



Fusion experiments at Z machine detect record neutron numbers

MagLIF output increases by order of magnitude



MORE POWER — Sandia researcher Matt Gomez stands under the Z-beamlet laser transport tube at Sandia's Z facility.

Photo by Randy Montoya

By Neal Singer

A relatively new method to control nuclear fusion that combines a massive jolt of electricity with strong magnetic fields and a powerful laser beam has achieved its own record output of neutrons — a key standard by which fusion efforts are judged — at Sandia's [Z Pulsed Power facility](#), the most powerful producer of X-rays on Earth.

The achievement, from a project called MagLIF, for magnetized liner inertial fusion, was [reported in a paper](#) published Oct. 9 in the journal *Physical Review Letters*.

"The output in neutrons in the past two years increased by more than an order of magnitude,"

said Sandia physicist and lead investigator Matt Gomez. "We're not only pleased that the improvements we implemented led to this increase in output, but that the increase was accurately predicted by theory."

MagLIF neutron production increased to 10 to the 13th (as much as 10 to the 15th, the 100-fold increase generally accepted by scientists, if an equal mixture of deuterium and tritium had been used), and the average ion temperature doubled. This was achieved through a simultaneous 50% increase in the applied magnetic field, a tripling of laser energy and an increase in Z's power input from 16 to 20 mega-amperes, Matt said.

"The output was only 2 kilojoules DT, a relatively small amount of energy," he said.

A kilojoule is defined as the heat energy dissipated by a current of 1,000 amperes passing through a one-ohm resistor for one second.

"But based on the experiments that we have done so far, which show a factor of 30 improvement in five years and simulations consistent with those experiments, we think a 30- to 50-kilojoule yield is possible, bringing us near the state known as scientific break-even."

The rise in output, predicted from changes in input, indicates that a proposal to build a machine even larger than Z, and better equipped to exceed break-even, now has a stronger basis from which to make that request, Matt said.

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Safeguarding biological data

Sandia partners to improve equipment security threatened during pandemic

By Michael Ellis Langley

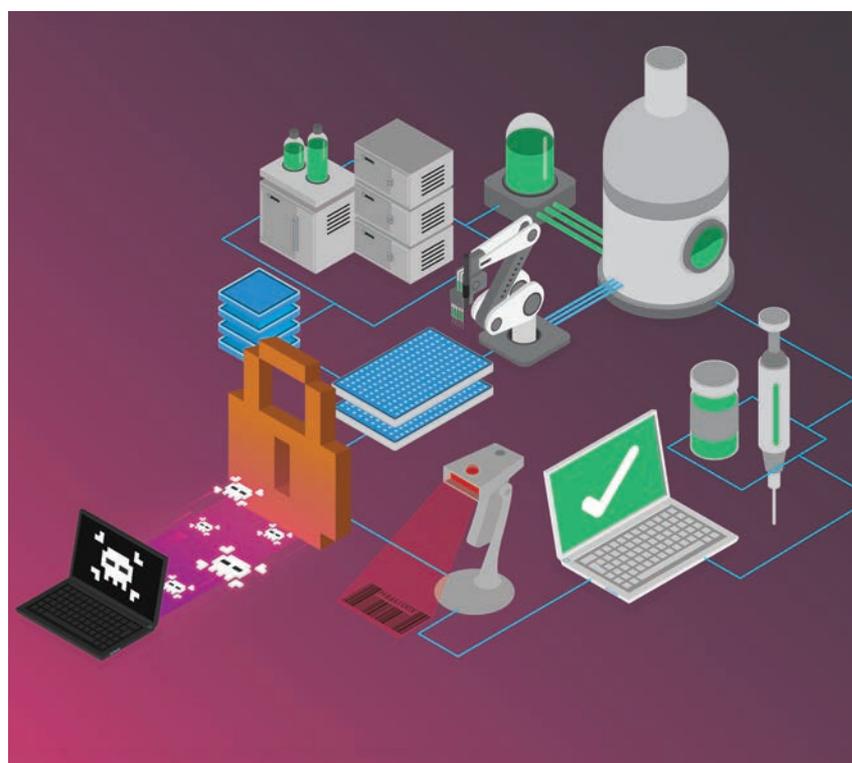
A partnership between Sandia and the Boston firm BioBright LLC to improve the security of synthetic biology equipment has become more relevant after the United States and others issued warnings that hackers were using the COVID-19 pandemic to increase their activities.

"In the past decade, genomics and synthetic biology have grown from principally academic pursuits to a major industry," said Sandia computational biology manager Corey Hudson. "This shift paves the way toward rapid production of small molecules on demand, precision healthcare and advanced materials."

Sandia and BioBright are working to develop better security for this new commercial field. Right now, large amounts of sensitive data about patients' health and pharmaceutical information are being handled with security models developed two decades ago for academic needs and not industrial risks, Corey said.

Many of the facilities responsible for ushering in this growth in synthetic biology scaled up from these academic models. This has meant that the digital environment responsible for automating these facilities has not grown with the same sophistication. According to Corey, the situation potentially leaves open the risk of data theft or targeted attack by hackers to interrupt production of vaccines and therapeutics or the manufacture of controlled, pathogenic or toxic materials.

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BLOCKING BIOHACKERS — This illustration depicts a cyber adversary attempting to access computer systems and equipment that contain genetic data. A collaboration between Sandia and BioBright LLC is yielding a security protocol to secure that data.

Illustration courtesy of BioBright LLC

2020 Special Appointments

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 LABNEWS Notes

'Iconic' researcher wins Indigenous Excellence Award

By **Troy Rummler**

Her peers know her as an exceptional engineer. But to some Indigenous people, Sandra Begay is legendary.

"Like many Native American students in STEM, I knew of Sandra before I met her," said Suzanne Singer, who is Navajo and interned under Sandra at Sandia in 2008. "She was the 'iconic' Native woman engineer — an example of what could be achieved through hard work and dedication."

In recognition of her substantial work to advance opportunities for Indigenous students and professionals in science, technology, engineering and math education and careers, Sandra, a member of the Navajo Nation, has received the 2020 Indigenous Excellence Award from the [American Indian Science and Engineering Society](#). The organization presented her with the award at its annual conference, held virtually Oct. 15-17.

Dozens of American Indian students like Singer have worked with Sandra through DOE's Office of Indian Energy Policy and Programs internships, a program Sandra started at Sandia in 2002. Through the program, she inspires new generations of Native American students and professionals to pursue work and research in engineering fields, especially in the energy sector.

"I tried to convey to my interns that I expect them to be respectful leaders, experienced tribal professionals and STEM champions within their careers," Sandra said. "I reminded them that they have the academic credentials, and the internship provided them with real hands-on experience in tribal energy development."

Improving access to electricity

Since joining Sandia in 1992, Sandra has worked to improve access to electricity in tribal communities, where remote housing and lack of infrastructure can make getting connected to the grid a financial and logistical challenge. Without

electricity, families don't have refrigerators, running water, adequate heating and cooling, lights or internet access.

"My passion for empowering tribal communities through renewable energy comes from seeing the impact on my Navajo grandmother receiving electrical power for the first time," Sandra said. "When I was in junior high, my family and I drove at dusk to see her new porch light. My dad and mom did not grow up with electricity, and many families living on the Navajo Nation do not have electricity. Residential photovoltaic solar energy is seen as a viable off-the-electrical-grid option."

Over the past 16 years, as requested by tribes, Sandra and her team have supported community-driven, strategic energy planning efforts across the U.S. Communities they have worked with include Acoma Pueblo; Crow Nation; Fort Independence Paiute; White Mountain Apache; Turtle Mountain Chippewa; Navajo Nation; Shoshone and Bannock Tribes; Mohawk Tribe; Mescalero Apache; Hopi Tribe; Klamath Tribes; Menominee Tribe; Delaware Tribe; Hoonah Village, Alaska; Hughes Village, Alaska; Gila River Indian Community; and Picuris Pueblo.

With Sandra's help, tribes have modified their energy policy; made plans to form a tribal utility; laid the groundwork to develop future, large scale solar plants; and have built a solar farm to power a village.

