Fusion experiments at Z machine detect record neutron numbers

MagLIF output increases by order of magnitude

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-amps, 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 improve- ment 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.

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

Photo by Randy Montoya

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.

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
**LABNEWS Notes**

**‘Iconic’ researcher wins Indigenous Excellence Award**

By Troy Rummel

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 can 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 imparts 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, Sandia 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, Sandia 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 Chipewa; Navajo Nation; Shoshone and Bannock Tribes; Mohawk Tribe; Mescalero Apache; Hopi Tribe; Klamath Tribes; Menominee Tribe; Delaware Tribe; Hoopa 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 Tsinajinnie at the University of New Mexico, who was Sandra’s intern in 2006. Tsinajinnie, 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,” Tsinajinnie said.

As her own community leaders struggled to explain these issues, 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 a new water line is in place,” she said.

**IMPRESSING 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 “Getting 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-founded 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.”

**SANDIA LAB NEWS**

October 23, 2020

EMPOWERING TRIBAL COMMUNITIES — Sandra Begay and Native American intern Tommy Jones discuss tribal energy development.

Sandra, a member of the Navajo Nation, has received the 2020 Indigenous Excellence Award from the American Indian Science and Engineering Society. Photo by Lonnie Anderson

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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.
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 electrical and computer engineering 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.”

IT Snippets

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.
Open Enrollment is here.

Open Enrollment dates
Oct. 26-Nov. 13

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

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.

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:
• 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)
• Home auto insurance
• Pet insurance
• Identity theft protection
• Adoption assistance
• Tuition assistance
For more information about these benefits, visit hrsandia.gov and read the Open Enrollment newsletter.

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.
Hispanic Heritage Month

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 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.
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 stockpiles, the work we do at Sandia is even more critical to safeguard our nuclear 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.

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 start-ups, 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 contains two extra neutrons. These extra neutrons are fusible, which means they release fusion energy when they 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.

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.

Steve added 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 this trial,” he said.

Employees can view the Nuclear Deterrence all-hands meeting video on Sandia’s Digital Media Library.  

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 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.

Steve also discussed 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.

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SANDIA 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

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 I. 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. “Those 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,” said BioBright CEO Charles Fracchia, a company that provides professional and information technology services.

Strategic Industry Inc., based in Kindsburg, 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 that provides professional and information technology services.

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.

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

“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 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 rising in light of current events.

“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 said. "And the 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.
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
- Tracy Jones: Solutions Architect, Div. 9000
- David J. Martinez: Engineering Prog. Lead, Div. 9000
- Scott Stephens: Solutions Architect, Div. 9000
- Lynne Starkweather: Executive Strategy Professional, Div. 10000

Senior Scientist/Engineer

- Martin Heinstein: 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
- Doug Chormley: R&D S&E, Cybersecurity, Div. 5000
- Larry Jones: R&D S&E, Systems Engineering, Div. 6000
- 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. Rel. and Analysis, Div. 6000
- Robert Armstrong: R&D S&E, Computer Science, Div. 8000
- Mark Ivey: R&D S&E, Geoscientist Eng., Div. 8000
- Jim Lauffer: R&D S&E, Systems Engineering, Div. 8000
- Habib Najm: R&D S&E, Mathematics, Div. 9000
- Susan Rempe: R&D S&E, Biosci., Sciences & Eng., Div. 9000
- Kim Merewether: R&D S&E, Electrical Eng., Div. 9000
Distinguished

Executive Support

Stephanie Cotinola
Administrative Support

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

John A. Lott
Electromechanical Technologist

Raymond Tuminaro
R&D S&E, Computer Science

Joshua Usher
Electromechanical Technologist

Karla Weaver
Health Physicist

David Wilson
R&D S&E, Controls Engineering

Vit Baboska
R&D S&E, Mechanical Engineering

Danny Rintoul
Computer Science

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

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

Jeff Meador
Electromechanical Technologist

Johnny W. Montano
Electromechanical Technologist

Greg Neugebauer
R&D S&E, System Engineering

Nancy Salem
Corporate Communications Specialist

Lisa Treses
Regulatory Assistance Specialist

Marc Ghattas
Construction Manager

Christopher Nesbit
Strategic Planner

Jeremy Pacheco
Information Security Specialist

John Cates
Electromechanical Technologist

Matt Eichenfield
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 Leviza
Microwave/Semiconductor Technologist

Amos Martinez
Mechanical Technologist

Mary Moya
R&D S&E, Electronics Engineering

Nick Pattengale
R&D S&E, Cybersecurity

Troy Satterthwaite
R&D Laboratory Support Technologist

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

Mark Leviza
Microwave/semiconductor Technologist

Amos Martinez
Mechanical Technologist

Mary Moya
R&D S&E, Electronics Engineering

Nick Pattengale
R&D S&E, Cybersecurity

Troy Satterthwaite
R&D Laboratory Support Technologist
Operation Backpack supports CA military families

The unprecedented health and economic crisis caused by COVID-19 is impacting the lives of millions of people, many of 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.

DONATE WINTER COATS

The unprecedented health and economic crisis caused by COVID-19 is impacting the lives of millions of people, many of 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.

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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 project was transitioned to Sandia, and I left Los Alamos for Sandia during one of the worst wildfires in Colorado’s history. 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.

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.”

hr.sandia.gov

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 by Lonnie Anderson