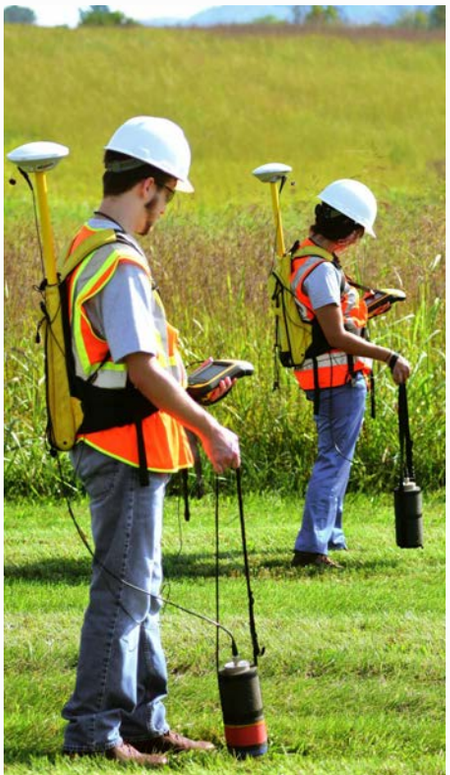
2024 ORAU Story



FURTHER.
TOGETHER.

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ORAU, a 501(c)(3) nonprofit corporation, provides science, health, and workforce solutions that address national priorities and serve the public interest. Through our specialized teams of experts and access to a consortium of more than 150 major Ph.D.-granting institutions, ORAU works with federal, state, local, and commercial customers to provide innovative scientific and technical solutions and help advance their missions. ORAU manages the Oak Ridge Institute for Science and Education (ORISE) for the U.S. Department of Energy (DOE). Learn more about ORAU at www.orau.org.

ORISE is a DOE asset that is dedicated to enabling critical scientific, research and health initiatives of the department and its laboratory system by providing world-class expertise in STEM workforce development, scientific and technical reviews, and evaluation of radiation exposure and environmental contamination. ORISE is managed by ORAU, a federal contractor, for DOE's Office of Science. The single largest supporter of basic research in the physical sciences in the United States, the Office of Science is working to address some of the most pressing challenges of our time.

The financial information provided in this report has been derived from the audited financial statements of the ORAU Corporation and the DOE contract fund for the year ended September 30, 2024. These audited financial statements are presented in separately bound reports.

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What's inside?

Message from the president

Harry S. Truman, the 33rd President of the United States, once said, “You can always amend a big plan, but you can never expand a little one. I don’t believe in little plans. I believe in plans big enough to meet a situation which we can’t possibly foresee now.”

I can’t help but think Truman’s quote applies to ORAU in 2024, where we saw in many ways the fulfillment of our big plans for a revitalized workforce and a realignment and revitalization of our Oak Ridge campuses. Over the past few years, we have implemented and refined our flexible work environment, which has enabled us to hire the best, most-qualified employees while ensuring outstanding performance to our customers both on-site and remotely.

We saw outstanding employee performance across the board in 2024, whether employees were directly or indirectly supporting our customers. This year set a record for the highest revenue in ORAU’s history, with revenue of more than $450 million.

ORAU’s Whole Campus Strategy Team continued work to revitalize our Oak Ridge campuses. Remodeling in Pollard Center, our multiuse conference and meeting facility, is nearly complete. ORAU’s Professional Training Programs has moved from the U.S. Department of Energy’s south campus to Pollard Center and adjacent office building, MC-212, on our main campus, and items from ORAU’s Museum of Radiation and Radioactivity will be on display in a series of new museum exhibits, also at Pollard Center.

ORAU Story, 2024, celebrates these accomplishments and other key contributions of our employees. In one example, the ORAU STEM Accelerator grew from concept to reality in just 18 short months. ORAU has partnered with key stakeholders in the nuclear energy industry, including the U.S. Department of Energy (DOE), National Nuclear Security Administration, Nuclear Regulatory Commission, Tennessee Valley Authority, the State of Tennessee, and various academic and industry organizations, to become a leader in building the capacity of the nation’s nuclear energy workforce.

Helping build that workforce includes supporting STEM education. Extreme Classroom Makeover (ECM) is one of my favorite community relations initiatives. Since we launched the program 15 years ago, ORAU has awarded more than $525,000 in technology upgrades to more than 30 East Tennessee schools. ECM is so successful that the blueprint for the program has manifested itself in the Central Intelligence Agency’s Mission Possible program, with ORISE providing support through DOE's Strategic Partnership Projects program.

Speaking of STEM programs, the ORISE K-12 STEM Education team continues to deliver high-quality, impactful education programs for educators and students alike. In the summer of 2024, the team hosted programs for nine sponsoring agencies. The variety of educator professional development programs, residential research programs and day camps served 756 participants in Oak Ridge, Tenn., Tuscon, Ariz., Albuquerque, N.M., Towson, Md., and elsewhere.

I’ve always said that people are our strongest asset. This year saw the hiring of Jim Sears as the senior vice president of ORAU Government Services, a diverse portfolio of programs aiming to advance government missions in learning, health, and science. Sears brings his distinguished 33-year career of service in the U.S. Air Force to the role, guiding a large team of more than 200 professionals to deliver innovative solutions that benefit the public. Also in 2024, 21-year ORAU employee Jenni Hoff, Ph.D., assumed the duties of project director for the National Institute for Occupational Safety and Health (NIOSH) Radiation Dose Reconstruction Project. The NIOSH Project has been managed by ORAU since 2002, and Hoff has served our NIOSH customer from day one. We also celebrate our so-called "boomerang" employees, who may leave ORAU because of life events or for other reasons but then ultimately find their way back to us, bringing new and innovative ideas with them.

ORAU employees continue to leverage their subject matter expertise to benefit others. David King, CHP, an ORAU health physicist, developed an online tool to help health physicists determine which tools and instruments are best used to make their calculations. Jennifer Reynolds, MPH, MCHES, and Kristin Mattson, MPH, MCHES, discuss the importance of connection with other people to reduce feelings of loneliness and improve mental health, maternal health and wellness, risk of substance use disorder and to reduce the likelihood young people will participate in risky behaviors.

ORAU and our employees continue to invest in nonprofit organizations that strengthen the communities where we do business. Together, we raised nearly $127,000 through our annual giving campaign to support the United Way

and Community Shares. Lights of Hope, a beautiful fundraising event for the American Cancer Society Cancer Action Network, saw hundreds of luminary bags light up the pathway around ORAU's main campus pond in memory and honor of people who have faced cancer. We are investing in the future of public health and health care by supporting the medical residence program at Methodist Medical Center in Oak Ridge and backing in the Roane State Community College Public Health Training Center. We also offered time and talent into the construction of another Habitat for Humanity build in Oak Ridge.

By any measure, 2024 has been a great year and our future is looking even brighter. Teams of employee stakeholders from across the organization are working to develop and advance a strategic plan to align organizational leadership, innovation and talent management around key priorities for our nation. Follow us in the coming year as we embody our new purpose, mission and vision statements:

- Purpose: Advance the nation's learning, health, and scientific knowledge to build a better world.
- Mission: Benefit the public by integrating academia, government, and industry to advance the nation's learning, health, and scientific priorities.
- Vision: Achieve our vision to be the recognized leader when national priorities require innovative solutions.

ORAU is future-ready to serve our customers and the nation, and we can't do it without the unwavering dedication and commitment of our employees. Together, we will continue to achieve great things for years to come.

H. A. Page

Andy Page, ORAU President and CEO

SCAN HERE TO WATCH

Exceptional performance earns ORAU a bridge contract to continue NIOSH Dose Reconstruction Project into 2025

In 2024, ORAU received an unprecedented vote of confidence from one of our long-term customers when the National Institute for Occupational Safety and Health (NIOSH) extended their contract with us for an extra year, based on ORAU's exceptional performance.

