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uncovered at
75th event
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Sandia's El Dorado supercomputer ranked 20th fastest in world



SUPER FAST COMPUTER — The latest Top500 list ranks Sandia's new El Dorado supercomputer the 20th fastest in the world..

Photo by Craig Fritz

Smaller but architecturally identical to world's fastest, El Capitan

By **Neal Singer**

Sandia's new El Dorado supercomputer has been ranked 20th in the world on the **latest Top 500 list**, which was released at the 2024 Supercomputing Conference in Atlanta. The machine is smaller in scale but architecturally identical to Lawrence Livermore National Laboratory's El Capitan supercomputer, which ranked as the fastest in the world in the same survey.

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New CA mural showcases Sandia's labor of love

By **Lea Blevins**

Sandia's California campus recently got a lot more colorful.

Inspired by the 75th anniversary theme of "Making history, Shaping the future," two creative designers made history of their own by painting the site's first mural.

"The goal was to have something bright and bold, bringing life to the east side of campus — something that could inspire and make people proud to be a Sandian," said Krissy Galbraith, who partnered on



ARTISTIC LEGACY — One of the four sides of the completed mural reflects Sandia's people and missions, with the Livermore, California, landscape.

Photo by Spencer Toy

the mural with team member Jami Butler.

Jami and Krissy were interested in working together to paint a mural on campus, and the 75th anniversary felt like the perfect opportunity.

The mural, painted on the walls of an electrical substation near the Badge Office

and Nucleus Event Pad, was officially unveiled during California's Family Day by Integrated Security Solutions Associate Labs Director Andy McIlroy, who recognized the artists for their dedication and hard work.

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EDITOR'S NOTE: Please send your comments and suggestions for stories or for improving the paper. If you have a column (500-800 words) or an idea to submit, contact the Lab News editor at labnews@sandia.gov.

Electron work yields positive outcome

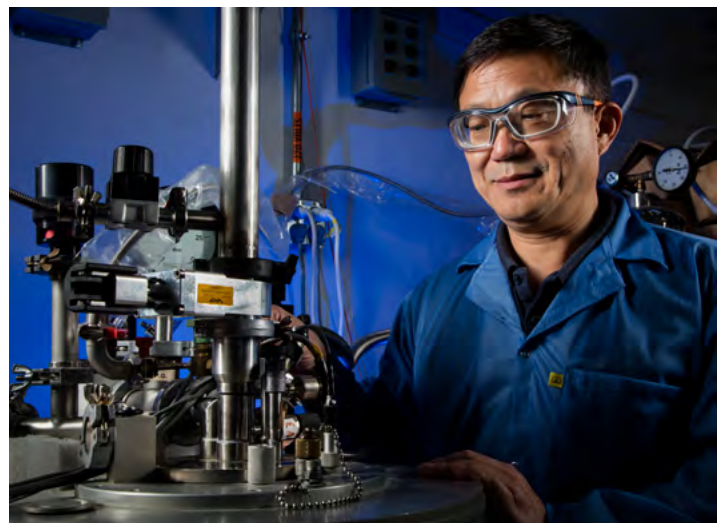
American Physical Society honors researcher with fellow appointment

By **Michael Ellis Langley**

Wei Pan may study electrons, but he is incredibly positive about his work and thankful for his election this year as a Fellow of the American Physical Society.

"I am grateful to the Division of Condensed Matter Physics of APS for the selection," Wei said, specifically thanking material scientist Jeff Tsao, retired Sandian John Aidun, and his manager Ashfia Huq for supporting his nomination.

The American Physical Society admitted him to their prestigious roster of fellows for "the discovery of several unconventional fractional quantum Hall states, and for innovative experiments exploring the excitonic insulator phase in InAs/GaSb, Majorana particles, topological superconductivity and Leggett



POSITIVELY CHARGED — Wei Pan was appointed as a Fellow of the American Physical Society for his work to innovate how quantum states of matter are researched. **Photo by Spencer Toy**

modes in Dirac semimetals."

"The fractional quantum Hall effect (FQHE) is a physical phenomenon due to a collective motion of electrons in a two-dimensional flatland, like a waltz dance of a group of people,"



SMALL STUDIES, BIG IMPACT — Wei Pan, performing a liquid helium transfer, turned a fascination with the smallest forms of matter into a career redefining how they are studied. **Photo by Spencer Toy**

Wei said. “FQHE has important implications for fault-tolerant quantum computing. There are many types of FQHE states, kind of like many types of dancing styles. I was fortunate to discover a few of them.”

Wei studied quantum phenomena that were theorized but not observed, through experiments that were not possible until the combination of the right materials and resources were brought together.

“This was not an easy task,” Wei said. “In general, these phenomena are topological. It studies things that are invariant under a continuous deformation. For example, one can deform a coffee mug continuously into a donut because they have the same topology — both have a hole. In physics, topology normally means protection. If a physics phenomenon is topological, it

means this phenomenon is robust and immune from their environmental perturbations. Imagine that we can utilize this topological protection to build a quantum computer. This kind of quantum computer would be much more robust than the one built by Google. As a result, a topologically protected quantum computer can be used for general purpose computing such as designing new medicines.”

The journey from theory to experimentation is exactly what excites Wei, who said his path began some time around elementary school.

“I remember reading the stories about Albert Einstein and found them exciting and fascinating,” he recalled. “That’s probably when my interest in science began. I still have an Einstein poster in my home! On the poster, it says ‘Gravitation cannot be held responsible for people falling in love.’”