Lasting impact

Sandra said her mentorship is rooted in providing interns real-world experience. She teaches her students the complexities of issues facing Native communities by traveling with them to meet tribal government leaders and community members face to face.

These meetings made a personal and lasting impact on professor Lani Tsinnajinnie at the University of New Mexico, who was Sandra's intern in 2006. Tsinnajinnie, of Navajo and Filipino descent, originally hails from Na'Neelzhiin, on the eastern edge of the Navajo Nation.

"Approximately 50% of households in my community lack access to running water," Tsinnajinnie said.

As her own community leaders struggled to explain when they would build new water pipelines, she heard echoes of tribal leaders she had met as an intern discussing difficulties in providing electricity.

"This led me to focus my expertise in water resources and hydrology so that I could use my knowledge to help my community best manage the water that will be delivered in a few years, when the infrastructure is in place," she said.



EMPOWERING TRIBAL COMMUNITIES — Sandia engineer and Native American STEM icon Sandra Begay has received the 2020 Indigenous Excellence Award from the American Indian Science and Engineering Society. **Photo by Lonnie Anderson**

Tommy Jones, a 2014 intern with Cherokee and Aleut heritage, said "Giving back is ingrained into Sandra, and that perspective of raising the collective well-being across Indian Country is infectious to those who have been fortunate enough to work with her."

Many of Sandra's interns have become highly regarded technical professionals and leaders within tribal organizations, industry, academia and nonprofit groups.

"Her impact is apparent when you see how her interns have thrived in their careers to become experts and leaders in their fields," said Singer, who went on to co-found Native Renewables, a nonprofit that provides renewable energy systems to Navajo Nation homes. "She has created a supportive environment among her interns, who love meeting each other and crossing paths."

Jones, who is now a contractor to DOE's Office of Indian Energy Policy and Programs, said, "Every major or minor event I attend, I find either an intern, current or past student, or professional that Sandra has helped, in some way, achieve their goals." 

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Tim Deshler, Editor	505-844-2502
Taylor Henry, Production	505-373-0775
Angela Barr, Production	505-844-1388
Randy Montoya, Photographer	505-844-5605
Paul Rhien, California Site Contact	925-294-6452

CONTRIBUTORS

Michelle Fleming (ads, milepost photos, 505-844-4902), Neal Singer (505-846-7078), Stephanie Holinka (505-284-9227), Kristen Meub (505-845-7215), Michael Baker (505-284-1085), Troy Rummler (505-284-1056), Manette Fisher (505-844-1742), Valerie Alba (505-284-7879), Meagan Brace (505-844-0499), Whitney Lacy (505-284-8005), Luke Frank (505-844-2020), Michael Langley (925-294-1482), Mike Burt (505-284-1663), Darrick Hurst, team lead (505-844-8009), Jim Danneskiold, manager (505-844-0587)

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 LABNEWS Notes

EDITOR'S NOTE: Lab News welcomes guest columnists who wish to tell their own "Sandia story" or offer their observations on life at the Labs or on science and technology in the news. If you have a column (500-800 words) or an idea to submit, contact Lab News editor Tim Deshler at tadeshl@sandia.gov.



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THANK YOU FOR READING!

'Magical' mathematics unlocks engineering honor for Sandia scientist

Tamara Kolda one of few mathematicians admitted to NAE

By **Michael Ellis Langley**

Sandia mathematician Tamara Kolda has spent a career finding mathematical patterns in data sets ranging from mouse neurons to crime statistics, so when she talks about how “magical” the results seem, even experts in other fields take notice.

Tamara was one of 87 members elected to the [National Academy of Engineering](#) this year — one of a handful of mathematicians ever granted membership.

“It’s an honor to be recognized in the National Academy of Engineering as a mathematician,” Tamara said. “I’ve had a great career at an engineering lab because I work with engineers focused on solving key problems of national interest.”

Tensor decomposition

Tamara, who has been at Sandia for more than 20 years, was selected in part for her groundbreaking work in tensor decomposition — automated mathematical calculations that can make models of turbulence in automotive engines easier to manage and chemical compositions of samples easier to extract.

“Tensor decomposition is a form of unsupervised machine learning,” she said, adding that tensors are making a big impact in understanding problems that require computers to process huge amounts of information to find solutions to complex physics, engineering and data science problems.

“Tensors are also used for data compression, reducing massive data from supercomputing simulations to a size that can be post-processed on a laptop computer,” Tamara said. She explained that many data science tasks require massive amounts of data. “This is why you don’t have voice recognition on your phone unless it’s connected to a network. The neural net is too big to live on your phone.”

To Tamara’s experienced eyes, tensors find patterns in raw data that are both beautiful and illuminating.

“Tensors are magical in their ability to reveal underlying patterns in data,” she said.

As a way to test her work, Tamara examined tensors that showed patterns of crime in America’s third-largest metropolitan area.

“We looked at more than a decade’s worth of data on crimes in Chicago, and we could see which types of crimes were prevalent in different areas, which areas were the hotspots of crimes. We could also clearly see which crimes were more prevalent in which season.”

The math of data science

Tamara joined Sandia in 1999, and since then, her work in tensor decompositions, graph models and algorithms, data mining, numerical optimization, linear algebra, high-performance computing and scientific software has been cited more than 20,000 times. She was one of only a few dozen mathematicians working on understanding tensors at the turn



CRITICAL CALCULATION — Sandia researcher Tamara Kolda is one of few mathematicians elected to the National Academy of Engineering. **Photo courtesy of Tamara Kolda**

of the century, and in 2004, co-developed the widely used Tensor Toolbox for MATLAB.

“One of the reasons I believe I was inducted is that I’ve been trying to elucidate the role of mathematics and engineering in data science,” Tamara said.

In 2003, Tamara was honored with the Presidential Early Career Award for Scientists and Engineers. She has earned an R&D100 award and three best-paper prizes at international conferences in her career. Tamara was elected fellow of the Society for Industrial and Applied Mathematics in 2015 and fellow of the Association for Computing Machinery in 2019.

Tamara earned her doctorate in applied mathematics from the University of Maryland, College Park, and bachelor’s degree in mathematics from the University of Maryland, Baltimore County. [f](#)

Material found in house paint may spur technology revolution

Sandia developed new device to more efficiently process information

By **Michael Ellis Langley**

The development of a new method to make non-volatile computer memory may have unlocked a problem that has been holding back machine learning and has the potential to revolutionize technologies like voice recognition, image processing and autonomous driving.

A team from Sandia, working with collaborators from the University of Michigan, published a paper in the peer-reviewed journal *Advanced Materials* that details a new method to imbue computing chips that power machine-learning applications with more processing power by using a common material found in house paint.

“Titanium oxide is one of the most commonly made materials. Every paint you buy has titanium oxide in it. It’s cheap and nontoxic,” said Sandia materials scientist Alec Talin. “It’s an oxide, there’s already oxygen there. But if you take a few out, you create what are called oxygen vacancies. It turns out that when you create oxygen vacancies, you make this material electrically conductive.”

Those oxygen vacancies can now store electrical data, giving almost any device more computing power. Alec and his team create the oxygen vacancies by heating a computer chip with a titanium oxide coating above 302 degrees F (150 degrees C), separating some of the oxygen molecules from the material using electrochemistry.

“When it cools off, it stores any information you program it with,” Alec said.

Energy efficiency

Right now, computers generally work by storing data in one place and processing that data in another place. That means computers constantly have to transfer data from one place to the next, wasting energy and computing power.