Since 2002, ORAU along with our partners NV5/Dade Moeller and MJW Technical Services has managed the NIOSH Dose Reconstruction Project. The ORAU team examines data related to radiation exposure for current and former U.S. Department of Energy (DOE) workers who have filed claims under the Energy Employees Occupational Illness Compensation Program Act (EEOICPA). Based on the ORAU team's assessments, the workers who qualify can potentially receive compensation as well as health care benefits from the federal government under the provisions of EEOICPA. Since the inception of the project, ORAU has investigated more than 66,000 claims from former DOE workers who have cancer or other chronic conditions.

ORAU's original contract with NIOSH has been renewed four times and was scheduled to be competed again in 2024. But thanks to ORAU's exceptional performance over the life of those contracts, particularly during the most recent performance period, NIOSH officials chose to do something they had never done before—award a 12-month, sole-source bridge contract that extends through September 2025.

ORAU scored 98.5 percent and 100 percent in their most recent Cost Plus Award Fee evaluations. In the agency's assessment of ORAU's performance, NIOSH officials highlighted the company's ability to remain flexible and responsive to the agency's needs.

"The contractor's performance in this area has been exceptional," evaluators said.

2024 also marked a change in ORAU's leadership of the NIOSH Dose Reconstruction Project as Jenni Hoff, Ph.D., who had previously served as associate director, was named project director. With the one-year bridge contract in place, Hoff said her team will continue to perform at their same high level, even as the next full contract competition is expected to begin later in 2025.

"The staff supporting the NIOSH Dose Reconstruction Project is a group of highly motivated individuals who remain focused and dedicated to the job at hand—to support NIOSH in completing their responsibilities under the Energy Employees Occupational Illness Compensation Act," Hoff said. "Everyone recognizes that no matter what role they play, they have a hand in developing the results for the claimants and petitioners that we serve. We address all goals and NIOSH initiatives as a team, and it is because of this teamwork that NIOSH trusts us to continue our important work on this program."

ORAU Overviews

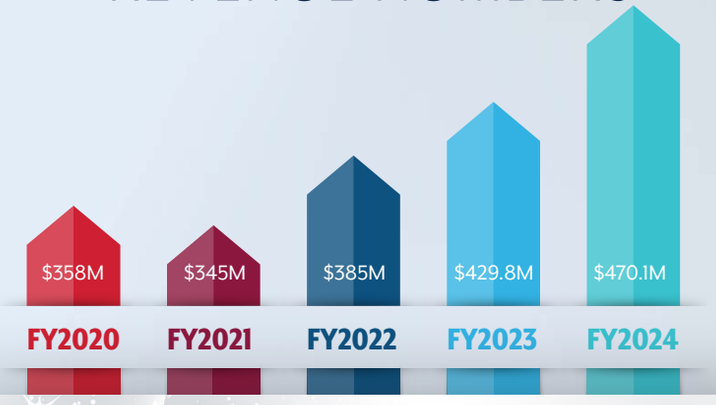
EMPLOYEE TOTALS, LOCATIONS, & STATES

975 employees

3 office locations:
Oak Ridge, Tenn.; Cincinnati, Ohio; and Arvada, Colo.

Employees in 41 states

REVENUE NUMBERS



ORAU CAPABILITIES

Workforce Development:

Provide full-spectrum workforce solutions, from mentored research experiences for students, faculty and postdoctoral researchers to scientific and technical staffing services and K-12 STEM education programs.

Health & Environment:

Protect public health and safety through health education, communications, preparedness and response, epidemiology, exposure science, health physics, ecology and environmental services.

Assessment & Evaluation:

Ensure scientific research integrity program effectiveness and quality performance through peer and merit reviews, multidisciplinary independent assessments and evaluations, and grants management expertise.

Preparedness, Response & Training:

Train, prepare and respond to emergencies, public health concerns and natural disasters and provide forensic science services and national security exercise planning.

Research & University Partnerships:

Advance research and development in collaboration with ORAU consortium member universities and other strategic partners to meet critical needs and strengthen the U.S. scientific enterprise.

AWARDS & DISTINCTIONS

- ISO 9001:2015 quality management system certification. ORAU has been ISO 9001 certified since 2013.
- ISO 14001:2015 environmental management certification. ORAU has been ISO 14001 certified since 2005.
- 2024 Best of the Best Employer by U.S. Veterans Magazine
- U.S. Department of Energy (DOE) Voluntary Protection Program (VPP) Star Site for Safety, 21st consecutive year
- Collected more than seven tons of recyclables during annual Earth Day event

Ashley Golden was recognized in the Knoxville News Sentinel 40 Under 40 class of 2024. This annual list honors the achievements and outstanding public service of young professionals who live and work across East Tennessee. Golden was also recognized in the Volunteer 40 Under 40 Class of 2025, which recognizes alumni under age 40 who are excelling professionally and personally since completing their degree at the University of Tennessee.

Mae Mosley was named the 2024 MLK Diversity Champion by the Dr. Martin Luther King, Jr. Commemorative Commission. The award goes to a Knoxville area individual whose life reflects the goals of Dr. Martin Luther King, Jr., who believed that equality transcends race, education and economic growth.

Surveillance system savings:

ORISE's continued commitment to finding cost efficiencies

Under the direction of the Director of Safeguards & Security Tom Amidon, ORISE's Safeguards & Security team has taken an innovative approach when it comes to funding. When Amidon took over as the director in 2007, he made it an emphasis to cut down spending while also maintaining the highest level of physical and cyber security for ORISE. ORISE has had a long legacy of cost efficiencies, and there have been many instances of getting projects done for less than what the budget allowed for. In one specific example, the DOE Office of Science approved ample budget for the 2024 upgrade of ORISE's campus-wide surveillance system. After working with procurement professionals at ORAU, which manages the ORISE contract for DOE, Amidon was able to get the final estimate down to half of the original budgeted cost.

"Angela Hawn on the ORAU procurement team fought tooth and nail to get the cost down as low as she could get it, and we ended up having a final estimate of more than half less the amount that was originally budgeted," said Amidon. "That was not only the price to replace the video recorder, but also all the dozens of cameras and the labor to do it for the entire campus."

After looking a little further into the budget, Amidon discovered that not only did they not need the full original granted amount from DOE's Office of Science, but they didn't need any of it.

"I called our Office of Science budget officer back and was able to let them know that with our existing operations funding and the work that our procurement team had done, we could give back the entire budgeted amount that they had originally granted us for this system upgrade."

The project was completed by the end of FY24 and is now fully in place and operational.

"A FIMSTASTIC VALIDATION":

DOE recognizes ORISE Office of Safety and Facilities for excellence in facilities management

In May 2024, representatives from the ORISE Office of Safety and Facilities attended the annual DOE Facilities Information Management System (FIMS) and Real Estate training event in St. Louis. During a session titled "Data Quality Best Practices," ORISE was recognized for vast improvement of our leadership in data quality processes and procedures and was also recognized for our preparation and successful completion of FIMS validation audit, which was conducted in April. The ORISE facilities team received an ALL GREEN (100%) score. Members of DOE's Office of Asset Management, the Oak Ridge Site Office, and AB-321 were present for this five-year quality assurance data validation audit.

Some comments for ORISE staff from the validation team include:

- "The Office of Asset Management was impressed with the processes and accuracy of data."
- "Buildings look very well maintained."
- "Source documents PDF format with bookmarks is very clean and organized."

ORAU's Director of Safety and Facilities Chad Becker said this recognition demonstrated his team's ongoing commitment to maintaining the highest standards for stewardship of DOE facilities under their care.

"Since the inception of the FIMS validation process 18 years ago, ORISE has maintained all-green scores for this pass/fail assessment, including the five-year revalidation like it was this year," Becker said. "Senior Facilities Manager Katie Moran and her team have done an outstanding job of ensuring that this year-long process of documenting and maintaining every facilities-related component of the campus meets DOE's highest standards."

