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Los Alamos
NATIONAL LABORATORY

Operational and Mission Highlights

A MONTHLY SUMMARY OF TOP ACHIEVEMENTS

November 2022

Contents

COMMUNITY RELATIONS

NUCLEAR SECURITY

Defense Nuclear Facilities Safety Board Conducts Public Hearing on Plutonium Facility and Pit Production

On November 16, Los Alamos National Laboratory Director Thom Mason answered questions from the Defense Nuclear Facilities Safety Board (DNFSB) at a public hearing in Santa Fe about the safety of operations at the Laboratory's plutonium facility and the pit production mission. Mason participated on a panel along with National Nuclear Security Administration's (NNSA) Administrator Jill Hruby, Deputy NNSA Administrator James McConnell, and NNSA Los Alamos Field Office Manager Ted Wyka.

The hearing was a chance for the public to hear concerns and questions from DNFSB, which provides recommendations and advice to the president and the secretary of energy regarding public health and safety issues at Department of Energy defense nuclear facilities. It was also an opportunity for the public to share their views. About 40 people attended in person and approximately 100 joined virtually.

Among the topics discussed during the hearing's two sessions that focused on NNSA and Laboratory operations were the safety systems and procedures in place at the Plutonium Facility, safety analyses and planned safety improvements to the facility, and expanding production activities at the facility.

New Group Will Manage W93/Mk7 Development

As development of the W93/Mk7 progresses into Phase 2, the Associate Laboratory Directorate for Weapons Engineering (ALDW) announced the formation of the W93 Systems Development and Realization group (Q-20) within its Weapons Stockpile Modernization division (Q). Phase 2 is a program feasibility study. It culminates in the Major Impact Report (MIR), which identifies the key factors in meeting W93/Mk7 program objectives and sets target dates for baseline design definition. During Phase 2, the design team and proposal are determined, and the Project Officers Group refines the weapon's military characteristics and the stockpile-to-target sequence. The final step for Phase 2 is to set the scope and schedule for Phase 2A, which will focus on design definition and cost estimates. Q-20 will be the hub of this expansive scope of work, which often incorporates expertise and resources from organizations across directorates. Leading the new group is Justin Scott, who will be the warhead manager for the W93/Mk7. Previously, Scott was the warhead manager for the W76-0, W76-1, and W76-2 systems.

New Weapons Systems Engineering Division Leader Reflects Lab's Commitment to Diversity

Anita Carrasco-Griego has been selected as the Associate Laboratory Directorate for Weapons Engineering's division leader for Weapons Systems Engineering (W). Her appointment is a historic one; she is the first woman to lead this division.

Carrasco-Griego started her career at Los Alamos National Laboratory in 2002 as an assembly engineer supporting the Laboratory in all aspects of weapon device design, analysis, and assembly. She advanced to facility supervision, followed by several years as an R&D systems engineering manager for W division. During this time, she supported all reentry systems (W76, W78 and W88). Carrasco-Griego was the deputy division leader for W and recently served as the acting division leader.

Her 20+ years in the weapons engineering directorate has allowed her to develop strong internal relationships, as well as relationships with the Laboratory's external partners and customers across the Nuclear Security Enterprise, to become a recognized leader in nuclear weapon sustainment.

Plutonium Infrastructure Cross–Associate Laboratory Directorate Improvement Office Established to Improve Collaboration and Shared Outcomes

The Deputy Laboratory Director for Weapons, Bob Webster, has created a new office under the Associate Laboratory Directorate for Plutonium Infrastructure (ALDPI) to help the Laboratory achieve the construction milestones and requirements related to meeting the top national security goal of 30 pits per year.

Launched October 31, the Plutonium Infrastructure Cross-ALD Improvement Office (PICIO), led by Dan Mack, former chief operating officer of ALDPI, will bring together ALDs including Weapons Production; Envi-

ronment, Safety, Health & Quality; Facilities and Operations; and Business Management. Mack will serve also as the point of contact for federal improvement initiatives.

In addition to fostering a collaborative, win-win atmosphere among ALDs supporting the pit mission, the PICIO aims to enhance communication and ensure all organizations actively participate in finding appropriate solutions to shared challenges.

Plutonium Infrastructure Protects Mission-Critical Information

The SAFE-Deployed Security team and other Associate Laboratory Directorate for Plutonium Infrastructure (ALDPI) staffers joined forces to find and implement a solution that protects mission-critical information and enhances security in the workplace. Starting later this month, ALDPI employees and onsite subcontractors will be required to use yellow, plastic stretch cords to indicate that a discussion or processing of Unclassified Controlled Nuclear Information (UCNI) is underway. UCNI is information concerning nuclear material, weapons, and components whose dissemination is controlled under Section 148 of the Atomic Energy Act.

