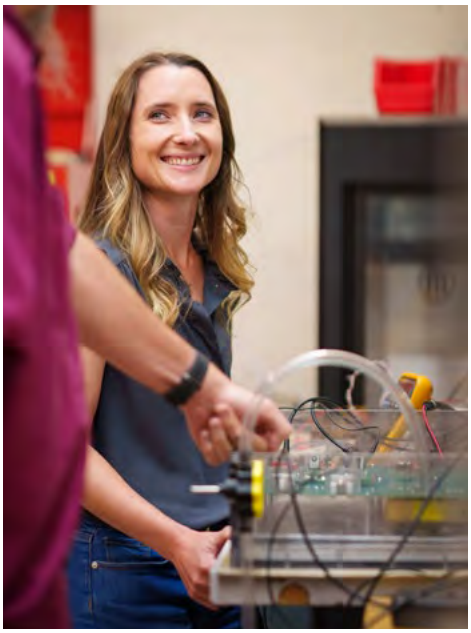
Advice for aspiring women engineers

"Be persistent. Engineering takes a long, sustained academic and professional effort. If you're looking for an easy college major or career, take engineering off your list."

Emily Schrock — Distinguished New Engineer

Emily is an electrical engineer conducting experimental lab work with various pulse-power systems. She performs modeling designs and diagnostics for both the systems and their components.

Emily's interest in engineering sparked at an early age visiting job sites with her dad, who is an electrical engineer in Texas where Emily grew up. "My dad always had a big hand in the electrical work as a project manager for the design



DISTINGUISHED NEW ENGINEER — Emily Schrock was named a 2023 Distinguished New Engineer by the Society of Women Engineers. **Photo by Craig Fritz**

and construction of buildings," Emily said. "We would walk through the sites and talk about electrical and mechanical designs and functions. Getting to see the actual application of electrical engineering growing up really got me interested."

As a teenager, Emily's interest and aptitude in math and science cleared a path toward physics where she was drawn to the electrical and magnetism disciplines. "When it came time to declare a major in college, I chose electrical engineering and I absolutely loved it," she said. "I had a great group of friends, and we took the same classes together. That support group helped but it wasn't easy. I remember a good number of all-nighters."

Emily earned her master's degree in electrical engineering from Texas Tech University in 2017, the same year her then fiancé was stationed at Kirtland Air Force Base in Albuquerque. Through a Tech alumnus, she learned of an opening at Sandia for an electrical engineer with pulse-power experience and a semiconductor background — work she had performed in college. She hired on at the Labs in 2017 as a research and development science and engineering microwave and sensor engineer.

"I've been able to do some very cool things here at Sandia," Emily said. "What I really like is building and then field-testing system hardware. Over the years, I've enjoyed being able to test our design work and experience its success in the field."

About the award

"It's really special because I was up against such a variety of people from major technology companies doing great things in their fields with backgrounds so different from mine."

Advice for aspiring women engineers

"If you want to be an engineer or physicist, don't let anything stand in your way. If you start feeling you don't belong, take advantage of the outreach available to you and find a mentor who will cheer you on. Don't allow others to choose your career path when you could make a big difference in an engineering realm."

Society of Women Engineers Patent Recognition Awards

The following engineers received the SWE Patent Recognition Awards:

Laura Biederman, research and development science and engineering in electronic, optical and nanomaterials. System and Method for Cooling Using a Heat Exchanger Having a Membrane and Filtration Membranes.

Suma Cardwell, research and development science and engineering in computer science. Spiking Retina Microscope.

Gabriella Dalton, research and development science and engineering in optical engineering. Calibration Method for a Spectral Computerized Tomography System.

Katharine Harrison, former Sandia employee in nanoscale sciences. Nanoporous Carbon as an Anode Material for Li-ion Batteries; and Nanoporous Carbon as a Host for Sodium.

Nadine Miner, research and development science and engineering manager in advanced science and technology, University of Texas partnerships. Methods, Systems and Computer Program Products for Determining Systems Re-Tasking.

Stacy Nelson, research and development science and engineering in materials and failure modeling. Enhanced Composites Via Selective Interfacial Modification.

Karla Reyes, research and development science and engineering manager in materials chemistry. Apparatus, Methods and System for Temperature Gradient Aging with In-Situ Electrical Monitoring; and Thermal Measurement Apparatus and Methods for Anisotropic Thermal Materials.

Dorina Sava Gallis, research and development science and engineering in nanoscale sciences. Degradation of Chemical Agents Using Metal-Organic Frameworks Compositions; Tunable Metal-Organic Framework Compositions and Methods Thereof; and Compositions, Systems and Methods for Selective Porous Material Oxygen Separation.

Heidi Smartt, research and development science and engineering in international safeguards and engagements. Non-Contact Rapid Reader System for Reflective Particle Tags and two for Fluorescent Compositions.

Erika Vreeland, research and development science and engineering in aerosol science. Micro-lensed Fiber Optic Plate; and Magnetic Needle Separation and Optical Monitoring.

The Society of Women Engineers, founded in 1950, is a not-for-profit educational and service organization that empowers women to achieve their full potential in careers as engineers and leaders.

Accessible workplace

CONTINUED FROM PAGE 1

of Sandia employee resource group put Sandia's name in the hat to be recognized by the Disability Equality Index.

