



S A N D I A

LABNEWS

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answer
the call
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Charting a course that all can travel

*Goals in Labs FY 23**Strategic Plan grew from year of asking 'What do we need to become?'*By **Jim Danneskiold****S**trategy.

Sandians joke when they're confused about team priorities or the Labs' direction: "I know there's a plan, but I don't have a clue what it is."

For years employee surveys have found that a top concern is a desire to know how what they do — day in and day out — really advances Sandia's mission.

Well, there is a plan and there is a strategy, worked out by a dedicated team, Labs leadership and staff from throughout the Labs.



STRATEGY FOR THE FUTURE — Sandia Labs Director James Peery, pictured here at a Rally Cry Q&A session in July, says of the 2023 Strategic Plan, "Strategy touches us all. ... We must keep an eye on the horizon and take the Labs closer to the tomorrow we envision."

Photo by Craig Fritz

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Ink flows to meet surging demand for national security research



TEAM LIFT — Student interns are introduced to Sandia's superfluid by test operations engineer Orlando Abeyta during a tour. Several new agreements signed this year are expected to increase the numbers of students and faculty partnering with Sandia to support its growing national security workload.

Photo by Craig Fritz

*Sandia expands circle of academic partners with 6 agreements*By **Troy Rummler**

The nation's largest national laboratory is embarking on a major expansion of its network of academic partners to meet the surging demand for national security science and engineering.

This year, Sandia inked memoranda of understanding with Texas A&M University; the University of California, Berkeley; North Carolina State University and the University of Texas at El Paso. It is finalizing agreements with Arizona State University and the University of Washington. When those are signed, Sandia will have **formal ties** with 27 universities, including 13 minority serving institutions.

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LABNEWS Notes

Lab News may contain photos shot prior to current COVID-19 policies. Individuals in photos followed all social distancing and masking guidelines that were in place when photos were taken.

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 Lab News editor Katherine Beherec at kgbeher@sandia.gov.

Sandia Gives

Get involved and meet new people while giving back

By **Katrina Wagner**



The annual Sandia Gives campaign is underway and is an opportunity for employees to donate to the nonprofits that matter to them. Employees can enroll in the Sandia Gives campaign through Oct. 21 and support the United Way or any other U.S. nonprofits through payroll deduction.



SHADE FOR PETS — From left, Retired Sandian Matt Schwartz, bottom left, and Sandians Tom Bosiljevack, bottom center, and Matt Cattaneo, top right, join volunteers Anna Werner, top left, and Lucias Begay, bottom right, to help Guys Give build a shade structure for the dog run at the Haven House, which allows their clients to bring their dogs when they are seeking shelter from domestic violence.

Photo courtesy of Guys Give

The United Way of Central New Mexico also offers a way to become involved through donor groups. The groups provide opportunities for networking, social events, volunteering, fundraising and grant allocation. Each group has a particular focus and style, and they all welcome new members.

Whether it's supporting women in their quest to be educated or employed or helping people experiencing domestic abuse, donor groups play a key role in shining a light on the community. Employees who enroll in Sandia Gives can choose to give to any of the donor groups.

Guys Give focuses on helping domestic violence victims

Guys Give believes in building community by meeting monthly for networking and brainstorming at local small businesses. It supports victims of domestic violence through fundraising and volunteer projects and partners with local shelters to identify needs the group can support.

Guys Give partners with other donor groups to increase its impact. It recently partnered with Women United to raise money for the **Laundry Love** program that helps low-income families get their laundry washed. The groups raised enough money to fully fund Laundry Love for a year.

Hispano Philanthropic Society promotes leadership in philanthropy

The **Hispano Philanthropic Society** works to positively affect the New Mexico Hispanic community through recognition of Hispanic leadership, education, mentoring and support of local nonprofit Hispanic-serving organizations through grant funding. It develops relationships, creates partnerships with other Hispanic serving organizations and collaborates with private industry, government and organizations to drive systemic and sustainable change.

"I am thrilled to have recently joined the HPS Council," said Roberta Rivera, the Sandia Gives campaign manager and the chair for Sandia's Hispanic Outreach for Leadership and Awareness group. I have a real opportunity to leverage each

of these roles and to help support many of our shared focus areas."

Sandia business systems analyst Maura Najera, who serves on the society's council, said, "I give back to my community because empowering others is extremely rewarding for me and life changing for them. It is satisfying to know that I am making a difference for future generations."

Women United is committed to improving women's lives

Women United works to improve women's lives through service and funding. Giving to the Women United fund allows them to support agencies that focus on providing housing and life skills for women and their families.

In 2021, the organization provided computer labs for Crossroads for Women and TenderLove, hosted eight nonprofit visits and two social events, and raised \$175,000 for its fund. This year, the donor group supported Catholic Charities, Crossroads for Women, Saranam, Susan's Legacy and TenderLove with grants.

Women United members can attend tours of nonprofits to gain a better understanding of the barriers some women experience. It also offers opportunities

to meet and network with community leaders and business executives and participate in volunteer projects and social events.

"Women United has given me the chance to become more connected to our community," said member Tamara Rodriguez, an engineer at Sandia. "I have gotten to know the agencies that make an impact every day through their work and how I can make a difference with them. I have made connections with other members in Women United and found new opportunities to grow, learn and contribute, and I get to be part of a wonderful group of individuals who have fun while making a difference."