To commemorate the perfect score, DOE reps awarded Moran (pictured second from left) and Facilities Administrative Associate Stacie Hayes (pictured third from left) with a mug that said, "A FIMSTASTIC VALIDATION."

From left to right: Adam Pugh (DOE), Katie Moran, Stacie Hayes, Mark Gordy (DOE).

Pugh and Gordy work at DOE Headquarters in the Office of Asset Management.

"Boomerang" employees

The boomerang is a powerful hunting tool that originated in Australia, where it is known for its amazing ability to be thrown in one direction, and after a short pause, return to the place where it started.

This curious dynamic of leaving and returning like a boomerang is something ORAU has witnessed among its workforce in surprising numbers in recent years as many employees who have left the company on good terms have, after a short time away, returned to ORAU.

When life circumstances change or professional opportunities that are impossible to pass up come along, it's often a natural step to leave the company where you work. But in rare cases, some people will reach another crossroads later in their careers and take a boomerang-like turn back to where they started.

And that is exactly what has happened repeatedly at ORAU. Since 2018, nearly 40 employees have left ORAU in one capacity and, after a short time away, have returned to the ORAU family.

According to ORAU Chief Human Resources Officer Meghan Millwood, every situation is unique, but what is common in almost all of them is that because ORAU is such a great place to work, people often eagerly return when the opportunity arises.

"One of the best testaments to what a great place ORAU is to work is that we have so many people who leave to work at other companies and then return to work here at some point in the future. For some it is many years, for others several years have gone by, and in one case I am aware of it was after only a few short weeks," Millwood said. "It has always surprised and delighted me to see familiar faces 'returning home' to work at ORAU. Since I have worked here for 22 years, it is also personally gratifying to get to work with great people that I have missed. They could choose to work anywhere else, but they choose to come back here."

Four of these "boomerang employees" Melissa George, Greg Nichols, Elaine Smith, and Vivian Vargas each had very different circumstances that led to their departures from ORAU. But all of them agree that returning to the company was a great decision.

GREG NICHOLS

Greg Nichols began his career at ORAU in 2009 as a health research intern supporting the company's work on the Kingston Coal Ash Spill project. Thanks to the good work he did there, when he finished his master's in public health in 2010, he received and accepted an offer to move from intern to full-time employee and quickly climbed the ladder in ORAU's Health Studies program. Among other things, Nichols launched a new nanotechnology initiative and became an important part of ORAU's business development activities in the health studies space.

"I got to work with almost every department and support unit from the get-go. It was kind of cool!" Nichols said. "I also had an opportunity to pitch a few investment ideas to the senior leadership team and was fortunate enough to get some initiatives funded, mainly the Nano Program. I got to work on almost every program that ORISE Health Studies had."

His work in the nanotechnology world got the attention of another company and that led to a job offer and a chance to keep the typical young professional career track moving upward after seven good years with ORAU.

Nichols spent the next eight years with that company, helping them in many ways, including playing an important role in their COVID-19 response. But some of the key relationships he had built at ORAU, including with ORAU President Andy Page and current ORISE Health Studies Director Ashley Golden, kept him on ORAU's radar. And when Golden needed a new operations manager in the ORISE Health Studies program, she worked hard to bring Nichols back to the fold.

Nichols said he never envisioned a return to ORAU being on his career bingo card, but he added that the return has gone even better than expected.

"Honestly, I never planned on coming back—even though Andy looked me in the eye my last day in 2016 and said, 'I'm going to get you back!' But in the end, I just felt in my heart that it was the right place to be next in my career, but it wasn't one of those things where I was homesick for the eight years I was gone," Nichols said. "It's funny how things change over time, though. I will say it's very comfortable being back, like a warm hug. It does feel like home to me."

ELAINE SMITH

In her first stint with ORAU, Elaine Smith worked in the project management office from March 2017 until November 2017. During those nine months, Smith said she always felt very welcomed and deeply integrated into projects across the organization.

"I was able to work with people from other departments which was a great way for me to get to know people. I enjoyed attending the company-wide events such as the all-staff meetings in Pollard and the Fall Chili Cook-Off.

It was a fun working environment even though I had a learning curve for working at a government company versus a publicly traded company," Smith said.

At the nine-month mark of her time at ORAU, Smith had a unique opportunity arise at a different company that needed her skills to help with a large payroll project. For that project, Smith worked as a contractor, and a few years later when the project was complete, she found herself looking for her next opportunity.

She said she was drawn to look at ORAU for a second time because of all it offered, including a much better work-life balance. After interviewing with a few companies, a project management position came open at ORAU and she applied.

"Coming back to ORAU has been a little easier than the first time since I already know some people and know the rules," Smith said. "However, it has been different since things changed during COVID-19 and people work from home and in the office. I'm used to working from home and enjoy it since I worked from home at the other company. I try to stay involved and enjoy participating in the Employees' Club."

MELISSA GEORGE

Melissa George got her start at ORAU in 2007 where she served in a variety of roles, all in ORAU's Human Resources Department. She started off as an HR assistant 1, and over the next seven years she reached level three in that role. At that point, George said she loved her job but was also feeling a great deal of uncertainty about the long-term stability of ORAU. Although the change she made at the time was meant to ensure she could continue to provide for her young family, George said she found that other companies were just not the same as ORAU.

"I had the experience of working at other companies where there were no friendships or personal relationships, only work relationships and employees were treated as such," George said. "So, when an opportunity to return to ORAU presented itself, I was very excited to apply and return to a place where I could thrive."

George returned to ORAU in 2018, once again in Human Resources, and said she has enjoyed her return even more than her first stint at ORAU. In this second act, she said she has enjoyed a chance to advance even further professionally while also connecting with colleagues on a deeper level.

"The work environment, friends and the ORAU reputation for being a great place to work drew me back," George said. "I have experienced this personally, and this definitely inspired me to do my best to go back to a place where I would be my best version of me and continue to grow, develop and thrive."

VIVIAN VARGAS

Vivian Vargas began her career at ORAU in 1992 and spent 25 years helping research participants with their travel needs. She remembers that times were very different during her first round as an ORAU employee, but even then, working at ORAU meant being close to her coworkers.

"We were a very close family. Everyone knew everyone. It was more of a slower time. People were not in a rush. They took time for each other," Vargas said. "We always had big gatherings, with work events, and events with the Employees' Club.

In 2017, Vargas left her job at ORAU to help care for her aging parents in Texas. A few years later, after her mother and father had passed, Vargas said she and her sister both felt the urge to return to Oak Ridge where they had grown up.

Once she had returned to East Tennessee, Vargas said she was interested in returning to ORAU but wasn't sure if it was possible. Turns out, it was. "I wasn't sure if I could come back, being gone for seven years, and I am so grateful I got to come back. ORAU is a very good company, and they care about their people," she said.

In her second act at ORAU, Vargas has found some things to be very different. But what hasn't changed is what made her want to return in the first place: the people.

"It's very different with everyone working from home. It has taken some getting used to, but it does work, and I am enjoying it," Vargas said. "My group, Travel Central, is a great team. They help each other. They get things done, and they enjoy doing it."

Vargas said the relationships she had with coworkers were the main thing that led her back to ORAU. "My draw was coming back to the people I knew. Almost everyone is still here, which is great. It's like I never left."

Using AI to improve radiation dose prediction accuracy for better *health outcomes*

Artificial Intelligence (AI) is rapidly transforming health care and has the potential to also further streamline health care operations and advance medical research, including the field of radiation research being conducted by Adayabalam Balajee, Ph.D. (pictured). Balajee is the director of the ORISE Cytogenetic Biodosimetry Laboratory (CBL) The CBL at REAC/TS performs individualized radiation dose assessment using the "gold standard" dicentric chromosome assay.