From that early foundation, Wei charted a path to one of the most renowned learning institutions in the world.

“When I was an undergraduate student, I was good at learning existing knowledge but did not have a chance to discover new things,” he said. “It is the graduate study experience I got while earning my

Ph.D. from Princeton University that really enabled me to unlock the joy of discovery.”

Wei joined Sandia in 2003 after earning his doctorate. He worked in Albuquerque until 2017 when he transferred to the Livermore site, where he works today. Wei said he has felt supported throughout his odyssey of innovation and discovery at Sandia, expressing gratitude to those who took their time and energy to help him.

“There are a lot of people I am indebted to for helping me grow and advance,” he said. “My Ph.D. thesis advisors professor Daniel Tsui and professor Dr. Horst Stormer were crucial resources for me. Jerry Simmons hired me into Sandia and gave me the freedom to explore things. Of course, to my colleagues who help my research, and to Sandia [LDRD program](#) and DOE Basic Energy Sciences program for funding the research.”

Wei’s advice for a path in research: “Follow your own interest. This can propel you longer and deeper in your research journey.”

“I want to thank my family for their strong support of me pursuing scientific research,” he said. “Without their selfless support, I wouldn’t be able to achieve what I have done. Second, I am fortunate to work with many people at Sandia. They have helped me tremendously, scientifically and personally.” [i](#)

El Dorado

CONTINUED FROM PAGE 1

“We at Sandia have invested in preparing many of our engineering and science codes to run effectively on El Capitan and El Dorado,” supercomputing manager Andrew Younge said. “I am looking forward to taking advantage of this massive new capability with El Capitan and enabling a much higher level of fidelity in our simulations.”

According to Andrew, the El Dorado-El Capitan system represents the first leadership-class exascale system designed to support NNSA stockpile stewardship missions. He described El Dorado’s specific functions as an application-readiness test system.

“Basically, it is an extra-large on-ramp for Sandia computing codes to build, test, prepare, validate and update, all at Sandia, before running at exascale on El Capitan.”

“Because El Dorado is actually quite large compared to normal application readiness systems, we anticipate it will provide production cycles to Sandia as well,” he said. “As a limited side function, El Dorado is also likely to enable Sandia to do more experimental R&D on the HPC system itself, perhaps exploring new workflows or similar avenues in the future.”

“Part of the magic — I call it the ‘special sauce’ — of the system is the use of the Cray-developed proprietary High-Speed Network called Slingshot,” computing manager Kevin Stroup said. Another plus, he said, is that

the compute nodes are direct liquid cooled, meaning that coolant fluid is piped through them and removes the heat generated using fluid-filled heat sinks. “Without this, it would be nearly impossible to operate the system and deal with the heat produced.”

The machine, designed and built by Hewlett Packard Enterprise, is an EX4000 model based on the company’s Cray product line. It consists of three cabinets of compute blades, with a total of 384 MI-300A nodes. The MI-300A is an accelerated processing unit from AMD — “sort of a CPU and GPU put together,” Kevin said.

The El Dorado supercomputer represents another major deliverable by the NNSA Advanced Simulation and Computing program to the nuclear security enterprise. [i](#)

Building Sandia: 2000s to 2020



By **Karli Massey and Kristen Reynolds**

The turn of the 21st century was a pivotal time of expansion and modernization at Sandia. In the wake of the Cold War and dissolution of the Soviet Union, Sandia focused on enhancing its capabilities for nuclear deterrence, nonproliferation and maintaining the safety, security and reliability of the existing nuclear weapons stockpile. Advanced technologies in development included robotics, microelectronics, high-performance computing and computational simulation.

This era saw the razing of obsolete World War II buildings, the modernization of existing facilities and new construction for housing advanced technologies. Architecture became a means to showcase Sandia's status as a technological innovator. New construction reflected a new interest in architectural style; the rising prevalence of green building practices, environmental stability and energy efficiency; and the emphasis on infill and compact development in installation planning.

Notable new buildings at Sandia during this period included the **MESA Complex** for microelectronics, the Robotics, Manufacturing, Science and Engineering Laboratory, the Joint Computational Engineering Laboratory, the Center for Integrated Nanotechnologies Core Facility, the Ion Beam Laboratory and the 725 Data Center Addition.

Some of the buildings for advanced technology research and development were designed in an architectural style now defined as high tech or structural expressionism. They incorporate a range of exterior materials — steel, aluminum, glass and concrete — reminiscent of industrial production. Flexible, adaptable floor plans for changing needs, distinct office towers and exposed support and maintenance elements are other characteristics of the style.

Located in Tech Area I, **JCEL** was built for high-performance computing, modeling and simulation technologies. Because nuclear explosive testing had been banned in 1992, stockpile stewardship necessitated a paradigm shift to computer modeling and simulation of stockpile weapon performance. A striking contrast to the Brutalist “clone” **buildings from the 1980s**, the 62,000-square-foot facility features three office towers projecting north off an elliptical façade with metal paneling and turquoise-tinted window bands. The interior office clusters and meeting and visualization rooms were designed to encourage collaboration.

At **JCEL's official opening in 2004**, U.S. Energy Secretary Spencer Abraham called the facility emblematic of the DOE's commitment to keep the nuclear weapons complex infrastructure at the cutting edge of technology.