Senior Weapons Production Leadership Visits Savannah River Site

In late October, management from the Associate Laboratory Directorate for Weapons Production visited the program leadership team representing the Savannah River Pit Production Facility (SRPPF). The event was the second summit of the LANL-SRPPF production agency partnership. At the summit, leadership reviewed mission status and addressed select current joint production agency activities, agreed on key areas of joint actions that enhance and mature the partnership to address mission needs, assigned responsibilities for follow-up actions, and proposed dates and location for the next summit. Detailed discussions were conducted at both the group and individual level, and leadership from both sites emphasized the importance of this unique partnership between the two pit production agencies. The need for mission success at both sites was reemphasized. The ongoing summits, expected to be quarterly, will enhance the cross-cultural environment across the two facilities; both partners recognized the meeting as a useful, effective mechanism to pursue continued conduct of operations at both sites.

SCIENCE, TECHNOLOGY, AND ENGINEERING

Africa Outreach Program Earns Los Alamos National Laboratory's Physicist the John Wheatley Award

Long-time computational physicist James Gubernatis from Los Alamos National Laboratory (now retired) has been named the winner of the American Physical Society's John Wheatley Award. The award, given biannually to one recipient, recognizes physicists who have contributed to the international development of physics.

Gubernatis worked through the International Union of Pure and Applied Physics to establish a computational physics school for students from Africa. The school allows students — mainly graduate and postdoctoral students in physics — to gain experience in the use of computational codes and accompanying software. Instructors include an international cast of physics researchers, leaders in their fields, who provide in-person mentoring over two weeks. The unique, hands-on framework has helped dozens of physicists from Africa apply computational codes to their research, explore opportunities in physics both outside and inside their home countries, and build connections with international researchers and institutions.

LANL and International Partners Detect Mars's largest Meteorite Impacts, Revealing Composition and Ice, and First Seismic Waves Outside of Earth

Los Alamos National Laboratory's Earth and Environmental Sciences researchers and international partners discovered two fresh craters on Mars and "marsquakes" powerful enough to flatten a city block (equivalent to a kiloton bomb). The researchers highlighted several key findings: the first seismic waves detected outside of Earth, the largest impacts on Mars, and chunks of ice uncovered by the meteorites, a first for the warm region of the red planet.

The team analyzed data from cameras and seismic instruments aboard NASA's InSight Mars lander and satellite Mars Reconnaissance Orbiter and compared empirical and numerical models of the meteorite impacts with the data. The Lab's international partners include NASA's Jet Propulsion Laboratory at California

Institute of Technology and France's Agence Nationale de la Recherche.

This study — heavily covered by the media, including New York Times, Washington Post and BBC — provided the first corroborative and near real-time observations of massive impacts on a planetary body. The recorded seismic data will contribute to a better understanding of the red planet's formation and composition, help identify similar events on Earth, and support the study of extraterrestrial objects and deflection technology.

LANL Team Uses Artificial Intelligence to Predict Labquake Future Fault Slip — a Path to Near-Term Real Earthquake Forecasting

Geophysicists from Los Alamos National Laboratory's Earth and Environmental Sciences (EES) division applied artificial intelligence to a laboratory fault's acoustic signals, advancing previous work by predicting aspects of the future state of the fault's physical system. The team analyzed seismic signals and — for the first time ever — predicted future friction. Their findings, published in Geophysical Research Letters, provide a potential path to near-term forecasting of earthquake timing. This team has previously applied various machine-learning techniques to the challenge of forecasting earthquakes in the laboratory and in the field. In a novel approach, they applied a deep-learning transformer model to acoustic emissions broadcast from the fault to predict the frictional state. Their technique revealed acoustic signals emitted by the laboratory fault contain foreshadowing information about the future fundamental physics of the system through the entire earthquake cycle and beyond. The method could be applied to other disciplines, such as nondestructive materials testing, where it could provide information about progressive damage and impending damage.

Leading Supercomputing Conference Underway

The International Conference for High Performance Computing, Networking, Storage and Analysis (SC22) began in Dallas on November 13. For six days, more than 200 sessions — lectures, panels, award presentations—will bring together more than 10,000 total participants and over 350 exhibitors will share the latest technology with live and virtual audiences. Candace Culhane, project/program director for Los Alamos National Laboratory's Associate Laboratory Directorate for Simulation and Computation (ALDSC), will chair the conference this year. The Lab has been a major part of the conference since its inception in 1988, with Culhane involved since 1992.

Culhane will be joined by more than fifty colleagues and experts from the Lab's High-Performance Computing; Theoretical; and Computer, Computation and Statistical Sciences divisions. They will be contributing by chairing workshops and panels and sharing posters. Three papers co-authored by Lab scientists from ALDSC are scheduled to be presented at the conference.

Los Alamos National Laboratory Aids in Global Road Map to Better Disease Testing

International coronavirus researchers are calling for consistent standards for disease test development in the wide world of emerging infectious diseases and public health emergencies. Los Alamos National Laboratory scientists are playing an important role in pushing for those standards as part of the Coronavirus Standards Working Group, which published a paper in the journal Nature Biotechnology.

Taking lessons learned from the SARS-CoV-2 pandemic, the working group examined the various stages of process to develop tests, including the tests' sensitivity and specificity for detecting the target. The scientists determined that specific standards for each stage of the process — from sample preparation to reference material used to results reporting — are critical to effective analysis. Standards are needed across the board, they point out, whether it is for evolving testing methods, serological testing, genomics, or wastewater surveillance.