Young Leaders empower youth

The **Young Leaders Society** encourages youth in Central New Mexico to donate their time, resources and skills. Its goal is to inspire success in the next generation of leaders by focusing on volunteerism and philanthropy.

The society provides opportunities for members to mentor young students, ages 13-18, as they transition into adulthood. Its donor-supported fund awards grants to local programs that encourage and



COUNCIL MEMBERS — Hispano Philanthropic Society council members are, from left, Justin Martinez, Nicole Hewitt, Aaron Gutierrez, Jade Rivera, Sandia business systems analyst Maura Najera, Andrea Romero, Gabriel Castro, Sandia business management professional Alma Gonzalez-Edwards, Stephanie Jaramillo Kozemchak, Sandia engineer Kenneth Armijo, Angela Gallegos-Macias, Manuel Pino and Ana Trujillo.


Photo courtesy of Hispano Philanthropic Society

empower youth through skill building, career exploration and mentoring. It mentors students on tools needed for high school and college success and encourages society members of all backgrounds to share their knowledge and experience.

“If you ever wished you had a mentor when you were younger or perhaps had a role model you looked up to, now is the opportunity to become that person for a young member of



HAVING FUN, GIVING BACK — Young Leaders Society Council members at the 2022 Young Leaders Society Signature Event at Explora Science Center & Children’s Museum are, from left, Nicole Hewitt, immediate past council chair Tracy Brewer, Sandia systems engineer and council chair Jason Starner, Sandia librarian Lee Ann Black and Sandia Safeguards and Security manager Bernardo Diaz. **Photo courtesy of Young Leaders Society**

our community,” said Jason Starner, a Sandia systems engineer and society member. “Having grown up in Albuquerque, YLS provides me with unique opportunities to give back to the community that supported my education.” 



NONPROFITS THAT CHANGE LIVES — Visiting Saranam in June to learn more about their work in ending homelessness in Albuquerque, Women United members posed for a picture with Saranam members. Pictured, from left, are Karen Haskell, Sara Sternberger, Cindy Perner, Tracy Weaver of Saranam, Diane Campbell of Saranam and Heidi Herrera, a Sandia engineer.

Photo courtesy of Women United

Building muscle memory

Labs annual emergency exercise strengthens response

By **Luke Frank,**
photos by **Craig Fritz**

Months of intense planning, organizing and coordinating culminated in Sandia’s Aug. 10 annual emergency exercise — a yearly workout to test its emergency response organization’s proficiency in responding to a site incident that could affect the safety and health of Sandia’s workforce and surrounding communities.


Participating with Sandia emergency management in the drill were senior Labs and Sandia Field Office leadership, Kirtland Fire Emergency Services, the Department of Energy, Kirtland Air Force Base, the city of Albuquerque, Isleta Pueblo, Bernalillo County and the state of New Mexico.



LEADERSHIP CORE — The Emergency Operations Center Policy Group, left to right, including Labs Director James Peery, Environment, Safety and Health acting Director Terry Cooper, Deputy Labs Director David Gibson, Deputy Technical Director for the Defense Nuclear Facilities Safety Board and exercise observer Richard Tontodonato, and Associate Labs Director for Infrastructure Operations Jeffrey Heath provide strategic support and decision-making during the exercise.

“This simulated emergency was a leap in complexity, and we take preparing and testing our emergency response organization very seriously,” said David Stuhan, senior manager in Emergency Management. “We created a very detailed and realistic scenario, established objectives and evaluated our capabilities to protect our workforce, public, property and the environment. Our preparedness level and response capabilities are strengthened through these complex exercises, and our major focus remains on continuous improvement.”

Sandia’s emergency response capabilities are based on the National Incident Management System, which standardizes principles, concepts and terminology to ensure a swift and effective response to natural or human-caused catastrophes. Sandia emergency management conducts drills throughout the year to prepare its responders and ensure equipment, systems and processes are proficient.

“As much as we endeavor to have a methodical, conditioned emergency response, we’re always mindful of what’s at stake — the safety and well-being of our colleagues, friends, families, communities and the environment,” David said. 



SIMULATED SCENARIO — During Sandia’s full-scale emergency exercise, Kirtland Fire Emergency Services exercise controller and evaluator Deputy Chief Abdur-Raheem As-Siddiq tracks critical details as first responders arrive on scene of a mock hazardous materials incident.



NERVE CENTER — Sandia’s Emergency Operations Center brings together highly trained experts and technology to coordinate resources, information and communications for the protection of Sandia’s workforce, the public, property and the environment in the event of a disaster.



SITTING AT ATTENTION — Emergency Operations Center Planning Section lead Cynthia Rivera works with emergency management leadership in the Emergency Operations Center as the simulated emergency unfolds.



DETAIL DISCLOSURE — Brad Romero, center, Hazardous Waste Handling Unit facility emergency coordinator, briefs first responders about a mock chemical spill.

Three Sandia women lauded as leaders

National Women Worth Watching awards focus on leadership, STEM

By **Luke Frank**

Sandia's Robin Jones and Kimberly Pino recently were recognized by Profiles in Diversity Journal as **Women Worth Watching in Leadership** award winners for 2022, while Sondra Spence received a **Women Worth Watching in STEM** award.