JCEL was also the first building at Sandia for which elements of sustainable design were incorporated from the outset of the project. Its green features include spectrally selective window glazing to permit daylight into the space while mitigating heat loss and gain; passive solar sunshades; raised flooring for



WOW FACTOR — JCEL was designed to attract top talent with its high-tech style and sustainability features. **Photo by Bill Doty**

ventilation, power and flexibility in room layouts; high-efficiency HVAC and plumbing; and occupancy sensors.

In 2008, JCEL became the first Sandia facility to be **awarded** a Leadership in Energy and Environmental Design certification by the U.S. Green Building Council. The LEED system rates building performance at Certified, Silver, Gold and Platinum levels.

LEEDing the way in design

The **CINT Core building**, completed in 2006, is one of a network of DOE Nanoscale Science Research Centers. The 97,000-square-foot facility was located outside the U.S. Air Force installation to promote open access for nanotechnology researchers from university, industry and government circles.

The façade, featuring a curved wall of stacked stone two stories high and 450 feet long, **mimics the walls of Chaco Canyon**. Three wings, arranged like the spokes of a wheel, feature open laboratory spaces, clean rooms, modular workstations and shared equipment areas for nanofabrication, characterization and analysis. The CINT Core Facility was designed using LEED as a central guide and, like JCEL, achieved LEED certification in 2008.

The first laboratory at Sandia to achieve LEED Gold certification, the Ion Beam Laboratory was built to enhance Sandia's



STONEFACED — CINT's façade is a nod to Chaco Canyon and New Mexico's ancestral Puebloan culture. **Photo by Randy Montoya**

materials analysis capability. Completed in 2010 in Tech Area I, it replaced a 1950s structure originally built to fold parachutes. The 27,000-square-foot facility houses high-bay laboratories and office space for high-energy ion beam research.

A new generation of advanced architecture prototype systems

Building 725 East, a 15,000-square-foot data center addition to Building 725, was completed in 2018 to house the Astra supercomputer, which was the first in a new generation of advanced architecture prototype systems to be deployed by the NNSA. Building 725E was Sandia's first LEED Gold certified data center — a significant accomplishment due to the massive water and power demands of such facilities.

The most novel innovation in the building's design, thermosyphon cooling systems for passive heat transfer save millions of gallons of water yearly by dramatically reducing the need for evaporative cooling. An abundance of natural lighting from north-facing frosted windows decreases the need for interior lighting. By 2022, Building 725E was the most efficient data center in the NNSA complex.

Efficiencies in building buildings

The first two decades of the 21st century also saw the construction of numerous institutional general plant projects, which were fast-track design-build projects consistent with LEED guidelines.

"The purpose of these buildings was to solve space issues and offer general office options," Sandia architect Rico Ortiz said. Sited where space was available, the buildings illustrate Sandia's commitment to installation planning focused on infill and compact development.




ASTRA-NOMICAL SUCCESS — Building 725E, home to the Astra supercomputer, earned a DOE Sustainability Award in 2020 for environmental efficiency. **Photo by Bret Latter**



ICONIC ARCHITECTURE — The Ion Beam Laboratory was the first Sandia lab to earn LEED Gold status. **Photo by Darrick Hurst**

The designs lack the high style of some research and development facilities but share common features. These steel-framed buildings include heavy horizontal and vertical massing, plain synthetic stucco surfaces, symmetrical bands of windows and the use of similar color palettes. The interiors were designed with areas that can be easily be reconfigured to meet changing needs.

A green campus

Sandia's commitment to sustainability in its built environment was recognized in 2018 when the Albuquerque campus achieved LEED v. 4 Campus Certification. A more flexible, performance-based approach, the certification calls for measurable results from sustainability efforts throughout a building's lifecycle. Sandia was the first DOE lab to achieve that status, solidifying its position as a pioneer in sustainable laboratory practices and setting a benchmark for other DOE institutions. As the laboratory continues to evolve, its commitment to innovation and sustainability will undoubtedly play a crucial role in addressing the complex challenges of the future. 



HIGH-PERFORMANCE DESIGN — Building 725E's novel cooling system saves millions of gallons of water annually. **Photo by Bret Latter**



FILLING THE GAPS — Buildings 969, left, and 971, among the first institutional general plant projects at Sandia, represent the Labs' commitment to infill as opposed to sprawl. **Photo by Norman Johnson**



SPACE-SAVING SOLUTIONS — Buildings 730, left, and 704 were constructed in Tech Area I during the 2010s. **Photo by Randy Montoya**

Building Sandia through the years

The buildings and structures at Sandia reflect a rich and varied 75-year architectural history. This is the fourth in a series of articles that explore the built environment of the Labs and the people who laid its foundation. See also [Building Sandia: 1940s to 1960s](#), [Building Sandia: Late 1960s to mid-1990s](#) and [Building Sandia: Home of the MESA Complex](#).

“ JOIN THE CONVERSATION ”

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. Visit us on your favorite networks and join the conversation.

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Building Sandia: Rico Ortiz



By **Karli Massey and Kristen Reynolds**

Rico Ortiz was one of the first three architects Sandia hired in 1992. After the Cold War, Sandia wanted its site and buildings to strongly reflect innovation in science and technology in order to recruit new scientists and impress visitors. Rico and the other newly hired architects were eager to put their professional skills to the test. Reflecting on his 32-year career in Sandia's Infrastructure Operations Division, Rico said that working with technical teams to design spaces that fit their needs was among the projects he enjoyed most.

