



SANDIA

LAB NEWS

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Seeking sustainability at Sandia Page 2

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Cycloalkanes a strong candidate for reducing aviation emissions

Sandia research paves way for sustainable jet fuel



SUSTAINABLE AVIATION — Sandia recently published research data demonstrating how cycloalkanes, when used in jet fuel, may reduce condensation trail formation and soot emissions as compared to current fuels. **Photo by Craig Fritz**

By **Paul Rhien**

Sandia scientists have released data that could play an important role in the future development of cleaner and more sustainable aviation fuel.

In collaboration with researchers at Los Alamos National Laboratory, the team explored the physical properties of cycloalkanes, or molecules composed of hydrogen and carbon atoms arranged in a ring structure using only single bonds. When used in jet fuel, cycloalkanes may reduce condensation trail formation and soot emissions as compared to current fuels.

The team detailed their findings in an

— CONTINUED ON PAGE 7

Employee engagement survey results spark new initiatives

By **Kerri Dufault**

Sandia leadership shared employee engagement survey results at a virtual Labs Town Hall in February. Executive Director and Chief Human Resources Officer Brian Carter presented the results, the Labs’ analysis of them and new initiatives to strengthen workforce engagement, including enhanced opportunities for staff to feel more connected to their work.

“When we listen to the needs of our employees, we can identify ways to improve operations, career opportunities and more,

— CONTINUED ON PAGE 5



VALUED FEEDBACK — Sandia Labs Director James Peery, left, Executive Director and Chief Human Resources Officer Brian Carter, center, and Communications Director Frederick Bermudez led a Labs Town Hall in February. During the presentation, Brian shared results of the Employee Engagement Survey and spoke about upcoming initiatives. **Photo by Lonnie Anderson**

SANDIA CELEBRATES EARTH DAY

Sandia National Laboratories

Albuquerque, New Mexico 87185-1468

Livermore, California 94550-0969

Tonopah, Nevada | Nevada National Security Site

Amarillo, Texas | Carlsbad, New Mexico | Washington, D.C.

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LABNEWS Notes

Lab News may contain photos shot prior to current COVID-19 policies. Individuals in photos followed all social distancing and masking guidelines that were in place when photos were taken.

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



WILDLIFE MONITORING — A female Williamson's sapsucker, or *Sphyrapicus thyroideus*, encountered during the fall bird banding project.

Photo by Evan Fahy

Earth Day at Sandia

Investing in our planet through site sustainability

By **Diana Hackenburg and Dan Ware**

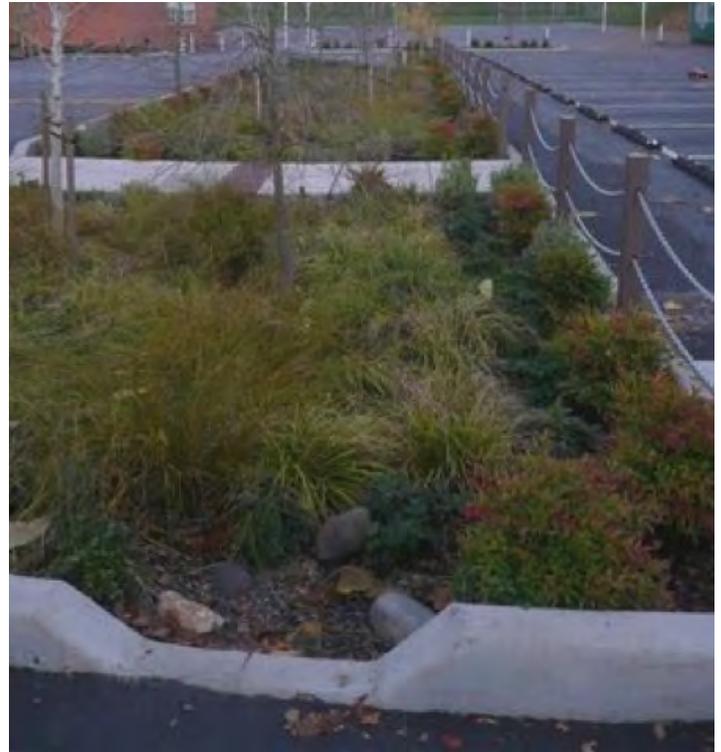
Sandia has provided the nation with important environmental and climate-related technical innovation for more than 50 years. In honor of Earth Day today, Sandia is celebrating all the ways it has invested — and continues to invest — in the planet through scientific mission and efforts to advance climate security.

From atmospheric testing and modeling to clean energy research and development, Sandia has developed capabilities that can help mitigate emissions, adapt to life in a changing climate, build awareness of what is happening and understand

potential interventions. For example, Sandia has managed DOE sites on the North Slope of Alaska for 20 years, contributing rigorous measurement data to help inform and improve climate and weather modeling for global and U.S. science and security missions.

This work is critically important as scientists emphasize that the time to act is now to limit the worst consequences of climate change. Sandia is positioned to address this global challenge because of the Labs' national security expertise, systems engineering strength and breadth and diversity of programs.

In addition to advancing state-of-the-art research and development, Sandia is committed to modeling the way forward



GREEN INFRASTRUCTURE — Stormwater detention basins and curb cuts in parking lot medians provide irrigation for landscaping.

Photos courtesy of John Kay

in site sustainability. In this issue, the Lab News highlights some of the efforts to reduce Sandia's carbon footprint and build a more sustainable organization.

A walk on the wild side

Tales of wild animals exploring empty streets and other once-crowded places during the COVID-19 pandemic enthralled many, but for Sandia biologist Evan Fahy, it's an everyday job to remind people that we share spaces with many nonhuman neighbors.