The leadership award recognizes those who work to expand and improve diversity, inclusion and equity in the workplace and beyond, while the STEM award recognizes high-achieving women in science, technology, engineering and math who are blazing trails for other women to build successful STEM careers.

Women Worth Watching in Leadership

Robin Jones, a manager in building systems engineering, became an environmental engineer to help improve the environment and provide people with clean water and air. "It's in the intersection of people and the environment that I found my passion," she said.

Part of the draw for Robin is the notion that, when done correctly, no one knows the field exists. "When water comes out of the tap and toilets flush and traffic signals change, no one thinks about the numerous engineers working hard for public health and safety," she said. "We might not be visible, but we can take pride in our work."

Robin earned her bachelor's degree in environmental engineering from New Mexico Institute of Mining and Technology and a master's in civil and environmental engineering from Stanford University. She's currently focused on transitioning Sandia's campuses to net-zero



LAUDING LEADERSHIP — Robin Jones, a manager in building systems engineering, became an environmental engineer to help clean up the environment. Robin is a Profiles in Diversity Journal Women Worth Watching in Leadership award winner. **Photo by Lonnie Anderson**

emissions. "With earth and ocean temperatures rising, net-zero is urgent to help mitigate climate change," she said. "I'm grateful for the opportunity to reduce greenhouse gas emissions at one of our national laboratories."

Kimberly Pino, a senior manager in facilities and infrastructure, believes that leadership is as much about others as it is about a leader. She feels people are the central focus of leading, and one's diversity and agility in connecting to people is where the magic resides.

"Being genuine and transparent are the most rewarding for people with whom you engage," Kimberly said. "Leading with authenticity fosters empathy and deeper appreciation in both directions. A skilled leader feels when and how to ignite action, quiet a stressful situation or amplify the feeling in the room."

Kimberly earned a bachelor's degree in architecture from the University of New Mexico and a master's in architecture

from the University of Nevada, Las Vegas. "Leading people is complex, nuanced and influenced by so many intangibles that represent the push and pull between competing approaches," she said. "The people we lead are all different, and one's leadership style must be just as diverse."

Profiles in Diversity Journal Publisher Jim Rector said this year's leaders represent the best of the best when it comes to putting diversity, inclusion and equity at the center of their decisions regarding recruitment, hiring, mentoring, recognition, support and promotion. "Even in a field populated by organizations that care about and support diversity, inclusion and equity in the workplace, the class of Diversity Leader Award recipients for 2022 clearly stands out," he said.

Women Worth Watching in STEM

In its fourth year, Women Worth Watching in STEM awardees are selected for their contributions, leadership, mentoring and professional achievements in



ANOTHER LAUDABLE LEADER — Kimberly Pino, a senior manager in facilities and infrastructure, is a 2022 Profiles in Diversity Journal Women Worth Watching in Leadership award winner. **Photo by Bret Latter**


science, technology, engineering or math. Each winner has excelled in her STEM career.

Sandia's **Sondra Spence**, an engineering program project lead, is the first female course director for the International Atomic Energy Agency's flagship International Training Course on Nuclear Security in its 44-year history.

As course director, Sondra helps develop course material, coordinates more than 40 participants from 30-plus countries and oversees 38 experts to run the three-week program. Sondra also develops and implements global nuclear security protocols on behalf of the NNSA for Sandia's International Nuclear Security Engineering department.

"Let's help all kids dream big through STEM education," Sondra said. "I would

like to see more emphasis placed on a wider variety of STEM-based educational opportunities for young people to give them the chance to explore their full potential. How many know that a STEM degree can lead to statistical analysis on insider threat, physical security systems design, next-generation nuclear security technology development, unmanned aircraft system science and so much more?"

STEM careers offer women opportunities to excel, achieve and become leaders in some of the most exciting areas of technological discovery and innovation, according to Profiles in Diversity Journal. Recognizing women who are succeeding in STEM careers can inspire other women, and girls, to pursue their own STEM dreams and ambitions. 



STEM STAR — Sondra Spence, engineering program project lead, earned a 2022 Women Worth Watching in STEM award.

Photo by Lonnie Anderson

Mileposts



Rod Schmidt

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Ron Manginell

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Dale Jackson

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Dina Jaramillo

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Raymond Wolfgang

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Recent Retirees



Mary Clare Stoddard

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Charting a course

CONTINUED FROM PAGE 1

They have asked that precise question: How can our individual organizations align our current and future work with a set of clear, Labswide goals?

This week the **2023 Strategic Plan** rolled out with four goals and 14 annual, actionable milestones to help achieve those goals. It charts a course to put the Labs in the best position to anticipate and respond to emerging threats over the next decade and guides hiring plans and investments.

“We need innovation from everywhere across the Labs to improve how we deliver on mission and to make Sandia an even better place to work,” said Labs Director James Peery. “Strategy touches us all, and by thinking individually about how each of us can contribute to achieving our goals, we can move toward this future together. In everything we do we must keep an eye on the horizon and take the Labs closer to the tomorrow we envision.”

Work on the plan began a year ago with an assessment of the global environment and a survey of trends, aided by a panel of external experts. They sought to answer questions on critical future national security challenges and what Sandia must do to address them.

The Senior Leadership Team then developed, reviewed and refined the four, five-year goals and committed to milestones that outline actions that will help achieve those goals.