The Robotics Manufacturing Science and Engineering Laboratory, Building 895, was the first new building constructed during this period. DOE had designated Sandia a Center of Excellence of Robotics and Automation in 1991. “In the mid-1990s, defense research and military reconnaissance was focused on advancements in robotics,” Rico said.

Rico oversaw the architectural design of the three-story, 71,000-square-foot building with its curved façade and striking concrete, steel and glass atrium that was designed to hug the main roadway into the Sandia tech area — a prominent, highly visible location. Within the interior, Rico focused on helping create expansive lab space that allows engineers and researchers



ORIGINAL ARCHITECT— Ortiz was one of the first three architects Sandia hired in 1992. **Photo by Craig Fritz**

to work without the constraints that a building can sometimes limit. Completed in 1996, RMSEL's architecture was a distinct departure from that of the **nine clone buildings** that were erected starting in 1980.

“I think Building 895 represented the beginning of the Labs' shift in its aesthetics,” Rico said. “That was also when our

profession as architects really started to be recognized and valued.”

In 1992, Rico took the lead in relocating thermal battery testing from the Pinellas Plant in Florida. Several buildings were constructed or renovated, like Building 870 in 1994, to host these new capabilities.

“It was an exciting time at Sandia, as we entered a big building boom with several congressionally funded projects,” Rico said.

Another of his memorable projects was the remodel of the Administration Center for Test Engineering, Building 6584, which demanded many late nights working on the design with building occupants, facilities engineers and the architectural team. It is the entryway to Tech Area III and the place for visitors to observe environmental testing activities to the south. The exterior is characterized by clean geometric lines, both curved and straight. Glass-walled “bump-outs” added along the north elevation contain small seating areas flooded with natural light and views of the ornamental landscaping.

“The purpose was to create space throughout the building for collaboration, along with a pleasant outdoor landscape for those working in this barren, remote space,” Rico said. The building was complete in

2002 and still offers modern working and observation space for test engineers, sponsors and clients.

A FAMILY in facilities


Throughout his career, Rico put his architectural training to work in a variety of roles within the organization. What started as a focus on building architecture and interior work-space design segued to project-construction management, site planning and management roles.

Today, Rico manages one of four Facilities Area Management teams, affectionately known as FAMs. These FAMs now love and care for Sandia’s array of facilities. Rico and his team partner with the global security and nuclear deterrence divisions to ensure their needs are being met, not only in New Mexico, but also at the Tonopah Test Range in Nevada and the



ROBOTIC MANUFACTURING SCIENCE AND ENGINEERING LABORATORY — Building 895, built in 1996, signifies Sandia’s shift in architectural ideology as it sought to have buildings reflect innovation in science and technology. **Photo by Craig Fritz**

Weapons Evaluation Test Laboratory in Texas.

“Our purpose is to steward and take good care of our portfolio of facilities,” Rico said. “While it’s been fun to be part of constructing so many iconic buildings here at Sandia, it’s also been important to preserve what we have. Either way, I take pride as an architect and our contributions to advancing Sandia’s science and technology.” 

California mural

CONTINUED FROM PAGE 1

“This is a really special moment,” Andy said. “Krissy and Jami brought their whole selves to work in this, brought their talents and brought their passions. They listened to the whole community. The mural celebrates the innovation California is known for, and we hope it inspires everybody to do more great work for our nation.”

The designers stood with Andy for the mural dedication, sharing their masterpiece for the first time with not only Sandians, but also family and friends.

“When we did the big reveal, it was surreal in a really good way,” Jami said. “Our work was honored in such a very special way, and it felt great to be able to contribute that piece of art to the Labs for our fellow Sandians to enjoy.”



PERSEVERING WITH PAINT — Krissy Galbraith, left, and Jami Butler painted early in the morning to limit hours in the summer heat at the Sandia California campus. **Photo by Spencer Toy**



MURAL IN MOTION — Krissy Galbraith paints the mural on Sandia California's east entrance.

Photo by Spencer Toy

Artistic innovation

At least six months before painting over the summer, Jami and Krissy met with Andy and executive leadership to brainstorm visual goals and refine ideas with what could realistically be painted.

“As we honor 75 years of the Labs, we wanted to commemorate the rich history of the Labs, and there’s so much history to honor,” Krissy said. “It was a complex task to capture the essence of so many people and their contributions. People are the heart and soul of the Labs, and we wanted this to be the focal point of the mural.”

They focused on highlighting the people and the work of Sandia as well as the Livermore landscape.

The final product incorporates compositional features to tell a cohesive story both in concept and in visual palette. It reflects Sandia’s history, from the core mission of nuclear deterrence to multiple national security missions, built around Sandians from a wide variety of backgrounds inspiring the next generation.

“It visually draws your eye through the story, keeping a seamless transition through the whole design,” Krissy said.

The four-sided mural starts with a vivid butterfly, symbolizing a theme of

transformation — marking the inception of Sandia’s journey. California poppies anchor the design to the site’s location. Moving around the corner, Sandians from various fields, in different stages of their careers, draw inspiration from the past and are dedicated to carrying on Sandia’s legacy.

From there, a white test-launch plume encircles an atom and transforms into a flock of birds, representing a singular mission to a multifaceted commitment to national security and global peace. In the background, green hills with Livermore’s distinctive wind turbines transition from blue skies into a glowing sunset around the next corner.

The darkening sky curves around to the final wall, which showcases space exploration and uncharted territories.

“The boy represents an aspirational forward look and outreach to young people, and the paper airplane represents innovation and ideas as well as Sandia’s technological contributions across the Labs” Jami said. “And the astronaut could be anybody — we’re all the astronaut.”

