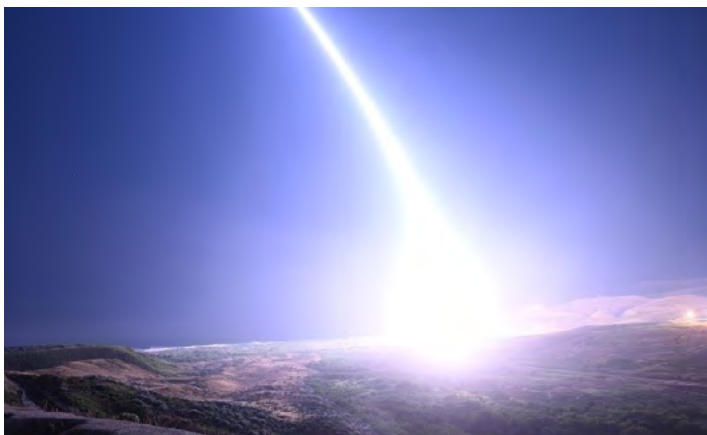




California & Beyond Edition

Vandenberg missile test helps launch Mk21 Fuze into U.S. nuclear stockpile



By **Tim Deshler**

At 12:56 a.m. on June 4, the sky over Vandenberg Space Force Base in Santa Barbara County, California, lit up momentarily as a Minuteman III missile was launched carrying a Flight Test Unit 4 Reentry Vehicle consisting of two new Sandia-designed components: a modernized Mk21 Fuze and a Joint Test Assembly 4a.

The test launch was the last in a series of planned activities designed to demonstrate the operational effectiveness of the Mk21 Fuze, providing proof to the U.S. Air Force that it is ready to be accepted into the U.S. nuclear stockpile.

The reentry vehicle reached its target — the Ronald Reagan Ballistic Missile Defense Test Site at Kwajalein Atoll, part of the Republic of the Marshall Islands in the central Pacific Ocean — where its splash point was evaluated via the Kwajalein Missile Impact Scoring System.

LAUNCH TIME — A U.S. Air Force Minuteman III missile carrying an Mk21 Fuze flight test unit onboard a joint test assembly reentry vehicle was launched from Vandenberg Space Force Base in Santa Barbara County, California, on June 4. This was the final test to demonstrate that the Mk21 Fuze is ready to be moved to the U.S. nuclear stockpile. **Photo by Olga Houtsma, USAF**

— CONTINUED ON PAGE 4

Sandia California: Innovation and inspiration come together



By **Michael Ellis Langley**

Without question, the most consequential investment Sandia has made in its 75-year history is the construction and support of the California site.

Sandia California was founded March 8, 1956, under the leadership of then-President James W. McRae. It was built on land that was once Naval Air Station Livermore, across the street from the University of California Radiation Laboratory Livermore — now Lawrence Livermore National Laboratory.

McRae transferred personnel from Albuquerque to Livermore to work closely with their peers across East Avenue in developing nuclear weapons that employed hydrogen fusion. That work and close collaboration continues to this day, but the story of Sandia California is one of evolution through innovation.

Keeping the nation safe

Sandia's primary mission of ensuring the U.S. nuclear arsenal is safe, secure and reliable — and can fully support our nation's deterrence policy — relies on close work with Lawrence Livermore.

The first decade at the Livermore site was largely devoted to weapons design and development projects, a dozen of which made it to the stockpile. Sandia California provided early critical support functions in safety, use control, reliability, testing and analysis.

One of the largest and most successful programs during this time was the W47 warhead for the Polaris missile. Environmental testing and systems studies were initiated during this time. The site

Making History, Shaping the Future

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Cybersecurity suite now on duty defending the nation



By **Michael Ellis Langley**

For the better part of a decade, dozens of Sandia engineers, each working on pieces of a new national security tool alongside federal partners, have revolutionized cybersecurity forensics with the Thorium platform and tool suite.

Thorium, which was deployed in 2023, automates the most laborious tasks involved with investigating a cyberattack, giving highly trained analysts the ability to focus on thwarting advanced persistent threats from around the world.

“You could imagine how the advent of artificial intelligence and the proliferation and amount of data that exists on the internet enables the adversaries,” project manager Kevin Hulin said. “Basically, anyone can develop malware. The threats are becoming much more voluminous. The threat is significant, and the need for automation is real.”

ON GUARD — From left, Threat Focused Reverse Engineering deputy project lead Jina Lee, project lead Evan Roncevich and project manager Kevin Hulin worked for years to develop a new suite of cybersecurity tools that are now part of the federal government’s threat response. **Photo by Randy Wong**

Finding a new way to thwart threats

Sandia recognized this fact in 2017, starting the work on automated malware analysis with a [Laboratory Directed Research and Development](#) project. Seeing the promise of the work, the [Cybersecurity and Infrastructure Security Agency](#) within the Department of Homeland Security became a sponsor, establishing the Threat Focused Reverse Engineering project.

The complexity of the malware threats and skill of the adversaries trying to unbalance the nation is also increasing, necessitating a nontraditional toolset — one that is able to pick apart malware.

“Historically this has been a very manual effort,” said current project lead Evan Roncevic. “What we wanted to address with TFRE were the difficult parts of reverse-engineering the malware and allow the analysts to better leverage automation in order to handle the complexity and larger volume of malware they are seeing.”

Advanced persistent threats

Analysts must break down a large piece of malware to figure out how it works, what artifacts it leaves behind and how to prevent it in the future. The stakes to get this analysis right and get it fast could not be higher, because advanced persistent threats — adversaries that have the funds, staff and infrastructure to threaten America and the patience to plan and execute attacks over long periods of time — continue to advance their digital weaponry.

“These are adversaries that can build malware with much more complexity than just some random individuals or small black-market organizations,” Evan said, adding that analysts must use today’s data to imagine future threats since those adversaries are continuing to escalate both the complexity and volume of their assaults.

[In 2020, the Russian Foreign Intelligence Service](#) executed a supply-chain based cyberattack against the SolarWinds IT Management platform, “giving [attackers] the ability to spy on and potentially disrupt more than 16,000 computer systems worldwide.”

“When the SolarWinds attack happened, the early response was to look through network logs and figure out what got

compromised and when. These indicators of compromise are examples of threat intelligence that defenders use to discover and prevent further malicious activity,” Evan said. “These events and responses become critical to developing new forensics tools because you can develop and test these tools on what defenders are actually seeing in the wild.”

The Cybersecurity and Infrastructure Security Agency’s mission to respond to and triage cyber incidents relies upon creative investments into new data collection, analysis and pattern discovery capabilities such as Threat Focused Reverse Engineering develops to revolutionize its approach to malware analysis threat intelligence discovery.

“We’re really talking about the importance of threat intelligence — understanding the threat and who has been affected,” Evan said. “What consequences may have been realized that we otherwise would be unaware of?”

From research to real-world

But it is not a simple matter to generate new tools to counter new methods. The time involved in such analysis, coupled with the increasing complexity and number of attacks, made it necessary for Sandia’s engineers to solve problems that hadn’t yet been solved to breathe life into the Threat Focused Reverse Engineering suite.

“There were a number of more basic research challenges that were identified while the TFRE suite was being built,” deputy project lead Jina Lee said. That’s when the team connected with the Department of Homeland Security [Science and Technology Directorate](#) to help answer some fundamental reverse engineering questions that had yet to be researched. The answers turned into building blocks for the suite.