The Disability Equality Index is a benchmarking tool that measures numerous factors related to advancing disability inclusion within corporations across the country. The scorecard is divided into six categories: Culture and Leadership, Enterprise-Wide Access, Employment Practices, Community Engagement Supplier Diversity and Non-U.S. Operations.

"We wanted to see how Sandia compared to other organizations, identify what gaps existed and create a roadmap for how we could continue to improve our own accessibility and inclusion efforts," Victoria said of the decision to submit Sandia for consideration.

Sandia ended up receiving a top score and was named one of 2023's Best Places to Work for Disability Inclusion by the Disability Equality Index.

"Sandia is highly committed to advancing disability inclusion in our workplace and supporting our many employees who can benefit from increased access and programs that provide broad opportunities," Deputy Labs Director and Abilities Champions of Sandia Executive Champion Laura McGill said. "We are especially proud of our recognition this year from the Disability Equality Index."

Increasing representation

The recognition pays homage to the many efforts Sandia has made and continues to make in creating a more accessible workplace.

One of the biggest accomplishments in this space includes Sandia's effort to increase the number of employees who identify as disabled.

Currently, 7.4% of Sandians identify as disabled, up from 3.07% in 2019. The benchmark set by the Office of Federal Contract Compliance Programs is 7%.

"We are working to breakdown stigmas surrounding disabilities, both physical and invisible, and create a culture where people feel like they belong," Victoria said. "We want people to know that they can disclose their disabilities in a safe environment."

In addition to the self-identification campaign, Sandia has developed targeted efforts to hire more disabled employees. In 2019, Sandia hired its first recruiter who specializes in hiring people with disabilities. Since then, the number of new hires who identify as disabled has fluctuated between 10% and 12%.

"Having more employees self-identify helps increase representation. It also helps us secure the resources needed to improve accessibility," Victoria said. Sandia needs these perspectives at the table, whatever the table is — new initiatives, policies, whatever conversation we're having. We need these diverse viewpoints to be included in everything we do."

The work online

Michelle Burke, a software systems engineer, is part of a team leading the charge to ensure all digital touchpoints across Sandia are accessible.

Michelle and her team have been working on a retroactive review process looking at Sandia's most visible and visited websites and spreading awareness about what improvements are needed.

"Common things we encounter include videos without closed captions, color contrast concerns, alternative text issues and keyboard accessibility issues," Michelle said. "We started this effort in 2020 and we still have a long way to go, but I'm proud of what our team has accomplished."

The effort is part of Sandia's goal to be fully compliant with Section 508 of the Rehabilitation Act. This federal law requires agencies to provide people with disabilities equal access to electronic information and data, comparable to those without disabilities.

"It's important that everyone understands the basics, not just content developers," Michelle said. "Digital accessibility impacts how you run meetings and how you present information. If you include a photo in a presentation — do you include alternative text or consider the colors you're using? We want to build awareness, so people understand how this stuff touches everything they do online."

Michelle encourages employees to visit Sandia's Web Accessibility site to learn more about her team's work.

The work on-site

"Sandia enforces the requirements of the American Disabilities Act, Architectural Barrier Act and International Code Council for all new construction, renovations, alterations and additions," Susan Spencer, operations architect and ADA subject matter expert, said. "We have multiple experts in Facilities including designers, reviewers, a building code official and inspectors that verify all construction is fully compliant."

The ADA was not passed into law until 1990 and 67% of the buildings on New Mexico's campus were built before that. In California, that number is 61%.

Sandia implemented a tracking system two years ago to start recording what components in those older buildings did not meet current accessibility standards. As of today, 19 buildings have been evaluated with 33 more nearing completion.

"The buildings are compliant with the previously adopted codes and standards they were built under, but our goal is to have a record of elements that don't meet current standards to work toward securing funding to make upgrades," Susan said.

Sandia has made great strides in correcting an array of issues, she said. Significant facilities upgrades, including 20 restroom projects throughout the Labs, most of which include building-wide restroom upgrades, are in various stages of design to construction. Additional improvements include a new wheelchair lift, a ramp and new accessible entrances.

Larger-scale projects in design include upgraded ADA-compliant exteriors and landscaping at Steve Schiff Auditorium and the Thunderbird Café, an interior ramp at the employee medical clinic and a new accessible entrance to another building.

"We've done a good job so far and are ahead of the curve or on par with other labs," Susan said.

The work left to do

While Sandia has made several inroads in creating a more accessible workplace, the work is ongoing.

Victoria said Sandia is working on getting a centralized accommodation

budget approved.

"This will help managers fund accommodations without having to worry where the money will come from," she said.

Additionally, there are some benefits and policies that can create challenges for people.

"The 90-day reset on sick leave can be problematic," she said.

Another hot issue has to do with the DOE's policy change related to Medical Portable Electronic Devices, or MedPEDs.

For years, DOE policy had stated that Sandians or visitors could not bring personally owned prohibited technology into certain secure and limited spaces on campus. This includes items such as cellphones, smart watches and tablets. Until 2019, the order had made exceptions for MedPEDs, such as Bluetooth-enabled hearing aids, glucose monitors and pacemakers, to name a few.

The 2019 order was updated to say MedPEDs would now need to be approved by the Sandia Field Office Oversight group.

Jennifer Samora has been leading the efforts to comply with the DOE order.

"When it first went live, if someone's device was denied, they couldn't come on-site with that item, and we initially had no way to compensate employees or help them get a new approved device," she said.