New High-Resolution Isotope Ratio Mass Spectrometer Supports Energy, Climate, Weapons, and Nonproliferation Sciences

In addition to extensive geology and geochemistry facility and infrastructure upgrades, the Lab's Earth and Environmental Sciences Division recently purchased and installed a powerful gas source mass spectrometer that discriminates critical mission-specific processes.

The Thermo 253 Ultra high-resolution isotope ratio mass spectrometer supports applications in energy, climate, environment, nonproliferation, treaty verifica-

tion, forensics, nuclear sciences, high-explosives testing and manufacturing, and subsurface hydrogen and carbon dioxide storage and sequestration. Potential also exists for unprecedented high-resolution analyses of noble gas isotopes and other gases.

This instrument's resolution is about two orders of magnitude greater than any comparable Lab capability, boosting the Lab's stable-isotope signature science and placing the Lab at the forefront in actinides and metal isotopes research and studying unique signatures of interest to the National Nuclear Security Administration, Department of Energy, Department of Defense, Department of Homeland Security, the intelligence community, and industry.

Radiological Control Technician Supervisor Keeps Mars Scientists Safe in the Arctic

James Harper, a radiological control technician supervisor at Los Alamos National Laboratory, traveled 600 miles north of the Arctic Circle this summer with a Laboratory team of Mars scientists to provide radiation protection field support. People often think that the work done to ensure the safety of employees takes place only at Laboratory sites, but, as Harper experienced, it takes place offsite, too.

The team camped near a 31-million-year-old crater to refine and optimize current methods of remote material identification using active gamma-ray and neutron spectroscopy for future missions on Mars and other planets or moons. During each research day, Harper carefully followed the Laboratory's radiological work permit and, in doing so, demonstrated a commitment to safe conduct of operations. After each one-hour exposure with the generator, he surveyed the area of operations using a neutron radiation detector and a beta/gamma radiation detector. This process verified that the generator (and surrounding area) was safe so that the researchers could break equipment down and relocate it for additional data collection and analysis.

Every day, the team visited sites around the crater and performed anywhere from two to five exposures, each an hour long, with the pulse neutron generator while collecting data with the ultra-sensitive neutron and gamma-ray detectors.

Scientists Install Technology to Support Hazard Analysis and Development of Subsurface Tools in Volcanic Geothermal Borehole

The Earth and Environmental Sciences (EES) division collaborated with the National Park Service (NPS) and New Mexico Tech to install optical fiber in a former geothermal borehole in the Valles Caldera National Preserve before it was permanently plugged. The borehole at Sulphur Springs displays volcanic features, including sulfuric-acid hot springs, volcanic fumaroles, and steaming mudpots; underground temperatures can reach up to 300 °C. EES realized the opportunity of using optical fiber to monitor hazards and subsurface phenomena using distributed acoustic sensing based on Rayleigh backscattering and distributed temperature sensing based on Raman backscattering. The team carefully operated under the safety envelopes of NPS and the wellbore operating contractor during installation.

EES scientists intend to monitor for seismic and volcanic hazards, develop tools to ensure wellbore integrity, and establish techniques to characterize underground fluid flow that can support hydrology, energy development, and carbon sequestration.

MISSION OPERATIONS

A Questioning Attitude in Weapons Production Leads to a Pause in Work

While performing work the week of November 9, a machinist in the Pit Technologies division noticed a potential issue with the integrity of a glove. He immediately paused work and checked for contamination, which was not detected. The employee alerted managers, and work remain paused until the glove could be changed later that day. Detecting an issue with a glove is important because it reduces the risk of a breach, which could result in contamination and a longer pause in work. The employee's keen eye and comfort in raising his concern highlights the positive work culture at the Plutonium Facility.

Chemical Compatibility Evaluations Strengthen the TRU Waste Process

Smart data tools deployed by the Nuclear Process Infrastructure (NPI) division are making transuranic (TRU) waste management faster, easier, and more systematic than before. One of the most important requirements for Los Alamos National Laboratory (LANL) processes involving the production and management of TRU waste is the evaluation of potential chemical incompatibilities in materials packaged for disposal at the Waste Isolation Pilot Plant. Before reevaluation by NPI-6, chemical compatibility evaluations (CCE) at LANL were performed by Acceptable Knowledge Scientists using the Central Characterization Project's CCE reports, which provided information on known chemical incompatibilities between groupings of chemicals. The CCE reports are a readily available reference, but the NPI-6 data team developed a LANL-specific CCE database that integrated information from a variety of sources to analyze potential chemical incompatibilities of waste products produced at LANL. The development of the LANL CCE database is one of the first of its kind in the complex and is a direct response to a recommendation from the Defense Nuclear Facilities Safety Board to improve conduct of operations and safety in TRU waste shipping. The eventual full integration of the database will increase efficiency for the waste characterization and certification processes and ensure that chemical incompatibility events do not happen.