“There were cases where the TFRE tool was not able to even start the analysis,” Jina continued. “A sister project that was funded by the Science and Technology Directorate would then focus on that particular problem and develop solutions so that the TFRE tool could overcome that technical barrier.



HERE WE COME!

FAMILY 75 DAY
2024

FAMILY DAY NEW MEXICO IS SATURDAY, SEPT. 7.

Hosts must print a **Registration Pass** with list of approved guests to access Kirtland Air Force Base and Sandia restricted areas. Guests who are not on the Registration Pass can join activities at Manzano Mesa Park, the Sandia Science & Technology Park and the National Museum of Nuclear Science and History.

Please visit the **Family Day New Mexico** site for important information.

We took the capabilities to the next level to go beyond the big research roadblocks and advance the tools.”

For example, the Science and Technology Directorate has supported the advancement of a tool developed by Sandia that allows analysts to find a sample they suspect is bad, put it in through the system and connect it to another sample that’s already been attributed to some advanced persistent threat.

“We were taking these academic, cutting-edge research approaches and attempting to apply them to real-world examples. But they were failing,” Kevin added. “Our partnership with the Science and Technology Directorate helped us take these advancements in areas like abstract interpretation and machine learning and bring them to bear in new ways for software analysis.”

One team, one goal

Evan said that Sandia also engaged Cybersecurity and Infrastructure Security Agency analysts almost the entire way, building a true partnership through one project.

“We realized that building the capability was only half the problem,” Evan said. “The other half was making it actually human-usable so the analysts would want to use it. Their feedback was really important for us in integrating into their types of workflows

instead of just building a tool and hoping that they would use it.”

Developing widespread APP-eal

The team hopes to make the tools developed through Thorium available to a variety of federal agencies and platforms. They envision an environment akin to an app store where analysts, researchers and developers can build, deploy and share their own tools across communities.

“This is a first step toward building a true community across the federal government and partners to build, develop and collaborate on advanced malware analysis capabilities.”


Kevin said. “Our vision is that this is adopted as a standard for deploying malware analysis capabilities writ large.”

“Standardizing the way that tools get shared across the different agencies is ideal,” Evan said, “because once you do that then it becomes a lot easier to do this app store idea. Then agencies can quickly get their hands on the latest and greatest malware analysis capabilities, TFRE or otherwise.”

Eyes on the future

The team continues to work with the Cybersecurity and Infrastructure Security Agency to refine Thorium.

“Over the next year, we’re going to be working with engineering contractors to get it fully integrated into their production operation environment,” Kevin said. “We are excited to continue this relationship, share these capabilities and improve them as we need them.”

“There is an ever-growing threat of malware that the U.S. deals with — more complicated malware and more volume of malware,” Evan said. “A lot of the capabilities in Thorium can do malware analysis in ways that didn’t exist before us. Ways that will hopefully make the nation a lot safer.” 

Missile test

CONTINUED FROM PAGE 1

The team is conducting a thorough analysis on the complete data set, but preliminary review of the telemetry data indicated that both the Mk21 Fuze Mod and JTA4a telemetry system successfully performed their functions.

All hands on deck

Sandia’s Nuclear Deterrence Modernization and Stockpile Systems Associate Labs Director Rita Gonzales, Integrated Security Solutions Associate Labs Director Andy McIlroy and Nuclear Deterrence Engineering Systems Director Brad Boswell joined the team at Vandenberg to witness the launch, along with Honeywell Federal Manufacturing and Technologies President Eric Wollerman from the Kansas City National Security Campus. **General Anthony**

Cotton, commander of U.S. Strategic Command, joined the team downrange at Kwajalein Atoll.

“It was a spectacular event demonstrating our nation’s capabilities and the accomplishments of our Labs,” Andy said. “The Mk21 Fuze is one of our Livermore Valley weapons systems, and I’m incredibly proud of the team’s success as we prepare to deliver it to the stockpile.”

Sandia’s Mk21 Fuze team collaborated with many organizations across the nuclear security enterprise to prepare for the test, including Air Force Global Strike Command, NNSA, DOD, Lawrence Livermore National Laboratory, Kansas City National Security Campus and Pantex Plant, as well as teams at Vandenberg and Kwajalein Atoll. Sandia’s W87-0 team also provided support for the design, build and integration testing for the flight test vehicle.

“It’s so rewarding to see the culmination of the hard work that our teams have accom-

plished — and for the flight test to be so accurate and successful is really icing on the cake,” Rita said. “It was an honor to be present for this achievement, and kudos go to the entire nuclear security enterprise team for this success.”

Full steam ahead


The Mk21 Mod Fuze program has been working for more than a decade to develop and



TOUCHDOWN — The Mk21 Fuze Reentry Vehicle performed through its planned trajectory, reaching its splash point at the Ronald Reagan Ballistic Missile Defense Test Site at Kwajalein Atoll in the Marshall Islands. The Kwajalein Missile Impact Scoring System there measures the accuracy and performance of intercontinental ballistic missile flight tests based on a number of factors. **Photo by Amy Hansen, U.S. Army**

produce a War Reserve Mk21 Fuze. The FTU4 flight test concluded the development portion of the program.

It was conducted under the scrutiny of the Air Force Operational Test and Evaluation Center, an independent Air Force assessment organization responsible for making acquisition recommendations for the Air Force.

The test met all its objectives, and the Mk21 Fuze program had already achieved Qualification Evaluation Release, **delivering its first production unit** a few months ahead of schedule, so all the Air Force Operational Test and Evaluation Center indicators look positive for the program to move into its production phase. 



COMMAND PERFORMANCE — Gen. Anthony Cotton, commander of U.S. Strategic Command, joined members of the team downrange at Kwajalein Atoll to view the final trajectory of the Mk21 Fuze Reentry Vehicle. **Photo courtesy of Lorenzo Abeyta**

Then and now

CONTINUED FROM PAGE 1

also assumed responsibility for gas bottles and obtained its first computer system, the Elecom 125, to calculate flight trajectories and stress analyses.

Early in the 1960s, the number of stockpile weapons rose as Cold War tensions mounted. The site developed expertise in welding and microelectronics.

As the engineering arm of the U.S. nuclear weapons enterprise, Sandia's responsibility is to ensure that every part of the nuclear deterrent is designed and maintained to the highest standard. In the 1990s, the weapons program changed its focus from designing new warheads to science-based stockpile stewardship and to maintaining and refurbishing existing warheads.

Sandia California continues to play a key role in life extension programs for multiple weapons systems, including the [W87-1](#) and [W80-4](#).

Combustion Research Facility

Research on gas transfer in weapons systems led directly to work that changed the American and international auto industry for decades. Almost a quarter-century to the day after Sandia California was established, the Labs demonstrated impressive foresight when it established the Combustion Research Facility on March 6, 1981.

The facility may have come from the throes of the energy crisis of the 1970s — when the Organization of Arab Petroleum Exporting Countries embargoed oil exports to the United States, causing a surge in gasoline prices and shortage of supply — but the prescience of the Labs has been proven many times over. Contributions that have come from the Combustion Research Facility include new alternative vehicle and aviation fuels, precision laser instruments, constantly evolving ways to model combustion using supercomputing and 40 patents.