"AI-based tools have the potential to revolutionize the field of biodosimetry by improving personalized medicine through the development of predictive algorithms to forecast an individual's risk for radiation-induced injuries," Balajee said.

Balajee co-authored an article titled "Neural Network Ensemble to Detect Dicentric Chromosomes in Metaphase Images," published in the November 2024 special issue of Applied Sciences. The article examines how AI-based tools can advance the field of radiation biodosimetry by improving the accuracy of absorbed-dose estimation and by facilitating the development of predictive modeling for radiation-induced short- and long-term health effects in humans.

In other words, whether someone has had recent or past radiation exposure(s) occupationally, incidentally or accidentally, these AI-based predictive models can help health care providers better estimate the level of radiation dose received and guide in tailoring better treatment strategies.

Balajee collaborated with researchers from the Universidad de Málaga and the Hospital Universitario y Politécnico La Fe in Valencia, Spain, to use the AI-based Convolutional Neural Networks to improve the precision of automated detection of radiation-induced dicentric chromosomes in human lymphocytes. The AI-based dicentric chromosome detection methodology will support a rapid triage by improving the dose prediction accuracy.

To read the abstract of the Applied Sciences article, scan the QR code.

Cytogenetic Biodosimetry Lab hosts delegation from *Japan*

ORISE's REAC/TS recently hosted a delegation from the Japan Nuclear Regulation Authority. The Japanese delegation spent a full day at Oak Ridge National Laboratory before coming to the REAC/TS Cytogenetic Biodosimetry Laboratory (CBL), where they were given a briefing by Carol Iddins, M.D., and Adayabalam Balajee, Ph.D., on the role of REAC/TS and the CBL, respectively.

The Japan Nuclear Regulation Authority was established to learn the lessons of the Fukushima Daiichi nuclear incident of 2011, with the goal of keeping such an incident from ever occurring again. The group's fundamental mission is to protect the general public and the environment through rigorous and reliable regulations of nuclear activities, ensuring that they are ready to swiftly respond to all emergency situations while ensuring that in normal times a fully effective response system is always in place.

In 2011, the U.S. Department of Energy/National Nuclear Security Administration activated REAC/TS to provide advice and assistance in the medical management of the radiation accident occurring at the Fukushima Daiichi Nuclear Power Plant following a devastating earthquake and tsunami in that Japanese province. The staff of REAC/TS and the CBL continually work to build international relationships such as these in support of radiation safety training and radiation emergency response.

REAC/TS travels to Hungary in support of NATO's largest medical exercise series

Imagine the expertise shared, key takeaways and knowledge gained from having the opportunity to be part of North Atlantic Treaty Organization (NATO)'s largest medical exercise series. ORISE's REAC/TS had just such an opportunity in late April/early May 2024. REAC/TS Director Carol Iddins, M.D., and Health Physicist Josh Hayes, Ph.D, participated in the NATO Vigorous Warrior and Clean Care exercises in Budapest and Bakonykúti, Hungary, with more than 1,600 military members from 35 NATO and partner nations taking part, including 42 medical units.

The Vigorous Warrior exercise series dates back to 2011 and is the largest dedicated multinational medical exercise in NATO, organized bi-annually by the NATO Centre of Excellence for Military Medicine and a voluntary host nation. This activity is the first time that the Vigorous Warrior and Clean Care exercises have been combined.

Josh Hayes, Ph.D., NRRPT, associate manager of health physics at REAC/TS, and Carol Iddins, M.D., senior director of REAC/TS, participated in the NATO Vigorous Warrior and Clean Care exercises in Hungary last year.

The main objectives of this year's Vigorous Warrior exercises were to learn about each country's different practices, to clarify professional language differences, and to prepare for modern challenges, such as ensuring the mobility of field hospitals and providing testing opportunities.

"As a member of one of the contributing countries, REAC/TS was able to experiment with different scenarios and concepts as a way to practice and test skills and operations with other nations," said Iddins. "One of the key focus areas was to coordinate the flow of casualties and of medical care in radiological and nuclear scenarios."

This year's exercise was held in conjunction with the Clean Care chemical, biological, radiological and nuclear exercise in Bakonykúti, Hungary, about 50 miles from Budapest. For the exercise, which involved a complex scenario simulating hundreds of casualties per day, numerous medical units and treatment facilities were deployed to train personnel to provide on-site medical support for a NATO operation.

Participating countries were able to practice the entire process of medical support up to surgical intervention, from planning to actual performance in a realistic environment. They were able to participate in concept development and experimentation as well as practice and test their interoperability skills with other nations. One of the key points was the synchronization of the flow of injured, sick people and of medical care processes.

Participation in exercises, courses and international meetings helps REAC/TS continue its leadership role as a deployable asset for the medical management of worldwide radiation accidents and incidents.

ORISE Future of Science Awards recognize *outstanding* scholarship, service among program participants, mentors

ORISE announced the winners of its third annual Future of Science Awards in September 2024. These prestigious awards recognize excellence performed by ORISE program participants in the areas of scientific achievement, professional growth, project contributions and leadership in four categories: undergraduate student and post-baccalaureate, graduate student and post-master's, postdoctoral, and mentor. The Future of Science Awards added the mentor category in 2024. Each winner received a cash prize of $1,000, an award plaque, and recognition from ORISE. The 2024 ORISE Future of Science Awards were presented during a virtual ceremony to the following individuals:

ORISE FUTURE OF SCIENCE AWARDS

REBEKAH SHIELDS

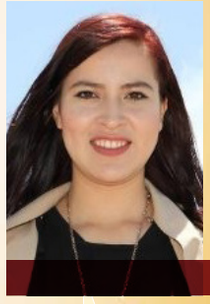
Undergraduate Student and Post-Baccalaureate Award

Rebekah Shields, a 2024 ORISE JUMP into STEM internship program participant, collaborated with the Thermal Energy Storage group at Oak Ridge National Laboratory, where she focused on thermally characterizing a range of materials using differential scanning calorimetry. Currently a senior at Worcester Polytechnic Institute, Shields is pursuing a combined bachelor's and master's degree in materials and mechanical engineering. Looking ahead, Shields aims to further her career in the development of environmentally sustainable heating and cooling solutions.

Nominated by: ORNL mentor Tuğba Turnaoğlu, Ph.D.

SUSANA NAJERA

Graduate Student and Post-Master's Award



Susana Najera, a 2024 ORISE fellow in the Office of Therapeutic Products under the Gene Therapy and Immunogenicity Branch at the U.S. Food and Drug Administration, collaborated on three independent research projects for developing safer and more effective therapies for patients. Najera's research focuses on identifying immunogenic epitopes found on viral vectors and transgenes, developing novel biopotency assays for adeno-associated virus, and characterizing 3D cultures for viral gene delivery. Najera holds a dual master's degree in regenerative medicine and stem cells, as well as molecular targets and drug discovery from Johns Hopkins University.

Nominated by: FDA mentor Ronit Mazor, Ph.D.

KEO CORAK, Ph.D.

Postdoctoral Award

Keo Corak, Ph.D., is currently a computational biologist with the U.S. Department of Agriculture Agricultural Research Service, working in the Genomics and Bioinformatics Research Unit after completing a 2024 ORISE postdoctoral fellowship in the same unit. Corak contributes to the modernization of sugarcane breeding through the integration of genomic, phenomic and big data analytics. Corak holds a Ph.D. in plant breeding and plant genetics and an M.S. in agroecology from the University of Wisconsin-Madison.

Nominated by: Amanda Hulse-Kemp, Ph.D., USDA

GERARDO RUIZ-MERCADO, Ph.D.