Blood, sweat, tears and paint

The design process was a challenging and rewarding one, and then there was painting the wall itself.

Four stucco walls stretching 800 square feet, resting on uneven ground, posed more challenges for the artists. They went through ladder training and hazardous waste training to learn proper handling and disposal of paint water.

Jami and Krissy spent a weekend projecting the design on the wall after dark and into the early morning hours. They encountered trial and error in the process of getting the design level, especially with lettering built into the artwork.

“It required a heavy hand with graphite on the stucco wall,” Jami said. “We had gloves on, and it was so much fun, though.”

They returned each morning layering acrylic paint over the graphite outline, fearing a sudden summer storm might ruin their night’s work.

“After a long process, we were thrilled to finally reach this stage,” Krissy said. “It

was time to start the fun part — painting!”

The designers created a detailed paint-by-number map of nearly a dozen pages with about 40 different colors, some they had to mix themselves. They spent 38 days painting, used 57 brushes and went through 33 gallons of paint. The walls required at least four coats of paint, and some areas nearly double that.

Working outside during the summer was another challenge, with many of the days reaching over 100 degrees. On those hot days, Krissy and Jami would come on-site before sunrise and haul all their supplies out for the day and work until it became too hot by mid-afternoon. Even still, their enthusiasm never waned.

“Coming to work every day and painting was a dream come true,” Krissy said. “It was something I never thought I could ever do here. It was amazing.”


They received support from other Sandia departments including Environment, Safety and Health for training and Facilities for supplies along the way, creating a sense of community with the project. Sandians walking by would stop to appreciate the work in progress, and seeing the mural underway even brought one person to tears.

“She was so moved that this opportunity was given to us, and she could feel how happy we were to be out there doing what we love and sharing it with others,” Krissy said.

Seeing the finished work of art, especially with the celebration on Family Day, has been a wonderful reward for the artists.

“Somebody commented that it feels like it was always here,” Jami said. “Like it was meant to be.”

Along with new signage and fresh landscaping — part of the [California Site Improvement Project](#) — the mural greets employees and visitors to the site, showing off Sandia’s sense of community and creativity.

“This mural is the final piece of our team’s revitalization efforts,” Krissy said. “As Sandia California’s front door, it creates a warm and welcoming atmosphere, reflecting our personality and inspiring pride.” 

Toys, coats bring holiday cheer



WISHLISTS FULFILLED — Toy donations are collected from drop boxes across Sandia California and New Mexico sites on Dec. 9, for the annual Marine Corps Reserve Toys for Tots campaign. This year, 261 toys were collected. Sandia has participated in this initiative since 2009, providing toys to local families in need.

Photo by Jamie Duranleau



COATS FOR ALL — Coats are piled high and sorted on Dec. 6, for the 13th Annual One Warm Coat Drive, led by Sandia California as part of the Sandia Gives campaign. Staff donated 335 coats, exceeding their goals for the drive. One Warm Coat raises awareness of the need for coats and partners with nonprofits across the U.S. to distribute them.

Photo by Krissy Galbraith

The engineer whose technology found a home in a time capsule



Retired Sandian's work comes full circle at 75th Anniversary celebration

By **Shelby Perea**

In 1976, Andrew Rogulich began what would be a decades-long career at Sandia.

It was the year Jimmy Carter was elected president. The year Apple Computer was founded by Steve Jobs and Steve Wozniak. It was the year iconic songs “Turn the Beat Around” and “Fly Like an Eagle” came out.

When he started out, Rogulich, 69, couldn't have guessed that technology he worked on in the '70s would become part of the official record of Sandia's 75 years of history and create one of the most gratifying experiences of his career.

The year of 1976 was an all-around different time in the nation and the Labs was no exception. The campus was nowhere near the size that it is today; Rogulich remembers everything east of Building 880 was “just dirt.” If he needed to look something up, he



A SMALLER SITE — Tech area I in 1976.

Photo courtesy of Sonia Wilson

didn't have a computer on his desk waiting to Google his every inquiry; he'd have to go to a design information center and look it up on microfilm or microfiche. The workforce population was less than half it is now with 7,022 members compared to the 16,825 people currently working at the Labs.

“One of my very close friends I made at Sandia once told me he was employee number six (hired at the Labs),” Rogulich said.

Rogulich came to work with some of the very first Sandians after graduating from DeVry University in Chicago where he studied electrical engineering. If you asked him then where he'd end up, he would have said Los Angeles or somewhere west. But a Sandia recruiter visiting DeVry told 20-year-old Rogulich about Albuquerque, New Mexico, and the important work happening there — altering his course entirely.

“I had no idea what Sandia National Labs was. The only thing I knew about Albuquerque was what I learned on ABC Wide World of Sports,” he said, remembering a segment on the dirt racetrack that was just south of the Innovation Parkway Office Center.

Rogulich wanted to make a difference with the surety of possibility reserved for new college grads. So, he heeded the word of the recruiter and moved to Albuquerque, starting work at Sandia on Jan. 19, 1976, as a technical staff associate.

For Rogulich, that surety never faded. In fact, it quickly grew as Sandia's mission became his vocation.

“When I was 20 years old, I told my coworker: ‘This work is so important that I will make it my personal commitment to give 50 years to government service,’” Rogulich said.

He's one year shy of his goal with 34 years at Sandia and 15 years at the Air Force Nuclear Weapons Center.