Sandia's work on hydrogen fuel cells has spurred millions of dollars in investment in a newly launched,



ENTRY POINT — Historical photo of the original entrance to Sandia California on East Avenue, taken before 1970 when the logo changed to the modern version. The entrance is no longer accessible to traffic, but the buildings are still in use. **Left photo by Craig Fritz; Historical photo from the Lab News archives**



SPARK OF COMBUSTION — The area around the Combustion Research Facility, which opened on the California campus in March 1981, has grown a lot in the last 40 years — as have the ways research conducted there contributed to generations of vehicle engines.

Left photo by Craig Fritz; Historical photo from the Lab News archives



BUILDING CAPABILITY — Over time, California's building 915 has housed elements of nuclear deterrence teams, cybersecurity researchers, information technology and even a café serving the Livermore campus.

Left photo by Randy Wong; Historical photo from the Lab News archives



hydrogen-powered ferry on the San Francisco Bay as well as the design of the [world's first hydrogen-powered research vessel by Scripps Oceanographic Institute](#).

Researchers at Sandia California combined several fields of study, using instrumentation found only in the Combustion Research Facility and algae growth beds, [to create renewable biofuels to power the next generations of vehicles and aircraft](#).

Cyber pioneers grown at Sandia California

In 1999, when the internet was young and cybersecurity was in its infancy, Sandia California established the [Center for Cyber Defenders](#) to cultivate, train and get inspiration from new generations of cybersecurity experts who have brought ingenuity to defending the nation.

Since its launch in Livermore, more than 800 interns have worked in the center in New Mexico and California, at least 200 of

whom were hired as full-time researchers — with 153 of them still employed today and working on the toughest national security problems facing the nation.


Open campus, unlimited future

In 2012, at the dawn of the 21st century, Sandia California embraced the culture of innovation and exploration in the Bay Area by partnering with Lawrence Livermore

National Laboratory in setting aside 10% of its property to create the **Livermore Valley Open Campus**. The goal of the campus is simply stated but powerfully futuristic: create unprecedented collaboration in an open research and development space.

By leveraging the combined intellectual might of both labs and the entrepreneurial ethos of Silicon Valley, the campus is home to the Combustion Research Facility,

the Center for Infrastructure Research and Innovation, and the Biotech Collaboration Center.

In this ever-expanding village of advanced scientific and engineering centers, researchers from private industry and academia collaborate freely with lab personnel to contribute to the next generation of big ideas — ideas that will solve the critical and seemingly intractable challenges faced by the nation. 

Celebrating the evolution of 75 years of Sandia

*California site
Associate Labs Director
Andy McIlroy reflects
on impacts of the Labs
through the years*

By **Michael Ellis Langley**

Associate Labs Director Andy McIlroy, head of Sandia's Integrated Security Solutions division, has worked at the Labs for 30 of its 75 years, witnessing the institution's evolution into an internationally renowned, problem-solving juggernaut.

The first mission

"When you look at the 75-year history of the Labs, we were founded with a sole mission of nuclear deterrence," Andy said, adding that it may be hard for younger generations of Americans and Sandians, who grew up following the end of the Cold War, to understand how the nation's nuclear stockpile may have prevented international conflict.

"As awful as nuclear weapons are, they have brought a certain level of peace and stability to the world that was sorely lacking in the several centuries previous to that," Andy continued. "People were genuinely worried about nuclear war. The nation's arsenal has served its purpose and has deterred numerous bad outcomes. Looking back, Sandia has played a central role in creating the safe, secure deterrent that made this possible and has given

policymakers a tool to keep the peace. When I consider what might have been, I think we can be proud of being part of that deterrent and helping to achieve a historically unprecedented level of global stability."

Sandia, which engineers all the non-nuclear components of weapons systems, has been a central champion for building safety systems into the stockpile.

"It's an incredible achievement — planned and executed largely by Sandia teams — to attain the level of safety that we have in nuclear weapons," Andy said. "Over the years, some plane crashes and other accidents have come closer to an unintended detonation than anyone would like. I think it's fair to say that Sandia has played an outsized role in assuring the safety and security of the weapons during our 75-year history. Nuclear weapons will remain secure, due in no small part to the work of our amazing scientists and engineers."

From weapons to world-changing technology

The reputation and experience that Sandia has developed as systems analysts and engineers since 1949 have made modern life possible — from the microchip to the automobile.

In 1962, Labs physicist Willis Whitfield created **the world's first laminar-flow cleanroom**, which filtered microscopic particles out of the air — allowing for the manufacturing of extraordinarily sensitive technologies in an atmosphere free from pollutants. This technology, licensed



CELEBRATING SANDIA — Associate Labs Director Andy McIlroy. **Photo by Randy Wong**

by Sandia around the world, has enabled billion-dollar industries to flourish, including microchips that are found in almost everything today.

"The laminar-flow cleanroom is a fundamental pillar in modern microelectronics," Andy said. "Talk about impact on the lives of everyday people! People who video chat, for example, do so over probably 50 different computers without realizing it. Smartphones. Cars. Most people don't know how one invention at Sandia enabled our modern way of life. The story is rarely told because it happened so long ago."

That was just Sandia's first step in ushering in the modern electronic age.

"In the 1990s, Sandia California, along with Lawrence Livermore and Lawrence Berkeley national labs, led what is still the largest cooperative research and development agreement in the history

of the national lab complex,” Andy said. “We partnered with the Semiconductor Manufacturing Technology, a not-for-profit consortium of companies focused on advancing microchip manufacturing, to develop practical extreme UV lithography.”

Extreme ultraviolet lithography is a method, using UV light, to create intricate patterns on silicon wafers. The method allows chipmakers to create electron pathways on wafers as small as three to five nanometers. This made it possible to create smaller technologies more powerful than anything that had come before.

“It was at Sandia California that the first EUVL machine was invented. We made the first prototype and demonstrated it,” Andy recalled. “It took 20 years before that became a practical industry capability, but the very highest-performance microchips of today are directly traceable back to the work that Rick Stulen (former vice president of Sandia California), Glenn Kubiak (former director of the Biological, Radiation, and Signature Science, Technology, & Engineering center), and their team did.”

Sandia, under the hood

Another era in scientific discovery was born inside the Combustion Research Facility on the Sandia California campus — one that has silently impacted the automotive industry for decades.

“Our focus was on clean and efficient combustion,” said Andy, who previously oversaw the Combustion Research Facility in one of his many prior roles at Sandia. “I once fielded a question from someone in academia during a CRF function about how much the work we were doing mattered



LOOKING BACK — A historical photo of the Combustion Research Facility in Livermore, California. **Photo by Randy Wong**

because they didn’t see many patents coming from there. Standing with me was the director of research and development for General Motors. Before I could respond, he said — quite succinctly I might add — “There is not a single car in the parking lot outside this building, domestic or international, whose engine has not been affected by the work done in this building.”

Andy said that Sandia’s fundamental work to understand combustion have helped the design of several generations of cleaner and more efficient vehicle engines.

“But there’s no Thunderbird stamped on all those engines, so most people don’t know about that part of the story,” he said.

National interest, international impact

Andy also pointed out the Combustion Research Facility’s status as one of the few facilities in the national security lab complex to host collaborators from all over the world.

“The founders of the CRF were rather prescient in understanding the importance of collaborating throughout the world on areas of common interest where national boundaries are less

important,” Andy said. “If you’re going to say you’re the best in the world, the only way you can know for sure is by diving into the international competition of ideas. Peer interactions and peer reviews hone your skills and make you better. They also help you understand what is actually state-of-the-art.”