By asking where Sandia is headed, the strategy team developed the target objective, an overarching goal that everyone at the Labs can work toward. The objective, “to unleash innovation and high-velocity engineering to counter global threats,” will help answer such big questions as “Where are we going?” and “What do we need to become?”

Goals for work and people

The first two of the fiscal year 2023 goals focus on improving the work Sandia does, and the other two aim to make advances for those who do that work. They are:

1. Provide unmatched value to our sponsor, clients and Nuclear Security Enterprise partners that builds trust in our ability to counter global threats.
2. Radically improve how we deliver the mission.
3. Empower Sandians to optimize mission delivery and position Sandia as a premier employer of choice.
4. Build a hybrid work environment for mission success.

“A wide variety of groups provided input at all stages of the yearlong effort to develop

our FY 23 goals,” said executive strategy professional Cally Maloney, who, with executive strategy professional Kathy Robertson and graduate intern Deidra Soto, helped lead the planning. “Across the Labs, there was a concerted effort to ensure the goals would have a wide-ranging impact and that many different Sandia organizations would have a hand in meeting the milestones.”

Milestones for the first goal involve increasing employee awareness of Sandia’s unique role, understanding what hinders innovation and building on the Labs’ role as system integrator across the Nuclear Security Enterprise.

Goal 2 milestones increase the use of digital engineering to speed delivery of hardware and software, improve supply chain resilience and project management execution and make electrical component development more consistent.

To empower the workforce, goal 3 milestones focus on hiring and the compensation program, redesigning performance management and ensuring the Labs’ organizational culture informs its strategic direction.

And goal 4 milestones enhance Information Technology infrastructure and services, demonstrate remote classified work and foster the transition to the hybrid workplace of the future.



A rigorous, quarterly reporting process tracks the progress Labs leaders and their organizations make in meeting those milestones, and identifies what other support they need to move initiatives toward accomplishing the goals. Those reviews will focus on challenges to progress and gathering information that leadership can use to make decisions that promote the goals.

Strategy an annual effort

Cally said strategic planning has been a vital element of Sandia's success for decades. The Labs used to develop five-year plans and periodically make minor annual adjustments. Today, the dynamic global security environment and Sandia's outsize role in national security demand a deliberate, Labswide effort


to build a plan each year that offers high-level guidance to decision-makers across multiple disciplines and programs.

"The Labs has this reputation as an objective, trusted adviser because we draw from our deep technical experience to anticipate, innovate, create and inform the national security policy debate," James said. "Getting our strategic plan right year after year is how we maintain and build on that reputation, whatever happens globally. We've seen that more than ever in the past year."

Cally agreed and said, "The planning process this year was especially urgent and paid more attention to the speed of change, both in the world and in how the workforce — facing the pandemic, a hybrid work environment and hiring and retention

challenges — has delivered on its mission requirements."

Each division and program must determine through its own planning process what they need to do to succeed, and they're encouraged to be as creative as possible in using the Labswide plan to work out the details. For an example, see the article below: "A better place to work and serve our mission'."

"What the individual organizations do in building their parts of the strategic plan expands the milestones into realistic, day-to-day actions that promote our target objective, the goals and milestones and the overall course charted in the plan," Cally said. 

'A better place to work and serve our mission'

National Security Programs develops strategy collectively

By **Andrea Mackay**

To plan its future work, the leaders of Sandia's National Security Programs pulled in ideas from across their centers and programs and aligned its strategic plan closely with the Labs' 10-year target objective to unleash innovation and high-velocity engineering.

The National Security Programs' plan was developed over six months of conversations and built on inputs from all parts of the organization, focused on its mission: to provide trusted, threat-informed pathfinder technologies for national security. The division and portfolio promote coordination between core NNSA capabilities and advanced defense, analysis and intelligence technologies.

Strategic planning provides a sense of direction to the organization's diverse and vital missions, said Associate Labs Director Deborah Frincke. The half-year-long planning process helped outline actionable milestones for fiscal year 2023.

"Our strategic plan builds on what matters most to all our people," she said. "The strategy reflects the most important things that the nation and Sandia need us to work toward collectively."

Executive strategy professional Francine Briones, who designed the collaborative strategy development process, said no one person created or wrote the FY 23 Strategic Plan.

"It is a reflection of the collective vision of the leadership team, guided by input from the broader organization," she said.

Milestones require collaboration

The plan documents the purpose, vision, strategic goals and annual milestones for the National Security Programs division and program portfolio.


"Our FY 23 milestones are the top seven things that require

collaboration among our organizations, and they are intended to complement both the overarching Sandia strategic plan and our individual plans," Deborah said.

The strategy emphasizes the need to be threat-informed and highly connected to the mission, to create time and space for over-the-horizon innovation and to make

the division a great place to work. By design, the strategy does not include every division capability or portfolio mission, because those specific plans live within the various programs and centers. Instead, the strategy highlights the most important, crosscutting focus areas toward which all the organizations need to work. It's a strategy that the leadership team hopes will inspire everyone and foster contributions from every part of the division, one of the Labs' largest.

Division leaders serve as champions for each milestone and will work with a team on a set of actions. Teams will report progress monthly to ensure the division and portfolio are headed in the right direction.

"Strategic plans should be there to energize and engage, not sit on a shelf," Deborah said. "We chose milestones that we are collectively passionate about, milestones that will make National Security Programs and Sandia a better place to work and serve our mission." 