Evan is part of the five-person team that manages Sandia's ecology program, which ensures compliance with all laws related to protecting and conserving wildlife. "We are very fortunate to be surrounded by a healthy, functioning ecosystem," said Evan of Sandia's Albuquerque site. But such proximity also comes with responsibility, he said.

As on-site employees transition back to campus from working at home, it is important to be aware of the landscape we have at Sandia and the potential for wildlife encounters. Everyone can do their part by disposing of food wrappers and containers and not intentionally feeding wildlife.

In an on-site encounter with a furry, feathery or scaly neighbor, Evan said to give it plenty of room and move to a safe position.

Then, submit an Eco-Ticket or call 311 to report the interaction, a step Evan highly encourages. "Even if the wildlife encounter doesn't require a physical follow-up, we just like to hear what animals are out there and what they are doing for our records.

"We are fortunate and want people to be excited about having wildlife around," Evan said. "Just enjoy from afar."

Waste not, want not

Taking out the trash is not just important for protecting wildlife; it is also the focus of Sandia's Zero Waste by 2025 initiative. Greenhouse gas emissions from the production, transportation, use and disposal of goods accounts for more than 40% of U.S. greenhouse gas emissions, according to the Environmental Protection Agency, and can be significantly reduced by eliminating waste.

Sandia is making serious progress toward its goal: in the last five years, the New Mexico site has reduced its commercial solid waste by 26% while at the same time increasing the amount of waste diverted through recycling and composting to 70%.

In addition to reducing, recycling and composting, staff are encouraged to refuse what they do not need and reuse items by

giving them a second life. The Zero Waste team provides many resources for those looking to reduce their waste footprint and encourages staff to submit their ideas for ways to conserve and recover more resources.

Savings from a rainy day

Another important way Sandia protects the local environment is by managing the quality and quantity of stormwater runoff. At Sandia's Albuquerque site, about 50 million gallons of stormwater flows each year to the Tijeras Arroyo, which then feeds into the Rio Grande, a major source of water for drinking, agriculture and wildlife.

Sandia's stormwater program lead John Kay said it is important for Sandia to engage in good housekeeping practices, such as preventing spills, to prevent possible pollutants from coming into contact with precipitation and runoff in the first place.

Sandia uses green stormwater infrastructure and low-impact development designs to preserve existing hydrologic conditions, as well as to capture rainwater for on-site irrigation and groundwater recharge. These structures include detention basins, curb cuts, rain gardens and rooftop harvesting.

"Using stormwater on-site accomplishes

numerous objectives simultaneously,” said John. “It allows us to stay in compliance with federal and state regulations, protect the environment, reduce the use of potable water, lower costs and enhance resilience against the impacts of climate change.”

Positive energy

In addition to managing stormwater, site sustainability also means reducing the amount of energy and water used by Sandia facilities. Robin Jones, building system engineering manager at Sandia, leads a team that looks closely at how the Labs can invest to meet new and emerging federal requirements for net-zero emissions, net-zero energy and energy resilience.

“These different but overlapping goals will require major shifts in how we build, power and run our facilities,” said Robin. “We’ve already made great progress in reducing our emissions and see this as an opportunity to think of Sandia’s sites as a living laboratory for how to achieve and scale the technologies needed to achieve our nation’s net-zero goals.”

Part of that progress can be attributed to Sandia’s Reinvestment of Utility Savings Program. Through this program, Sandia uses cost avoidance from renegotiated utility rates and reinvests the savings into energy

projects. In 2023, Sandia will be able to reinvest about \$2.3 million a year in projects such as installing LED lighting and occupancy sensors, upgrading building controls and improving metering to understand how and when both energy and water are used.

New buildings and renovation projects also must meet high sustainability standards. In addition to following the Guiding Principles for Sustainable Federal Buildings, Robin and her team are implementing the Smart Labs process to improve safety, efficiency and sustainability at Sandia. “Not only will we be able to provide safe and controlled workspaces to support our missions, but we will build sustainability into the design from the beginning.”

Driving down emissions

To achieve net-zero emissions, Sandia must also tackle indirect sources related to our operations, such as investments, purchased goods and services, and business travel. The Commuter Assistance Program tackles another source that falls within this category: emissions related to employees traveling to and from Sandia sites.

“Sandia has an average of 7,500 daily commuters and most are using single occupancy vehicles,” said Ben Henning, commuter assistance program lead. “We

want to help connect members of the workforce to other options that produce less emissions.”

Almost 40% of employees have created a commuter profile, which allows users to learn more about and compare the emissions related to different commuting options, such as carpooling or bike riding. Better awareness of the options and their relative impacts is often the first step in changing people’s behaviors, Ben said.

“The commuter profile gives people the power to understand their role in generating greenhouse gases and possibilities for action,” said Ben. “Additionally, it has greatly improved the accuracy of our data related to this source, which can help us further improve the solutions we provide in the future.”

One such solution for lowering emissions that Sandia commuters might consider is using a partial- or full-electric vehicle. EV drivers can join a program that allows them to charge their vehicle on-site at select locations for a membership fee of \$10 a month.

Whether they drive EVs or not, Ben encourages employees to reach out to the Commuter Assistance Program to provide feedback. “We’re always open to new ideas for how we can better serve the community and lower our impact on the planet.” 