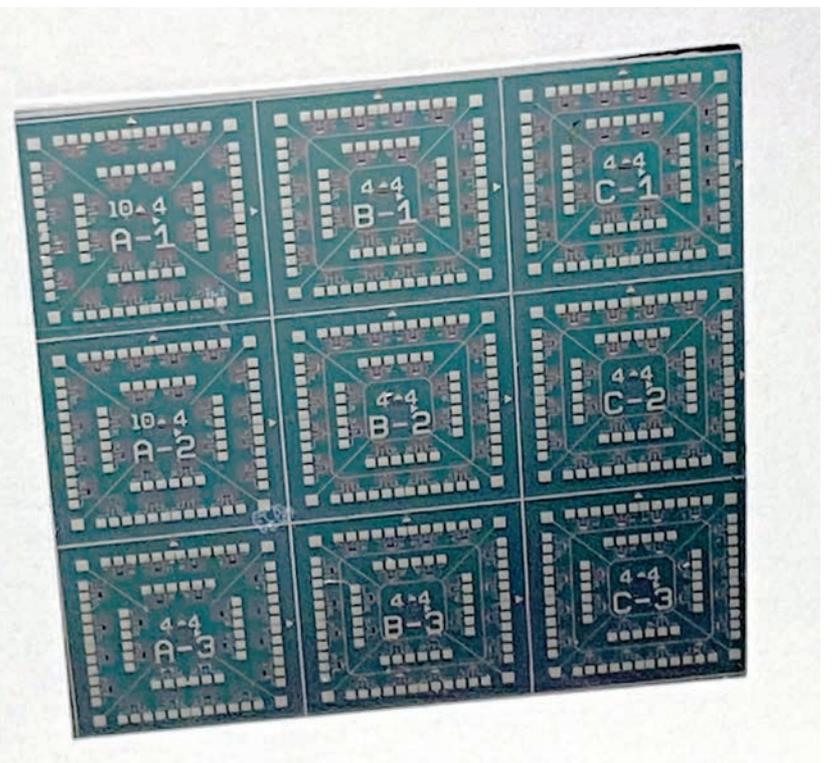
Yiyang Li — a former Truman Fellow at Sandia, now an assistant professor of materials science at the University of Michigan — led the work and helped author the paper. He explained how their process has the potential to completely change how computers work.

“What we’ve done is make the processing and the storage at the same place,” Li said. “What’s new is that we’ve been able to do it in a predictable and repeatable manner.”

A boost for machine learning

Both Li and Alec see the use of oxygen vacancies as a way to help machine learning overcome a big obstacle holding it back right now — power consumption.

“If we are trying to do machine learning, that takes a lot of energy because you are moving it back and forth, and one of the barriers to realizing machine learning is power consumption,” Li said. “If you have autonomous vehicles, making decisions about driving consumes a large amount of energy to process all the inputs. If we can create an alternative material for computer chips, they will be able to process information more efficiently, saving energy and processing a lot more data.”



POWER PERFORMER — An array of processors coated with titanium oxide has the potential to revolutionize technologies like voice recognition, image processing and autonomous driving. **Photo by Alec Talin**

Everyday impact

Alec sees the potential in the performance of everyday devices.

“Think about your cell phone,” he said. “If you want to give it a voice command, you need to be connected to a network that transfers the command to a central hub of computers that listen to your voice and then send a signal back telling your phone what to do. Through this process, voice recognition and other functions happen right in your phone.”

Alec said the team is working on refining several processes and testing the method on a larger scale. The project is funded through Sandia’s [Laboratory Directed Research and Development](#) program. [f](#)

Benefits Open Enrollment

Open Enrollment
is here.



Active employees

Open Enrollment dates Oct. 26-Nov. 13

Optimize Sandia's benefits to fit your life during this year's Open Enrollment for active employees, beginning Monday, Oct. 26. Open Enrollment is your annual opportunity to review and update benefit elections, including medical, dental and vision coverage, flexible spending accounts, changes to covered dependents, vacation buy and more.

For active employees, 2021 Open Enrollment selections must be made by **5 p.m. MST (4 p.m. PST) on Friday, Nov. 13**. To learn more, visit HR Solutions at hr.sandia.gov.

Open Enrollment is going virtual. Instead of in-person on-site benefits fairs, this year, you will find everything you need online in one place. Learn about:

- How to tailor your benefits with Sandia Extras
- Which benefits roll over, and how to take action
- Expert advice from Sandia's plan administrators for medical, dental, vision and voluntary benefits

Plus, you'll have the opportunity to earn 500 Virgin Pulse points by watching the Open Enrollment video presentation, which covers topics such as choosing the right medical plan for you and maximizing your HRA funding. Visit HR Solutions to learn more about all your benefits and to enroll.

Saving for college

As part of the Sandia Extras voluntary benefits program, you can now make direct deposits from your paycheck into the tax-advantaged 529 Education Plan and save for your child's future. Enrolling is easy and takes less than 15 minutes. You can open a 529 Plan with just \$1 and contribute as much or as little as you wish. Visit HR Solutions for details and benefits, including a video, FAQs and links to resources.

What's new for 2021

Effective Sept. 30, 2020, you can automatically convert new after-tax contributions to a Roth IRA in the NTESS 401(k) Plan.

About HR Solutions

You may have noticed some changes around here. We are working as one Human Resources team to deliver meaningful solutions for your life and work. We also want you to feel that working with Human Resources is simple — where you can count on the right answer the first time.

We encourage you and your family to take advantage of all the programs and tools Sandia offers for your health, finances, career and life. Drop us a line if you need help. We're here when you need us: hr.sandia.gov.

Beginning Jan. 1, 2021:

- Sandia Total Health plan medical premiums will increase between \$1 and \$4 per month, depending on coverage level and salary tier. Dental and vision premiums will not increase for 2021.
- Enhanced provider networks will be offered under the Sandia Total Health Plan for both United Healthcare and Blue Cross Blue Shield of New Mexico. BCBSNM is expanding access to lower-cost Tier 1 providers in New Mexico by moving to the Blue Preferred Plus Network. UHC is adding a new, lower-cost Tier 1 network called Choice Plus Premium, available in all locations except California, due to current state regulations. California will be added when permitted.
- Virtual visit copays will be \$10 per visit (a decrease of \$25 from 2020).
- We've added a few more Sandia Extras to the voluntary benefits menu, including the 529 Education Plan, help renting or buying a home, and roadside assistance.

Visit HR Solutions to read the Open Enrollment newsletter and find more details about these benefits.

Voluntary benefits

Open Enrollment is your chance to select the voluntary benefits most important to you. Some benefits from the Sandia Extras platform, including guaranteed issue of short-term disability insurance, accident insurance, critical illness insurance and prepaid legal services, can only be elected during Open Enrollment.

Retirees

Open Enrollment dates

Pre-Medicare: Oct. 15-Nov. 13
Medicare: Oct. 15-Dec. 7

Open Enrollment is going virtual. This year, instead of in-person benefits fairs, you can find everything you need online at SandiaRetireeBenefits.com. Watch the video presentation to learn what you need to know about choosing your 2021 benefits.

What is changing

The changes listed below are effective Jan. 1, 2021:

Pre-Medicare retirees:

- Pre-Medicare premiums will increase.
- The Pre-Medicare provider networks for United Healthcare and Blue Cross Blue Shield of New Mexico are changing. The BCBSNM Sandia Health Partner Network will change to

Jumpstart on tax season

You may opt to receive an electronic 2020 1095-C form, which provides proof of health insurance coverage. Request an electronic form in HR Self-Service by Dec. 22. Consider signing up for an electronic W-2 as well, if you haven't already. This convenient option ensures the forms are available as soon as you need them.

You should receive your 1095-C form by Jan. 31, 2021, either electronically or through the mail. The form should be kept as supplemental documentation for your 2020 taxes.

Need help signing up for electronic forms in HR Self Service? Contact HR Solutions at hr.sandia.gov.

During Open Enrollment 2021, proof of good health is not required for short-term disability insurance. Benefit payments are not made for conditions that occurred prior to the coverage effective date.

Additional voluntary benefits you can elect during Open Enrollment include:

- Vacation buy
- Employee-paid supplemental life insurance, increase or decrease of coverage (proof of good health may be required to increase coverage)
- Long-term disability buy-up
- 401(k) automatic increase and rebalancing
- Flexible Spending Accounts for dependent care, healthcare and transportation (CA-only)

Voluntary benefits are available year-round; however, Open Enrollment is a good time to review your overall benefits package and evaluate what the next year may have in store. Anytime benefits include:

- **New!** 529 Education Plan
- **New!** Home Buy It Program
- **New!** Roadside assistance
- Home and auto insurance
- Pet insurance
- Identity theft protection
- Adoption assistance
- Tuition assistance

For more information about these benefits, visit hr.sandia.gov and read the Open Enrollment newsletter.

the NM Blue Preferred Plus Network. UHC is adding a new benefit tier called the Choice Plus Premium Network.