Jennifer and her team have streamlined the approval process for MedPEDs with an online application. They've also worked to make the change easier for employees who rely on these devices.

"If an employee has a prohibited device, we now have a list of high-confidence alternative devices that we can recommend, and Sandia can pay for those devices. We've also created a charge code that people can use so they can get paid while they wait for new devices," Jennifer said. "I have some rock stars on my team who put in a lot of behind the scenes work to make a difficult process just a little bit easier for employees impacted by the change."

Working across the pond

Exchange assignments offer opportunity to share resources, knowledge

By **Jennifer Awe**

Since 1958, the United States and the United Kingdom have shared information, materials and equipment regarding atomic energy use within the provisions of the Mutual Defense Agreement. Through a codified **strategic intent partnership**, Sandia works with the U.K.'s Atomic Weapons Establishment to develop opportunities for collaboration.

One way to partner is through exchange assignments: Sandians working at the establishment and vice versa. This enables immersion and deep understanding of the respective organizational and engineering cultures. It also provides pathways to share knowledge via security provisions coordinated through Sandia's International Programs Office.

Senior manager exchange

There are four main Sandia-AWE assignments, or secondments: senior management exchange, program specific, supporting a specific non-nuclear component and supporting component areas.

The senior manager exchange is coordinated through the Advanced Systems and Transformation center. Director Ernie Wilson has first-hand experience, having worked at AWE from 2017-2019. "It was an important milestone in my career," he said. "The Sandia team there became like family and our AWE colleagues surrounded us with a sense of community. It meant a lot to me to help strengthen the partnership between the NNSA and the U.K.'s Ministry of Defence."

A conversation with 'cracking lads'

Sandia corporate communicator Jennifer Awe recently spoke with two senior managers living this mirrored experience. Steven Trujillo is a Sandia employee working at AWE, and David Gill is an AWE employee working at Sandia's New Mexico site.

What inspired you to try a long-term, overseas assignment?

Steven: I had a positive experience doing an assignment in Washington, D.C., about 10 years ago. I was ready for a change and felt this was an opportunity to try something new, while remaining within Nuclear Deterrence. I knew I'd enjoy stewarding critical relationships between the sites. I'm also interested

EYE-OPENING EXPERIENCE — Steven Trujillo, a Sandia senior manager working abroad at the Atomic Weapons Establishment, reflects on lessons of his overseas assignment. "I'm getting a sense of this British sensibility for engineering," he said. "That's the point of a long-term assignment, to allow yourself time to absorb."

Photo courtesy of Steven Trujillo

AWE INSPIRING — During his time in Albuquerque, David Gill, a senior manager at the Atomic Weapons Establishment, conquers the La Luz Trail. **Photo courtesy of David Gill**

in organizational culture, and this is a chance to experience something different in that sense.

David: An assignment to the U.S. was on my bucket list because I wanted to experience living and working here. I shared my interest with managers over the years, and I was approached when we began planning for the return of our previous secondee. It was good timing, as I'd been in my group leader role four years and my family was supportive of the experience.

What initial differences have you observed between the sites?

Steven: The organizational charts here are very resource-based, a much more matrixed organization. They tend to group as resources rather than products. Also, space is completely different. AWE has open floorplans without walls. The building I'm in has centralized spaces where meetings are conducted. It's very different but drives interaction to help move things forward.

David: The biggest difference is the individual office space for senior managers. I prefer the ad-hoc interactions of an open floorplan, so I leave my door open here and tend to walk the halls. I feel there is more social discussion with colleagues in the U.K. than in the U.S., where you tend to get down to business more quickly here.

How are you acclimating to a new country?

Steven: I'm getting a sense of this British sensibility for engineering. I'm internalizing and getting a crisper definition of what that is. It's kind of a different ordering of performance characteristics and considerations. That's the point of a long-term assignment, to allow yourself time to absorb.

David: I've embraced New Mexico. I love the culture and the outdoors. There's no traffic compared to the U.K., and I can always find a parking spot. The food is awesome; I eat a lot of New Mexican.

So, red or green, Dave?

David: Green. I'm even making my own breakfast burritos!

What are the main benefits of assignments? What do you recommend as a first step if someone is interested in a future assignment?

David: There are major benefits in the training and development it provides our AWE staff to share different perspectives and contributions. These assignments take time and planning so we hope to have a pipeline. If you're interested, be sure to discuss with your managers. I place high value on understanding the U.S. nuclear weapons complex and in understanding the policy, postures and history of nuclear weapons in this country. I'd like us to do more formal training for folks who will come to the U.S.

Steven: If you're interested in an assignment, tell your manager and start discussing it with the important people in your life well ahead of any specific opportunity. The benefit of any assignment is learning alternative ways of thinking and doing in the nuclear weapons business and bringing that back to Sandia in the form of thought, relationships and skills.

How do you remain connected to your home team?

Steven: It can be challenging with a seven-hour time difference. It's important to me to stay connected so when there are all-hands or team building, I try to join even if it means logging in after hours. I've also maintained the meetings and mentoring relationships I had while in New Mexico.

I travel back to New Mexico as needed and am getting better with the jet lag. I've had few weeks in the U.K. without hosting visiting Americans, whether fellow Sandians, NNSA partners or peers from other labs.

David: Early in the day is my time to catch up with U.K. peers, at the end of their day. I've been at AWE for 22 years so people from various fields whom I may not have worked closely with in the U.K. will reach out to me when they visit the U.S. The travel is not my favorite, and the jet lag can be hard.