Mentor Award

Gerardo Ruiz-Mercado, Ph.D., a research chemical engineer with the Office of Research and Development at the U.S. Environmental Protection Agency, leads projects on decision-support tools, techniques, economics and planning for the sustainable management of end-of-life materials. He holds a Ph.D. from the University of Puerto Rico-Mayaguez and a B.S. from Universidad del Atlántico-Colombia. Ruiz-Mercado volunteers as an adjunct professor at the Universidad del Atlántico, a journal assistant editor, an executive member of the American Institute of Chemical Engineers, and a mentor for Ph.D., M.S. and B.S. students.

Nominated by: David Perez, Florida A&M University

Michalene Rodriguez:

Providing health physics expertise in radiation dose reconstruction

Michalene Rodriguez (pictured, lower right) has dedicated more than two decades of her career at ORAU to radiation dose reconstruction, a specialized area that combines the expertise of health physics with the meticulous process of assessing human radiation exposure.

The Energy Employees Occupational Illness Compensation Program Act (EEOICPA) of 2000 provides for compensation and coverage of medical expenses for energy employees (or eligible survivors if the employee is deceased) who may have developed cancer due to exposure to ionizing radiation while working at a U.S. Department of Energy (DOE) facility as an employee, contractor or subcontractor. The National Institute for Occupational Safety and Health (NIOSH) Dose Reconstruction Project—which is managed by ORAU and a team of partners—covers an extensive network of 332 DOE sites and facilities. Within this vast landscape, Rodriguez is one of twelve health physicists/dose reconstructors from ORAU, who work together with other health physicists from our team of partners, tasked with performing radiation dose assessments of current and former energy employees who have submitted claims under EEOICPA.

The basic principle of dose reconstruction is to characterize the occupational radiation environment to which a worker was exposed, using available worker and/or workplace monitoring information. When a claim is filed by an energy employee or survivor, Rodriguez and the dose reconstruction team delves into a comprehensive database that chronicles the individual's exposure history. This is complemented by site-specific, technical-basis documents that guide the dose reconstruction process for each location, ensuring a tailored and accurate assessment. The complexity and thorough nature of this effort underscores the importance of the team's expertise and work in identifying and quantifying possible radiation exposures.

The dose reconstruction process is intricate, considering both internal and external sources of radiation in the individual's exposure history provided by DOE. External doses stem from photon, electron and neutron radiation. Other external sources considered are environmental exposures and occupational medical exposures. Internal doses to a specific organ are calculated using urine samples or body count data, biokinetic modeling—which basically looks at how substances move through the body— and the Integrated Modules for Bioassay Analysis (IMBA) software. The IMBA software in particular can provide a comprehensive picture of how a substance is absorbed by the body, how it's distributed to different organs and what effects it might have on them, how it's broken down and how it is eventually removed from the body. Using these resources, the team can calculate the rate of internal radiation intake and its impact on specific organs through various means, including ingestion and inhalation. This comprehensive approach allows them to construct a technically defensible dose reconstruction that is crucial for evaluating the claim. In cases where monitoring records are not available, Michalene and the dose reconstruction team turn to site-specific, co-exposure or air monitoring data available for most DOE facilities.

The culmination of their work is the calculation of the probability of causation, a metric that determines whether the employee's cancer is determined "at least as likely as not" to have been related to their employment. If the probability of causation is greater than 50%, then the claimant or their survivor may be entitled to compensation of $150,000 plus medical expenses. This standard of proof underscores the significance of the team's findings in supporting the claims determination process under EEOICPA.

Michalene's commitment to her role as a health physicist and dose reconstructor is a testament to the vital service these experts provide to energy employees and their families. Through these detailed assessments and reports, she not only contributes to a greater understanding of radiation's impact but also helps those affected receive the recognition and compensation they deserve under EEOICPA. As Rodriguez and the dose reconstruction team continue their essential work, they embody the intersection of science and compassion, offering both clarity and closure to those impacted by navigating occupational radiation exposure.

Research and ORAU's University Consortium:

Empowering innovation through collaboration

Investing in research helps ORAU be more competitive, hire great people, keep the great people who are already here, grow our reputation and make an impact on our customers and the nation.

So says Ken Tobin, ORAU chief research and university partnerships officer.

"We have this amazing history and this mission that is so apparent and unique, and we continue to attract new interest in what we do and how we do it," he said.

Part of that interest is fueled by the $19.6 million supported or facilitated by ORAU in research in FY24, a $2.3 million increase over the previous year.

Some of that investment was made in steadfast initiatives like the ORAU-Directed Research and Development program, which funds pilot projects to solve modern challenges in topic areas linked to ORAU's capabilities and our member universities' research strengths. This is a major aspect of our value proposition with our ORAU University Consortium members. Another area of investment is the Ralph E. Powe Junior Faculty Enhancement Awards program, which invests in early career researchers in partnership with university consortium members.

Even more important to Tobin, though, is the programmatic research investment across the ORAU enterprise. ORAU has been tracking time and money invested in research, including research being done for and on behalf of our government agency customers, with the goal of steadily increasing both over the past several years.

"This is not to say these entire programs are research activities, but a portion of our work with these customers involves practical research that moves our customer missions forward," Tobin said.

These are the top four programmatic research activities at ORAU:

- The National Institute of Occupational Safety and Health Dose Reconstruction Project has a strong research component in health physics and exposure science, supporting radiation dose reconstruction.
- National Oceanic and Atmospheric Administration Atmospheric Turbulence and Diffusion Division has a significant research component linked to instrumentation and data analysis for climate monitoring.
- Center for Medicare and Medicaid Services Initiative to Support Promising Research has a research component related to transforming health care delivery, promoting innovation and reducing costs.
- National Library of Medicine All of Us program involves data training and research engagement for academic libraries.

Expanding ORAU's value proposition

The success of ORAU's research enterprise is enhanced by expanding the value proposition for the company's 158-member university consortium.

"Connecting the right people and resources creates a large space for collaboration and innovation," said Cathy Fore, senior director of university partnerships.

ORAU's Research and University Partnerships Office facilitates several pathways for bringing university partners and ORAU subject matter experts together, including the annual meeting and topic-based quarterly dialogue sessions.

"It is amazing the outcomes of getting the right people together," Fore said. University representatives and our subject matter experts "love talking about their research. Not just what they're doing now but where they could take their research and even how it could transition to an economic development opportunity. It's exciting to see that whole cycle of where you can take a research outcome or a product, and ORAU, in partnership with industry and our member universities, remains involved throughout the entire process."

An example of this process at work involves a recent award ORAU received from the Federal Emergency Management Agency (FEMA) around earthquake emergency preparedness and response. Fore said there aren't enough professionals with expertise in seismic activity in the workforce. ORAU determined that 21 member universities have expertise in earthquake science. Three universities—Portland State University, Columbia University and the University of Memphis, which is located in an earthquake zone—were included in the proposal for the project.

"FEMA saw that as a true discriminator," Fore said. "It's a beautiful example of how we can engage all parties together for success."

The expansion of ORAU's university consortium to 158 members is a testament to the organization's role as an expert in the research community. This network of consortium members facilitates an exchange of knowledge and resources that strengthens the ability to address complex challenges. Through this consortium, ORAU, alongside its industry and government partners, creates a robust research collective that benefits everyone involved.

Showcasing ORAU's minority serving institutions

For many years, ORAU's Research and University Partnership Office has also actively worked with the minority serving institutions (MSIs) that are part of the ORAU university consortium. The goal is to connect their expertise with government and private sector organizations to create meaningful partnerships in scientific research and education.