MOST IMPORTANT — Associate Labs Director Deborah Frincke said the plan chose "milestones that we are collectively passionate about."

Photo by Lonnie Anderson

Society of Women Engineers bestows awards on three Sandians, including its highest honor

By **Troy Rummler**

The Society of Women Engineers has bestowed awards on three Sandia employees. Senior scientist Tina Nenoff received the society's highest honor, the Achievement Award, chemical engineer Yuliya Preger received a Rising Technical Contributor Award and Nedra Bonal received a Patent Recognition Award.

The society bestows awards annually to professionals, collegiates and groups from influential businesses, corporations and universities worldwide.

Award recipients will be recognized at WE22, a SWE conference and career fair for women engineers and technologists Oct. 20-22 in Houston.

Tina Nenoff: Using chemistry to solve worldwide challenges

Metal-organic frameworks, or MOFs, are versatile and powerful molecules. When incorporated onto an electrode and attached to the outside of a nuclear weapon, a MOF-based sensor using about a millionth of a watt of power can tell if propellant inside the weapon is degrading. In a petrochemical plant, MOFs can



ACHIEVER — Sandia senior scientist Tina Nenoff has received the Society of Women Engineers' highest honor, the Achievement Award.

Photo courtesy of Sandia

efficiently separate gas poisons from fuel streams. Cage like and designed to trap specific chemicals, they can even clean up radioactive gases from contaminated air.

Tina is a creative force whose pioneering work with MOFs and other nanoporous materials has resulted in numerous inventions that have benefitted society and the environment worldwide. A fellow of both the American Association for the Advancement of Science and the American Chemical Society, she received the sole 2022 SWE Achievement Award, which is reserved for a person "who has made significant and progressive technical contributions," according to a SWE press release.

"I'm honored to be counted among the top women in science who have received this award. It speaks to the diversity in research and teams that I've always tried to maintain at Sandia, which I truly believe has been paramount to being able to translate fundamental research to useful applications. I'd say that has always been a passion for me," Tina said.

A longstanding proponent of collaboration, Tina has worked with teams to use some of the fastest supercomputers in the world to discover framework variations that will be most beneficial to society. She is currently developing a sensor that detects iodine gas, which releases from a nuclear power plant during a melt-down. The sensor could be further developed into an early detection and warning system for plant workers and nearby communities.

"MOFs are easy to make, cheap to use and good for national security," Tina said.

Yuliya Preger: Advancing reliable energy solutions

The electrical grid is transforming. Utilities are pivoting to reduce greenhouse gas emissions and their reliance on fossil fuels. Personal and commercial vehicles are converting from gas and diesel power to electric, requiring a new charging infrastructure. At the heart of these changes



ON THE RISE — Sandia researcher Yuliya Preger was recognized with a 2022 Rising Technical Contributor Award. Photo courtesy of Sandia

is energy storage, and Preger is a rising expert performing research to keep new storage technologies **safe and reliable**.

Yuliya was honored with the Rising Technical Contributor Award, bestowed upon a SWE member "at the professional or graduate student level, who has been actively engaged in the fields of engineering or engineering technology and has individually contributed technical work resulting in significant breakthroughs or results," the society said in a press release.

"As energy storage grows in scale and importance, the need to ensure that these systems are designed and operated carefully also increases," Yuliya said. "We try to understand the risks of lithium-ion batteries as well as emerging technologies at the lab-scale to anticipate and minimize issues in fielded systems."

Yuliya is also passionate about sharing battery data publicly. She co-founded batteryarchive.org in 2020 — the first public repository for battery degradation research data across institutions — and is currently leading a project that is yielding some of the broadest public datasets of lithium-ion battery cycling and materials data. This data has been leveraged by users ranging from undergrads working


on class projects to utilities to engineers at Fortune 500 companies. Individuals can thus reap the benefits of government-funded research.

Nedra Bonal: Of mountains and muons

The society also recognized Sandia researcher Nedra Bonal with a Patent Recognition Award for muon detectors, systems and methods. A **muon** is a particle similar to an electron but much heavier and shorter lived. Dozens are passing through your body each second, raining down from our atmosphere, where most muons on Earth originate. Nedra and her co-inventors were awarded a patent last year for a new imaging device they

created to investigate whether these particles could be used to image underground structures like facilities inside mountains.

“We needed a different set of hardware than what was available,” Nedra said. “Naturally occurring muons mostly travel in a downward direction, but we needed to utilize those traveling from other specific angles. So, we invented a way to determine their direction and isolate the ones of interest, like those traveling horizontally through a mountain.”

Nedra has since transitioned from her research role to managing Sandia’s Office of Research and Development Excellence, which promotes research integrity and provides resources for staff seeking to publish their work. 



INNOVATOR — Sandia researcher Nedra Bonal received a Society of Women Engineers Patent Award. **Photo courtesy of Sandia**

Meet surging demand

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Work at Sandia, which is performed almost entirely for federal agencies, has been rising steadily. From fiscal year 2015 to fiscal year 2021, the Labs’ budget increased more than 50%, from \$2.9 billion to \$4.5 billion. Over the same period, the Labs increased its workforce by more than 25%, from 11,700 to 15,000.

But Sandia won’t meet its obligations just by hiring staff.