Is there anything else you'd like to share about your role?

David: I'm working to identify additional collaborative opportunities between AWE and Sandia. I hope there will be even more partnering when I leave than when I arrived. If anyone wants peer review, a second opinion or advice on how we can partner, please reach out to me and I'd love to help.

Steven: I'm proud of the scope of collaborative work I see here, and it's a privilege to grow my involvement with that portfolio. But the thing I really want people to know is that even things that seem simple, like dropping in on Sandia colleagues' visits to AWE, require advance coordination and planning because of the governance around how the sites may interact. So, keep me in mind and let me know early if you're coming for a visit.

Staff can learn more about Sandia assignments by visiting the **offsite extended duty assignment** site. Read the full version of this interview on the **Nuclear Deterrence blog**.

Nuclear deterrence all hands showcases how behaviors lead to results

BEHAVIORS DRIVING SUCCESS — Deputy Laboratories Director Laura McGill, right, with Associate Labs Director for Stockpile Management, Components and Production Steve Girrens listening on, addressed a live and online audience at a nuclear deterrence all-hands meeting Nov. 28. Laura and Steve emphasized how Sandia's corporate behaviors — acting courageously, being purpose-driven and connecting with others — work in concert with the recently launched nuclear deterrence portfolio strategy. The three strategy pillars of simplifying, empowering and partnering are directly connected to the Labs behaviors and are embedded in how work gets done. During the meeting, employees shared stories showcasing how their embrace of the pillars and behaviors help Sandia meet its goals to deliver on its commitments without sacrificing safety and reliability.

Photo by Craig Fritz

Purpose and mentorship: 2 ERA winners reflect on their 'why'

By **Maggie Krajewski**

Peers recognizing peers.

That is one of the many things that makes Sandia's Employee Recognition Awards so special.

Since 1993, ERAs have served as opportunities for Sandians to recognize other Sandians for outstanding contributions that have led to exceptional impact within the Labs.

The program kicks off at the start of the new year and features six award categories: innovation, technical excellence, leadership, operational excellence, collaboration, and inclusion and diversity.

Every single Sandian plays a pivotal role in upholding the Labs' commitment to national security, and the ERAs highlight individuals and teams working

RECOGNIZING EXCELLENCE — Associate Labs Director Scott Aeilts, left, and Labs Director James Peery, right, present Fabian Aragon with an award at the 2023 Employee Recognition Awards ceremony on June 21.

Photo by Lonnie Anderson

behind the scenes and going the extra mile — sometimes further — to make a lasting impact.

Fabian Aragon

"When I drive to work each morning, I remind myself of what we do at Sandia, what our purpose is and how we all play a part," Fabian said.

Fabian is a senior manager within the Integrated Business Management Center. He also led a security team that won a 2023 ERA for collaboration. Fabian's work at the Labs is driven by his commitment to that purpose, but he's also been a force in bringing staff together to better understand their role in Sandia's larger mission from a security perspective.

"We all play a part in protecting information, regardless of our jobs. Little pieces of information can add up to big threats," Fabian said.

In 2021, Fabian attended a security briefing focused on supply chain risks. As Fabian absorbed the information, he started to think about how a briefing like this could benefit his group.

"We had experienced some security mishaps at that time and then with remote work, people had lost a sense of connection," Fabian said. "I worried some people started to see their work as just a job and had lost sight of our purpose.

Fabian recognized the risk this lost connection posed to national security and wanted to bridge that gap, so he turned to the presenter of the supply chain risk briefing and colleagues from across multiple centers in mission services to help develop what would become the Mission Services Security Briefing.

"This is now a required in-person class for my two centers," Fabian said. "Since its implementation, one of my centers went over a year without a security incident."

The briefing his team helped develop was one of the first events to bring people back together since March 2020 and as Fabian explains, it set off a domino effect, "We set an example for other teams and centers to get people together again for trainings, events, activities.

"Being together as a team helps remind people of why we do what we do at Sandia. It's so much more than a job, it's a commitment to national security," Fabian said.

LAB DIRECTOR'S AWARD WINNER — Matt Kiesling won an Individual Employee Recognition Award for Leadership in 2023, as well as a Lab Director's Award.

Photo by Lonnie Anderson

Matt Kiesling

Matt jokingly refers to himself as a bit of a dying breed.

"When I started at Sandia in 2005 and walked into my department, you couldn't throw a ball down the hallway without hitting someone who didn't have at least 10 to 15 years of experience," Matt said. "Today it's about three of us, as opposed to 30 or 40, with that kind of experience."

Matt has worked at Sandia with critical asset security for 18 years. And for Matt, that tenure comes with a responsibility to develop and foster a knowledge transfer base.

"You can go to school and earn a degree for electrical or mechanical engineering, but applying that degree to the work we do at Sandia can be hard to figure out," Matt said. "I know it was hard for me when I started. I had talents but no idea how or where to apply them. I relied heavily on those more experienced Sandians to show me the ropes."

Matt said that his goal has always been to help new colleagues "not put their foot in their mouth too many times" but also be able to learn from their mistakes and continuously improve along the way. He sees knowledge transfer as something essential to Sandia's ultimate success.

"If we don't do something to try and pass on our experiences and expertise to the younger people coming here, we're going to lose valuable institutional knowledge. Losing that resource would be difficult to recover from," Matt said.