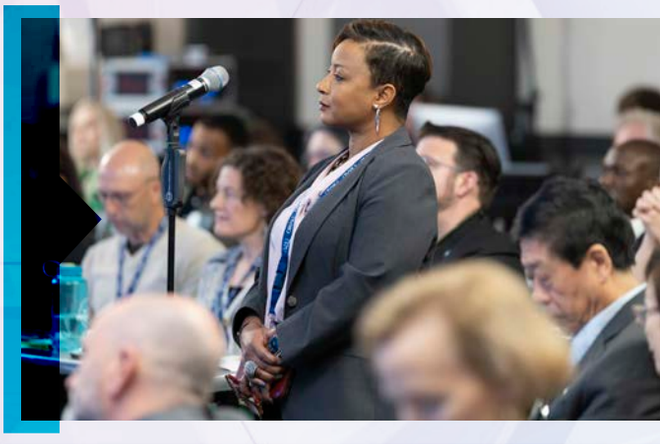
In 2024, ORAU formed the historically black colleges and universities (HBCUs) Research Working Group. The group's purpose is to provide a new way for the 16 HBCs that are part of the ORAU consortium to voice their unique perspectives and thought leadership toward maximizing research, promoting long-term collaborations and enhancing institutional capacity.

Fore explained that creating this new HBCU group was the first step in reorganizing the infrastructure of the ORAU consortium in ways that help member institutions make better connections with private industry.

"We are actively creating research clusters that represent the capabilities of our university consortium members, specifically the Minority Serving Institutions. Formation of these research clusters represents a unique differentiator for ORAU's growth potential," Fore said. "The HBCU Research Working Group is our pilot group to explore how we can advance the institutions' research portfolio and capacity through expanded partnerships with private industry. The goal is to drive an improved infrastructure that is in sync with industry's research and workforce needs."

ORAU's university consortium makes us unique among government contractors. Bringing together the capabilities of our internal subject matter experts and leveraging the research interests of consortium members, we create high value for our industry partners and government customers.

"It's a win-win for everyone involved," Tobin said.



Photos from the 2024 ORAU Annual Meeting of the Council of Sponsoring Institutions

Farming for answers:

ODRD study explores how small family farms are affected by extreme weather patterns

What do you think of when you imagine a farmers market? Is it a large gathering of vendors selling local honey, goat cheese or farm-to-table milk held once a month? A brick-and-mortar store filled with fresh fruits and vegetables from all over the county? Or an open-air vegetable stand run out of a barn, where luscious food is sold from the very farm where it was grown? Whatever the phrase means to you, it's likely that the goods bought at these markets are the result of small family farms. Small family farms—defined as farms with a gross cash farm income of less than $350,000—make up 90% of farms nationwide and 95% of farms in Tennessee. If you've ever visited a farmers market—in any form—you've likely supported a small family farm.

One of the many benefits of being a member of ORAU's university consortium is the opportunity to participate in the ORAU-Directed Research and Development (ODRD) Program. ODRD is a grant program that supports collaborations between ORAU researchers and faculty at our member universities.

One of the projects that received ODRD funding in FY24 focused on the impact of extreme weather on small family farms. ORAU Research Associate Amanda McHale, Dr.PH., and Jennifer Russomanno, Dr.PH., of the University of Tennessee, Knoxville, are leading this project. The two recently discussed their findings on an episode of Further Together: The ORAU Podcast.

"We looked at how small family farms in East Tennessee manage extreme weather events," McHale explained, "and in turn, how that affects the economic health of those farms."

McHale and Russomanno collaborated on a pilot study that focuses on emergency preparedness and response activities of these small family farms, which aligns with ORAU's capabilities in preparedness, response and training as well as health and environment. However, McHale and Russomanno could find no data on how these farms manage extreme weather.

"We had this huge cohort of 18 small farms, but we don't actually know what's happening when we have these tornadoes in December or people lose their entire crop because of a drought," Russomanno said. "We had no idea. So essentially, because we had no idea, we really had to start with collecting our own qualitative data because we had to ask the questions we didn't know the answers to."

For their research, McHale and Russomanno conducted in-depth interviews with farmers residing in five East Tennessee counties.

"The majority of participants in our study—when asked about changes in weather over time in Tennessee—

Amanda McHale, Dr.PH., M.P.H.

Jennifer Russomanno, Dr.PH.
Photo Credit: Gage Talent Agency

responded that the weather patterns are changing," said McHale. "The most common changes we've heard so far are milder winters and stronger winds."

McHale and Russomanno also found that 100% of the farmers they interviewed supplemented their farming with another income.

"None of them were completely reliant on farm income," Russomanno explained. "They all talked about how they farm because of the love of farming and how they really loved their land. But they did say that if they relied on their farm on a full-time basis, their responses to extreme weather could be very different."

Because these families have other incomes, Russomanno said that the farmers are either unwilling or unable to make infrastructural changes to their farms, affecting the ways that they prepare for extreme weather events. This brought about an interesting implication.

"With 95% of the farmers in Tennessee owning small farms, what does that mean for sustainability?" asked Russomanno. "If we're made up of mostly part-time farmers, mostly hobby farmers in our state, what does that mean in the long term for the small family farm?"

Hear the full interview at Further Together: The ORAU Podcast.

FURTHER TOGETHER
THE ORAU PODCAST

SCAN HERE TO LISTEN

Advancing science:

How ORAU research grants help experts and consortium member partners pursue impactful research

The ORAU-Directed Research and Development (ODRD) investment program provides funding for relevant and impactful research projects that align with ORAU's core capabilities and our member universities' research interests. Led by ORAU subject matter experts and leveraging the talents and expertise of our member universities, ODRD projects strengthen and expand the capabilities of both parties to advance science.

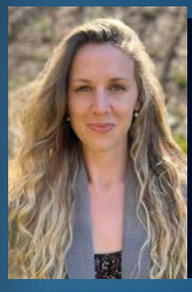
ODRD funding, distributed through a competitive process, serves as seed money for exploratory research and collaboration opportunities between ORAU subject matter experts and our university partners. This seed money and exploratory research provides greater potential for significant funding from external sources. The list below details the FY24 ODRD award winners and their projects.

FY24 ODRD Award Winners & Projects

PennState

Penn State University and Taylor Vaughan, M.P.H., ORAU

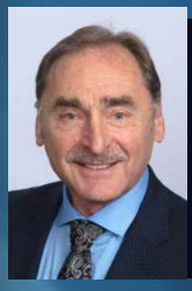
Measuring community and environmental impacts of unconventional oil and gas development



THE UNIVERSITY OF TENNESSEE KNOXVILLE

University of Tennessee and Amanda McHale, Dr.PH., M.P.H., ORAU

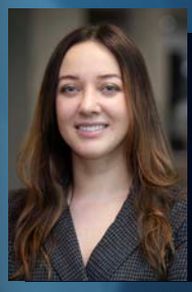
Exploring and assessing the mental, physical and financial health impacts of extreme weather events on small family farms



VIRGINIA TECH

Virginia Tech and Steve Bartell, Ph.D., ORAU

Determining impacts of climate change on environmental antimicrobial resistance exposures for disadvantaged populations



VIRGINIA TECH

Virginia Tech and Alexa Brantley, ORAU

Developing a hybrid mentoring program for autistic undergraduate STEM students for competitive employment

Highlighting innovation:

FY24 ORAU Thought Leadership Research Award winners and their groundbreaking projects

ORAU offers Thought Leadership Research Awards to fund completion of papers for publication in peer-reviewed journals and to cover expenses to present original research and concept papers at national and international meetings. Many times, these awards are used to complete publications and support travel for ORAU-Directed Research and Development grant participants after their ODRD funding has expired.

FY24 ORAU Thought Leadership Award Winners & Projects

Betsy Smither, M.P.H., ORAU

Publication: "Effectively Engaging Faith-Based Leaders on Syringe Services Programs: U.S. Pastors' Knowledge, Perceptions and Questions"

Michelle Schaur, M.P.H., ORAU

Publication: "Building Rapid Capacity for Cultural Communication in Emergency Response – Case Examples in Hispanic/ Latino Populations in Multiple States"

Holly Holt, Ph.D., ORAU

Publication: "Evaluating Lethal and Sublethal Effects of Heavy Metals on Black Soldier Flies in Support of ODRD Application"

Julie Crumly, Ph.D., ORAU

Collaboration to develop a proposal titled, "Unveiling Critical Experiences of Older Adults from Hurricane Katrina"

Matthew Schnupp, M.S.P.H., ORAU

Publication: "Giveashot – Vaccine Initiative Recommendations from Provider Interviews"

The Thought Leadership Research Awards is an example of how ORAU works to address current and future customer needs while advancing the need for research and scientific knowledge to the benefit of ORAU, our university partners and the nation.