The Livermore Valley Open Campus, which includes portions of both Sandia California and Lawrence Livermore National Laboratory, has created a nexus of national lab experts, foreign national experts and the Bay Area’s high-tech community to tackle groundbreaking work. But the campus is about more than science diplomacy.

“The LVOC is critically important for our national security missions,” Andy said. “Our energy and science programs give us global arenas to test ourselves, so we can see where we stand and make sure we rise up to truly be the best in the world. The world is a far more competitive place than it was seven decades ago. Understanding where we sit in that space and other countries’ capabilities is vital.”

The evolution of Sandia’s culture

Modernizing research and capabilities for the 21st century is not the only way in which Sandia has evolved.

“In the ’50s,” Andy said, “there was a model of recruiting the smartest people at a college campus to work at the Labs.



MODERN RESEARCH — The present-day interior of Sandia California’s Combustion Research Facility. **Photo by Dino Vournas**

Unfortunately, this meant that the early Sandians were almost all white males, especially because women were actively kept out of scientific fields. My own mother tried to take physics in college and was literally told by the professor to leave and un-register from the class.”

Today, Andy sees a diverse laboratory, composed of individuals who have come to Sandia from a range of backgrounds, bringing different cultural viewpoints. He also sees the incalculable benefits of that diversity.

“When teams have a wide range of expertise and viewpoints, they usually do better — sometimes a lot better,” he said. “Your culture and where you came from influence how you think about solving problems and how you approach those things. People who say, ‘Oh, it’s all just technical, you don’t need that,’ sell themselves and their organizations short. If we still limited ourselves to hiring white, male, U.S.-born scientists and engineers, we would have an awfully small pool to

draw from, and we would miss out on lots of talent.”

Andy believes in casting a wide net to find the best possible minds on earth to tackle the most pressing issues facing the nation and the world.


“The nation has become more diverse, and the competition for that talent has become much more intense,” he points out, particularly when it comes to policymaking. “When we sit down at Sandia’s senior leadership table, we have true diversity around the table and different ways of thinking about problems. We reach better solutions that way. Sometimes things can be a little rocky during our discussions because folks are coming from very different perspectives and different ways of thinking about things.”

“But,” Andy said, “the solutions that we arrive at are better for having been tested in all those different dimensions. This has been a really positive evolution for us as a laboratory.”



PEEKING INTO THE PAST — Historical photo of cleanroom inventor Willis Whitfield stepping out of a mobile cleanroom at Sandia..

Photo from the Lab News archives

And that evolution is one of many things to celebrate in Sandia’s 75-year history. 

Investigating the nation’s solar infrastructure and severe weather

New project to identify damage to photovoltaic systems and develop solutions

By **Kelly Sullivan**

Two decades ago, solar energy capacity in snowy northern regions was almost nonexistent. Today, because of dramatic cost drops, some of the fastest-growing regions for photovoltaics are now above 40 degrees north latitude, where snow is abundant in winter.

Snow and ice can physically stress modules, resulting in breakage. Moreover, while snow on the ground is highly reflective and can boost photovoltaic solar energy output, snow that covers the panels blocks sunlight from reaching the

solar cells. Estimated snow losses, or the energy lost when snow shades photovoltaic panels, range from 1% to 15% annually and can reach as high as 90% in a month, depending on specific climatic and system design factors. At that scale of loss, major snowstorms that sweep across the country can reduce solar generation at a regional scale.

The snow-photovoltaic nexus

Over the past six years, Sandia has emerged as a leader in the study of snow and its effects on photovoltaic performance and reliability at northern latitudes, with funding from the DOE **Solar Energy Technologies Office**.

Working with the **University of Alaska-Fairbanks** and **Michigan Technological University**, as well as multiple industry partners, Sandia has advanced research on the snow-photovoltaic nexus. This research



SNOWBOUND — Snow cover on photovoltaic systems can block light and create ice dams, resulting in significant power losses and reliability concerns. **Photo by Laurie Burnham**

includes development of advanced snow-performance models, identification of technologies and designs to accelerate snow shedding, and development and deployment of monitoring stations to measure the amount of light that passes through snow and the weight of snow on photovoltaic panels.

“Snow on PV systems presents a unique challenge,” said Sandia scientist and principal investigator Laurie Burnham. “Not only is snow ubiquitous in the northern U.S. in winter — and therefore, seasonally predictable — it is a repetitive and persistent stressor. Our team is making important strides toward shifting the industry away from a one-size-fits-all approach to photovoltaics by generating the data to support the adoption of solar designs and technologies that are more efficient in wintry climates.”

Understanding solar infrastructure in severe weather

The current three-year project, “Increasing the efficiency and resilience of PV systems in Northern Regions,” will formally end in September but then immediately expand into a broader effort aimed at securing the nation’s solar infrastructure against severe weather, including snowstorms.

Sandia will lead the new three-year DOE-funded project, “Securing solar technologies through optimization, resilience and modeled systems,” known as SSTORMS. The Sandia project team will include Laurie Burnham, Dan Riley, Bruce King, Thushara Gunda and Nicole Jackson.

Lawrence Berkeley National Laboratory and the National Renewable Energy

Laboratory will contribute to the project, which will focus on identifying physical damages to photovoltaic systems and components caused by specific storm categories, developing technical solutions and hardening strategies to ensure resource availability, and disseminating best practices to stakeholders.

Like Sandia’s snow-focused research, the SSTORMS project will investigate the performance and reliability of photovoltaic power plants in the context of global climate change and the associated increase in the frequency and severity of extreme weather events. Extreme weather events can inflict catastrophic damage on photovoltaic systems, including the shattering of glass and collapse of racks, that can cause the destruction of individual modules or even whole systems.


Damage can also be subcatastrophic, such as internal damage to the solar cells or other module components that may not be detected through a visual inspection. Undiagnosed damage may worsen over time, resulting in accelerated performance degradation or the



CHANGE IN LATITUDE — Located in the state’s Upper Peninsula, the Michigan Regional Test Center at Michigan Technological University supports Sandia’s research activities on the performance and reliability of photovoltaic systems at northern latitudes. **Photo by Paul W. Dice**

accelerated aging of module components. Such damage is only detectable with costly diagnostic techniques like infrared or electroluminescence imaging.

The team will investigate both damage categories to identify vulnerabilities and opportunities for storm-hardening. They will also create a risk index to inform future photovoltaic siting and design decisions and create resource adequacy models to ensure sufficient generation in a solar-dominant energy future. Storm categories of greatest interest to the team are hurricanes, floods, tornados and hail, in addition to snow.

“This is the time,” Laurie said, “to take an objective and thorough look at the reliability of our solar infrastructure in the face of global climate change and increased storm activity and make sure it is robust. Our new project aims to do just that.” 

California campus improvements enhance site for Sandians and visitors

By **Lea Blevins**

Sandia strives to provide exceptional service in the national interest, and now the Livermore, California, site is well on its way to exemplifying “exceptional” quality, too.

The campus recently completed its first major phase of the California Site Improvement Project. The goal was to transform what had been likened to an “abandoned fort” into looking like the modern, cutting-edge laboratory that Sandia already epitomizes.

“The site improvements are for our sense of Sandia camaraderie and for showing we care about the people who work here,” said strategic planner Joel Stauber, who helped drive improvements forward. “The project exceeded even my own expectations.”

The first phase of this undertaking earned the team — composed of more than a dozen collaborators — an Employee Recognition Award earlier this year.