Matt's commitment to knowledge transfer and mentorship has not gone unnoticed. In 2023, he was nominated and won an individual ERA for leadership as well as the Lab Director's Award.

The nomination highlighted Matt as a "key contributor through leveraging his vast experience, historical knowledge and connections to tackle technical challenges" and "trusted adviser to leads, sponsors, subcontractors and managers."

And while this recognition is a big deal, for Matt the highest honor was his team's nomination.

"The fact that they felt that I deserved this award, took the time to put in the submission — that meant a lot," Matt said. "This is the third or fourth cycle of new folks I've worked with and shared experiences with, so their nomination really validated my time and effort. Maybe I'm doing something right after all."

Before you shut down

Think of those Sandians who made an extraordinary impact this year.

- ✓ Nominations run Jan. 8 through Feb. 2.
- ✓ Winners are selected in March.
- ✓ Visit **era.sandia.gov** for more information.

STEM fun at the Discovery Festival

THE BASICS OF ENGINEERING — Postdoctoral appointee Aditya Venkatraman, right, uses a snap circuit to demonstrate electronics and circuitry concepts to students at the Discovery Festival on Nov. 17. The annual event, hosted by Big Brothers Big Sisters of Central New Mexico and sponsored by Sandia, introduces K-12 students to businesses and job opportunities through interactive activities and discovery. **Photo by Daniel Roth**

Lean Summit showcases industry innovation method to unleash excellence

By **Sylvia Vigil-Raines**

Perfection in continuous improvement and innovation doesn't mean shaming people when something doesn't go as planned.

Lorenzo Gutierrez, director of Enterprise Excellence, kicked off Sandia's recent Lean Summit: Unleash Excellence, held on Nov. 13-15, by inviting in-person and virtual attendees to learn how to more easily and efficiently accomplish Sandia's shared national mission.

"Unleashing Excellence, the title of this year's summit, represents a body of work aimed at challenging the status quo at Sandia," Lorenzo said. "It is challenging our ways of working with increased intention and critical thought as we seek to deliver exceptional service without exception, in all we do. Unleash Excellence serves as a social contract with our employees and our external partners in making Sandia a great place to work and a great partner to work with."

Unleash Excellence is Sandia's version of NNSA's efforts to lead meaningful change in a positive way through its Enhanced Mission Delivery Initiative. Two Lean method experts were invited to speak to staff during the three-day summit at the Computer Science Research Institute at Sandia. The Lean method aims to increase efficiency through continuous improvement, and the presentations focused on how a "Lean" culture can make a difference in innovation success.

CULTURE OF INNOVATION — Matthew Raymer, left, asks questions at the Unleash Excellence Summit on Nov. 13. The event was hosted at the Computer Science Research Institute. **Photo by Craig Fritz**

According to Ken Snyder, executive director of the Shingo Institute, "A key concept as we begin to look at ways to improve by innovating, is that failure is okay. The failure is not the people. It's the process."

Snyder expanded on this idea by saying that when people focus instead on the process as they aim for perfection, they can make progress toward increased excellence. Also, failure is OK because every time someone fails at something, they learn something.

The Shingo Institute's purpose is based on the timeless principle of shaping

cultures that drive organizational and operational excellence.

During his presentation, "Don't Let Perfect be the Enemy of Better," Snyder shared necessary elements for a culture of continuous improvement, including that overall culture is the sum of all the behaviors in an organization.

He emphasized that when starting down a path of continuous improvement, an organization should first ensure the purpose for improvements is aligned with the organization's overall goals.

"Make sure the improvements are going where you want them to go," he said.

Industry shows the way

Norbert Majerus, retired Lean champion of the Goodyear & Rubber Co., Global Innovation Centers, Lean innovation author and consultant, and Shingo Institute faculty fellow, shared how Goodyear moved to a culture of innovation in 1990.

"Their move to concentrate on innovation saved the company," he said. In fact, it helped them launch a tire so different that it had never been seen before. The Aquatred Tire was designed with a center channel designed to dissipate water. This change drove great interest in Goodyear and resulted in increased sales of 21% and a new income increase of 533%."

During his presentation, "Creating a Culture of Innovation," Majerus shared that many successful approaches to innovation use a Lean culture model.

"Whether a company succeeds or fails at innovation always comes down to their culture. The culture is the process and values that the people use and have," Majerus said.

Key components of a Lean culture promote respect, engagement and trust, which together, reduce fear of a culture change that promotes team progress over individual or department goals.

Majerus said one obstacle to innovation is an employee's fear of losing their job status or even continued employment. He suggested overcoming this by aligning organization and individual professional goals, and then the expected behaviors and rewards that support those goals. Other key characteristics of the culture are humble leadership, empowerment and sustainability. Education about innovation and a system that incorporates agility and cycle speed were included as additional culture elements critical to innovation.

A LEANER SANDIA — On day one of the Unleash Excellence Summit, Norbert Majerus, Shingo Institute faculty fellow, speaks to Sandians about the benefits of a Lean culture model, aimed at increasing efficiency through continuous improvement. **Photo by Craig Fritz**

Snyder said that an organization must create a system that enables behaviors that support the culture. "When an organization's leadership makes it easy for workers to do the right thing, such as improve, then the workers will do it," he said. "Ideal results require ideal behaviors, so align behaviors with performance goals."