DOE solar energy leaders tour National Solar Thermal Test Facility



FEET ON THE GROUND

— Representatives from the DOE’s Solar Energy Technologies Office visited Sandia’s National Solar Thermal Test Facility April 11-15. In this photo, Randy Brost, left, facilitates a tour of the Concentrating Solar Optics Lab. Also pictured from left, Sandia engineers Henk Laubscher, Braden Smith, Jeremy Sment and Margaret Gordon, and DOE Solar Energy Technologies Office Concentrating Solar Power Program technology managers Shane Powers, Matthew Bauer and “Vijay” Rajgopal Vijaykumar.

Photo by Bret Latter

Survey results

CONTINUED FROM PAGE 1

then take action to ensure continued success at Sandia,” Labs Director James Peery said. “The employee engagement survey results provide valuable feedback that inform leadership decisions at every level of the Labs.”

Employee engagement is the degree of connectedness, maintenance, intensity and direction of energy employees give to the organization, which will either increase or decrease their level of performance.

“Another way of thinking of it is, what is the extent to which an employee is willing to give discretionary effort because of that level of connectiveness they have with the organization,” Brian said.

Listening to feedback

Sandia conducted the survey in May 2021 in partnership with an external vendor. The Labs received 9,580 responses, a 67% participation rate and an overall score of 3.94 out of five.

“Engagement is complex and is driven by two types of needs known as level one and level two factors,” said Brian. “Level-one factors are the essential needs of employees. Examples include compensation, resources, capacity and training; working conditions and job security; relationships and supervision; and meaningful work, advancement and promotion. Level-two factors that drive employee engagement can be categorized into four primary areas: belonging and

influence, line of sight, leadership acumen and organizational integrity.”

The majority of employees feel engaged or have a high degree of connectedness. Sandia wants to continue building employee connectedness so that employees get more enjoyment and satisfaction from their work, which will in turn enhance the Labs’ ability to meet mission needs.

As it relates to the level-one and level-two factors, an impact analysis on Sandia’s results found that employees perceive many level-one factors are favorable; however, employees see improvement opportunities in the areas of advancement, recognition, training, company direction and compensation. The same analysis found that Sandia scored favorably on leadership acumen, line of sight and organizational integrity but less favorably on belonging and influence. Based on the survey results, Sandia identified its top five improvement priorities, shown below.

Taking action

Much of Sandia’s strategic plan and the People and Culture Strategy, which is currently under development, actively addresses several of the opportunities for improvement identified in the survey.

“We as leaders at the Labs know that our workforce and the environment in which we all work are critical to Sandia’s success,” said Michael Rosales, manager of human resources and communications strategy. “We have to think strategically about how we continue to care for our people and work

environment in order to be successful long into the future.”

Survey results have been shared with the divisions and centers, and leaders have identified actions at all levels to work on improvements that will make the greatest impact on employee work and well-being.

Additionally, Sandia is conducting a comprehensive review of its compensation system, reviewing everything from job descriptions and incoming salaries to promotions.

In the interim, Sandia worked with DOE and NNSA to provide midyear pay raises for all eligible employees.

Sandia is also redesigning how it delivers performance management. Employee survey feedback indicated that the system is burdensome, tends to value individual contributions over teamwork and employees struggle to identify the value of their work with the block rating distributions.

“We’re looking at how we can smooth out the bumps, make it easier to use and improve our communication,” said Brian. “The goal is to ensure the system is viewed as fair and as accurately reflecting employee performance.”

In addition to these efforts, the Sandia Spark initiative seeks to foster an environment where employees feel as energized, valued and engaged as they did on their first day at Sandia. “It’s about reinforcing our workforce’s connection to our mission and to each other,” said communications and marketing manager Erica Lopez-Hamby.

“I’m really excited about the Spark initiatives we have planned,” said Erica. “Especially our career week in June that will highlight options and provide tools and resources for employees pursuing career development opportunities. This event is in direct response to feedback we received from employees around a desire for more career development opportunities.”

Sandia is launching a website for Sandia Spark to share information and increase transparency of the work being done to support employees through this initiative. The link will be available in future communications.

Sandia invites employees to participate in an engagement survey in 2023 and will conduct shorter surveys periodically to ensure employees can share their feedback and engage in meaningful changes. 



Pay, rewards, incentives benefits



Coordination between groups and departments



Growth and advancement (promotion/job opportunities)



Company direction, leadership, policies



Training and development

TOP FIVE — Sandia summarized employee engagement survey results into five priorities for improvement. The survey was conducted in May 2021, and results were shared with staff in February.

Graphic by the Workforce Planning and Effectiveness team

2022 EMS awards recognize waste reduction, energy efficiency, resource conservation and more

By **Dan Ware**

Accomplishments of staff who helped Sandia reduce its impact on the environment were recognized this week with the annual Environmental Management System Environmental Excellence Awards, held as part of the Labs' weeklong Earth Day 2022 virtual celebration. The week of events was hosted by Environment, Safety and Health and Employee Health Services.

Projects and activities were awarded in six categories: Above and Beyond, Greenie, Kaizen, Sequoia, Grassroots and Resource Conservation.

Above and Beyond

The cross-division team Legacy Chemical Clean Up identified and properly disposed of more than 400 excessive old "legacy" chemicals stored safely in multiple laboratories, some of which had been on-site since the 1970s. The project team also recycled outdated equipment including numerous power supply units, fluorescent lightbulbs, lead, oil, batteries, capacitors and more.

Project team members included Colton Gibney and Lewis Hill from Accelerator Operations; Alexander Voges from Coating and Additive Manufacturing; Ellie Thompson, Bradley Romero, Karl Mireles, Joaquin Flores, Kelly Wiese and Nicholas Massey from Facilities' Waste Management and Pollution Prevention; and Joshua Dominguez from Facilities Area Management.