SENSE OF PLACE — The plaza in front of Building 912 showcases a Zen garden in the shape of an atom surrounded by water-wise plants. **Photo by Spencer Toy**

Two improvements, new monument signs plus water-wise landscaping along the main site entrance on Greenville Road, can be seen immediately when entering. Additional landscape improvements were made to Building 912's plaza, which Associate Labs Director Andy McIlroy passes on the way to his office.

"I'm thrilled with the results of the California Site Improvement Project," Andy said. "The new, environmentally friendly landscape and the striking signage have helped bring the campus into the modern era. It's great when driving into campus or walking on-site to see the upgrades that have already been completed, as well as those underway."

Upgrading the 912 plaza posed a challenge for the team. Due to basement laboratories and offices underneath, the new landscaping had to comply with weight restrictions. The team developed a Zen garden — in the shape of an atom — that offered a light-weight approach. The drought-friendly alternative lightened the load on the plaza by reducing soil weight and avoiding the need for irrigation.

Finding a way to a curated campus

The other key element of the project was to revamp the two main signs leading onto the site — one on the east side's open campus "front door" entrance and the other at Post 1's entrance for workforce members on the west side.

"First impressions are really important," Joel said.

He worked closely with Sandia creative designer Loren Stacks on the project. Loren used his background in sign design to create the new entry markers, which became a tribute to the era when Sandia New Mexico was founded in 1949, followed by the California location in 1956.

"The shape is inspired by mid-century design that used a lot of trapezoids, so it's a very subtle nod to our history," Loren said. "We've gotten tremendous feedback. Everybody loves that monument sign."

Loren and Joel are encouraged by the positive reception, especially as they've been coordinating with counterparts in Albuquerque on a Sign Standards Committee to upgrade signage for Sandia as a whole.

"This is something I've always thought was a need — and that's one thing I love about Sandia," Loren said. "If you see a need for something and you have the skills to solve that problem, you can present the idea, and people will listen."

The committee is collaborating on plans to eventually update signage for Sandia's sites in Tonopah, Nevada;



LIVERMORE LANDMARK — The new monument sign at Sandia California's entrance on Greenville Road.

Photo by Spencer Toy

Kauai, Hawaii; and potentially more.

"It would be a way of helping to unify Sandia," Joel said.


The new monument sign at Sandia California's main entrance now helps distinguish the site from Lawrence Livermore National Laboratory across the street.

"It's obviously an entrance now — it's a destination, and it never felt that way before," Loren said. "It instills pride in the workforce. And for visitors, it makes a good first impression and a lasting impression. It's what a national lab should look like. We're at the forefront of technology, and the look of the campus should match that."

Improving the site now, and beyond

Joel and Loren are focusing on next steps for the California campus, including renovating the Visitor Badge Office and upgrading additional signage around the site.

Craig Taylor, director of California's site operations, was an advocate for the project. He shared that he is proud to come to work on-site with many of the enhancements already in place.

"The California Site Improvement Project was designed to address state water conservation requirements, campus character and visitor wayfinding," Craig said. "The resulting landscaping and signage have exceeded expectations. I can recall no recent facilities effort where I have received so many positive comments. It's been truly transformational in so many ways." 

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Sandians resolve critical security challenges across the nation and beyond

By **Trina West**

Sandians are lending their expertise to other government agencies in support of critical missions via Offsite Extended Duty Assignments.

The **program** allows Sandians to continue their essential work supporting the nation's security by embedding with host agencies such as the DOE, NNSA, DOD and other entities.

Several types of Offsite Extended Duty Assignments support Sandia's mission and benefit partner agencies. For example, under the Intergovernmental Personnel Act mobility program, an employee does not perform Sandia's work but is assigned as a technical adviser to work on behalf of the government agency. A Strategic Partnership Project assignment allows an employee to engage in Sandia project work

at an external host agency. Most assignments start with one year and are often renewed for two to three years.

Influencers beyond the fence

Most assignments involve moving temporarily to a domestic or international location, while some may be performed remotely. Employees are offered two relocation options to choose from. Extended Travel Duty, the most common option, requires them to keep their permanent residence while on assignment, and they receive a per diem allowance to offset the cost of residing and working at the temporary location. The Temporary Change of Station option provides relocation of the employee's household to the temporary work location. Sometimes, the assignment process can be long and arduous, but the benefits are worthwhile to those participating.

"I was very eager to get going," said Erik Spoerke, who just began a remote Intergovernmental Personnel Act assignment from New Mexico to Washington, D.C., at the DOE Office of Electricity. "Having patience as you anticipate moving is good training for once you get to your assignment, and I think learning how to work through the process is worth it."

The assignments team, Alicia Cloer and Monica Price, steadfastly guide assignees through the process, from applying to relocating to transitioning back to Sandia. To ensure a smooth and transparent experience, they partner with human resources and Sandia's relocation provider to give assignees a detailed briefing about the assignment and relocation processes, including the steps, timeline and potential challenges.

"The most successful assignees are the ones who are very intentional about why they're doing it, what they want to get out of it, and go into it with an adventurous attitude," Alicia said.



SERVICE IN THE NATIONAL INTEREST — Sandia's Washington, D.C., offices are just steps from the DOE headquarters and serve as a home base for many assignees working there.

Photo by Meagan Brace

Currently, Sandia has 57 workforce members on assignment. Of those, 54 assignees are located throughout the United States, with three in western Europe.

Assignments can range from working with the Department of Homeland Security to determine the impact emerging technologies have on the federal government's ability to protect its cybersecurity infrastructure, to being a technical adviser to the U.S. Congress and supporting the research and analysis conducted at the headquarters of the Nuclear Regulatory Commission in Washington, D.C. These assignments are not only diverse but also have a significant impact on national security and the advancement of critical technologies.

Being in the room where it happens

Because assignees support other programs off-site, it is easy to overlook how influential their work is to national security.

"This is the United States electric grid," said Erik, who is working to realize the benefits of long-duration energy storage. "It is the most complex and largest machine ever built. What is going on right now is an electrical energy revolution. And the United States grid is going to change more in the next 10 years than it has in the last century."

Michael Minner lives in Virginia and is especially proud of his work developing zero-trust guidance with the Department of Homeland Security Cybersecurity and

**2024
HISPANIC
HERITAGE**

DIVERSITY EVENT DAY
Thursday, Sept. 12 | 11 a.m. – 1 p.m. | Hardin Field
Kirtland Air Force Base

11:00 – 11:15	Sound Productions DJ & MC Service by Matt Martinez
11:15 – 11:30	Presentation of colors, national anthem by Sandia Singers
11:30 – 11:35	Opening comments from Hispanic Outreach for Leadership and Awareness Chair Roberta Rivera
11:35 – 11:50	VIPs: Rafael Gonzalez (SNL); Dr. Daryl Hauck (NNSA), and Col. David Wyrick (377th ABW Deputy Commander)
11:50 – 12:30	Education/Awareness in Cultural Music: Tierra Adentro Baile Flamenco
12:30 – 1:00	Sound Productions DJ & MC Service by Matt Martinez Car Show – Judging of vehicles will start at 12:30 p.m.

Food provided by Thunderbird Café (pre-order), Hangry Jalapeño Food Truck, La Urraca, Pop-Pops, and more. Educational awareness information from outreach and networking groups. Winning art from the 2023 student art contest on display.

Thunderbird Café will feature a special main dish each week of Hispanic Heritage Month.