FOCUS ON THE PATH — Ken Snyder, executive director of the Shingo Institute, speaks to Sandians about focusing on improving processes to achieve success during the Unleash Excellence Summit. **Photo by Craig Fritz**

All about the people

Majerus said that for Lean to work properly, there must be motivation for improvements, meaning there must be buy-in from staff. "Employees must be motivated to be innovative," he said. "They must find joy in their work. They do this by having autonomy, being able to use their expertise and having a purpose."

"People love to be in charge, use their expertise and if allowed, will come up with ways to make things better. Let them innovate," Majerus said.

Of course, people work on teams with colleagues who often have disparate goals. Concentrating on organization goals over department goals is key, Majerus said, and focusing on mutual respect can make this easier.

Collaboration that values company over ego is essential for successful innovation and helps departments win at the intersection of their specific interests. Ideally, project managers create a project environment that supports this and ensures that team success is recognized.

In talking about a holistic approach to continuous improvement, Snyder said that a Shingo Institute principle considers continuous improvement as the responsibility of everybody, everywhere in the organization and all the time.

"It's not something you get released from doing, and it's not the responsibility of a lead department," he said.

Sandia economist selected fellow of energy association

By **Mollie Rappe**

Sandia economist and manager Peter Kobos has been selected as a senior fellow of the United States Association for Energy Economics.

Peter defines energy economics as the science of storytelling, using data to determine which energy technologies can perform as needed and which technologies are cost-effective enough to thrive in the market.

The United States Association for Energy Economics is a forum for professionals interested in energy economics to exchange ideas, discuss challenges and share research results. Its members include researchers from academia, industry, national labs and regulatory agencies.

The association bestows the honor of senior fellow upon individuals who have made distinguished contributions to the field of energy economics or to the association itself. Peter was recognized on Nov. 7 during an awards ceremony at the association's 40th meeting held in Chicago.

"I'm thankful and honored to be recognized by the community," Peter said. "I'm grateful for the time and counsel that many mentors have provided me over the years, and I value the opportunity to give back to the community in the same manner. This is an unexpected, true honor."

Service in economics and for the association

Peter has dedicated his career to improving the efficiency and economic viability of both renewable and fossil-fuel-based energy systems. Recently, he has been working with Sandia experts and the DOE's Water Power Technologies Office to make water power devices more efficient and economically viable.

"I find it very inspiring to see these engineers and scientists with such passion for energy systems," Peter said.

SENIOR ECONOMIST — Peter Kobos, an economist and manager of Sandia's water power research program, was recently selected as a senior fellow of the United States Association for Energy Economics.. **Photo by Lonnie Anderson**

Peter began at Sandia in 2003 as a postdoctoral appointee after completing his doctorate in ecological economics from Rensselaer Polytechnic Institute in New York. He became a staff economist in 2004 and has worked on numerous projects, primarily in energy systems and geotechnologies. In 2016, Peter became the manager of the water power research program at Sandia.

He has also been involved in a long-term energy modeling effort, collaborating with researchers from Sandia and the National Energy Technology Laboratory. This effort has led to the expansion of several programs.

Peter has been a member of the United States Association for Energy Economics since 2000. He served as the vice president of the association in 2016 and has served on several national committees for the association. Additionally, he has been a member of the association's governing council. Peter said that his participation in the association's various councils and committees has provided valuable networking opportunities.

Peter enjoys spending time outdoors, including mountain biking with friends and skiing with his family.

Employee resource group leaders represent Sandia at DOE summit

STRONGER CONNECTIONS — On Sept. 21, the DOE hosted its inaugural Employee Resource Group Summit at its headquarters in Washington, D.C. Leadership from several Sandia's employee resource groups in New Mexico and California attended the summit to network with leaders in similar roles across the DOE complex, learn from each other's work and experience, and participate in professional development sessions. Employee resource group leaders from Sandia included, from left, Myra Blaylock from the Sandia California Diversity Council; Kara Komula from Advancing the Next Generation of Leadership Excellence; Caylin Howard from the African American Outreach Committee; Brian Duong from the Sandia California Diversity Council and the Asian Pacific Leadership Council; Victoria Morrison from the Abilities Champions of Sandia; Laura Oviedo from Advancing the Next Generation of Leadership Excellence; Kimberley Mac Donald from Sandia Women's Connection; Stephan King-Monroe from the African American Outreach Committee; Nicholas Leathe from Sandia Pride Alliance Network; and Chief Diversity Officer Larry Thomas. **Photo courtesy of DOE Employee Resource Group Summit**

A sustainable dialogue: Climate Speaker Series wraps up its second year

By **Stephen Scott**

The forecast is decidedly not favorable if climate change continues unaddressed.

In a talk at Sandia on Nov. 1, meteorologist Sunny Wescott presented on extreme weather hazards made more extreme by climate change — wildfires, floods, droughts, extreme heat and extreme cold — painting a picture of their intensifying toll on agriculture, transportation, manufacturing and public health.

The discussion that followed was notable for audience members who expressed both gratitude and alarm. Two called the presentation "terrifying." A third deadpanned, "Are you saying we might be in trouble?"

Wescott, the lead meteorologist for the Cybersecurity and Infrastructure Security Agency in the Department of Homeland Security, emphasized that most of today's infrastructure was built for resilience using standards and historical data that don't address the frequency or severity of hazards emerging now.

"I think my mission is getting people to understand that," she said in an interview with Lab News after her talk. "We weren't paying attention to certain underlying effects, and now we're going to pay the price at an expedited speed. Had we been paying attention, we would have seen this coming like a shockwave."