- The in-network virtual visit copay for BCBSNM and UHC will be \$10 (a decrease of \$25 from 2020).

Medicare retirees:

- The allowance for Your Spending Arrangement will increase.
- Premiums will change for Sandia-sponsored Group Medicare plans.
- **New!** The UHC Sandia Group Medicare Advantage plan will be available to all Medicare-eligible retirees, spouses, dependents, surviving spouses and long-term disability termines nationwide. The New Mexico residence restriction has been removed.
- For Pre-2012 Medicare retirees, premiums will change for Sandia-sponsored Medicare plans.

Details about Sandia retiree plans and Via benefits can be found in the 2021 Benefit Choices and Open Enrollment Guides, available online at SandiaRetireeBenefits.com. 

Hispanic Heritage Month



Juan A. Bustos received Best of Show for his 1962 Chevy Impala.



Luciano Crespin won first place for his 1949 Dodge Dually.



Michael Marquez received second place for his 1955 Buick Special.



Lynnwood Dukes walked away with third place for his 2006 supercharged Ford Mustang.



Associate Labs Director Scott Aeilts, left, joined Kirtland Air Force Base's 377 Vice Commander Col. Ryan Nye in judging the Hispanic Heritage Month car show.

Car photos by Bret Latter

Virtual celebrations and cool cars

By **Stephanie Holinka**

Sandia's celebration of Hispanic Heritage Month, Sept. 15-Oct. 15, went mostly virtual this year. The national theme of HHM this year was Hispanics: Be proud of your past and embrace the future.

The Hispanic Outreach for Leadership and Awareness employee resource group's festivities opened with a welcome [video message](#) from HOLA Executive Champion and Associate Labs Director Scott Aeilts, Kirtland Air Force Base Installation Commander Col. David Miller and NNSA Federal Contracting Officer Corinne Sisneros.

"The Hispanic Heritage Month car show has been one way that the HOLA team has celebrated Hispanic Heritage month at Sandia," Scott said. "This year, despite a scaled back and modified approach to ensure it was done with all COVID-19 safety protocols, it was a tremendous success."

The fifth annual car show was the only in-person event this year. Co-hosted by Sandia and KAFB and held at Hardin Field, the socially distanced event featured 24 vehicles on display.

The Sandia workforce swept the car show awards. Juan A. Bustos received Best of Show for his 1962 Chevy Impala, Luciano Crespin won first place for his 1949 Dodge Dually, Michael Marquez received second place for his 1955 Buick Special and

Lynnwood Dukes walked away with third place for his 2006 supercharged Ford Mustang. Visit [Sandia's HHM Facebook page](#) for more photos.

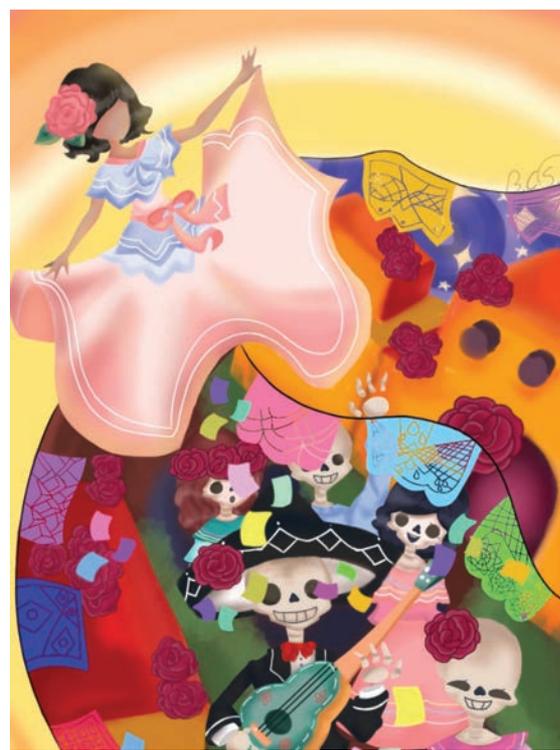
HENAAC winners, art show and more

Also honored this year were the 2020 Hispanic Engineering National Achievement Awards Conference award winners [Angela Rivas](#), who received a Luminary Honoree award, and [Tito Bonano](#), recipient of the Lifetime Achievement Award. Past HENAAC winners also were highlighted throughout the month, through a series of Q&A profiles.

The art this year featured the annual youth art contests for [high school](#), [middle school](#) and [elementary school](#) artists, along with a Sandian [art display presentation](#). The Sandian art can also be viewed in person at the Thunderbird Café.

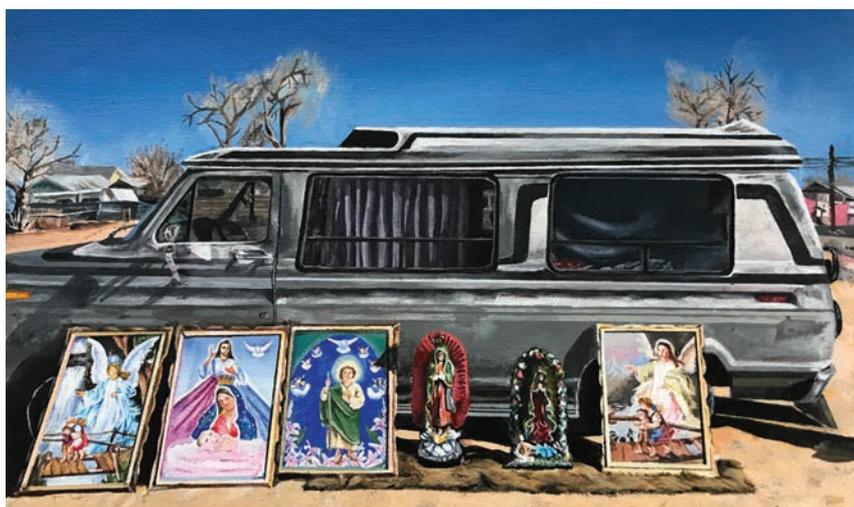
For the many, many people who are sorely missing the food this year, HOLA also put together [Libro de Recetas/Dichos/Remedios Caseros](#), a booklet of recipes to calm the cravings for good food, served along with dichos (old sayings), as well as some traditional remedies.

Hispanic Heritage Month observances started in 1968 as Hispanic Heritage Week under President Lyndon Johnson and was expanded by President Ronald Reagan in 1988 to cover the 30-day period. It was enacted into law on August 17, 1988, on the



Beatrice Castillo (7th grader) took third place for her painting inspired by how art influences her culture.

approval of Public Law 100-402. Sept. 15 is significant because it is the anniversary of independence for Latin American countries Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua. In addition, Mexico and Chile celebrate their independence days on Sept. 16 and Sept. 18, respectively. [📷](#)



Grace Archibeck (12th grader) won first place with her painting of religious artwork being sold in Albuquerque, which also shows the resiliency of people selling homemade goods during this challenging time.



Sophia Dallo (12th grader) earned second place for her painting, The Two Nurses, inspired by Frida Kahlo's painting, The Two Fridas. In the spirit of being socially distant, Sophia painted the nurses six feet apart and wearing masks.

Nuclear Deterrence delivers on the mission

All-hands presentation lauds tremendous Labs accomplishments in a challenging year

By Whitney Lacy

Holding an all-hands meeting during an ongoing pandemic hit a reality check last month: going virtual was the safest venue. And for the Nuclear Deterrence mission portfolio, under Associate Labs Director and Chief Engineer for Nuclear Weapons Steve Girrens, technology helped people stay safe and connected.

“It’s different this year,” Steve said. “I’m here in my office instead of the Steve Schiff Auditorium.”