Dr. Stephen Coleman Formally Assumes Duties as ALDESHQ at Los Alamos National Laboratory

Dr. Stephen Coleman has formally started as the Associate Laboratory Director for Environment, Safety, Health, and Quality (ALDESHQ) at Los Alamos National Laboratory. In his new role, Coleman is responsible for the leadership, management, oversight, strategic planning, and execution of the Laboratory's environment, safety, and health (ES&H) portfolio.

Coleman has 36 years of professional experience in multiple roles related to ES&H. He has been the ALD for ES&H at Brookhaven National Laboratory for the past five years. He started his career as a nuclear electrical operator in the U.S. Navy and has substantial experience in facilities and waste operations management. Coleman was also an oversight assessor as well as a radiological control division manager. He has a doctorate in management in organizational leadership and a master's in project and energy management.

Information and Technology Team Launches New Collaboration Tool for Workers

In October, Los Alamos National Laboratory's Information and Technology team launched Microsoft OneDrive for Business. OneDrive is a cloud storage solution that allows users to access files on the go. Employees can now access their work files from anywhere via their Lab-issued computer and/or mobile devices. OneDrive for Business provides a new tool for increased collaboration amongst employees.

Lab Employees Serve as Mentors in Texas A&M Nonproliferation Exercise

In late October, a group of Los Alamos employees from the Weapons Production and Weapons Engineering directorates visited the Texas A&M University College of Engineering to serve as mentors for a problem-solving challenge related to nuclear security. The challenge questions were influenced by situations researchers at Los Alamos National Laboratory confront every day. Over 48 hours, 11 teams researched and developed an idea with the help of the mentors from Los Alamos, who worked to take real challenges, adjust them to an unclassified form, and present them in a way that students can come up with viable solutions. Those solutions included themes such as energy and power access, complex geometries and robotic parts, and 3D radiation tracking. The challenge and its solutions were a part of engaging potential future employees in nuclear nonproliferation education.

Lab Leaders Host Open Discussions with Craft Workforce

Top Laboratory leaders met with the craft workforce over the course of two days in early November to discuss their challenges and safety concerns, and to thank them for their work throughout the pandemic.

In a series of daytime and evening meetings that helped promote an honest, transparent work culture, Laboratory Director Thom Mason and Deputy Laboratory Director for Operations Kelly Beierschmitt met with about 1,200 craft employees, including those on

the swing and graveyard shifts. The pair gave short presentations that covered the Laboratory's recent growth, their expectations for safety, and the importance of NNSA labs given the current geopolitical climate.

Kelly Beierschmitt then hosted open Q&A sessions where he answered live questions about equipment, pausing work, transportation and housing, childcare, cost-of-living increases, weather-related notifications, and more. To wrap up each meeting, craft workers were thanked with Operations Excellence challenge coins.

Lab Receives 2022 HIRE Vets Medallion Award

Los Alamos National Laboratory is a gold-level award recipient of the 2022 HIRE Vets Medallion Award for its exemplary efforts in recruiting, employing, and retaining veterans. The award was presented to the Laboratory by the U.S. Department of Labor on November 9.

The HIRE Vets Medallion Award is earned by businesses that demonstrate unparalleled commitment to attracting, hiring, and retaining veterans. The Lab has received this annual award since the award program's inception in 2018.

The Honoring Investments in Recruiting and Employing American Military Veterans (HIRE Vets) Medallion Program implements the requirements of the HIRE Vets Act of 2017 (Public Law 115-31). The HIRE Vets Medallion Award is the only federal award that recognizes exceptional achievement in veteran employment.

By meeting the criteria required for a Gold Medallion Award, Los Alamos National Laboratory demonstrated both patriotism and recognition of the values veterans bring to the workplace. The companies that are recognized have long-term career and growth plans that apply the diverse skills that veterans acquire during their military service.

Recipients of the 2022 HIRE Vets Medallion Award meet rigorous employment and veteran integration assistance criteria such as percentages of hiring and retaining veterans, availability of veteran-specific resources, leadership programming for veterans, dedicated human resource efforts, pay compensation, and tuition assistance programs for veterans.

LANL Seeks Recertification as a Voluntary Protection Program Star Site

Los Alamos National Laboratory (LANL) recently welcomed a team of evaluators representing the Department of Energy's Voluntary Protection Program (VPP) as part of an effort to recertify LANL as a VPP Star Site and transition the certification to Triad. Following a three-week, virtual review period consisting of nearly 70 interviews and meeting observations, the team spent eight days onsite conducting site visits and in-person program reviews and attending meetings with a broad and diverse range of employees to assess the safety culture at LANL. At the out brief on November 3, DOE VPP Team Leader Brad Davy recommended that LANL under Triad management continue as a VPP Star Site.

The evaluators visited sites such as the Los Alamos Neutron Science Center and Sigma, the Emergency Operations Center, mechanical shops, the Radiation Protection Calibration Facility, Occupational Medicine, Technical Area-55, the clean chemistry lab at Technical Area-48, and Crossroads Supercomputer.

Evaluators also participated in collaborative learning and improvement activities including the "Hazard Hunters" program and the Motorcycle Safety Committee. The final evaluation report will be issued by the end of this year. At present, LANL is the largest DOE site to be certified as a VPP Star Site.