Greenie Award

Robin Jones, manager of strategic site planning for building system engineering, was honored for her support of the energy management program and her passion for Sandia's potential to make a positive impact on the environment. Robin advocated for the reinvestment of utility savings funding, which brought \$2.3 million to the energy program, pushed for the execution of an Energy Savings Performance Contract and encouraged the development of renewable energy plans.

Kaizen Award

The Concrete and Asphalt Recycle Area Large Scale Recycling Project, composed of multiple organizations and divisions, developed and executed a plan to remove and recycle 13,693 tons of concrete and asphalt from the recycle area that had built up over the past five years. The plan was hatched after the team determined the material could not be effectively reused on-site due to environmental concerns.

Project team members included Robert Archibeque, Daniel Lopez, Eduardo Trujillo and Roy Cain from Facilities Mechanical Utilities; Leroy Duran and Lori Sanders from Facilities Waste Management and Pollution Prevention; Joshua Konetzni, Jeff Butler,

John Campbell and James Corcoran from Facilities Structural Services; Bradley Elkin from Facilities Work Planning and Control/Hazardous Waste; and Kelly Bowles from Environment, Safety and Health's Environmental Systems.



Sequoia Award

In fiscal year 2021, Sandia's composting program was expanded to include Tech Area I and Tech Area IV, which are limited areas. Facilities placed 335 new compost bins in 68 buildings, contributing to an 8% increase toward the overall 70% recycling diversion rate from the New Mexico campus. Since fiscal year 2019, the direct impact to the amount of compost diverted from the landfill has increased by 9.3%.

Members of Facilities multiorganization team included Kelly Wiese, Walter Dods Jr., Daniel Simms, Christopher Dean, Paul Sabia, Jeffrey Koch, Nicolas Massey and Leroy Duran from Waste Management and Pollution Prevention; Shawn Thompson, Marcus Riggs, Randy Ortiz, Michael Clearwater, Bernadette Otero, Marcos Zamora and Joshua Dominguez from Area Management; and Linda Jones, Harry Greatbatch, Chris Romero, Anna Torres-Atencio and Kenneth Martinez-Eubanks from Custodial Services.

Grassroots Award

A multidivisional working group of experts created a grassroots effort to support Sandia's resiliency and renewable energy goals. Their goals include identifying projects that support resiliency, establishing conceptual models that can be applied at other locations, coordinating resources to facilitate sustainability and resilience goals, replacing fossil fuel use, enhancing renewable energy sources and more.

Team members include Jodie Lord from Global and Nuclear Security Partnerships and Business Development; Craig Lawton from Resilient Energy Systems Mission Campaign; Robin Jones, Gerald Gallegos and Nicole Rinaldi from Building System Engineering; Rafael Gonzalez from Facilities Management and Engineering; Andrew Gough from Environment, Safety and Health's Environmental Management; Abraham Ellis from Renewable Energy Technologies; Henry Guan from Energy Storage Technology and Systems; Jason Mayfield and Casiano Armenta from

Asset Management Information Systems; Jeremy Michaels from Infrastructure Engineering; Charles Hanley from Grid Modernization and Resilient Infrastructure; Nora Wintermute and Chemanji Shu-Nyamboli from Environment, Safety and Health Operations and Systems; Sandra Begay from Photovoltaics and Materials Technology; Ninaad Desai from W87-1 Systems Engineering; Alicia Brown and Joel Stauber from Partnership and Planning; Summer Ferreira and Jimmy Quiroz from Renewable Energy and Distributed Systems Integration; Matthew Reno from Electric Power Systems Research; Amy Halloran from Nuclear Fuel Cycle and Grid Modernization; Stephanie Salinas from Environment, Safety and Health's Environmental Stewardship; Susan Altman from Energy and Homeland Security Programs; Clifford Ho from Climate Change Security; Rosemary Avery from Environmental Compliance and Monitoring; and Jennifer Reisz Westlund from Strategic Capital Planning.

Resource Conservation

During the coronavirus pandemic, a team from the Center for Global Security and Cooperation worked with Environment, Safety and Health to support shifting international engagements from in-person meetings worldwide to virtual meetings. This reduced

business travel by about 18,409,425 miles and saved an estimated 148,135 metric tons of carbon dioxide emissions. In addition to cutting greenhouse gas emissions, other resources were saved by virtual engagements, like paper and office supplies and energy resources.

Team members include Rebecca Jaramillo-Contreras from Environment, Safety and Health System Integration; David Sandison, Dominic Martinez, John Dickerson, Tina Hernandez, Adriane Littlefield, Pulak Nath, Susan Washburn, Laurie Wallis, James Schol, Anne Descour from the Center for Global Security and Cooperation; and Wallace Butler from Deployed Cyber Professionals.

"Despite the constraints placed on us during the pandemic and changes the workforce has endured, these teams were able to show what Sandia can do when they consider the environmental impacts of their work," said Environmental Excellence Awards program coordinator Ben Henning. "Their ability to identify challenges and devise large-scale Labwide solutions models how others can protect and preserve the environment."

More information, nominations and winning projects are available at the Environmental Excellence Awards page on the Environmental Management System website. [🔗](#)

Reducing aviation emissions

CONTINUED FROM PAGE 1

article recently published in [Frontiers in Energy Research](#).

As the global demand for aviation fuel remains high and is expected to grow, the combustion of petroleum fuel will continue to emit more carbon dioxide into the atmosphere and with it comes growing impacts on climate change, said Sandia chemist Alexander Landera.

"Unlike other forms of travel, such as cars and trucks, there is currently no foreseeable path to electrify the aviation sector," Alexander said. "Therefore, mitigation efforts are necessary to decarbonize the aviation industry."