Chair, vice chair of ORAU's Council of Sponsoring Institutions bring a passion for research to their roles

The importance of our academic consortium is right there in our name: Oak Ridge Associated Universities. What began as 14 founding universities in 1946 has grown to 132 sponsoring institutions, with 26 member universities in 2024. The Council of Sponsoring Institutions is made up of these 132 entities, selecting the ORAU Board of Directors, and drawing the chair and vice chair from the Board.

Rebekah Hersch, Ph.D., serves as the chair for the Council of Sponsoring Institutions, while Quincy Quick, Ph.D., serves as the vice chair. Both have a strong background and passion for research and are bringing that to their roles on the Council.

Hersch is the associate vice president for Research and Innovation Initiatives at George Mason University (GMU) in Virginia. The Office of Research and Innovation Initiatives oversees GMU's research development services, assisting faculty identify and obtain research grants.

Hersch joined GMU in 2017 after spending 30 years as a soft-money funded researcher. She wrote research grants and conducted research on behavioral sciences and psychology, including substance use/abuse prevention, mental health and HIV/AIDS prevention. However, she is thrilled to be pursuing her current work and passionate about helping faculty and showing others how well a career change can work.

"I remain at Mason a kid in a candy store," she said. "My role in the Office of Research and particularly research development services—as well as my work at ORAU—allows me to learn about nuclear energy work or other kinds of STEM workforce development. I continue to learn every day from incredibly smart people."

Quick serves as the associate vice president for research and sponsored programs at Tennessee State University (TSU), where he oversees the university's research ecosystem and enterprise.

"My role involves building and expanding our research capacity and capabilities as well as forming diverse partnerships across academia, government agencies and other academic institutions," he shared. "This aligns with my involvement on the Board of Directors at ORAU."

Quick emphasized the importance of engaging with the Council of Sponsoring Institutions to strengthen TSU's connections with research organizations across Tennessee.

"ORAU is based in Tennessee, and TSU is a historically black college and university (HBCU)," he explained. "It's important that we create partnerships with as many entities and stakeholders as possible in the research space in the state of Tennessee. So it was a natural fit, I think, in many ways. Participating in the Council gives you a different perspective about things. It gives a clear understanding about what the research focus is outside of the scope of your own institution."

In addition to his administrative duties, Quick is passionate about his research in brain tumor biology and spends his free time writing manuscripts and reviewing articles in the field.

"I love research, the independence of it. I like the creativity of it, so I do it all the time," he said.

Rebekah Hersch, Ph.D.

Quincy Quick, Ph.D.
Photo credit: Tennessee State University

Reenergizing the nuclear energy renaissance

The nuclear energy industry in the United States continues to undergo a renaissance that includes the development of a more cost-effective and efficient infrastructure, such as modular nuclear reactors. However, significant challenges exist in attracting and retaining qualified talent to keep the industry humming.

To help address these challenges, ORAU launched the Partnership for Nuclear Energy (PNE). PNE brings together leading nuclear energy experts to form a comprehensive think tank comprised of more than 95 partners, including leading universities, community colleges and technical skill training organizations, industries producing large and small nuclear reactors, professional industry organizations, national research laboratories, and government agencies.

"We established the Partnership for Nuclear Energy to develop a set of comprehensive solutions that address and correct STEM shortfalls, whether they exist at the national policy and programmatic levels, within education and training initiatives, and/or relative to federal and private industry investments," said Ken Tobin, Ph.D., Chief Research and University Partnerships Officer. ORAU leads and convenes PNE. "This collaborative approach is essential to bridge the gaps, drive collective action and ensure a more comprehensive and sustainable clean energy strategy."

PNE has already had an impact nationally and internationally, including:

- Developing a nuclear workforce capacity building model: The Tennessee Nuclear Energy Workforce Center (T-NEWC) was established as the first local/regional model to address the challenges of educating, training and development talent for the nuclear workforce. This innovative program, piloted in Tennessee, has since been scaled to other regions, including the Great Lakes region, Florida, Texas, Louisiana and Virginia. The model focuses on five key areas: people, pipeline development, process, physical infrastructure and planning. By addressing these critical aspects, the model aims to ensure a robust and skilled nuclear workforce to meet the growing demands of the industry.
- Identifying gaps and making recommendations for a stronger, national nuclear workforce strategy. PNE hosted a workshop in May 2024, attended by more than 90 stakeholders in the nuclear energy sector. The outcome of the workshops was the publication of 17 recommendations to address the needs of the nuclear energy industry, including promoting career awareness, coordinating workforce capacity-building efforts across all nuclear energy organizations and addressing competition from other workforce sectors.
- Developing an academic road map to build nuclear workforce capacity. PNE convened more than 220 stakeholders from K-12 schools, community colleges and four-year institutions in May 2024 for the first-ever meeting of the Nuclear Energy Academic Alliance. Through a series of workshops, the Alliance developed a comprehensive road map for nuclear workforce capacity-building that encompasses all levels of education. The result, to be published in 2025, provides "a clear road map to the entire nation on how to build career awareness, financial resources, pathways and curriculum development to reenergize and equip the potential workforce that will drive the nuclear renaissance," Tobin said.
- Developing and strengthening international partnerships in nuclear energy education and training. PNE is leading partnerships with Canada, the United Kingdom, Japan and new nuclear countries in Eastern Europe and Southeast Asia to support development of national and international strategies in nuclear energy education and training. For example, PNE is leading an Organization for Economic Cooperation and Development/Nuclear Energy Agency international nuclear energy education program in Paris, France. PNE is working with Japan and new nuclear energy countries focused on education, training and workforce capacity-building and is serving as a committee member and workshop leader for the Global Nuclear Energy Rising Stars Program in Germany.

The nuclear energy industry in the U.S. has its challenges. By bringing together key stakeholders, identifying gaps and making recommendations to fill them, the Partnership for Nuclear Energy hopes to strengthen the country's global leadership in the nuclear energy sector.

ORAU Consortium

158 member institutions collaborating with ORAU and its customers and partners in scientific research and mission support

ORAU consortium membership offers exclusive opportunities for faculty and students. Through partnerships with our institution members in 36 states and Washington, D.C., we work with government agencies, national labs and private industry to advance scientific research, education and other critical national priorities. Belonging includes access to unique funding vehicles for research, professional growth, and mutually beneficial collaborations, including ORAU-Directed Research and Development Program and ORAU's Ralph E. Powe Junior Faculty Enhancement Awards Program. University members can also partner with the ORAU STEM Accelerator to help strengthen America's global leadership in STEM through research, education and training, and STEM capacity building.