This year’s Nuclear Deterrence all-hands meeting was pre-recorded in early September and included presentations by the division’s two newest directors, Rita Gonzales, who leads advanced systems and transformation, and Carl Vanecek, who leads component science, engineering and production. The video included answers to questions employees had submitted in advance of the recording.

Accomplishments and challenges

In the 38-minute video, Steve lauded numerous accomplishments that Nuclear Deterrence was able to achieve despite the ongoing pandemic, which caused a disruption in supply chain, restricted travel and limited most employees to working from home.

After first commemorating the 75th anniversary of the Trinity Test, Steve went on to stress that, “We are all mission critical people in the scope of our roles here at Sandia, whatever our job may be.”

He said that while other nuclear states continue to improve their weapons stockpile, the work we do at Sandia is even more critical to safeguard our stockpile and modernize our weapons through life extension programs and alterations.

Steve also discussed overcoming challenges faced because of the pandemic, including flight tests that were held, milestones met on accelerated schedules and mission production projects continuing.



NUCLEAR CHIEF — Nuclear Deterrence Associate Labs Director and Chief Engineer for Nuclear Weapons Steve Girrens hosted the annual Nuclear Deterrence all-hands meeting virtually this year, due to the pandemic. **Photo by Randy Montoya**

A special mention was made of the B61-12 teams, who were congratulated in person by NNSA Administrator and DOE Under Secretary for Nuclear Security Lisa E. Gordon-Hagerty. “These teams have been the trailblazers for other sites on how to work safely during a pandemic,” Steve said.

A new organization and a thank you

The briefing ended with Steve addressing the announced change in leadership in Sandia’s Nuclear Deterrence mission: a new deputy labs director overseeing the portfolio and a new division and associate labs director when the current division is split into two.

Steve also addressed what he called the “elephant in the room,” acknowledging the difficulties many Sandians are facing in their own lives due to the effects of the pandemic, including school closures, working from home and restricted travel. He also recognized the more than 50 COVID-19 relief projects that Sandians have spearheaded or been a part of over the past year.

“It’s truly an honor to work with all of you, and I appreciate your creative spirits and generosity in the face of these trials,” he said.

Employees can view the [Nuclear Deterrence all-hands meeting video](#) on Sandia’s Digital Media Library. 

Fusion experiments

CONTINUED FROM PAGE 1

“Results at MagLIF have stirred a tremendous interest in fusion research that — by combining magnetism, lasers and electrical energy — spans the plasma states between traditional inertial confinement fusion, like the lasers at Lawrence Livermore National Lab’s National Ignition Facility, and traditional magnetic confinement fusion like the international ITER project in southern France,” said Dan Sinars, director of Sandia’s Pulsed Power Sciences Center. “MagLIF’s success has led to new programs and several fusion startups, and helps build interest in this broader field.”

“Plasma conditions and performance varying predictably with changes in input have given us additional confidence we can scale MagLIF to higher currents,” said Sandia manager David Ampleford.

Intermediate goal: Break-even

Break-even occurs when the amount of energy invested in the fuel is equal to the amount of energy it emits, a milestone achievement to those in the field. When more energy is emitted than is needed to maintain the experiment — a condition known as “high yield”— the world’s dream of clean energy from seawater, the most accessible material on Earth, will take a giant step forward.

Seawater contains a variant of hydrogen called deuterium, which contains an extra neutron, and tritium, which has two extra neutrons. These extra neutrons are fusible, which means they release fusion energy when they can combine. Deuterium, easier to work with, is the current material of choice in almost every fusion experiment at Z, with tritium’s more energetic presence sometimes simulated.

Even prior to break-even, the work is useful: data from increasingly powerful fusion reactions fed into supercomputers has been sufficient to put the physical testing of nuclear weapons on hold.

Story of MagLIF

The theory behind Sandia’s MagLIF fusion method was originated a decade ago by a team led by theoretical physicist Steve Slutz. The method combines a massive electrical pulse from Z with a laser burst that pre-heats a sometimes-icy pencil-eraser-sized deuterium target, bringing it closer to an appropriate starting temperature from which to climb to fusion. The method then employs a magnetic field to keep charged particles within the cylindrical operational area so they fuse in greater numbers.

Then, still informed by theory, came a wave of improvements, most recently led by Matt’s Sandia team. The team decreased the thickness of a clear plastic window that restrained the room-temperature fusion gas but also partially blocked an entry port for the laser beam.

Initially, the team conservatively chose a very thick window to ensure that it would not burst prior to the experiment and ruin the target, Matt said. Subsequently, the team rigorously tested window materials in a variety of thicknesses to identify the pressure at which each would fail.

“We determined that we could roughly halve the thickness and still robustly contain the fusion fuel,” he said.

Disappearing window

The fuel preserved, the researchers turned to computer simulations that showed how much improvement in the energy coupling of the laser beam with the target could be expected, given decreased window thickness.

“The laser doesn’t pass through the window in the way we might traditionally think it would,” Matt said. “The laser is so intense that it actually ionizes the window, converting it into a plasma, heating it up until it becomes more or less transparent to the laser. The process of heating the window to these extreme temperatures accounts for a decent fraction of the laser energy lost. We removed about half of the window material mass, so we don’t need to heat as much up, so we lose less energy.

“Our simulations were subsequently confirmed with experiments,” Matt said.



HIGH YIELD — Researcher Matt Gomez and his team are seeing significant results from their fusion research at Sandia’s Z Pulsed Power facility.

Photo by Lonnie Anderson

Sandia also increased the power of the magnetic fields that restrained charged particles from leaving the playing field, making it more likely they would stay to interact and fuse.

Another problem overcome was how to increase the strength of two magnetic coils while maintaining a window between them for diagnostic access, Matt said. “Previously, we needed to decide between a larger magnetic field without diagnostic access, which we were reluctant to even try, and a smaller magnetic field with diagnostic access. We now have the larger field and the diagnostic access, which we achieved through internal reinforcement of the coils.”

The stability of the reactions remains an issue as powerful operating forces increase. The fusion implosion, rocked by increased input, can spin out into nothingness. But simulations show that higher pressure in the fuel area should act to stabilize against increased incoming forces.

“Break-even is still two orders of magnitude away, but simulations that capture our experimental trends indicate another order-of-magnitude increase in yield is possible with additional increases of input parameters,” he said.

Matt also mentioned more fuel, more powerful laser bursts, magnetic fields and electrical pulses as controllable contributing factors leading to higher outputs he considers inevitable. 

First companies picked for Sandia's new Mentor-Protégé Program

Small-business protégés based in New Mexico, California and Missouri

By **Michael J. Baker**

Sandia has selected three companies as its first protégés in a new partnership program designed to help small businesses develop and build solid foundations when competing for federal and industry opportunities.

“Sandia was looking for small businesses that wanted to grow and learn, and we believe we’ve found three great partners,” said Sandia small-business program manager Paul Sedillo. “These companies will receive access to experts from across Sandia’s 14,000-plus workforce.”

The protégés, from three different states, include a woman-owned and two veteran-owned small businesses. The mentor-protégé agreements will be for two years, with the option of an additional year, said Royina Lopez, Sandia’s Mentor-Protégé Program lead.

The first protégés

Sandia experts will lead sessions with the businesses beginning this month and focusing on specific development needs as requested by the protégés to help build their businesses, Royina said. “We are thrilled to collaborate with these small business protégés, providing opportunities and resources to take them to the next level.”

Albuquerque-based **Pluma LLC** is a service-disabled, veteran-owned small disadvantaged business that offers several services, including general contracting, electrical contracting, design-build, construction project management, commercial tenant improvements, residential remodeling, flooring and steel buildings.

Strategic Industry Inc., based in Kingsburg, California, is a service-disabled, veteran-owned small business established as a general contractor that self-performs electrical and low voltage trades.

CeLeen LLC is a woman-owned small disadvantaged business based in Perryville, Missouri, with an operating location in Belleville, Illinois, that provides professional and information technology services.

“We’re very excited Pluma is going to get mentored by one of the world’s premier institutions,” said Pluma owner Christofer Pacheco, “It’s a very organized approach, and it will help us in several ways — from project management, safety, quality, business development, finance and more.”