Line Crews' Culture of Safety Fundamental to Powerline Project Success

Los Alamos National Laboratory's line crews used Safe Conduct of Research principles to keep a critical powerline replacement project on track. With the upcoming arrival of the Lab's newest supercomputer, Crossroads, crews needed to replace legacy infrastructure and bring new powerlines into the Strategic Computing Complex (SCC). The SCC is considered the heart of NNSA's Advanced Simulation and Computing program and enables key predictive science through simulation in support of stockpile stewardship.

After erecting new towers and running miles of transmission lines, crews needed to connect four main power feeds to the complex itself. This procedure was rehearsed by crews ahead of time. Four weeks were

set aside for this phase of the project, but crews soon discovered that a secondary unit substation had previously been misconfigured. Work had to stop, and new parts had to be ordered—this delay had the potential to leave the SCC underpowered for an unacceptable length of time.

In the planning stages of the project, the crews had discussed contingencies and included time in the schedule to allow for issues such as this one. The team regrouped and assessed the situation in a calm, rational manner. A plan was quickly developed that maximized safety, avoided outages, and enabled the project to be completed one full week ahead of schedule with all operations conducted in a safe manner.

More than 500 Square Feet of New Space Made Available in Plutonium Facility Through Secure Disposition of 800 Classified Parts

The Weapons Dismantlement and Disposition program completed the disposition of more than 800 beryllium classified parts, leaving 522 square feet of classified vault space in the Plutonium Facility (PF-4) available for use by the pit production mission.

The beryllium classified parts, which had been stored in PF-4 since they arrived from Rocky Flats in the 1990s, were transported out of TA-55 for either permanent disposal or to be recycled and reused. For example, the Sigma Beryllium Technology Facility will use 200 parts for welding and research. The dispositioning work occurred between April and the end of FY22. Employees from the Operational Readiness Implementation, Experimental Device Engineering and Assembly, Sigma, and Weapons Modernization Production were all crucial in accomplishing this Level 2 milestone.

New Digital Delivery of Daily Activity Reports Improves Efficiency and Security

Through a combined effort of the Strategic Planning and Logistics Office and Subcontract Technical Representative teams within the Associate Laboratory Directorate for Infrastructure and Capital Projects, the Lab's daily activity report system now allows subcontractors to submit reports electronically. Subcontract technical representatives, who manage subcontractors, can use the new system to review subcontractor performance in a near real-time environment. Ongoing improvements to the system will enhance the ability to measure subcontractor performance; this will help the Lab award work to high-performing contractors.

Information such as time and work location of each subcontractor, work description, resources used for the work, and any nonconformance reports that were opened or closed is collected through the web-based reporting system. Dar.lanl.gov and the contractor hour tracking system are on the open, unclassified network and easy for subcontractors to access.

New Electric Vehicles to Lower Emissions, Improve Lab Operations

In support of the U.S. Department of Energy's efforts to tackle climate change and work toward net-zero emissions goals, the Science and Technology Operations division received four new electric utility terrain vehicles (UTVs) for onsite operations and facilities maintenance. The new vehicles are part of an ambitious plan to convert the Lab's fleet of electric vehicles over the next five years. The Polaris Ranger electric UTVs are expected to meet the daily demands of operations staff while lowering the Lab's carbon emissions for 2050 net-zero goals.

New Tool Drives Continuous Improvement and Greater Efficiency for Laboratory Work

A new tool was recently developed by the Associate Laboratory Directorate for Infrastructure and Capital Projects. Known as the Project Variance initiative, the tool was used to consolidate data from more than 30 sources to identify causes of project errors, delays, and rework. This tracking data is being used to drive continuous improvement and more efficient processes for the Lab.

The Strategic Planning and Logistics Office consolidated data from events that caused delays to projects, such as design errors, insufficient materials at sites, and rejected inspections, into one database. The tool links to data on Lab and subcontractor labor hours to ensure output is normalized when analytics are run. Project managers can now see detailed visualizations via the Project Variance initiative dashboard that show what events cause delays, allowing staff to anticipate and prevent errors and rework. This innovative solution

to an ongoing issue saves time and money and improves project performance.

The tool can be used by other executing organizations to target specific subsets of data for analysis. Improvements to the tool are ongoing and include a visualization that predicts the cost of a project based on any delays to the project and tracking of overall costs for projects.

Office of Classification Gets Top Marks for Training Approach

In a recent assessment, the DOE Office of Classification (AU-60) recognized Los Alamos National Laboratory's training approach for derivative classifiers as best in class.

The Lab's classification officer, Diana Hollis, was recommended by her peers from other labs to become the incoming chair of the Weapons Complex Classification Conference, a position she assumed in October 2022. Hollis said she aims to make Los Alamos National Laboratory a model classification program across the nuclear security enterprise.

Classification officers from other labs have requested Los Alamos's help with training derivative classifiers and classification analysts. Some sites are planning to send team members to shadow the Lab's analysts.