Infrastructure Security Agency under [Executive Order 14028](#).

“It has had a widespread impact on how agencies are improving their cybersecurity posture at large,” Michael said.

Currently working at the Pentagon, Scott Frederick is an Intergovernmental Personnel Act assignee with the Office of Nuclear Matters.

“It’s the place where all things defense are happening,” Scott said. “It’s interesting to see the politics, what makes the priority list and how the executives at the three- to four-star level handle themselves in meetings, negotiate and deal with conflict. It’s like having a front-row seat to the big show.”

Connection with intention

Several assignees maintain their connection to Sandia while on assignment by attending department meetings, lunch and learn sessions and external professional and social events.

“I miss my team and all the very cool, excellent work they do,” said Kyle Clavier, who teleworks from Florida to the Accident Analysis Branch under the Office of Research, Division of Systems Analysis for the Nuclear Regulatory Commission. “My Sandia manager has been great about creating opportunities for me to

stay connected to my team and regularly checks in on how I’m doing personally and professionally.”

Mentoring incoming assignees is a common thread among veteran participants. Scott explained that gaining more real-world experience beyond Sandia’s fence and sharing that outside perspective with others is excellent leverage.

“Preparation for the role is important,” he said.

In addition to strengthening Sandia’s relationships with partner agencies, those within the off-site assignment program highlight its significant impact on their professional growth, allowing them to experience fulfilling career achievements.

“Nuclear safety is a small, tight-knit field,” Kyle said. “Many of the personal and professional relationships I cultivated during my assignment will greatly benefit my career and personal life.”

“For me,” Michael said, “it’s more about the incredible people that I get to work and team with. So, I’m grateful for the opportunity.”

Learn more about Sandia’s policy as a Federally Funded Research and Development Center that facilitates the

Offsite Extended Duty Assignments

Intergovernmental Personnel Act Assignment:

The employee acts as a federal employee of the agency to which they are assigned and may manage and give direction on behalf of the government.

Strategic Partnership Project Assignment:

Sandia temporarily assigns an employee to perform Sandia project work at an external customer location in support of a Strategic Partnership Agreement.

Sandia Assignment: Sandia temporarily assigns an employee to perform Sandia project work at an external customer location in support of a Strategic Partnership Agreement.

Congressional Fellowship Assignment: The employee acts as a technical adviser or consultant providing expertise and experience to the U.S. Congress and is prohibited from acting as a federal employee.

M&O Task Assignment to DOE or NNSA:

The employee acts as a technical adviser or consultant providing expertise and experience and is prohibited from acting as a federal employee.

Personnel Loan Assignment: The employee acts on behalf of a non-federal entity and may manage and give direction on behalf of that entity.

Other Assignment: Sandia temporarily assigns an employee to participate in activities at entities not otherwise described.

Offsite Extended Duty Assignments on Sandia’s policy website. [🔗](#)

Transformation in the Permian Basin

Permian Energy Development Lab guiding region through economic innovation

By [Diana Hackenburg](#)

Stretching across 66 counties in West Texas and eastern New Mexico, the vast region known as the Permian Basin is a cornerstone of the U.S. energy economy.

The Permian Basin accounts for nearly half of U.S. crude oil production, and if it were a country, it would be one of the biggest oil producers in the world.

Having an economy so closely tied to the oil and gas industry presents certain

challenges — especially as the United States seeks to lead in addressing global climate change by reducing greenhouse gas emissions. The region’s skilled workforce and natural resources, however, also create opportunities for the region to reinforce its status as a leader in the new advanced energy economy.

The Permian Energy Development Lab, also known as PEDL, looks to foster those opportunities by bringing together industry, government and academic partners to advance energy development in ways that benefit both local communities and the country. Sandia has been involved with PEDL since its formation as a key technical adviser.

Nadine Miner, Sandia’s campus partnership manager for the University of Texas at

Austin, recalls first learning about the idea for PEDL from Brian Korgel, director of the university’s Energy Institute.

“He had this vision,” Nadine said, “for creating an energy development lab that would enable large-scale, proof-of-concept projects to test safe and resilient clean energy solutions at scale.”

At the same time Nadine was talking with University of Texas Austin, the National Renewable Energy Laboratory also reached out to Sandia to pitch the concept.

“Sandia was just a perfect fit based on our breadth of energy work, experience working with communities and presence in New Mexico,” Nadine said.

Sandia signed a memorandum of understanding in spring 2022 to team on this effort, becoming a PEDL cofounder along

with University of Texas Austin as the prime lead. Other partners included the National Renewable Energy Laboratory, the Cynthia and George Mitchell Foundation, Midland College, Houston Advanced Research Center, New Mexico State University, New Mexico Institute of Mining and Technology, Odessa College, University of Texas at El Paso and University of Texas Permian Basin.

Origins of PEDL

The Permian Basin is uniquely positioned to contribute to an advanced energy future because of its renewable resources and geology, specialized expertise and existing infrastructure. **PEDL** aims to leverage these resources to catalyze advanced energy research, develop new energy professionals and entrepreneurs and share the benefits of the energy economy.

Funding from the Mitchell Foundation, a grant-making organization out of Austin, Texas, facilitated initial efforts to get PEDL off the ground, including support for Sandia's participation starting in 2023.

"We're grateful to PEDL leadership, and in particular Brian Korgel at UT Austin and Marilu Hastings at the Mitchell Foundation, for recognizing the significant value that national labs like the National Renewable Energy Laboratory and Sandia could contribute to this important energy innovation initiative," said Ben Cook, Sandia's PEDL senior management champion.

A survey and focus groups provided the PEDL team with important insights into how the region's communities perceive energy and their concerns. While they found energy is not top of mind, Permian Basin residents do worry about the energy transition's impact on their communities and would like to see sustainability and workforce training prioritized moving forward.

Drawing on those concerns, PEDL is working with the New Mexico State University Global Campus to create courses that address knowledge gaps uncovered in a larger landscape analysis of the region's strengths. The first course, Advanced Energy 101, is planned to launch in spring 2025 and will provide

a high-level overview of advanced energy topics, such as geothermal, hydrogen, storage and energy-water issues.

Safeguarding the region's scarce water resources is another primary concern raised by basin residents. This finding led the team to incorporate a focus on water in their plans, including at PEDL's 320-acre demonstration site in Yoakum County, Texas, which is adjacent to Lea County, New Mexico.

"If you take a systems approach, you see that water is actually integral to energy development," said Thushara Gunda, Sandia's technical lead for PEDL. "We plan to use the PEDL site to demonstrate how innovations in water treatment can bridge multiple technologies."

An example of that systems approach, Thushara said, would be to pilot and test technologies that use solar and wind energy to remove oil and sediments from the groundwater brought to the surface by pumping rigs. The treated water could then aid in generating hydrogen from oilfield methane emissions.

"Such advances can convert energy waste streams into valuable resources for the region," she said.

At Sandia, Thushara and others are exploring all the ways Sandia's technical expertise could contribute to these R&D efforts.

"Most Sandia research programs are oriented around a capability that can be applied to different regions," Thushara said. "PEDL flips the script by being place-based. It allows you to think through opportunities at the intersection of technologies that might not otherwise bubble up."

Modeling a new, just energy economy

With renewables like solar and wind energy expected to overtake coal as the



ENERGY MIX — The Permian Energy Development Lab is a consortium of universities, community groups, national labs and other educational institutions that are working together to create a robust energy ecosystem.