Minimizing aromatics

One of the team's key objectives has been to minimize the aromatic content of aviation fuel and replace it with cycloalkanes.

Aromatics are substances derived from refining crude oil and are used as a source of octane, which increases the engine's power and fuel efficiency. Aromatics have traditionally been beneficial in fuel because they cause the O-rings in the engine to swell—an important function in maintaining engine seals and preventing fuel leaks.

However, aromatics are problematic because they produce soot during combustion, which, like carbon dioxide, has a greenhouse effect and contributes to heating of Earth's climate system, Alexander said.

"Ideally, we would wish to remove all aromatics from fuel," he said. "But if we can even replace a large portion of the aromatics with cycloalkanes, we find they make good candidates as far as their ability to cause O-ring swelling and their strong

fuel properties."

Cycloalkanes can also be produced from feedstock or renewable biological material, Alexander added, potentially making their production more carbon sustainable.

Physical properties of cycloalkanes

The research data examines physical properties of cycloalkanes that would influence the aircraft's operability, performance and safety. Alexander hopes that by building a database of these properties, their research will help clear the way for cycloalkane's inclusion in future aviation fuels.

"We've looked at various families of cycloalkanes to identify which ones have the strongest fuel properties and which have higher energy content," Alexander said.

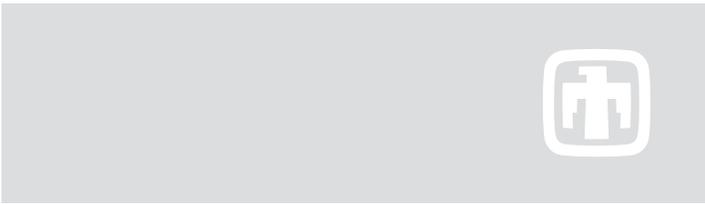
Addressing global climate security

Sandia is engaged in work to decrease the cost, increase the sustainability and expand the production and use of sustainable aviation fuels.

Funded by the DOE's Bioenergy Technologies Office, this research is part of Sandia's overall mission to address the national and global security threats associated with the climate crisis, said Anthe George, senior manager of the Labs' Applied Biosciences and Engineering Group.

"Climate change poses a threat to national and global security," Anthe said. "Sandia has a long heritage of providing the nation with climate-related innovations that have already made an impact in mitigating emissions, including combustion research, solar thermal testing and wind farm technology. Developing sustainable aviation fuel with decreased carbon dioxide and soot emissions will be pivotal to ongoing mitigation efforts against global warming." [🔗](#)

Mileposts



Eric Dettlefs 35



Michael Thomas 35



James Peery 25



Matthew Brito 25



Jenny Galasso 20



Andrew Steele 20



Maria Galaviz 20



Edmund Yu 20



Jake Zubiate 20



Ryan Anderson 15



Darryn Fleming 15



Jim Foucar 15



Sherry Gaines 15



Kevin Jameson 15



Victoria Atencio 15



Ryann Washburn 15



MJ Waldrip 15

Recent Retirees



Karen Armstrong 31



Nicolette Bauer 21

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Ombuds is back

Ronnie Thomson has reestablished a place where Sandians can talk through work-related concerns informally, confidentially and impartially.

By **Nancy Salem**

Ronnie Thomson loves her job. When uncomfortable issues arise in the workplace, she's there to lend an ear, and sometimes that's what people need most. "I'm not part of management, I'm not an attorney, and I'm not an investigator. I have no authority," she said. "I listen. I ask questions, and I help people organize and identify what they are feeling. I'm listening for their story, their experience."

Ronnie recently reestablished an office with a 30-year history at Sandia. The corporate ombuds was launched in 1992 by Wendell Jones, who served in the role 11 years in Albuquerque, and by Mike Birnbaum in Livermore. The program grew to two ombuds in New Mexico and one in California but temporarily closed in 2018.

Based on feedback from Sandia leadership and staff, Labs Director James Peery decided in 2020 to reestablish the office and launched a nationwide search for an ombuds. Ronnie was hired in 2021 and set about bringing the program back to life. "It's important to have a place to discuss the undiscussable," she said. "What I want to provide to anyone who visits the ombuds is a sense of honoring their dignity and their story. Their perspective matters, and I consider it their truth."

The Ombuds Office provides conflict and early dispute resolution adhering to principles of fairness and equity and remaining independent, impartial, informal and confidential. All employees have the right to consult the ombuds without fear of retaliation or reprisal. The office does not handle formal complaints and personally identifiable data is not retained. "I consider myself a trusted guide, someone with whom to discuss issues providing you a space to hear your own thoughts without judgment," Ronnie said. "With an ombuds, you are empowered to unpack, talk, reframe and attend to issues in a positive, professional way to minimize damage."

College grad determined to find a job

Ronnie, an ombuds since 2001, came to her profession on a winding road. Born in Delaware, her family moved frequently, settling in Mississippi where Ronnie went to high school and



TRUSTED GUIDE — Ronnie Thomson is a long-time corporate ombuds who studied under original Sandia ombuds Wendell Jones and Don Noack. "It's a huge privilege to continue what they began," she said.

Photo by Lonnie Anderson

college. She earned a bachelor's degree in sociology from the University of Southern Mississippi and then moved to Corpus Christi, Texas, with a friend. "It was the mid-1980s when the oil fields bottomed out, and the economy was terrible. Billboards leaving Houston read 'Last one out turn off the lights,'" she said. "We were two college grads from Mississippi determined to find jobs."

"I consider myself a trusted guide, someone with whom to discuss issues providing you a space to hear your own thoughts without judgment."