Saving interface

Those 49 years have brought many points of professional pride but none more than



HANDHELD HISTORY — From left, Sandia retiree Andy Rogulich holds the SMU-105/C Interface Simulator with former Labs Corporate Archivist Myra O'Canna and current Archivist Sonia Wilson. Photo courtesy of Andy Rogulich

his work on technology that was included in Sandia's 75th Anniversary celebration on Oct. 31.

Hundreds of people came to the celebration in front of Building 800 to watch Historian Rebecca Ullrich remove floppy disks, heaps of paper, video tapes, an array from the Z machine and more from a time capsule sealed 25 years prior. Meanwhile, Rogulich attended with his eye out for a small blue device called the SMU-105/C Interface Simulator.

In 1979, Rogulich was the systems engineer on the nuclear weapons simulator project after the German and Italian governments needed a handheld device that could simulate the cockpit responses of nuclear weapons for aircraft crews' training. The standard at the time was developing a full-up weapon shape that would have to be loaded up on the aircraft, released and refurbished. The German and Italian militaries wanted something small and lightweight, and Sandia had to figure out how to make that happen.

“As a systems engineer, I was in charge of designing what this thing was supposed

to look like,” Rogulich said about the project that took from 1979 to 1981.

The simulator is a device used for military nuclear weapon delivery training and aircraft compatibility testing, simulating the electrical logic interface of a variety of nuclear bombs with aircraft responses identical to those of true nuclear weapons, Rebecca said. It also happens to be the perfect size for a time capsule container.

In 1999, when former Labs Corporate Archivist Myra O’Canna was tasked with finding artifacts for Sandia’s 50th Anniversary time capsule, she had to find compact, unclassified and quintessentially Sandian items to include. Rogulich thought the SMU-105/C Interface Simulator fit the bill, seeing it as representative of Sandia’s work before the new millennium while remaining relevant far into the future.

“I put in (a simulator) that works because I was confident it would still be in use by the time we open the time capsule,” he said.

On Nov. 1, 1999, Rogulich watched as the 50th anniversary time capsule — with the simulator nestled inside — was lowered into the ground in front of Building 800, which is where it sat for two and a half decades.

In those 25 years, Andrew spent about 10 more years at Sandia, climbed the ranks to principal member of the technical staff, got married and had children. After retiring from Sandia on a Friday, he went to work at the Air Force Nuclear Weapons Center on the next Monday.

Another 15 years of driving through the Kirtland Air Force Base gates, hopping on work meetings and meeting deadlines

zoomed by until his daughter, who is now a mechanical engineer at Sandia, told her dad about the 75th Anniversary celebration, which included the opening of the old time capsule.

Full circle

While some say 25 years is hardly enough time for a time capsule to lay dormant, Rogulich saw it as a cyclical moment he otherwise never would have had.

“It was like going full circle,” he said. “You never think you are going to be old enough to see something you put into a time capsule be taken out.”

Yet again, he sat in the crowd in front of Building 800 — this time on an unseasonably warm fall afternoon in 2024 — to watch Rebecca take artifact after artifact out of the container, eventually pulling out the sky-blue simulator.

Rogulich was right. The devices are still in use today as a nuclear weapon delivery training device by the U.S. and NATO since 1983, according to Rebecca.

“What a sense of fulfillment,” he said. “All the guys I worked with are long gone but the legacy of their hardware lives on.”

It’s hard not to get sentimental when such a definitive marker of time presents itself like the time capsule did.


Rogulich thinks about how he liked to



PASSING THE TORCH — Kimberly Atkinson, left, mechanical engineer at Sandia and Andy Rogulich’s daughter, and Rogulich attend the time capsule opening in front of Building 800. **Photo courtesy of Andy Rogulich**

grab lunch at the **Coronado Club**, a hot spot and Sandian favorite that opened on base in the ’50s. He reflects on how different his first day on the job was compared to the modern new employee orientation. His inaugural day consisted of getting a badge, being shown where the bathroom was and told to jump right in with on-the-job training.

Overall, he thinks about how quickly time went from being a systems engineer working on the SMU-105/C Interface Simulator project, eager to solve a global problem, to a veteran Sandian coming back on campus to watch his work hoisted out of a memento designed to be emblematic of the past.

“The first 30 years go by real fast,” he said. “I would tell Sandians today to enjoy the time they have because they will look back and see just how fast their career really went.” 

Mileposts



Joe Chiu

40



Andre Claudet

20



Elizabeth Gallegos

20

Sandia welcomes over 50 interns from HBCUs

By **Sophia Horowitz**

This summer, more than 50 interns from over 13 historically Black colleges and universities brought fresh energy to the Labs. Under the guidance of their managers and mentors, they engaged in technical projects and contributed to research across various fields.

Supported by more than 90 staff members, these interns received invaluable mentorship on professional growth and networking. The institute included professional development seminars, graduate school workshops and facility tours.

Interns showcased their research and achievements through poster presentations. A standout presentation was delivered by year-round interns Josiah Moore and Kenneth Howard, who introduced their contributions to ATLAS, an AI-assisted tool designed to help quality engineers with complex processes.

“The diverse work I get to do as an intern has been fantastic. Working on this AI tool is something I never imagined



AI IN ACTION — Interns Josiah Moore, left, and Kenneth Howard present their research project ATLAS, an AI-assisted tool designed to help quality engineers with complex processes and questions.