Screenshot from a Permian Energy Development Lab video

world's largest source of electricity generation by early 2025, the clean energy transition is well underway. This shift in our energy mix could provide a pathway to economic diversification and increased community resilience, according to PEDL.

"This period of diversification provides a lot of opportunities for economic innovation and for building a workforce that benefits all members of the region," said Stephanie Kuzio, manager of Sandia's Energy-Water Systems Integration team. "Still, more research, technology development, training and community engagement are needed to ensure that our energy future is just."

All PEDL activities aim to advance energy equity and environmental justice for local communities within the Permian, with an eye toward transferability to other similar regions. They accomplish this in part by working to balance community and industry needs and benefits while also developing a plan for collecting measurable data on their impact in the Permian.

The PEDL team is now pursuing multiple options to continue and build this work. A Phase 1 grant from the **National Science Foundation Regional Innovation Engines program**, in particular, has supported community engagement with the goal of spurring innovation and economic growth.

"Our hope is that through these efforts, the Permian Basin will not only thrive but also serve as a model for other energy-producing regions, demonstrating that the future of energy can be safe, reliable and fair," Thushara said. 

The technology tie that binds

How Sandians across the country use technology to impact the mission and remain connected

By **Sarah Jewel Johnson**

Think back to your last Teams call. Do you know where each participant was located? Do they work on-site, telecommute or are they remote workers? Do they live in your town — or even your state?

Thanks to many virtual communication tools and modern workplace flexibility, many Sandians support diverse research and development projects from across the country. Impactful work and collaboration are no longer confined to a building or a site.

While select Sandians were remote before the mass transition to telework in 2020 during the COVID-19 pandemic, others were forced into uncharted waters — working from home on kitchen tables, at makeshift desks and in converted closets.

As the pandemic eased and the world transitioned to a new normal, many Sandians settled into a novel way of engaging with the culture, mission and management as full-time remote workers and telecommuters. Daily rituals changed, commutes were eradicated or greatly reduced, and newfound workspaces emerged in home offices. Technology



FURRY COWORKERS — Diana Hackenburg works from home alongside her dog Lucy in Santa Fe, New Mexico.

Photo courtesy of Diana Hackenburg

became the tie that binds us together and, in some ways, makes teams closer and more accessible than ever before.

Diana Hackenburg, a climate communications specialist, has been a remote worker since starting at Sandia in 2021. She lives in Santa Fe, New Mexico, and while she still frequently visits the Albuquerque site, she appreciates that her remote setup reduces commute frequency, increases efficiency and reduces her carbon footprint.

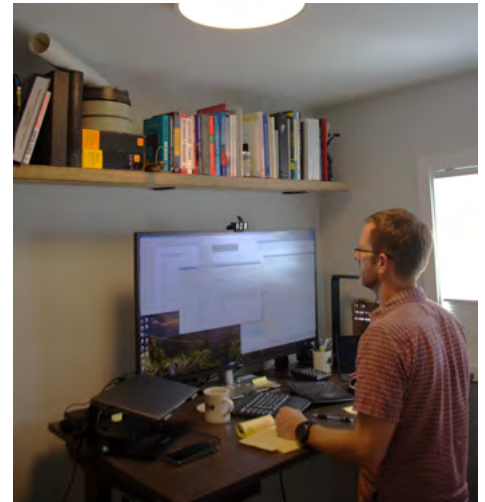
“I really dislike driving. Being able to work remotely means not only reducing stress and saving time from commuting but it also has allowed us to keep just one vehicle, saving money and further reducing our carbon footprint,” Diana said. “In addition to the personal benefits, I also see the corporate and global benefits. By allowing remote workers, Sandia can reduce its carbon footprint in both the energy it takes to run facilities and the indirect emissions associated with activities like employee commuting. Remote work also allows us to use workspaces more efficiently and attract a more diverse pool of applicants.”

Diana pointed out that much of her work doesn’t necessitate being on-site, adding, “my work is inherently cross-Labs, and I collaborate often with individuals located across the country. In-person meetings aren’t an option most of the time, so working remotely makes more sense than being on-site by myself all day in an office or touchdown space.”

Increasing efficiency — at work and at home

Geoff Klise, a remote manager for Sandia’s Wind Energy Computational Sciences department, lives in Bellingham, Washington, and commends remote work for adding efficiency gains during the workday. During his 17 years at Sandia, Geoff was on-site for 15 years before moving to Washington to be closer to family.

“In my management role, I am either on calls most of the day with external collaborators or meeting with staff. While in-person meetings are important, much



CREATIVE SPACES — Geoff Klise works remotely from Washington. He converted a small corner in his garage into an office space.

Photo courtesy of Geoff Klise

of my work can be done remotely,” Geoff said. “Before, my workday was less efficient — walking between buildings, driving to different tech areas — and I spent many evenings at home catching up on the items I could not get to when I was on-site. Now I find that I can complete more of my tasks during regular working hours.”

Justin Hogan, a procurement manager who lives in Oklahoma, has worked 17 years at Sandia, nine of which have been remote. Justin has been a manager for the



COMFORT OF HOME — Justin Hogan, a Sandia procurement manager, and his office mate Molly work remotely from Oklahoma.

Photo courtesy of Justin Hogan

last year and a half and appreciates the lessened commute, increased efficiency and balance remote work provides.

“There are so many benefits to working remotely — first and foremost is the work-life balance. The fact that I’m not spending time commuting to work means more time with my wife and my son, which is so important to me,” Justin said. “On top of that, the environmental impact is a big deal. I also see my productivity increase because I am able to control my work environment. All of that really does lead to increased job satisfaction.”

Like Justin, other remote Sandians expressed that working from home has positively impacted their mental health and work-life balance.

Liz Hillman, a technical business development specialist matrixed to the Energy and Homeland Security Portfolio, lives in Denver and has been a remote worker for nine of her 13 years at Sandia.

“I appreciated that remote work gave me the ability to stay at Sandia when family priorities led me to relocate from Albuquerque to Denver. I considered working in person for another national lab when I moved, but I feel much more aligned with the Sandia mission and culture and am happy I was able to stay at Sandia remotely,” Liz said. “I am also grateful for the flexibility remote work provides. I am able to help my kids get to school and be home when they arrive home, all while making meaningful contributions at work.”



ROOM WITH A VIEW — Liz Hillman enjoys the view from her home office in Denver, Colorado.

Photo courtesy of Liz Hillman

Cindy Symonds, an information management professional for Sandia’s W87-1 Program, lives in Fort Wayne, Indiana, and has been a remote worker since 2021. She



HOME SWEET WORKPLACE — Cindy Symonds, an information management professional, works from her home office in Fort Wayne, Indiana.

Photo courtesy of Cindy Symonds

also appreciates the mental and physical health benefits remote work offers.

“I like the ability to focus on my physical health. I now have time to exercise without the stress of managing my kids’ schedules,” Cindy said. “I like being home when my kids return from school, which also saves on childcare costs. My kids love that I am home when they arrive. I truly appreciate the joy of spending more time with them compared to when I worked in the office.”

Navigating the changes of telework

While many remote workers embrace their status, not being on-site full-time can pose issues.

“Navigating the technologies that enable remote and hybrid work can be a challenge. Haven’t we all experienced an issue with Teams at one point or another?” Diana said. “However, I also see these technologies as an opportunity in that they can provide us advantages to help us do our jobs more efficiently and effectively. For example, being able to collaboratively edit documents is a game-changer. I am always happy to spend a few minutes walking someone through how to use those types of tools.”