“Partnering with universities keeps Sandia science at the state of the art and enables us to do more research for our national security mission than we can on our sites alone,” said Diane Peebles, Sandia’s senior manager of academic programs.

The partnerships take many forms. Research collaborations can range from nuclear science and nonproliferation to climate change, quantum computing, cybersecurity, pandemic resiliency and biodefense.

Additionally, “A memorandum of understanding aligns the leadership at each institution to invest and deeply engage to help each other in numerous ways beyond just collaborative research,” said Ken Patel, Sandia’s campus partnership manager for Purdue University and UC Berkeley. “The MOU is more strategic and thinks long term rather than project specific. It helps to meld the institutional synergies and leverage the unique differences, so that we can become more effective partners.”

Ken said the agreements also streamline other activities — such as when Sandia staff teach university courses or when the laboratory arranges workspace for a visiting faculty — and simplify financial agreements.

Partnerships strengthen Sandia's national security mission

The new memoranda expand existing relationships Sandia uses to carry out its national security programs, ranging from research to recruiting and workforce development.

A longstanding collaboration with UC Berkeley professor Jennifer Doudna, who shared the 2020 Nobel Prize in chemistry for her work on CRISPR-Cas9, a way to edit DNA, has helped Sandia and the DOE **design safeguards** for genetically engineered organisms. The project helps ensure the organisms do not cause unintended, negative environmental and social impacts. Sandia also works with UC Berkeley on nuclear deterrence, global security and quantum information science projects.

Texas A&M and Sandia have had research relationships in hypersonics, global security research, materials science and, more recently, infrastructure cybersecurity. The relationship is further strengthened by Texas A&M-RELLIS, the technology and testing research hub of the Texas A&M University System that facilitates collaboration and educational opportunities in areas such as autonomous and connected vehicles, robotics, roadside safety and physical security, large-scale infrastructure, smart power grids and water systems, and the internet of things.

“For nearly 15 years, Texas A&M University and Sandia National Laboratories have worked together to advance national security research,” said Texas A&M President M. Katherine Banks. “Becoming an alliance partner formalizes our working relationship and commitment to strengthening the safety of our country.”

The University of Texas at El Paso and Sandia work together to develop a sustainable and high-caliber STEM workforce from minorities and underrepresented groups by providing an innovative research and educational platform at the intersection of legacy power system analysis, nuclear engineering and cyber-physical systems. The two institutions are partners in the **Consortium for Research and Education in Power and Energy Systems** for Sustainable STEM Workforce, which is supported by the NNSA’s Minority Serving Institution Partnership Program.

Sandia has a decadeslong recruiting relationship with North Carolina State University, where many alumni have gone on to work as Sandia staff on projects such as the U.S. Navy’s Conventional Prompt Strike hypersonics program. Both institutions have been

involved in collaborative research efforts, including NNSA nonproliferation programs and the DOE's **Consortium for the Advanced Simulation of Light Water Reactor**. The memorandum of understanding will allow for more opportunities for both institutions to impact Sandia's national security and energy initiatives.

Collaborations with Arizona State University have enhanced Sandia's capability in building microelectronic systems that improve the performance, reliability and functionality of national security platforms. Former Sandia staff member Matthew Marinella collaborated extensively with the university in these areas. He recently joined ASU as an associate professor and has continued to foster a research relationship that is producing radiation-hardened microelectronics and neuromorphic computing technologies. Sandia also is working with Sarma Vrudhula, ASU professor and director of the National Science Foundation's **Center for Embedded Systems**, to discuss the feasibility of establishing a new multi-institutional research coalition.

In 2021, Sandia teamed up with the University of Washington and other research institutions to form **Perovskite PV Accelerator for Commercializing Technologies** to standardize tests and documentation for rapidly evolving solar cell technologies. The university is also home to the Institute for Nuclear Theory, which the DOE established in 1990 to facilitate interdisciplinary research, workshops and training in subatomic physics.

Students to benefit from new research, networking opportunities

The expansion of partners also means that more college students than ever before will have opportunities to participate in national security projects with Sandia starting this fall. A formal relationship with a university enables Sandia to create student jobs through **Laboratory Directed Research and Development** funding provided to schools that can be used to pay for research stipends.

"When we get students involved in that LDRD research, then those students get to see what Sandia projects look like, they get to work directly with Sandia principal investigators, and they get a poster session at the



SUPER ENGAGEMENT — From left to right, students Jacqueline van Zyl and Amari Murry from Georgia Tech, Jorge Jimenez from the University of Illinois, Caroline Flesch from Ripon College, and Cameron Shock from Michigan Tech, are shown an attachment for the superfuge by test operations engineer Orlando Abeyta during a tour in June.

Photo by Craig Fritz

end of each fiscal year to present their work," Diane said.

Networking and recruiting events, also sponsored by Sandia and facilitated through the new agreements, help students find

well-paying jobs after they graduate.

"It's a chance to make a serious impact in national security in a way that they probably wouldn't have at other institutions," Diane said. [f](#)

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Sandia Labs has official social media accounts on several online communities to engage in conversations about our work, update followers about the latest Labs news, share opportunities, and support the open government principles of transparency, participation and collaboration.