Photo courtesy of Breanna Gallegos-Schnedar

I would do. I’m applying skills from my data structure and data science classes to help build this AI model. Networking with experts has been life-changing,” Josiah said.

Starting a new internship can feel overwhelming. However, the START HBCU intern institute, which stands for Securing Top Academic Research & Talent at HBCUs, and the Black Leadership Committee ensured that all students felt welcome by organizing social events. These activities allowed interns to connect with each other and the broader Sandia and Albuquerque communities, fostering camaraderie and lasting relationships.

Kenedi Catoe, a year-round intern and North Carolina A&T State campus ambassador, said, “Planning events for the Black Leadership Committee was fun and exciting. We made sure all interns felt welcomed and included. Activities like bowling and white water rafting helped create a sense of community that I can carry into the school year. This has been one of the many reasons I’m returning to Sandia.”

NNSA program enhances talent pathways

The NNSA **Minority Serving Partnership Institute Program**, designed to create career pathways for students from minority-serving institutions and tribal colleges, supported over 106 students at the Labs over the summer. Several students were supported by both the NNSA Minority Serving Partnership Institute Program and the START HBCU intern institute.

Sandia is collaborating with Alabama A&M University on the NNSA project, the Consortium for Research and Education in Power and Energy Systems, or CREPES.




FUTURE LEADERS — Interns come together for a group photo.

Photo courtesy of Breanna Gallegos-Schnedar

Led by Sandian Brian Pierre and Alabama A&M professor Mebougna Drabo, this initiative, in partnership with Florida International University and the University of Texas at El Paso, focuses on preparing students from minority-serving institutions for careers in national security.

“CREPES is an exciting program to provide a diverse group of interns opportunities to perform hands on experience that will impact the national security of the U.S. energy systems. It is wonderful to see students return to Sandia multiple summers and grow in their scientific careers,” Brian said.

Betsy Snell, program director of the NNSA Minority Serving Partnership Institute Program, said, “This program empowers students from diverse backgrounds, reinforcing the mission of MSIPP to sustain a career pathway and strengthening the future workforce of the nuclear security enterprise.” 

For more information

The success of the Securing Top Academic Research and Talent at Historically Black Colleges and Universities, or START HBCU, intern institute this summer highlights Sandia’s commitment to fostering diversity, promoting STEM education and developing future leaders. The institute is always seeking Sandia mentors for interns, as well as managers or departments interested in hiring interns. It remains dedicated to building strong partnerships with HBCUs and supporting the growth and development of its interns. For more information on this program, please contact Academic Alliance at acadalli@sandia.gov.

Academic relationships continue to fuel legacy of innovation



By **Michael Ellis Langley**

The Labs has made many prescient investments in its 75-year history, but few have provided more access to recruitment, research partners and new capabilities than the Sandia University Partnership Network.

Through this network, which was formally organized in 2015, Sandia employees designated as campus executives foster and maintain relationships with colleges and universities in 17 states — some of them the world’s most prestigious educational institutions.

Sandia’s researchers can not only leverage those connections to attract new staff but also draw upon scientific fields of study that can benefit the Labs’ national security priorities.

Programs like hypersonics and the **CHIPS and Science Act** have benefited enormously from the academic alliances that Sandia maintains.

Nuts, bolts and CHIPS

“The program has been so very impactful,” microsystems engineer Rick McCormick said of how the partnership network has affected Sandia’s leadership in the execution of the CHIPS and Science Act. “I really couldn’t be supporting the engagement that we have so far without our campus program managers.”

Congress passed the act just over two years ago, with money divided between the departments of state, defense and commerce to create technological hubs around the nation. More than \$30 billion was committed to the Department of Commerce, which is funding projects to encourage industrial development across 15 states.

“Sandia, which has the government’s largest and deepest semiconductor capability, is pretty popular as a partner,” Rick said. “We have a lot of expertise and a lot of credibility because we not only do research, but we do prototyping, as well as

technology maturation and production. All of which we do pretty well.”

Sandia is a lead partner for one of the DOD Microelectronics Commons hubs working on spurring new investment and jobs in microelectronics, which is being led by Arizona State University — a preexisting member of the Labs university network.

“There’s at least one main university and several other universities in each of these hubs, and we already have projects with many of the universities involved in CHIPS opportunities,” Rick said.

ASU is not the only university in Sandia’s network leading CHIPS activities. Purdue, Georgia Tech and University of Texas at Austin are all engaged to grow America’s semiconductor capability, and all are key partners for the Labs.

“Academic Programs looks for partnership opportunities that compliment Sandia’s capabilities that can lead to greater achievements,” Academic Programs senior manager Jim Redmond said. “By partnering with universities, we aim to secure CHIPS Act funding for projects that we can’t tackle alone.”

Most relationships are cultivated and maintained by experienced on-site campus partnership managers who connect the Labs with colleges from around the nation.

“I really rely on our campus partnership managers. The leads in a number of the organizations that are going after these different funding opportunities are part of our Academic Programs network,” Rick said. “It’s all these universities that we’re partnered with so its incredibly handy to be



RECRUITERS — Campus Partnership Manager Anthony Sanders, left, and Technical Business Development Specialist Breanna Gallegos-Schnedar participate at the Minority Serving Institution Partnership Program annual event at Florida A&M University in April. **Photo courtesy of Anthony Sanders**

able to pick up the phone and call somebody who lives on those campuses.”

High-speed support

While not a lot can be said about Sandia’s work in creating hypersonic weapons, program Senior Manager Alex Roesler has quite a lot to say about how the partnership network has directly impacted the Labs’ work.