At the Lab, classification analysts have been recategorized from "professionals" back to R&D scientists, as had been the practice for years. Staffing has increased in the Classification Office, and the culture is highly collaborative. The analysts work as a team to collaboratively solve problems, which shorten the learning curve for new members. The team is purposefully made up of analysts who have expertise in at least one classified mission program—materials science; nuclear, chemical and mechanical engineering; or computer science—and have the agility to learn about all other programs. The interface with senior leadership is strong, and outreach to help the vast number of new employees understand the importance of protecting national security secrets has intensified.

Plutonium Infrastructure Team Prepares for Glovebox Transfers Using Video Simulations

On October 6, the Plutonium Infrastructure (ALDPI) Facility Interface team unveiled several video simulations supporting both the removal of legacy gloveboxes and the introduction of newly fabricated gloveboxes into the Plutonium Facility. Developing and reviewing simulations will help workers ensure no major constraints or obstacles restrict the safe handling, movement, and staging of glovebox enclosures. These simulations are instrumental to the planning stages of intricate field execution activities such as glovebox removal in support of the Laboratory's 10-pits-per-year and 30-pits-per-year missions.

The group's efforts exemplify effective planning, coordination, teamwork, and conduct of operations and are paramount for safe and efficient transport of equipment. Later this fall, the group will prepare a simulation of the entire evolution of the relocation of a new glovebox currently undergoing pre-installation and fabrication.

Plutonium Shipment from Los Alamos to Austria Proves Successful, Creates Future Efficiencies

In FY22, Leonard Manzanares of the Operational Safety and Compliance program supported a project to complete a shipment of plutonium metal certified reference materials from LANL to the International Atomic Energy Agency (IAEA) laboratories in Siebersdorf, Austria for the U.S. Program of Technical Assistance to IAEA Safeguards. The shipment was safely unpacked and completed in late October.

This shipment was unique because of its use of a stainless-steel special form capsule combined with a stainless-steel inner containment layer that protects the ampule containing plutonium. This new configuration allows the material to ship as fissile exempt in a Department of Transportation–approved type-A shipping container that is readily available and easy to ship. Previously, the project required a type-B fissile shipping container that is more difficult to obtain and has more stringent requirements. In addition, the configuration allowed the material to ship by air after ground transportation through Canada, which significantly reduced the time for the material to arrive at its destination.

Manzanares represented LANL in Siebersdorf to support the IAEA teams in the removal of the material from the special form capsules using a destructive process. With support from many LANL teams across the Weapons Production directorate and the Laboratory, Manzanares prepared a guidance document for

extracting the material, which resulted in a successful effort with no damage to the material and no contamination issues. This put the IAEA in a better position to receive these types of shipments in the future. LANL's commitment to collaboration and disciplined operations will support the IAEA's mission for nuclear safety for years to come.

Safe Conduct of Research Principles Keep D-Wave Decommissioning on Track

The High-Performance Computing-Data Center Management group's culture of safe operations—especially the use of dry-run practice sessions—recently helped successfully complete the decommissioning of Los Alamos National Laboratory's D-Wave quantum computer.

During a dry-run session, team members identified that an enclosure used to maintain the D-Wave's super-cold environment was partially made of a copper-beryllium alloy, a material that has unique properties and requires special safety and handling protocols. Getting proper equipment and training to safely address the issue meant lengthening the project timeline.

A team of technicians from D-Wave Systems, Inc., located in Canada, needed to be on hand during decommissioning in case there were any issues with data loss. Because the copper-beryllium alloy was noticed early during the dry run, the team was able to adjust their plan to avoid the expense of having the Canadian team onsite for what could have been weeks until they were needed.

Successful Recruiting Efforts for the Weapons Program Focus on Veterans

Employees in the Associate Laboratory Directorate for Weapons Production have been heavily involved in recruiting events over past months, specifically recruitment of military veterans. Since June, employees have joined representatives from Human Resources to recruit at events including those at Texas A&M University, Texas Tech University, the Disabled American Veterans organization in Denver, and the Dallas Service Academy Career Conference. Several thousand students and attendees passed through the events, and Lab employees spoke with hundreds of prospective employees. Specifically, at the Dallas Service Academy event, with students and graduates from all five military service academies, the team met with approximately 120 potential recruits about full-time opportunities at the Laboratory and gave a brief presentation on the Lab's mission and how it aligns with that of the U.S. military. One of the members of this recruiting team, Dave Connell, works in the Plutonium Facility in the Actinide Materials Processing and Power division. Connell was recruited himself at the same event just one year ago, revealing not only the successful recruiting efforts but also the culture at the Laboratory that inspired him to recruit more service members.

Surface and Paving Projects Improve Laboratory Infrastructure and Keep Employees Safe

Twenty projects were completed in FY22 to improve the Laboratory's aging infrastructure and to keep pedestrians safe. These projects included modernization of parking lots, road improvements, sidewalk updates, Americans with Disabilities Act–compliant ramp installation, and drainage mitigation work.