—Sandia Ombuds Ronnie Thomson

Ronnie, whose minor was in human resources, found an HR job with a gas compressor manufacturer being readied for sale and owned by a prominent Texan. As her work intensified, she got engaged to a man who was moving to Houston. "I didn't want to leave them," she said. "I had built a strong relationship with the company and they were willing to give me an office in

their Houston field location. Instead of seeing it as an end, I saw it as an opportunity, and we negotiated a way that I could stay."

Several sales, mergers and moves later in the volatile oilfield energy sector found Ronnie learning of the ombuds concept at Halliburton. It struck a chord. "I could see that in all the employee relations issues I had worked on the HR side, win-lose was actually lose-lose. There were no good outcomes for employees with significant issues, and the company most often had a mindset focused on defending themselves," she said. "Generally, at that time, the only people benefiting from employment disputes were the attorneys."

Building on a legacy

Ronnie learned from experienced ombuds at Halliburton and stayed with the company seven years until COVID-19 hit the oilfield services industry, and the ombuds office was closed. During those years she became active in the International

Ombuds Association, the premier training organization for the profession, and now sits on the board of directors. While the association has grown from 200 to more than 1,000 members and now includes mediators, employee relations, ethics and compliance, ombuds have their own niche. “The key nuances in the practice include confidentiality and informality,” Ronnie said. “In most professional roles, interactions are documented. We do not document. Privacy and informality make

the ombuds unique.”

The move to Sandia has special meaning to Ronnie, who was a student of Wendell Jones and Don Noack, another former Labs ombuds. “I am beyond honored to relaunch the office in the spirit of the Sandia ombuds of the past who I hold in such high regard,” she said. “It’s a huge privilege to continue what they began. I feel a connection to the legacy the original ombuds left. I feel at home.” 

Open house

Ronnie Thomson will hold an open house for the relaunched Sandia Ombuds Office on April 26 from 8-10 a.m. and 3-5 p.m. in Building 800, Room 171, and encourages Sandians to visit.

“Stop by, meet your ombuds, see the new comfortable space for in-person visits and enjoy a refreshment plus a little swag,” Ronnie said.

Climate security focus of workshop series with University of Illinois Urbana-Champaign

By [Diana Hackenburg](#)

More than 30 people from Sandia and the University of Illinois Urbana-Champaign participated in a workshop on Feb. 11 focused on climate-modeling research. The workshop was the fourth in a yearlong series centered on climate security topics and designed to create interactions between Sandia researchers and university faculty and students.

“The idea is to get people together and get them engaged, so they know what each other is doing and what expertise each is bringing to the table,” explained Brenda Wilson, microbiology professor at the university and Sandia faculty fellow for the Office of the Vice Chancellor for Research and Innovation. From there, she added, participants can identify additional perspectives and gaps that can be filled through cooperation, which often leads to new projects and funding proposals.

Mallory Stites, a University of Illinois Urbana-Champaign campus partnership manager for Sandia, along with Matt Windsor, said that for the Labs, University of Illinois Urbana-Champaign and other universities have capabilities and resources that make partnering with academia both complementary and valuable. “The more we can figure out what universities are doing to stay on the cutting edge of climate science and then

bring it into our work makes it a force multiplier for achieving our missions,” Mallory said.

University of Illinois Urbana-Champaign is part of Sandia’s [University Partnerships Network](#), which supports university partnerships to increase the Labs’ impact and solve big problems. According to Amy Halloran, Sandia’s University of Illinois Urbana-Champaign campus executive and director of the Nuclear Fuel Cycle and Grid Modernization Center, this relationship has been so successful because the university’s strengths in engineering and applied work translate well to what we do at Sandia. Currently, more than 300 staff possess over 400 degrees from University of Illinois Urbana-Champaign.

With that successful history in mind, the workshop organizers wanted to use this series as an opportunity to expand outreach to other academic programs.

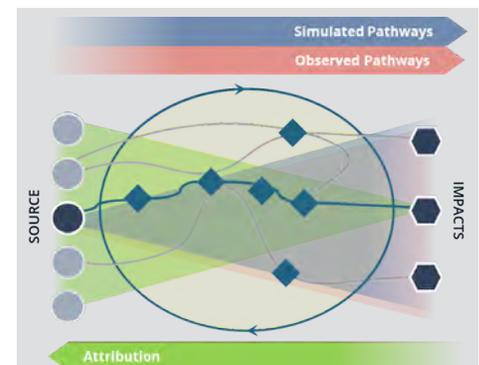
“Faculty in other areas — atmospheric sciences, biology, genomics, geology, mathematics, statistics and more — were doing exciting things in alignment with Sandia’s work,” said Wilson. “We also saw a lot of interest in climate and environmental policy topics, so it made sense to engage those people, too.”

In addition to climate change being a broad topic that intersects with multiple disciplines, this issue is gaining traction as a strategic priority for Sandia

because of the national and global security threats it poses. Further, the climate crisis can’t be addressed by Sandia alone. “Partnerships with universities help us leverage what Sandia can do,” Wilson said.

Previous workshops in this series covered the water-energy-climate nexus and geological carbon storage. This particular workshop was the second to tackle the topic of climate modeling.

Presentations by University of Illinois



CLIMATE ATTRIBUTION — Sandia’s Climate impact: Determining etiology through pathways, or CLDERA, project combines simulated and observational data to understand the physical processes that connect geographically and temporally localized climate-change sources to impacts, illustrated from left to right; resulting pathways will then be used to attribute impacts back to the source, illustrated from right to left. The goal is to transform the science of attribution to improve climate risk assessments for national security and policy decision-making.