Sandia’s work to revolutionize the weapons systems in the nation’s stockpile has spanned each of its 75 years, including cutting-edge new designs for hypersonic platforms that travel at more than Mach 5, or 3,836 mph. The Common Hypersonic Glide Body, which was used on multiple weapons programs, was designed and built at Sandia. The Labs has partnered with industry to accelerate the manufacturing of glide bodies for future deployment.

In recent years, the nation’s military has fast-tracked the timelines to create operational hypersonic platforms, and Sandia has answered the call. That timeline for development created a need for partners that Alex said the academic alliances helped meet.

“There was certainly a challenge as far as how to build the bridge,” he said of the effort it took to leverage academic capabilities in a highly sensitive area. “It takes a lot

of work, a lot of networking, to make the relationship between those faculty and the staff at Sandia successful.”

Though the universities could not work on classified elements of the projects, the work they continue to do is indispensable.

“Basic research and development are the foundation of all our key technologies and provide great opportunities for collaboration,” Jim said. “However, we are seeing more universities reaching out to the national security sector and expanding their capabilities to handle sensitive work, including classified labs and computing facilities, as well as involving cleared professors and students in these projects.”

Alex called the relationship-building rewarding.

“The campus managers absolutely helped identify potential research collaborators at the university and made all the introductions,” he said. “So, with regard to building that external network of university collaborators, they were absolutely instrumental.”

Campus connectors

In various forms, Sandia has spent decades matching institutes of higher education with the dedicated people who lead Sandia’s missions and innovate advances that the nation relies upon. Jim said the team follows a highly structured process in relationship-building.

“Using a data-based approach that emphasizes our strong research reputation, diverse talent, national presence and partnership approach, we have formed partnerships with 27 universities that strengthen our identity as a national lab,” he said. “Each university has a designated campus executive who works with their teams to identify and support impactful research collaborations. We also track partnership metrics to ensure a good return


on investment and adjust our network as needed.”

The regular presence of campus executives at these universities pays dividends that have benefited both academia and the Labs, which enjoys a pipeline to recruit new employees who are already familiar with Sandia.

“At the schools in our network, dedicated on-site campus partnership managers play a crucial role by increasing visibility, supporting student events and collaborating with departments and professors,” Jim said. “These roles have proven invaluable to staff and program managers in expanding our capabilities and accelerating innovation. Those that engage with them value these connections, and campus executives appreciate the networking opportunities.”

Rick confirms that these opportunities are plentiful and beneficial.

“North Carolina State is calling us saying, ‘Hey, can we collaborate on power electronics?’” he said. “The AI hardware hub wants to take advantage of our neuro-morphic accelerators, and it’s because we have all these relationships. If Stanford wants to collaborate with us, the campus manager is talking to them every week.”

[Visit the Sandia University Partnerships Network](#) for more information about relationships between Sandia and the nation’s education institutions. 



CREATING CONNECTIONS — Texas A&M students and Sandians, including Campus Partnership Manager Andy Brewer, front row far left, at an Aggies Invent event in November. **Photo courtesy of Andy Brewer**

Then and now: California site



SAY CHEESE — Sandians gather for a group shot at the California site — first in 1999, and again this year.

No-sew blanket project ties Labs to community

By Erika Y. Bonilla

A desire to improve local communities is woven into the history and ethos of the Labs. Through many initiatives, Sandia encourages contributions beyond financial giving, emphasizing the value of time and talent. Most recently, centers are gathering to make no-sew blankets, which they donate to local nonprofit organizations that support people and animals in need.

“I love the no-sew blanket project for its versatility,” Community Involvement Specialist Katrina Wagner said. “Whether you’re crafting a blanket at home alone, with friends and family, or as a team at work, it brings people together for a meaningful cause. Nonprofits that serve both people and animals in our community cherish these blankets, as they provide comfort and warmth to those facing difficult times.”

Community Involvement invites Sandians from across the Labs to make blankets for donation to nonprofits such as Veterans Integration Center, The New Mexico Dream Center, the Animal Humane Society and New Day Youth and Family Services.

“I am inspired by the many ways we can give back to our community. Giving doesn’t always have to be monetary; it can also come through our time and talents,” said Danny Milo, director of Labs Strategy, Communications and External Engagements. “Sandians are inherently generous, often identifying areas in need of basic support. Helping those who are less fortunate is a deeply fulfilling experience for all of us. For Sandians, giving is a natural instinct. We genuinely care about our community, our fellow citizens and our country.”

Assisting those in need is a rewarding experience that connects communities. Together, Sandians can make a positive impact and contribute to a brighter future for everyone. [fb](#)



HOMEMADE GIFT — Sandians picked up blanket kits to make with family and friends during winter shutdown. **Photo by Craig Fritz**



INVESTING IN A CAUSE — From left, health educator Jon Pier and HR support team member Brianna Sena tie no-sew blankets during a new employee orientation event. **Photo by Lonnie Anderson**



TEAMING UP — From left, talent acquisition specialists Mario Esquibel, Louis Carvin, Kelly Thoesen and Tom Schroeder make blankets during a new employee orientation event. **Photo by Tally Lobato**



GIVING BACK — Danny Milo, director of Labs Strategy, Communications and External Engagements, invites Sandians to give back at the Community Involvement and New Employee Onboarding Culture of Giving event on Oct. 2. **Photo by Lonnie Anderson**