Program benefits protégé, mentor

Sandia launched its **Mentor-Protégé Program** last fall for applications from companies that qualified as small businesses, including historically Black colleges and universities and other minority higher-learning institutions; had been in business for at least two years; had not been a previous participant in a DOE mentor-protégé program; were a U.S.-owned business; had a good safety record; and met product and service needs



SMALL-BUSINESS MENTORING — Sandia small-business program manager Paul Sedillo presented the new Mentor-Protégé Program to small-business representatives and owners during a forum last year at the University of New Mexico Lobo Rainforest. **Photo by Lonnie Anderson**

of Sandia. While Sandia has had protégés in the past, this newest program was designed to further the exceptional small-business commitment of the current prime contract.

“The diversity and number of qualified applicants was impressive,” Paul said. “Having such a robust mentor-protégé program fits nicely with Sandia’s small-business outreach efforts. By working with these small businesses, we’re expanding not only what they can offer to Sandia but to their respective industries as a whole.”

Assistance for businesses can include developmental and technical help aimed at allowing small businesses to better compete for DOE contracts. Protégés are eligible to receive noncompetitive contracts from Sandia, DOE and other national labs and federal agencies with thresholds of \$6.5 million for construction contracts and \$4 million for other contracts.

Part of a larger effort

Sandia’s Mentor-Protégé Program becomes yet another opportunity for **small businesses** looking to work with the Labs. Sandia lists **contracting**

opportunities on its website and anticipates resuming public forums with suppliers and civic leaders to discuss subcontracting opportunities in fiscal year 2021. Sandia also offers a **5% pricing preference** for qualified New Mexico small businesses.

In **fiscal year 2019**, the latest period for which data is available, Sandia added more than 535 new small businesses to its supplier base. Small businesses represented 65% of all Sandia suppliers and received \$784.2 million in Sandia subcontract spending. New Mexico small businesses received nearly \$364 million. Sandia increased spending in several small-business categories, including woman-owned small businesses, Historically Underutilized Business Zone, or HUBZone, companies, small disadvantaged businesses, veteran-owned small businesses and service-disabled veteran-owned businesses.

“Sandia plans to continue this program for future years, allowing for additional opportunities,” Paul said. “Sandia has a lot to offer in helping small businesses grow, particularly in these difficult times.”

Biological data

CONTINUED FROM PAGE 1

“Modern synthetic biology and pharmaceutical workflows rely on digital tools — instruments and software that were designed before security was such an important consideration,” said BioBright CEO Charles Fracchia.

The risk associated with using dated security measures for a modern, automated process is rising in light of current events. On May 5, the U.S. Department of Homeland Security, U.S. Cybersecurity & Infrastructure Security Agency and U.K. National Cyber Security Centre issued a joint alert warning that malicious hackers were

exploiting the COVID-19 pandemic as part of their attacks.

Sifting through terabytes

Earlier work by Corey and his team focused on identifying, reporting and mitigating vulnerabilities in genomics and genomic operations within synthetic biology.

“You have a genetic sequencer that is producing terabytes of data,” Corey said. “Those data are being transferred, through a series of software, until you identify the genetic variants. The clinical decisions are made from those results.”

Corey and his team are collaborating with Fracchia’s team at BioBright, a company that provides secure data collection and analysis to biotech and pharmaceutical companies. They are

working to help better secure synthetic biology operations and genomic data across industry, government and academia, protecting America’s bioeconomy and digital infrastructure. Using Emulytics, a research initiative developed at Sandia for evaluating realistic threats against critical systems, the teams are developing countermeasures to the risks.

“We can examine the data and see how to make the entire system safer and more secure,” Corey said.

The initial work done by Corey and his team was funded through Sandia’s **Laboratory Directed Research and Development** program. The collaboration with BioBright is funded by the Defense Advanced Research Projects Agency through the Safe Genes project.

Special Appointments

Sandia recognizes 107 employees for career accomplishments, contributions

Every year, Sandia promotes high-achieving employees to the rank of Distinguished, Senior Administrator or Senior Scientist/Engineer. These special appointments include employees from all areas of the Labs' operations.

Promotion to the Distinguished level signifies a move to the fourth level of the job. This level is composed of a select group of employees who have distinguished themselves in their careers. This year, 85 Sandians earned promotion to that rank.

Also featured are 22 exceptional Sandians appointed to the title of Senior Administrator or Senior Scientist/Engineer, a recognition of significant professional accomplishment and contribution to the Labs.

Senior Administrator



Chad Hjorth
Industrial Hygienist
Executive Support



Annie Garcia
Technical Bus. Dev. Specialist
Div. 8000



Tracy Jones
Solutions Architect
Div. 9000



David J. Martinez
Engineering Prog./Proj. Lead
Div. 9000

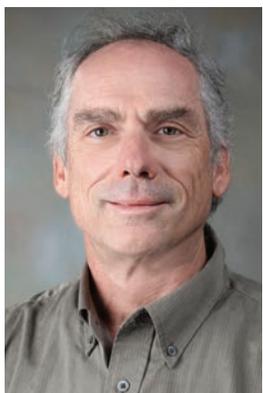


Scott Stephens
Solutions Architect
Div. 9000



Lynne Starkweather
Executive Strategy Professional
Div. 10000

Senior Scientist/Engineer



Martin Heinstejn
R&D S&E, Computer Science
Div. 1000



Jeffrey Tsao
R&D S&E, Physics
Div. 1000



Paul Vianco
R&D S&E, Materials Science
Div. 1000



Carla Busick
R&D S&E, Nuclear Engineering
Div. 2000



Marcia Cooper
R&D S&E, Materials Science
Div. 2000



Doug Ghormley
R&D S&E, Cybersecurity
Div. 5000



Larry Jones
R&D S&E, Systems Engineering
Div. 5000



Steve Gentry
R&D S&E, Systems Engineering
Div. 6000



Michelle Griffith
R&D S&E, Systems Engineering
Div. 6000



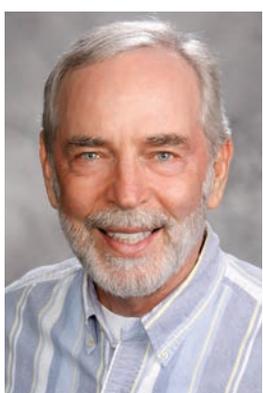
Amir Mohagheghi
R&D S&E, Sys. Res. and Analysis
Div. 6000