TOWER VISIT — Sunny Wescott spoke to Sandians on Nov. 1 about the grim impact of climate change. Her visit to Sandia included a tour of the National Solar Thermal Test Facility. **Photo courtesy of Sunny Wescott**

Wescott's was the 12th talk this year to be presented by Sandia's Climate Speaker Series, which began bringing external speakers to Sandia in early 2022 to promote engagement and discussion on topics related to the Labs Climate Security Strategy. In 2023, speakers have included top climate advisers and researchers from the National Oceanic and Atmospheric Administration, NASA, the National Renewable Energy Laboratory and multiple universities and research institutions. The combined attendance for these events is about 4,500.

"The Climate Speaker Series has brought in a top-tier slate of guests to discuss some of the biggest challenges — and greatest opportunities — we face as a nation in addressing climate security," said Rob Leland, leader of the Labs Climate Security Strategy and director of the Climate Change Security Center. "Not only does the series enhance Sandia's visibility as a leader in the climate domain but it also creates new opportunities for engagement and partnerships that will increase our climate change-related impact."

Some talks, like Wescott's, assess the scale and urgency of the climate problem; others explore the possibilities presented by the emerging science and engineering devoted to potential solutions.

On Nov. 6, Boston University climate researcher and social scientist Benjamin Sovacool visited the New Mexico site for a talk that touched on the technical and social challenges facing a wide range of carbon-removal and radiation-management interventions. His team has visited direct carbon capture facilities in Canada and Iceland, toured a seagrass nursery in Wales and witnessed marine cloud brightening operations over Australia's Great Barrier Reef. The team's research indicates that there is not yet a broad consensus on the desirability of such approaches.

"Most key stakeholders haven't made up their mind," Sovacool said. "It's not determined, which means it could be shaped in the next five or 10 years by research patterns, deployment patterns or major policies."

FRAGILE FUTURE — Among other issues, Wescott's talk addressed the effects of excessive groundwater pumping, which can result in the subsidence of land surfaces and damage to infrastructure, such as this dam spillway in California.

Photo by Kelly M. Grow, California Department of Water Resources

Q&A with Sunny Wescott

In her first role at the Cybersecurity and Infrastructure Security Agency as an infrastructure analyst, Sunny Wescott "learned a ton about critical infrastructure — why it was breaking, where it was breaking, what was breaking it," she said. The data kept pointing her in a familiar direction. "It turned out that most often when we saw damage in the U.S., the actual impacts to the nation were coming from weather events."

Today, as the agency's lead meteorologist, Wescott is an expert for multiple climatological events, such as drought, subsidence, wildfires, tropical cyclones and extreme winter weather events. After her Climate Speaker Series talk, Wescott met with numerous Sandia teams and toured the concentrating solar tower at the National Solar Thermal Test Facility. She also sat for a brief interview with Lab News, which has been edited for length and clarity.

Lab News: Is there a challenge in persuading infrastructure owners to have a sense of urgency about extreme weather threats?

Sunny Wescott: Getting them to take action is still very difficult. They still, in many cases, refuse to acknowledge the underlying reason why they need to take action. The approach involves showing them failures that have occurred elsewhere and asking: If the same event happened here, can you definitively tell me — with statistics — that you're good? In many instances, they're looking for a single safeguard that will reduce their need to pay attention to this.

LN: Is it possible for us to adapt ourselves out of harm's way completely?

SW: Can we prevent the event from happening? Absolutely not. We started the tidal wave; we must ride it at this point. The goal is to stay above water the whole time. I believe every scientific community that does climate studies is aware that the forecasts that we put out five years ago were so rosy that the new forecasts are going to seem borderline apocalyptic.

LN: Are there particular adaptation strategies that you think deserve special attention at the moment or that seem especially promising?

SW: Albedo shifting is one of the best, fastest moves you can make. Heat is really one of our main problems. Painting rooftops white to cool them is super easy to do. That has the immediate impact of cooling down areas that need it most. That can be done very quickly.

Another ideal move is water resiliency at the local level. Getting on black and gray water recycling — out of all the resources, all the things you need as a human being or as an animal on this planet, water is first and foremost.

LN: You spent two full days here at Sandia. Any immediate impressions or takeaways?

SW: There's a lot of really cool research being done, which is great, and there's a lot of ability at Sandia to weigh in on — for example, how we're weighing different impacts, whether it's surface or upper atmospherics, whether we're coordinating data the right way, certain databases of forecasted impacts and modeling of those forecasted impacts.

LN: Fun question. Do people ever tease you about being a meteorologist named Sunny?

SW: I get it at work sometimes — even now. And I've met people who go by the nickname Sunny, who are in the weather community. They don't like that I'm "naturally" a Sunny.

Also in November, the series presented Amanda Staudt and Apurva Dave, both in climate leadership positions at the National Academies of Sciences, Engineering and Medicine. Their talk focused on new climate and climate-related security activities at NASEM.

The 2024 Climate Speaker Series is still being developed, with Melanie Kenderdine, a principal of the Energy Futures Initiative, and Milind Tambe, professor and director of the Center for Research on Computation and Society at Harvard University, already on the schedule. To nominate a speaker, please contact Dylan Poindexter. Watch recordings of previous Climate Speaker Series events, and find more news and events about Sandia's work in energy and climate security.

Recent Patents

July-September 2023

Note: Patents listed here include the names of active Sandians only; former Sandians and non-Sandia inventors are not included.