New contracting approaches are being developed with the Pueblo Alliance and SAMES, Inc., a local small business specializing in engineering, surveying, project management, and construction. These partnerships will help build small businesses and increase project capacity. In FY23, the Facilities and Operations directorate is on track to execute $25 million in sidewalk and paving repairs, which is almost a ten-fold annual increase from the Laboratory's contract transition in 2018.

COMMUNITY RELATIONS

Lab Teams with County on Critical Safety Repair

On November 16, 2022, the Laboratory partnered with the Los Alamos Department of Public Utilities to address a critical safety issue. The issue was identified after one of the two underground lines fed by the Laboratory went down, and all county electric customers were moved to the other supply line, doubling its usual electric load. Lab linemen identified a critical safety issue on the failed line that had to be repaired; this work required a planned outage. Critical safety repairs were completed, and the in-service supply line was inspected to ensure it had not been damaged. Thanks to the team effort between the Laboratory and the Los Alamos Department of Public Utilities, power was safe-

ly restored to the Lab and entire Los Alamos townsite within an hour of the anticipated timeframe.

Laboratory researchers Help Nonprofit Measure Its Impact with Free Data Sprint

The second Laboratory-organized Northern New Mexico Community Data Sprint, sponsored by the Laboratory's Information Science and Technology Institute and Community Partnerships Office, was a success. A team of four LANL data scientists participated to help solve data-related problems for education nonprofit STEM Santa Fe.

The Community Data Sprint is part of the Laboratory's Community Technical Assistance program that makes the unique expertise and capabilities of the Lab available at no cost to nonprofits and tribal and governmental entities located in the seven counties of Northern New Mexico.

STEM Santa Fe organizes a range of science, technology, engineering, and math programming, mentoring, and resources for students across Northern New Mexico, particularly focused on groups underrepresented in STEM. The week-long virtual Community Data Sprint was free for the nonprofit.

Survey data from students participating in STEM Santa Fe's programs assessed the overall impact of the programs and the effectiveness of different modes of program delivery. Changes in students' confidence with math and science shown through the survey data confirmed the effectiveness of the programs in stimulating STEM interest and showed that the pre-tests in confidence for youth who had already attended one of STEM Santa Fe's programs were consistently and reliably higher than the pre-tests for first-time participants.

SELECTED MEDIA COVERAGE

Gut Health in Space: How Zero Gravity Could Wreak Havoc on the Microbiome
Inverse, Miriam Fauzia (10/26)
When humans travel to space, we often forget that we bring along trillions of unwitting microbial stowaways. We have some idea of how our bodies change without Earth's guiding force, but we don't have a good sense of how those microbes fare.

Los Alamos Business Accelerator Completes Phase I
Los Alamos Daily Post, Kirsten Laskey (10/26)
Sixteen individuals were accepted into the program this year, which is the second cohort, and just completed Phase I of the coursework.

LANL Remains Key Part of U.S. Nuclear Weapons Plan
Santa Fe New Mexican, Scott Wyland (10/27)
Los Alamos National Laboratory received only a brief mention in the Biden administration's much-awaited update of the country's nuclear strategy, but it's clear the Pentagon views the lab's future bomb-core production as vital in deterring adversaries from attacking the U.S. and its allies.

Los Alamos National Laboratory's Bette T. Korber Named Among Best Female Scientists in the World 2022 Ranking
Los Alamos Daily Post , Carol A. Clark (10/27)
Los Alamos National Laboratory Fellow Bette T. Korber, a computational biologist, has been named amongst the "Best Female Scientists in the World 2022 Ranking" by Research.com.

Unica Viramontes Named LANL Associate Director for Defense Protection Program
Los Alamos Reporter (10/28)
Los Alamos National Laboratory has named Unica Viramontes associate Laboratory director for the newly created Defense Protection Program.

LANL Works to Brew the Perfect Beer
KOB4, Ryan Laughlin (10/29)
New Mexico's craft beer scene is thriving – and now, local breweries might be getting a boost from Los Alamos National Lab.

Dr. Anna Llobet Leads Volunteers Who Empower and Mentor Young Women Through Annual Physics Camp
Los Alamos Reporter, Maire O'Neill (11/1)
This year more than 100 volunteers worked to make the camp happen in June. They included folks from LANL, Sandia, N3B, and Oak Ridge National Laboratory, as well as professors from Dresden, Germany, and the University of California.

LANL: New Effort Underway to Help Revolutionize Future of Vaccine Development
Los Alamos Reporter (11/3)
A new multi-laboratory effort funded by the Defense Threat Reduction Agency is underway, creating a machine-learning tool to revolutionize the future of vac-

cine development, rapidly choosing a suitable vaccine platform for any viral and bacterial pathogen.

LANL Physicist James Gubernatis Wins John Wheatley Award for Africa Outreach
Los Alamos Reporter (11/3)
Long-time computational physicist James Gubernatis at Los Alamos National Laboratory has been named the winner of the American Physical Society's John Wheatley award. The award, given biannually to one recipient, recognizes physicists who have contributed to the international development of physics.