Robert Armstrong
R&D S&E, Computer Science
Div. 8000



Mark Ivey
R&D S&E, Geosciences Eng.
Div. 8000



Jim Lauffer
R&D S&E, Systems Engineering
Div. 8000



Habib Najm
R&D S&E, Mathematics
Div. 8000



Susan Rempe
R&D S&E, Bio. Sciences & Eng.
Div. 8000



Kim Merewether
R&D S&E, Electrical Eng.
Div. 9000



Distinguished



Executive Support



Stephanie Cotinola
Administrative Support



Todd Culp
Health Physicist



James Duncan
Radiological Control Technologist



Gerry Langwell
Environment, Safety and Health Coordinator/Technologist



Division 1000



Vit Babuska
R&D S&E, Mechanical Engineering



John A. Lott
Electromechanical Technologist



Larry M. Lucero
Engineering Support Technologist



Kyle McDonald
R&D S&E, Physics



David G. Moore
R&D S&E, Mechanical Engineering



Ciji Nelson
Nondestructive Inspection Technologist



David Noble
R&D S&E, Computer Science



George E. Orient
R&D S&E, Mechanical Engineering



Danny Rintoul
R&D S&E, Computer Science



Raymond Tuminaro
R&D S&E, Computer Science



Joshua Usher
Electromechanical Technologist



Karla Weaver
Health Physicist



David Wilson
R&D S&E, Controls Engineering



Division 2000



Travis M. Anderson
R&D S&E, Chemistry



Phil Chamberlin
Technical Systems Analyst



Harry Cincotta
R&D S&E, Electrical Engineering



Glen Harvey
Computer Aided Design and Drafting Technologist



Nancy Hayden
R&D S&E, Systems Research and Analysis



Michael Marquez
R&D Laboratory Support Technologist



Jeff Meador
Electromechanical Technologist



Johnny W. Montano
Electromechanical Technologist



Greg Neugebauer
R&D S&E, Systems Engineering



Division 3000



Nancy Salem
Corporate Communications Specialist



Lisa Teves
Registered Dietitian



Division 4000



Marc Ghattas
Construction Manager



Christopher Nesbit
Strategic Planner



Jeremy Pacheco
Information Security Specialist



Division 5000



John Cates
Electromechanical Technologist



Matt Eichenfield
R&D S&E, Electronics Engineering



Ihab El-Kady
R&D S&E, Electronics Engineering



Tony Giunta
R&D S&E, Systems Engineering



Ginger Hernandez
R&D S&E, Materials Science



Jacques Loui
R&D S&E, Microwave & Sensor Engineering



Mark Loviza
Microelectronic/Semiconductor Technologist



Amos Martinez
Mechanical Technologist



Mary Moya
R&D S&E, Electronics Engineering



Bradley Otts
R&D S&E, Electrical Engineering



Nick Pattengale
R&D S&E, Cybersecurity



Troy Satterthwait
R&D Laboratory Support Technologist



Norm Smith
R&D S&E, Cybersecurity



Travis Young
Microelectronic/
Semiconductor Technologist



Art Brito
Solutions Architect



Theckla Elmazi
R&D S&E, Computer
Science



Bridget Ford
R&D S&E, Optical
Engineering



Geoffrey Forden
R&D S&E, Systems
Research and Analysis



Mark Harris
R&D S&E, Computer
Science



Ryan Prescott
R&D S&E, Computer
Science



WVenner Saul
R&D S&E, Mechanical
Engineering



Jeni Turgeon
R&D S&E, Systems
Research and Analysis



Cynthia Backlund
Environment, Safety and
Health Coordinator



Stephanie Beasley
Technical Business
Development Specialist



Sam Durbin
R&D S&E, Mechanical
Engineering



Todd Houchens
Electronics Technologist



Pam Irish
Environment, Safety, and
Health Technologist



Matthew Johnson
R&D S&E, Electronics
Engineering



Christopher Klierer
R&D S&E, Chemistry



Tim Lambert
R&D S&E, Chemistry



Blake MacDonald
Facilities Engineering
Project Manager



Michael Maguire
R&D S&E, Materials
Science



Kent Pfeifer
R&D S&E, Microwave &
Sensor Engineering



Thomas Reichardt
R&D S&E, Optical
Engineering



Jesse Roberts
R&D S&E, Mechanical
Engineering



Dave Robinson
R&D S&E, Materials
Science



Lorraine Sadler
R&D S&E, Systems
Research and Analysis



Steve Verzi
R&D S&E, Computer
Science



Hollie Voelker
General Technologist



Doug Vrieling
Strategic Planner



Judit Zador
R&D S&E, Chemistry



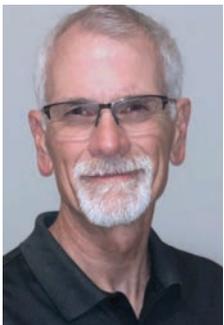
Mario J. Chavez
R&D S&E, Computer
Systems



Jeremy Dencklau
Solutions Architect



Meredith Haney
Solutions Architect



Stan Haynes
R&D S&E, Systems
Engineering



Joe Ingram
R&D S&E, Computer
Science



Glen Roybal
Solutions Architect



Andrew Steele
Solutions Architect



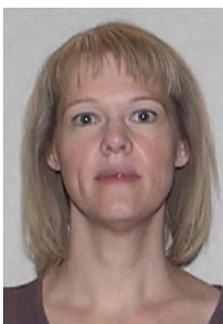
Matthew R. Lopez
Business Management
Professional



Alfred Lorber
S&E Project Manager



Carrie Mcphee
Quality Systems
Professional



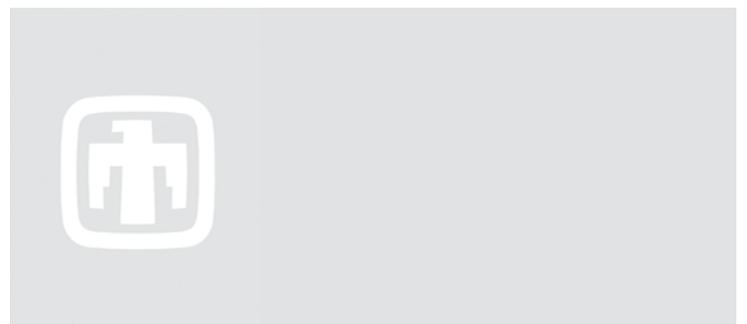
Karen Reeder
Quality Systems
Professional



Chad Twitchell
Business Management
Professional



Ross Wimborne
Business Management
Professional



Operation Backpack supports CA military families



DRIVE-THRU BACKPACK – Parks Reserve Forces Training Area Garrison Commander Lt. Col. Serena Johnson provides a donated backpack to a military family during the Operation Backpack event at Moffett Field held on Sept. 23. Children of military families in California received 206 backpacks this year thanks to generous donations from Sandia employees.

Photo courtesy of Parks Reserve Forces Training Area

By **Paul Rhien**

The start of the new school year looked and felt very different for families of school-aged children this fall. But for all the changes resulting from the COVID-19 pandemic, one thing remained constant — the need for donated school supplies and backpacks to benefit local military families.

This summer, the Military Support Committee at Sandia’s California site took a different approach to organizing and executing their traditional Operation Backpack campaign — now in its seventh year — asking instead for donations to be purchased directly, via an Amazon wish list.

“I lost track of how many packages and boxes I unpacked,” said Rachel Sowell, MSC co-chair. “But it was well over 90.”

Rachel admitted feeling nervous organizing the donation drive this year due to the pandemic.

“Given everything, I did not want our employees to feel the added burden of supporting this voluntary fundraiser. However, I should never underestimate the generosity of our employees,” she said. “We still had an amazing turnout of support.”

In August, Rachel was joined by colleague Adina Eliassian in delivering more than 100 backpacks filled with needed supplies to a drive-up distribution event held at Camp Parks, a U.S. Army training facility in Dublin, California.

Sandia’s strong support was so warmly received, Rachel said, that an additional request was made for the Labs to provide another 100 backpacks for a similar event to be held at Moffett Federal Airfield near Mountain View, California, in September.

In total, participants donated 206 backpacks filled with needed supplies to children of local military families.

“It was really heart-warming to see our workforce answer the call during this challenging time for so many,” Rachel said. [f](#)



DONATE WINTER COATS

for California wildfire relief

The unprecedented health and economic crisis caused by COVID-19 is impacting the lives of millions of people, many who were already struggling to make ends meet. With recent California wildfires, the growing need for coats this fall and winter is greater than ever before.

How You Can Help

This year, we have had to pivot our efforts to a virtual campaign. All donations will be shipped to Sandia One Warm Coat Ambassador Krissy Galbraith to sort and donate.



Amazon Wish List

Give warmth by purchasing a coat from our Sandia Gives [Amazon wish list](#)



Financial Contribution

Contribute financially to One Warm Coat (EIN 74-3045243) via the [Sandia Gives tool](#) every \$1 donated warms 1 person



Donations accepted Oct. 1-31
in partnership with One Warm Coat 

DONATE WINTER COATS

The unprecedented health and economic crisis caused by COVID-19 is impacting the lives of millions of people, many who were already struggling to make ends meet. If you missed Operation Backpack or are looking for another opportunity to give, consider donating a winter coat for California wildfire relief through [One Warm Coat](#), organized by [Sandia Gives](#) ambassador Krissy Galbraith. The donation drive runs through Oct. 31.

How You Can Help

Due to COVID-19 restrictions, we are unable to collect gently used coats during the Sandia Gives campaign this year, but you can still donate using one of the methods in the flyer above. All donations will be shipped to Sandia to sort and donate.

SANDIA CLASSIFIED ADS

Note: The classified ad deadline for the Nov. 6 Lab News was Wednesday, Oct. 21. Ads submitted after that date will be held for the Nov. 20 issue.