Liz in Colorado also feels the benefits of remote work outweigh potential technical hiccups.

“As a result of the pandemic, Sandia has really embraced hybrid work, and many of the challenges I faced originally have gotten significantly better,” Liz said. “As long as there is more than one remote/teleworker on a team, I have found the teams function as well as the in-person teams I was part of before.”

Along with navigating technological woes, some remote workers also address common work-from-home cliches.

Justin disputes remote worker stereotypes, both as a manager and a member of the larger remote workforce.

“I think a motivated individual is motivated regardless of location. If you love your job and you are satisfied and have a work ethic, location doesn’t matter at all,” Justin said. “In supply chain we keep metrics, and last year we set a record for dollars spent — and we did it with a primarily remote workforce.”

While working remotely, Liz said she was fortunate to be promoted from a senior to principal level in her role.

“There is a stereotype that remote worker contributions are ‘less than’ in person work or that you can’t grow in your career while being a remote worker,” Liz said. “I’ve been able to challenge myself and take on new, impactful projects, even winning an individual Employee Recognition Award for Collaboration Excellence as a result of my work developing the Labs Climate Security Strategy. Remote work does not mean decreased impact or engagement.”

Maintaining a sense of belonging

Despite large geographic differences and occasional visits on-site, remote workers are still connected to the Sandia mission and culture.

“I feel as connected to the culture now as I ever have been,” Justin said. “That’s a testament to the culture in supply chain of working hard and efficiently in a compliant manner. We have fun while we work, and that’s not limited by where you sit. When you enjoy the people you work with, it doesn’t matter how you connect.”

Even in Washington state, Geoff feels connected to the newly emerging Sandia culture, including the cultural impacts of remote work.

“The Sandia culture has changed substantially since COVID-19 by allowing for more remote employees and telecommuters, so I feel like we are all trying to figure out that new baseline. It’s definitely not the same as it was when on-site work was the norm,” Geoff said. “I believe I am doing the best


I can at keeping staff engaged, especially with the variety of telecommuting agreements in my own department. The connection is different and requires more effort to maintain. However, I think it's working well based on the passion staff have for their research and little-to-no attrition in the department."

Sandia's dedication to embracing the modern workforce means embracing cultural changes, such as remote work and telecommuting. Despite living across the country, many remote workers and

teleworkers at Sandia experience increased efficiency, positive work-life balance and a tie to their teams and tasks. Regardless of location, all Sandians can connect with the mission and the culture and feel a sense of belonging.

Diana shared that remote work does not mean a lessened or insincere connection. In fact, remote work provides an opportunity to connect more frequently, regardless of location.

"I feel very connected to my coworkers at Sandia, in part because my managers

have made concerted efforts to build rapport between team members. Even though I may never meet some people in person or have only met them a couple of times, I get the sense that they care about who I am as a person," Diana said. "Other activities like our division all-hands meetings and the Sandia podcast make me feel part of a team that's working toward common goals even if we're working on separate projects to meet those goals." 

Mileposts



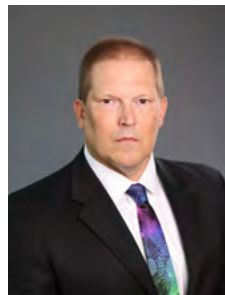
John Pott

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Dianne Sanchez

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David Wick

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Alicia Anastasio

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Alicia Aragon

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Alfonso Lopez-Gaston

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Alice Sobczak

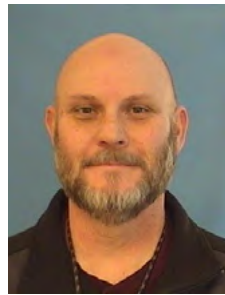
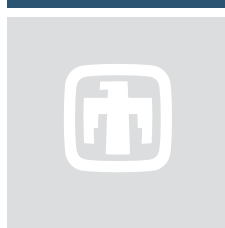
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Michael McLain

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Recent Retirees



Ben Huff

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Chuck Nove

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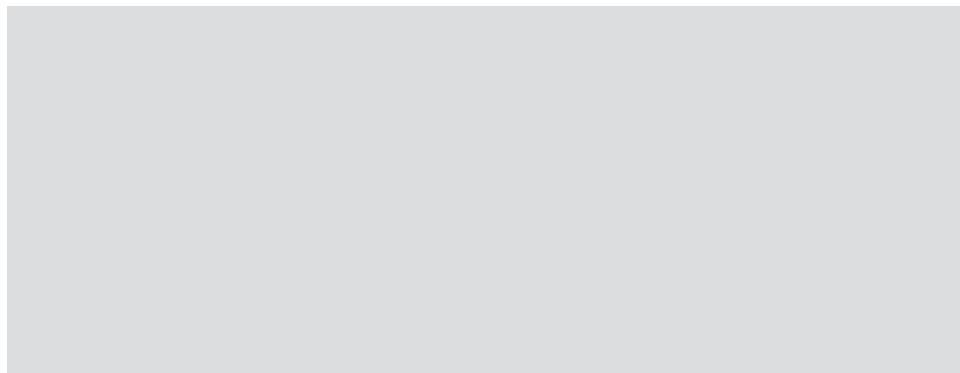
Dan Pless

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Penne Szklarz

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California's student interns teach next generation

By **Michael Shaikh**

Sandia's Student Intern Programs and Community Involvement collaborated on a day of service and fun in Berkeley, California, on June 15.

One of Community Involvement's core partners, Scientific Adventures for Girls, hosted their year-end STEAMstravaganza festival, facilitating learning opportunities for underprivileged elementary-aged students.

Seven Sandia interns and three full-time workforce members donated their time to serve more than 300 attendees from 23 different schools in Berkeley, Oakland, Richmond and Emeryville. The attendees explored the complexities of buoyancy, extracting DNA, volumetric estimating, and more.

Graduate intern Sid Sabhnani, who has prior experience as a teaching assistant at the University of Texas at Austin and was a lead volunteer at Perot Museum of Nature and Science in Dallas, explained that "these events and activities reward curiosity and encourage creative thinking for young students to apply throughout their life."

Sid facilitated an activity where kids guessed how many items were in a container. He was able to show STEAMstravaganza attendees how to estimate the number of items.

Following the volunteer event, University of California, Berkeley, student and Sandia intern Sanjana Goyal led a handful of interns on a campus tour. The group learned about the deep-rooted history of the university and went to the top of the Campanile, the third tallest free-standing bell-and-clock tower in the world. The 307-foot tower offered those on the tour views of the campus plus the cities of Berkeley and Oakland.

"The opportunity for Sandia interns to connect with one another, the Labs' culture of giving and getting acquainted with other employees added to a great day of volunteering," Sandia Community Relations Specialist Michelle Walker-Wade said. "Now when we see one another on-site, our friendly smiles and 'hellos' have more meaning." 



ESTIMATING ITEMS — Michael Shaikh, Loyal Shafee and Sid Sabhnani lead an activity for kids to guess how many items are in each container.

Photo by Michelle Walker-Wade



SANDIA STEAM — Lateefah Mutiu, Sanjana Goyal, Michael Shaikh, Rushil Dandamudi, Tylor Takahashi, Brittanie North and Michelle Walker-Wade pose for a picture after the STEAMstravaganza volunteer event.

Photo by Michelle Walker-Wade