Following the listing for each patent is a patent number, searchable at the U.S. Patent and Trademark Office website.

- **Andrea Ambrosini and Eric Nicholas Coker:** Redox-active oxide materials for thermal energy storage. Patent #10800665
- **Matthew J. Paul:** Rarefied piezometric uptake apparatus and method for measuring gaseous uptake. Patent #11698315
- **Giorgio Bacelli, Ryan Geoffrey Coe, Dominic Forbush, Steven James Spencer and David G. Wilson:** Self-tuning wave energy converter (WEC) controller for changing sea states. Patent # 11703027
- **Stanley Shihyao Chou and Christopher Ryan Riley:** Efficient low-temperature, catalyst-free dehydrogenation of alkanes. Patent #11708312
- **Charles J. Mueller:** Ducted fuel injection system alignment device. Patent #11713742
- **Yasmin Dening and Judith Maria Lavin:** Additively featured plates for heat exchangers. Patent #11717892
- **Michael Alfonso Gallegos, Bryan James Kaehr and Peter Randall Schunk:** Architected stamps for liquid transfer printing. Patent #11718115
- **LaRico Juan Treadwell:** Solvent-free synthesis of lanthanide oxide and mixed lanthanide oxide nanoparticles. Patent #11718536
- **Curtis Co, Paul Girard Cummings Jr., Robert Ferrizz, Shawn Martin, Rosalie A. Multari, Nishant Bhupendra Patel, Jaideep Ray and Lisa A. Walla:** Systems and methods for screening particle source manufacturing and development test data. Patent #11719727
- **Caleb Loverro, Richard James Strong and Vincent Urias:** Automated platform to assess software assurance. Patent #11720385
- **William M. S. Stout and Vincent Urias:** Emulation automation and model checking. Patent #11720391
- **Yongliang Xiong:** Radioactive waste repository when contacted by water provides borates that absorb neutrons. Patent #11721448
- **Darren W. Branch:** Multifunctional RF limiting amplifier. Patent #11722106
- **Alejandro J. Grine, Alexander Ruyack, Darwin K. Serkland and Michael Wood:** MEMS-tunable optical ring resonator. Patent #11722120
- **Scott E. Rose and Steven James Spencer:** Active tether control for a tethered multirotor. Patent #11724923
- **Nicholas Myllenbeck:** Defect-resistant plastic scintillators with aliphatic additives. Patent #11725137
- **Ryan Wesley Davis and Amit Kumar Jha:** Production of fusel lactates via biocatalysis. Patent #11725220
- **Raymond H. Byrne, Steven F. Glover, Tu Anh Nguyen and David G. Wilson:** Power packet networks for wave energy converter arrays. Patent #11725622
- **Darryn Fleming, Andrew Kustas, Logan Madacey Rapp, Salvador B. Rodriguez and Shaun Ross Whetten:** Refractory high entropy alloy compact heat exchanger. Patent #11725889
- **Alejandro J. Grine, Andrew Eugene Hollowell, Bryan James Kaehr, Alexander Ruyack, Darwin K. Serkland and Michael Wood:** Multi-chip photonics transceiver. Patent #11726276
- **Rodriguez Luciano Andres Garcia, Lee Gill, Jacob Mueller and Jason Christopher Neely:** High voltage switch with cascaded transistor topology. Patent #11728804
- **Matthew W. Moorman and Joshua Johnathan Whiting:** Methods and systems for opioid detection. Patent #11733217
- **Leah Appelhans, Erica Marie Redline, Chad Staiger and David R. Wheeler:** Crosslinked polymers with tunable coefficients of thermal expansion. Patent #11739092
- **Darren W. Branch and Aleem Mohammad Siddiqui:** Nanocomposite-seeded epitaxial growth of single-domain lithium niobate thin films for surface acoustic wave devices. Patent #11746437
- **Brandon Lee Ennis:** Thrust-optimized blade design for wind turbines. Patent #11746742
- **Igal Brener:** Photoconductive metasurface-based ultrafast device. Patent #11749694
- **Tyler Bowman:** Series tee splitter for impedance measurements. Patent #11754605
- **James Bradley Aimone, William Mark Severa, Stephen Joseph Verzi and Craig Michael Vineyard:** Devices and methods for increasing the speed or power efficiency of a computer when performing machine learning using spiking neural networks. Patent #11755891
- **Philip Rocco Miller, Nathaniel Bryant Pfeifer and Ronen Polsky:** Coaxial microneedle assemblies and methods thereof. Patent #11766203
- **Smet Dennis J. De, Jongmin Lee and Peter Schwindt:** Passively pumped, polycrystalline ceramic high and ultra-high vacuum chambers. Patent #11766651
- **Kimberly Butler, Dorina F. Sava Gallis and Lauren E. S. Rohwer:** Optical tags comprising rare earth metal-organic frameworks. Patent #11767468

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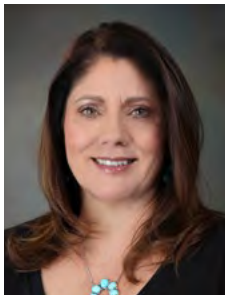
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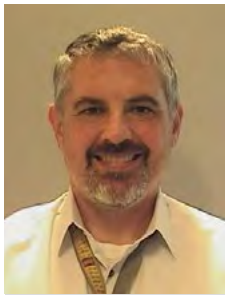
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