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Answering the call

Sandians support national security mission

In support of the Nuclear Deterrence Modernization Efforts Rally Cry, Lab News continues to highlight employees and the ways that they contribute to Sandia's national security mission. Read more profiles from [previous editions](#).

Photos by **Craig Fritz**

Ken Morris

*Electrical engineer
23 years at Sandia*

Ken conducts radiation effects testing on various nuclear weapon components for Sandia's Advanced Nuclear Concepts group to assure the components act as intended in stressing environments.

"I was planning to retire four years ago, but I had interest in this job," he said. "I was so excited to contribute to this space and I haven't looked back."

Ken feels that graduates entering the Sandia workforce have a particularly special chance to learn new things and explore diverse career opportunities.

"When you are in school you learn how to learn, but here you can learn and explore new skillsets," he said. "Working at Sandia is a tremendous opportunity to contribute to so many areas if you are willing to learn. You may discover an area you didn't know existed. It's all about how you can contribute to the mission and how you can make a difference — and at Sandia we make a huge difference."

— Sarah Johnson



Tiffany Silva

*W80-4 administrative program support lead
3 years at Sandia*

Tiffany and her family understand what it means to serve. For her, working at Sandia continues a tradition.

"My dad was a command sergeant major in the United States Army for 30 plus years," she said.

"Growing up with him, I truly learned to be proud and love my country. Because of that I wanted to be part of something special as it relates to the betterment of our country. Sandia is truly that."

As team lead for W80-4 administrative program support, Tiffany answers the call to protect the national interest. "Program support schedules, facilitates and coordinates all aspects as it relates to the W80-4 program," she said.

"I have never come across or worked with a more kind, passionate, intelligent and truly sincere group of people," Tiffany said about the people at Sandia. "The dedication I see and the knowledge I have learned is so inspiring."

— David Hill



Photo by Randy Wong

Janson Wu

*Systems analyst
23 years at Sandia*

As an impatient child who, on Christmas, took his remote-controlled car apart to modify it because it wasn't radio controlled, Janson said he learned to "be very specific in what you ask for."

That precision paid off when, as an electrical engineer, he worked on grand challenges like the Micro-Chem Lab and was the electrical lead for the Sandia/California and Lawrence Livermore National Laboratory Reliable Replacement Warhead team that won the Phase 1 competition for the new Air Force and Navy warhead.

Janson left Sandia and spent four years at Silicon Valley startups before bringing that experience back to the Labs as a component engineer and becoming an expert on surety. Now, as an analyst, he's contributing in different ways, like writing portions of a tri-lab position paper to Congress that led to the W76-2. Unable to stay away, he's back to engineering with Integrated Surety Architectures, developing enhanced shipping configurations for DOE weapon transportation.

"I lead the effort to realize a whole range of products for a vast portion of our stockpile," he said. "My dream of being able to contribute directly to the stockpile will be realized with the first production unit of this capability."

— J.C. Ross

Greg Noel

*Explosive component design engineer
12 years at Sandia*

Greg describes explosive component design as "incredibly interesting, super complicated and complex." Many aspects of explosives are still not well understood, and Greg enjoys taking on the technical challenges that are often involved with getting them to perform as intended.

"There's always something new to think about and work on. You seldom deal with the same issue twice," he said.



Photo by Randy Wong



This variety, the attendant challenges and the people have kept him engaged for 12 years, Greg said. "It's really important to contribute to the defense of our nation and our allies around the world in a way that prevents our adversaries from being hostile against us and our interests."

— Antonia Cardella

Cassandra Trevino

*High assurance cryptographic certification lead
15 years at Sandia*

Strong cryptography and information assurance is at the heart of modern nuclear weapon command and control. Ensuring the nation's nuclear deterrent is only usable when authorized is a core Sandia mission. Cassandra applies her extensive expertise in cryptographic and cybersecurity technologies to ensure Sandia products meet National Security Agency certification requirements.

Software verification tests are critical moments in the certification process where NSA personnel travel to witness a live demonstration that cryptographic systems will not fail in an insecure manner. Last year such a test was needed when COVID-19 made NSA travel impossible. As a workaround, NSA requested that Cassandra act in their stead as a trusted witness. Thanks to Cassandra's high standing with the NSA, the test was carried out on schedule, the system passed and the program schedule was maintained.

"I was honored that NSA extended me their trust," she said. "I felt fortunate to be in a position to ensure the integrity of the system and keep the project on schedule. I am dedicated to the mission, and I am passionate about what I can contribute. It makes me exceptionally proud knowing the decisions I make have an impact."

— Andrea Mackay



How to answer the call

Employees can go to the [Nuclear Deterrence Modernization Efforts Rally Cry](#) internal website to let Sandia know how they can answer the call or submit questions.

Operation Backpack serves more than ever

By **Michael Ellis Langley**

Sandians who supported Operation Backpack this year ended up serving more military families than ever, including some from a newly added installation.

The effort at Sandia/California, organized by senior management assistants Rachel Sowell and Adina Eliassian, resulted in 228 backpacks full of school supplies delivered to military families in California at Camp Parks in Dublin, Moffett Airfield in Mountain View, and newly added Fort Hunter Liggett in southern Monterey County.

“I was totally happy to help out the third base,” said Rachel, who started Operation Backpack nine years ago, when she was the senior management assistant of the former California Weapons Center. “It was my desire to make sure that, as we did at the California Weapons Center, we organized fundraisers for the military. I want to ensure that Operation Backpack continued to be a fundraiser that Sandians could feel proud to support.”