Graphic by Jason Bolles

Urbana-Champaign researchers revealed a broad range of climate modeling activities, from advancing methods to simulate complex interactions between the atmosphere and oceans, to combining observations, numerical models and statistical tools to better predict regional impacts of extreme weather. This research not only advances the science of climate modeling but also builds awareness of potential climate change risks, such as how increasing temperatures could impact agricultural yields.

Sandia's portion of the workshop highlighted the CLDERA, or Climate impact: Determining etiology through pathways, Grand Challenge project, with presentations from Diana Bull, principal investigator, and Laura Swiler, attribution lead, as well as a presentation from Kenny Chowdhary on autotuning funded by DOE's Office of Science. CLDERA seeks to develop new methods to attribute climate impacts to source events using a novel pathways approach. Attribution of the source of an impact is needed to guide liability, policy, treaty and national security decisions, especially as climate intervention strategies are being proposed as options to reduce the negative impacts of climate change.

"Establishing connective relationships in climate is hard because of confounding characteristics like high internal variability in earth systems, limited ensemble members from earth systems models and historically limited observational data,"

said Diana. "We want to move beyond a correlative approach to establish connective relationships in a way that's not just about a single source and a single impact. Our novel approach is focused on tracing how a source drives the climate system to respond with varied impacts."

This collaborative project draws on Sandia's capabilities in modeling and simulation, detection and attribution, risk analysis, high-reliability engineering, as well as the expertise of four academic partners, including University of Illinois Urbana-Champaign.

As discussion was winding down, the question of how to capitalize on all the overlapping interests discovered through the workshop revealed another goal of this partnership: to create career pathways for students from University of Illinois Urbana-Champaign to Sandia. One of the easiest ways to start collaborating is to get students involved in joint projects, such as through internships and postdoctoral appointments at Sandia.

In general, Mallory said that the workshop series has been a great way to get early-career researchers excited about Sandia's climate security-related research and to show students outside of engineering disciplines that there is room for their skills at Sandia. "We are creating a community of common researchers." 

Staff steps up for National Volunteer Month



STEM IN THE COMMUNITY — Rudy Garcia and Carla Jordan spoke with students and led fun hands-on activities at the Jefferson Middle School STEAM Extravaganza during National Volunteer Month in April. About 20 community partners, including Sandia, participated in the event to engage students and inspire interest in STEM careers and opportunities.

Photo by Debra Menke

Building systems engineer helps lessen climate impact of Sandia's campuses

By **Sarah Jewel Johnson**

Robin Jones, manager of building systems engineering at Sandia, makes a daily effort to only use the resources she needs. Energy efficiency is her life-long passion, and it shows — from her exuberant discussions about reducing waste, to her desire to make Sandia campuses more energy efficient, Robin is driven by a calling to waste nothing and make use of everything. In addition to her manager role, Robin is part of a team working to make the Sandia/California campus net-zero, which refers to an equal balance of greenhouse gases emitted and removed from the atmosphere.

Robin attended New Mexico Tech for her undergraduate studies and Stanford University for graduate work, where she obtained a master's degree in environmental engineering. Prior to her work at



NET-ZERO HERO — Robin Jones, manager of building systems engineering at Sandia, poses in Chicago with Joe the Guardian by artist Thomas Dambo, who uses recycled materials in his art to raise environmental awareness. Robin is part of a group at Sandia that aims to achieve net-zero energy and emissions on the California campus.

Photo by Robin Jones

Sandia, Robin worked in sanitary sewer maintenance at the Compton Field Office of the Los Angeles County Sanitation Districts. She then designed systems that cleaned up various contamination elements, namely diesel fuel and chlorinated compounds, from soil and drinking water. In 2009, Robin joined Sandia as a large-construction project manager before transitioning her work into capital investment planning and then nuclear weapons. In 2018, Robin accepted her current role because it allowed her to return to her passion of conservation and apply her education to solve heavy-hitting energy issues.

Read Robin's interview below to learn more about her projects in New Mexico and California, her entry into environmental engineering and her take on how to recruit others to join the fight against climate change.

Why are you passionate about climate change?

This is it. This is our planet. If we make it inhospitable for our species, then it's all over. Have you seen Mars? I would rather live here.

What does "climate security" mean to you?

I think climate security really means security of vital resources. Climate change can affect access to resources, like water, and cause extreme weather events that destroy people's housing. When necessities of life are endangered, people get worried. When countries get worried, conflict arises. Also, as we encroach on another species' habitat, they encroach on our habitat, and then we mix diseases and fight for the same resources. This is such a complicated problem.

But if I can do a little thing to help — make something more energy efficient, turn off a light, shop at a thrift store, use only what I need — then there are

more resources available and a little less insecurity.

What climate-related challenge are you most excited to work on?

I love the idea of delivering clean water to people and taking away their dirty water. To me, there is no higher calling. And, as an engineer, I can work to provide clean water, cut energy usage and clean up an environment — all of which is essential to human health.

As a facilities organization, it feels really good to change out an old inefficient heating, ventilation and air conditioning system to one that uses a lot less energy, but we also have a role in raising energy awareness among the workforce. Small things can make a big difference.

Several years ago, we put these little stickers in some of the labs at Sandia that said, "shut the sash." The fume hood uses a fan to pull air outside. When you "shut the sash," the fan in the hood turns off. We put these stickers in the labs to bring awareness to the use of the electricity the fans require. We found that when people started to "shut the sash" they also started to turn off the lights, turn off their computer and use less water when they wash their hands. The awareness has a chain reaction effect.

At the moment, I am really excited about working to make the California campus net-zero for energy and emissions.

How does your work at Sandia advance climate security?