<p>AD SUBMISSION GUIDELINES</p> <p>AD SUBMISSION DEADLINE: Friday noon before the week of publication unless changed by holiday.</p> <p>Questions to Michelle Fleming at 505-844-4902.</p>	<p>Submit by one of the following methods:</p> <ul style="list-style-type: none"> • EMAIL: Michelle Fleming (classads@sandia.gov) • FAX: 505-844-0645 • MAIL: MS1468 (Dept. 3651) 	<ul style="list-style-type: none"> • INTERNAL WEB: Click on the News tab at the top of the TechWeb homepage to visit the News Center, then select Announcements >> Submit Announcement. <p><i>Due to space constraints, ads will be printed on a first-come, first-served basis.</i></p>
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<p>MISCELLANEOUS</p> <p>ELLIPTICAL RECUMBENT BIKE, Teeter FreeStep, like new, \$325 OBO. Hietala, 505-610-1252.</p> <p>MOTORCYCLE JACKETS, Joe Rocket, excellent condition: female, size small; male, size XL; \$50 ea.; portable inverter generator, 3100-W, \$500; in East Mountains. Willmas, djwillmas@gmail.com.</p> <p>DINING TABLE, oak, seats 4, expands to 10, w/leaves, \$100 OBO. Dennett, 505-379-9971.</p> <p>WASHER, Whirlpool, mid-2000s, good condition, \$60 cash; 6-drawer dresser, 17" x 36" x 56", good condition, \$40 cash; contactless pick-up only. Hartley, 352-872-2736.</p>	<p>DINING TABLE, w/5 chairs, 40-in. square, w/leaf extension, seats 6-8, dark wood tabletop/chair seats, wrought iron legs, \$600. Wells, 505-292-0179.</p> <p>TRANSPORTATION</p> <p>*46 JEEP CJ2A; 1944 Farmall tractor (parade winner); 2006 Dodge Cummins w/27-ft. 5th wheel. Clark, 505-469-1937, leave message.</p> <p>*18 GMC SIERRA SLT, 5.3L, 4x4, short bed, metallic blue, Premium Plus & Z71 off-road pkgs., 17K miles, \$37,000. Rahimian, 505-385-5638.</p>
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RECREATION

BIKES: Trek 7000, 21-spd., \$300; Raleigh Sprite 27, ladies' 10-spd, \$200; Hercules, 10-spd., \$100. Leighley, 505-281-1865.

GIRL'S BICYCLE, standard size, 3-spd, Raleigh, cover, helmet, training wheels, locking chain, \$50. Lewis, 505-323-7268, ask for Barbara.

WANTED

VOLUNTEERS: AARP Tax-Aide needs volunteers to help senior taxpayers. Free training provided. Apply at aarpfoundation.org/taxaidevolunteer. Campos, 505-289-0535.

AD RULES

<ol style="list-style-type: none"> 1. Limit 18 words, including last name and home phone (web or email address counts as two or three words, depending on length). 2. Include organization and full name with ad submission. 3. Submit ad in writing. No phone-ins. 4. Type or print ad legibly; use accepted abbreviations. 5. One ad per issue. 6. The same ad may not run more than twice. 	<ol style="list-style-type: none"> 7. No "for rent" ads except for employees on temporary assignment. 8. No commercial ads. 9. For active Sandia members of the workforce and retired Sandians only. 10. Housing listed for sale is available without regard to race, creed, color or national origin. 11. Work wanted ads are limited to student-aged children of employees. 12. We reserve the right not to publish any ad that may be considered offensive or in poor taste.
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A distinguished journey

Sandia electrical engineer charts path from custodian to DMTS

By Jennifer Awe

Harry Cincotta recently received a special appointment to Distinguished Member of the Technical Staff, after nearly 34 years at Sandia. His journey began as a custodian, then technologist, onto electrical engineer, and now to serving NNSA's accident response team for the past decade.

"Harry has been a mentor to me multiple times in my career and I'm thrilled to see him recognized for his significant contributions to national security," said senior manager Bernie Gomez. "His journey is inspiring, he is a role model for Sandia's core values and behaviors, and he has given back to the Lab and the nation in so many ways."

Harry joined Sandia in 1986 as a Grade 1 custodian, while he was attending the University of New Mexico for electrical engineering.

"I'd applied for a technical apprenticeship program and didn't get in so I filled out the custodial paperwork on a whim, thinking it would help me get my foot in the door at Sandia," he said.

It did. Once onboard as a custodian, Harry swept and mopped floors by day and pursued his degree after hours. He soon joined Sandia's Technical Institute Equivalency program, putting UNM on hold so he could accumulate credits while at Sandia during lunch and after work. The program was equivalent to a two-year associates degree.

"I received my Sandia technical equivalency in 1989 and then worked as a technologist," he said. "My managers were very supportive of me going back to UNM and helped me join Sandia's undergrad part-time program so that I could better manage my time and focus on my grades."

Harry spent two years bringing his grades up with more time to focus on academics. He completed his electrical engineering degree and was promoted to Member of the Technical Staff in 1993. His first engineering job was in air-delivered weapons.

A brief detour

Harry was raised in a farming community in upstate New York, and he wanted something similar for his family. So in 1999, with two young children, his small-town roots called him up to Los Alamos. Harry describes his time at Los Alamos National Laboratory as a bit rocky.

"It was bad timing," he recalls. "A life extension program was transitioned to Sandia California, there was the Wen Ho Lee story, and then the Cerro Grande Fire. I felt like it was time to leave, though I made lifelong friends in Los Alamos."

Harry moved back to Albuquerque in 2001 and felt a bit more settled as he joined Sandia's nuclear safety assessment program.

"As an engineer, I felt much more comfortable at Sandia than at a physics lab," he said.

Harry has spent his entire Sandia career supporting the nuclear deterrence mission, from weapons systems to stockpile surveillance to

safety assessment to nuclear counterterrorism, which eventually led him to his work in nuclear weapon accident response. He leveraged his experience in nuclear weapon safety to support NNSA's Accident Response Group. Volunteering for ARG led to him supporting additional response teams, with one year in Washington, D.C., where he joined experts from all three NNSA nuclear weapons labs.

"You're not really from this lab or that lab, but you're all one team, one fight," he said.

In 2010, after volunteering with ARG in some capacity since 1993, Harry was offered a position as ARG project lead, and he has led the team ever since. Harry is one of a handful of Sandians working on ARG full time to recruit, train and develop capabilities and equipment to safely recover from a weapon accident.

"It's a readiness mission," he said. "It gets you thinking about national security in a different way in order to plan for how our nation would respond to a nuclear weapon accident. We call on experts to take what they know about a system, which is everything, and join our team. ARG is comprised of the three weapon labs, Pantex, and Nevada's Remote Sensing Laboratory, all working with NNSA."

Looking back

A lot can change in 34 years: on Harry's first day at Sandia, [Irwin Welber was Labs Director](#), Ronald Reagan was president, and a postage stamp cost \$0.22. Yet, Sandians haven't changed very much.

"The people that work here are still enthusiastic and brilliant, and it's always fun to work with people like that," Harry said.



ON A MISSION — Sandia engineer Harry Cincotta has spent his career supporting the Labs' nuclear deterrence mission.

Photo by Lonnie Anderson

"I've seen a positive shift in our scope of work. ND is still hugely critical, but Sandia has done a good job diversifying our work and impact on national security over the decades."

Going from a custodian to a DMTS makes for a good story, but Harry believes it's as much his story as it is Sandia's.

"My journey is what this Laboratory has allowed me to do," he said. "You can stay in the same place for 30 years if that suits you, or you can explore other opportunities. I look back and feel fortunate, truly blessed, that I had managers and mentors at critical points in my career path that took the time to share experiences and provide guidance." <#>



PATH TO SUCCESS — When he's not working, Sandia engineer Harry Cincotta enjoys exploring the southwest on a good Jeep trail, like Imogene Pass in Colorado, at an elevation of more than 13,000 feet.

Photo courtesy of Harry Cincotta

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