STEM Santa Fe Hosts 2022 Conference Saturday Nov. 5
Los Alamos Daily Post, Carol A. Clark (11/4)
The 2022 conference features eight hands-on workshops, each led by local New Mexico STEM women professionals, and covering a wide range in STEM disciplines.

Asteroids! Solar storms! Nukes! Climate Calamity! Killer Robots!
The Washington Post, Joel Achenbach (11/7)
We are not being paranoid when we recognize that human civilization has become increasingly complex and simultaneously armed with techniques for self-destruction.

Perceptron: AI That Sees With Sound, Learns to Walk, and Predicts Seismic Physics
Tech Crunch, Kyle Wiggers and Devin Coldewey (11/7)
Work with a potentially more immediate application came earlier this month out of Los Alamos National Laboratory, where researchers developed a machine learning technique to predict the friction that occurs during earthquakes — providing a way to forecast earthquakes.

LANL Gathering Breath Prints to Try Out Fatigue Breathalyzer
KRQE, Laila Freeman (11/8)
Los Alamos National Laboratory (LANL) biologists said they are gathering different people's breath prints to create an average baseline and compare them to see when someone is fatigued and needs to take a break at work.

LANL Among Nine New Mexico Employers Awarded 2022 HIRE Vets Medallion for Employing Nation's Heroes
Los Alamos Daily Post, Carol A. Clark (11/9)
The U.S. Department of Labor (DOL) today recognized 835 employers from around the nation for their commitment to hiring and retaining U.S. military veterans during an online event broadcast from the department's Washington headquarters.

LANL Aids in Global Roadmap to Better Disease Testing
Los Alamos Reporter (11/11)
International coronavirus researchers are calling for consistent standards for disease test development in the wide world of emerging infectious diseases and public health emergencies. Los Alamos scientists Patrick Chain, Alina Deshpande and Po-E Li of the Bioscience Division are part of the Coronavirus Standards Working Group whose paper is out in the journal Nature Biotechnology.

Los Alamos League of Women Voters 'Dinner' With a Leader Features LANL Director Thomas Mason Nov. 17
Los Alamos Daily Post, Carol A. Clark (11/14)
The Los Alamos League of Women Voters (LWV) will host its community event, Lunch with a Leader, this time Dinner, 6:30-7:30 p.m. Nov. 17 via zoom. The featured speaker is Los Alamos National Laboratory Director Thom Mason.

Los Alamos National Laboratory Recognizes Its Veterans
Los Alamos Daily Post, Carol A. Clark (11/14)
Veterans make up roughly 7.3 percent of all regular and term employees and 5 percent of the craft workforce at Los Alamos National Laboratory.

LANL Develops Breath Test for Detecting Fatigue
KOB4, Griffin Rushton (11/15)
Los Alamos National Lab researchers are developing a breathalyzer that can determine how tired someone is. The device works like other breathalyzers – including ones that measure alcohol.

Hydrogen Big Rigs: Fuel Cell Electric Trucks Emerging as a Viable Climate Solution
In Transition, Mark Solof (11/14)
With the threats of climate change becoming a stark reality everywhere—including 6,000 temperature records set around the U.S. in July 2022—the efforts to build a clean energy economy must look to any and all options for replacing fossil fuels.

LANL Seeks Expressions of Interest in Establishment of a Childcare Operation in Los Alamos to Address Childcare Issues Faced by Staff
Los Alamos Reporter, Maire O'Neill (11/18)
Childcare services for Los Alamos National Laboratory staff and other working parents in the community has been a challenge for quite some time. At LANL, some

68 percent of staff with 0-5 years at LANL who are moving on to work elsewhere have cited the childcare challenge as one of their reasons for doing so.

The Executive's Desk: Hydrogen Production Technology Getting Closer to Road-Ready

Albuquerque Journal , Troy Semelsberger (11/19)

The era of viable alternatives to fossil fuel-based transportation appears to be at hand. With the transportation sector the biggest contributor of greenhouse gases in the United States, California recently became the first of potentially many states to put a 2035 expiration on the sale of new internal-combustion vehicles.

Los Alamos National Laboratory Team Develops Novel Approach for Comparing Neural Networks to Provide Look into 'Black Box' of Artificial Intelligence

Los Alamos Daily Post, Carol A. Clark (11/20)

A team at Los Alamos National Laboratory (LANL) has developed a novel approach for comparing neural networks that looks within the black box of artificial intelligence to help better understand neural network behavior.

NMSU's USDA Grant to Use Bird Migration to Prepare New Scientists to Respond to Ecological Disasters

Grant County Beat (11/20)

New Mexico State University's Departments of Biology and Fish, Wildlife and Conservation Ecology are collaborating with Los Alamos National Laboratory, the U.S. Geological Survey and others on a project titled "Prepping for Disaster Ecology: HSI-based training for managing climate change impacts on migratory birds."

Pueblo Neighbors and LANL Partner for Fire Mitigation

Los Alamos Reporter (11/21)

In early October, tribal members from the Accord pueblos of San Ildefonso, Santa Clara, Cochiti and Jemez picked up hundreds of cords of free firewood from the Lab, helping repurpose timber that was cleared during on-site forest fire mitigation efforts this year.