I am the manager of a strategic planning group for building systems, including the air conditioning system, domestic and hot water systems, electrical system, roofing system, elevators, etc. You name it, if it's inside a building, my group is doing strategic planning for it. One of the reasons I took this position is because it also has energy management

and sustainability opportunities, and that's really where my passion is. My team does building audits every four years on all of Sandia's large buildings. The team assesses how much electricity, natural gas and water the building uses. We also evaluate the building environment for comfort and human aspects. We take all these findings and write a report that summarizes the state of the building to help us plan for more efficient use in the future.

Right now, I am also on special assignment as part of a team to make the California campus net-zero. It's important to understand that net-zero energy and net-zero emissions are two different things. I will use the example of a building. A net-zero energy building means that all the energy that building is using is being produced locally by renewable sources, for example, solar panels. The panels provide all the energy that you need. Net-zero emissions is a little more complicated and means that you are capturing all the greenhouse gases you are emitting. Now that's the tricky part. How do you capture what you emit? But our researchers here at Sandia are working on that challenge and many others.

What perspective or capabilities does Sandia bring to addressing the climate crisis?

We have a few programs in place that leverage research and really bring awareness to basic energy-savings habits.

Right now, we are piloting **Smart Labs**, which is a program that really comes down to only using the energy you need. You figure out what chemicals are in your lab, identify your hazards and then design a system that uses just the right amount of energy to make the lab safe but energy efficient. More is not always better, so Smart Labs helps us maintain a system to exactly what we

need and no more.

Another program is called ongoing commissioning. Here at Sandia, we have building automation systems in place that monitor daily operations. This information is fed to a computer program that uses data analytics to detect faults in the building's operations. This system helps us remain as efficient as possible and maintain healthy and comfortable spaces. The COVID-19 pandemic made things like heating and cooling buildings even more complicated. If we have an empty building because everyone is working at home, how do we heat or cool it for optimum efficiency? On the other hand, if people are in the building during COVID-19, we want to maximize outside air, which isn't very energy efficient but better for health and safety. These are the decisions that building engineers must balance.

need and no more.

What does the nation or world look like in the future if we are successful in addressing climate change?

I don't know, but in certain ways, I think things are already better. There has been some progress. I grew up in Los Angeles, and when I was a kid, we used to have smog days where you couldn't go outside and play at recess. I remember certain days that it hurt to breathe, and my mom, who also grew up in LA, said she remembers days she had to sit down on the curb because her lungs burned so bad. But now they brought in catalytic converters and air pollution regulations, and the air quality in the basin has improved immensely.

How you feel about the climate problem depends a lot on your personal experiences. If you grew up somewhere remote, like Montana, you may not see what all the fuss over air pollution is about. But if you see glaciers melting or bears coming into residential areas or

your home now floods every year, you can really feel the problem.

If we are successful in addressing climate change, there will be adequate resources, like clean water and air, for everyone.

What's your vision for integrating energy equity and environmental justice into Sandia's climate security efforts?

Energy equity and environmental justice is such a hard issue because oftentimes the people who don't need it don't have an issue with it, and those who need it most can't get it. For example, I put solar panels on my house because I can. I now have a lower electric bill because I could afford the solar panels, but I don't necessarily need a lower bill. At the same time, there are people who really need lower bills who can't afford the solar panels. So, the question is, how do we help those who need access to resources, like solar panels, when they can't necessarily afford them or get access. I don't know what the answer is, but I think a start would be for everyone to use only the energy they need to help establish resource equity.

If you were trying to recruit or inspire somebody to work on the problem of climate change, what would you say to them?

Well, we've all heard about carbon footprints, but I think the key to inspiring others to combat climate change is through talking about a climate shadow. Climate shadow is the example that one person sets by reducing energy usage and the ripple effect that one person has on others in their shadow. I think I would also ask the person, "How are you going to serve your fellow human beings? How can you go into a career to help combat the problem?"

My son wants to design an aircraft for Elon Musk, and I said, "You know what, instead of working on a rocket, why don't you design an airplane that

is emission-free? That would make a huge impact.” One of the larger sources of greenhouse gas that Sandia produces is when our staff travels — airline travel. So, we and the generations following us have this opportunity to make huge impacts by thinking about these questions and problems in a new way. We can invent new things to solve old problems. Instead of thinking, “How am I going to make money?” these generations are starting to think, “How am I going to make a difference?”

How can we educate and involve more people in addressing the climate crisis?

I think the schools are doing amazing work teaching about the climate crisis and talking to kids about what they can do to make changes. When my son and I were both at home during the pandemic, we did this really cool thing called an energy-savings treasure hunt. You go around your home or place of business and use the booklet DOE provides to identify ways to save energy in your home. You answer questions about your appliances, your thermostat and your daily routine. It’s all simple things that kids can understand, but it impacts all of us. I think fun activities like that really open the possibility to teach and involve new people in climate change.

There is also an opportunity to teach through other means, like art. Thomas Dambo, a Danish artist, uses recycled pallets and materials to make massive sculptures around the world. Once again, it brings to mind your carbon shadow and how you can reuse things to make something new rather than just tossing them in the trash.

I’ve also seen places use simple competitions to raise awareness about energy usage, and that’s another way we could teach about climate change and energy efficiency in a fun way. By only using what we need, we could see massive reductions of energy usage that could grow over time. 

This article is part of Sandia’s Climate Community Series that highlights Sandia’s work in a diverse range of climate research and categories of action.

Staff are invited to join the Sandia Climate Community by signing up for our climate email list, attending all hands meetings and participating in conversations on Teams. A link to join the community is available on the Climate Security at Sandia website.



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