Both women point out that expenses for working families can be significantly higher in the Bay Area, and members of the armed services are not immune from those pressures.

“I know it might seem like a small endeavor,” Rachel said. “However, what might seem insignificant, such as a backpack or some school supplies, actually does have a meaningful impact on the families who are receiving them. Many times, there are multiple children in a family with a parent who is deployed, so our donations with all the needed school supplies help the families of our servicemen and women who don’t always have everything they need for school, like a lot of American families.”

The team created several ways that Sandians, whether they work on the California site, work remotely or live in New Mexico, were able to support the effort.

“We’ve tried to create different ways for people to contribute, whether it’s the Amazon wish list, or shopping for some supplies and just drop it off with us, or even sponsoring a child or multiple children,” Rachel said.

“You would think that we wouldn’t be getting as much this year (because of the pandemic), but we got even more, and some paid a hefty shipping price to send it to us,” Adina said.

“I think for those individuals who’ve been around long enough and have been involved in donating to Operation Backpack, they actually look forward to it,” Rachel said. “Every year we have multiple staff members who ask for more than one child to sponsor, because it’s something they look forward to doing with their own kids. They take their kids shopping to get them involved and say, ‘Hey, here’s the need of a child, or several children and a family.’”

Adina agreed: “They make a whole family activity with it. They say how much their children enjoy shopping for this and putting the



PROVIDERS — From left, Dominic Browning, Rachel Sowell and Adina Eliassian delivered backpacks and school supplies to military families as part of Operation Backpack.

Photo courtesy Rachel Sowell



SERVING SERVICEMEMBERS — Vehicles stuffed with school supplies, backpacks and Girl Scout Cookies are filled at the Sandia/California campus for delivery to military families on three northern California installations.


Photo courtesy Rachel Sowell

backpacks together. They make special labels and a lot of them were so beautiful. Some of them go above and beyond, and sometimes they stuff those backpacks so much that there’s not enough room, and they have to attach two more bags to the backpack because they couldn’t fit everything in. It’s very heartwarming to see how much they care about this campaign.”

Rachel — who was joined by her 12-year-old daughter, who started helping put backpacks together when she was three — also points out that many Sandians joined the Labs in the last three years.

“I feel that as we get new employees who are not used to our causes, this is one way to remind them that part of Sandia culture is giving back to our communities,” she said. Rachel even took her daughter to help deliver the backpacks to the families this year to show her how important acts of compassion and charity can be for the families.

Adina wanted everyone who gave to understand how huge their gifts are for these military families.

“It’s very rewarding, seeing the faces on the children and the parents when we deliver the supplies,” she explained. “It’s a very rewarding experience.” 

Unidos: Inclusivity for a Stronger Nation

Sandia celebrates Hispanic Heritage Month

By **Valerie Alba**


More than 200 people attended Sandia's kickoff of National Hispanic Heritage Month on Sept. 15 with a lively in-person Diversity Day at Hardin Field. The theme of this year's commemoration is "Unidos: Inclusivity for a Stronger Nation" to celebrate the cultures, histories and contributions of the Hispanic population. The event included food, a flamenco dance performance by the Public Academy for Performing Arts, and the vocal talents of the Sandia Singers Choir. Local musicians Proyecto Cumbion also performed, and attendees were treated to a show of vintage and modern cars and a display of

STEM artwork by local students.

Diversity Day was hosted by the Hispanic Outreach for Leadership and Awareness employee resource group and featured remarks by HOLA Chair Roberta Rivera; Daryl Hauck, NNSA Sandia Field Office Manager; and Col. Jason Vattioni, 377th Air Base Wing and Installation Commander for Kirtland Air Force Base. Associate Labs Director Scott Aeilts handed the baton of HOLA executive champion to Associate Labs Director Rita Gonzales, who previously chaired the group from 2016-2018.

The celebration of Hispanic Heritage Month continued on Sept. 29 with a Diversity Cinema presentation hosted by HOLA and Sandia's Inclusion, Diversity,

Equal Employment Opportunity and Affirmative Action organization at the Steve Schiff Auditorium. "Life Lessons from Our Abuelos (Grandparents)" featured a panel of employees sharing heartfelt memories of family members who shaped their values and life paths. Each story of the lessons learned from cherished grandparents is connected to the Sandia core values of service, respect, integrity, excellence and teaming. A recording of the event can be viewed on the HOLA and IDEA websites.

Roberta said, "I can't quite describe how wonderful it was to gather in person, to see people talking and laughing and enjoying each other's company." 



LIFE LESSONS — Associate Labs Director and executive sponsor Rita Gonzales speaks during HOLA's Diversity Cinema: "Life Lessons from our Abuelos" on Sept. 29 at Steve Schiff Auditorium.

Photo by Craig Fritz



SHOW TIME — Students from the Public Academy of Performing Arts, an Albuquerque public charter school, dazzled attendees with flamenco dance at Hardin Field. Photo by Bret Latter



HOT RODS — The event featured the popular annual show of modern and vintage cars.

Photo by Bret Latter



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CELEBRATING WITH SONGS — Local musicians Projecto Cumbion performed at Hardin Field at the Hispanic Heritage Month kickoff.

Photo by Bret Latter