Air Force Institute of Technology
Alabama A&M University*
Appalachian State University
Arizona State University*
Arkansas State University
Auburn University
Augusta University
Berea College
Carnegie Mellon University
Catholic University of America
City College of New York*
Clark Atlanta University*
Clemson University
College of Charleston
College of William and Mary
Colorado State University
Columbia University
Des Moines University
Drexel University
Duke University
East Carolina University
East Tennessee State University
Eastern Kentucky University
Embry-Riddle Aeronautical University
Emory University
Fayetteville State University*
Florida A&M University*
Florida Atlantic University*
Florida Institute of Technology
Florida International University*
Florida State University
George Mason University*
George Washington University
Georgia Institute of Technology
Georgia State University*
Howard University*
Idaho State University
Illinois Institute of Technology
Indiana University Bloomington
Indiana University Indianapolis
Iowa State University
Jackson State University*
Johns Hopkins University
Johnson C. Smith University*
Lehigh University
Lincoln Memorial University
Louisiana State University
Marymount University*
Maryville College
Meharry Medical College*
Mercer University
Mercyhurst University
Michigan State University
Michigan Technological University
Middle Tennessee State University
Mississippi State University
Missouri University of Science and Technology
Navajo Technical University*
North Carolina A&T State University*
North Carolina State University
Oakland University
Ohio State University
Ohio University
Oklahoma State University
Penn State University
Portland State University*
Purdue University
Rice University
Rutgers University
South Carolina State University*
Southern Illinois University at Carbondale
Southern Methodist University
Southern University and A&M College*
Spelman College*
Syracuse University
Temple University
Tennessee State University*
Tennessee Technological University
Texas A&M University
Texas A&M University-Kingsville*
Texas Christian University
Texas Tech University*
Thomas Jefferson University
Tufts University
Tulane University
Tuskegee University*
University at Albany
University of Alabama
University of Alabama at Birmingham
University of Alabama in Huntsville
University of Arizona*
University of Arkansas
University of Arkansas for Medical Sciences
University of Central Florida*
University of Cincinnati
University of Colorado Boulder
University of Colorado Denver*
University of Delaware
University of Florida
University of Georgia
University of Houston*
University of Kentucky
University of Louisiana at Lafayette
University of Louisville
University of Maryland
University of Maryland, Baltimore County*
University of Maryland, Eastern Shore*
University of Massachusetts Lowell
University of Memphis
University of Miami
University of Michigan
University of Mississippi
University of Missouri
University of Missouri-St. Louis
University of Nevada, Reno
University of New Mexico*
University of North Carolina at Chapel Hill
University of North Carolina at Charlotte
University of North Texas*
University of Notre Dame
University of Oklahoma
University of Oklahoma Health Sciences Center
University of Pittsburgh
University of South Alabama
University of South Carolina
University of South Dakota
University of South Florida
University of Southern Mississippi
University of Tennessee
University of Tennessee at Chattanooga
University of Tennessee Health Science Center
University of Texas at Arlington*
University of Texas at Austin*
University of Texas at Dallas
University of Texas at El Paso*
University of Texas at San Antonio*
University of Texas Permian Basin*
University of Texas Rio Grande Valley*
University of the District of Columbia*
University of Toledo
University of Tulsa
University of Utah
University of Virginia
University of West Georgia
University of Wisconsin-Madison
Utah State University
Vanderbilt University
Villanova University
Virginia Commonwealth University*
Virginia Tech*
Wake Forest University
Washington University in St. Louis
Wayne State University
Western Carolina University
Western Kentucky University
Western Michigan University
Wichita State University
Yale University

42 Members are minority serving institutions, including 16 HBCUs and 1 tribal university

ORAU grant program *celebrates, strengthens* university partnerships for innovation in STEM

Photo credit: Brenda Ahearn/University of Michigan

ORAU's Innovation Partnerships Grant (IPG) program is structured to build stronger relationships between university members and ORAU collaborators by focusing on research and education topics that align well with ORAU's expertise and current priorities. The applications for ORAU funding center around focused workshops/conferences that highlight the university's strategic STEM research and education growth areas and where collaborations with other member universities would add value. ORAU is specifically interested in funding events that can bring more thought leadership around the topic of building a national strategy for STEM education and workforce capacity building.

Examples of ORAU's Innovation Partnership Grants for 2024 include:

- **The University of Michigan's Harper Academy 4 Future Nuclear Engineers**

  The Academy was a four-week residential program that exposed students to nuclear engineering careers and prepared them to successfully enroll in a nuclear engineering program. The focus on nuclear energy lends itself to the mission of ORAU's STEM Accelerator.

  During the event, students experienced the independence and challenges of college student life, enjoyed time with other Harper Academy participants discovering what it takes to be a nuclear climate change agent and took part in exciting research opportunities through hands-on activities.

- **Appalachian State University's "Understanding and addressing health disparities in rural central and southcentral Appalachia" event at Appalachian State University**

  The event brought together academic researchers from Appalachian State University, East Tennessee State University, Virginia Tech and Wake Forest University School of Medicine and numerous regional-based public health professionals. During the two-day event, participants were able to engage in great discussion about the assets and needs of the Appalachian region and to forge new and ongoing collaborative opportunities and partnerships.

  The event included breakout presentations centered around key themes impacting northwestern North Carolina, eastern Tennessee, and southwestern Virginia region, as well as poster presentations, group discussion, and group collaboration and analysis aimed at forging ongoing partnerships. ORAU Senior Director of Health Policy Brenda Blunt served as a keynote speaker for the event.

- **The University of Georgia-hosted 2024 Spring Meeting of the Eastern States Section of the Combustion Institute**

  This conference was attended by more than two dozen other ORAU university consortium member schools. The focus area of the conference was the climate and environment—in particular, the specific areas of clean energy technologies development, energy sustainability, environmental justice, emerging technologies, measurement and impact assessment (of air quality), diversity and inclusion, and data science and analytics. ORAU Health Education Specialist Will Artley served as the subject matter expert.

"Having the chance to educate college graduate students was a welcomed challenge," said Artley. "It provided an opportunity to educate them at the beginning of their careers, which is the best time to start using plain language principles. The Plain Writing Act of 2010 requires federal agencies to use clear government communication that the public can understand and use. This law applies to United States governmental agencies, but it does not apply to non-governmental groups, such as colleges and universities. That does not mean, however, that schools shouldn't incorporate plain language into their curriculum."

In total, there were 15 IPG program award recipients for FY24, and it's important to note that none of this would be possible without strong relationships with university consortium members at the highest levels.

Powe Award Recipient Alycen Wiacek is helping improve breast biopsies with augmented reality

With more than one million breast biopsies performed annually in the United States, according to the Agency for Healthcare Research and Quality, the need to ensure diagnostic accuracy is great. Typically, during a biopsy to extract breast tissue samples for examination of conditions like breast cancer, physicians depend on ultrasound monitors placed within their peripheral view to guide them—which is not exactly ideal for the highly targeted and delicate procedure of biopsy needle placement. Alycen Wiacek, Ph.D., motivated by the impact breast cancer has had on her family and a desire to make a difference, is conducting research to help solve this problem through engineering and augmented reality (AR).

Wiacek is an assistant professor at Oakland University and a Ralph E. Powe Junior Faculty Enhancement Award recipient. In her lab, the Medical Acoustics for Global Health Imaging and Clinical Translation, she and her students are developing a system that integrates various imaging modalities into AR to assist in the targeted biopsy of breast masses. This approach with AR means images and information can be displayed directly in the physician's field of view to better guide the biopsy process. "This can greatly reduce the complexity of this task," Wiacek explains.

Wiacek's vision extends beyond simplifying the technical aspects of biopsies. "If we can have AR-based approaches for biopsy, imagine what else could be done with this technology in health care," she notes, envisioning a future where AR could be used in various clinical settings beyond cancer diagnosis, particularly to increase access to high quality health care throughout the world.

Supported by ORAU's Ralph E. Powe Junior Faculty Enhancement Award, and partnering with the Augmented Reality for Enterprise Alliance, Wiacek's research adds to promising paths for modernization in health care through technology. The Powe Award provides $5,000 in research seed money for junior faculty members, which is matched by the recipient's university. Since its establishment, the Powe Award has provided more than 900 grants totaling over $4.1 million.

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Photo Credit: Robert Hall Photography

Kristin Mattson:

Championing public health, campaigning against cancer, other health threats

Kristin Mattson has always had a desire to help people.

Mattson, ORAU senior health communication and marketing specialist, grew up wanting to be a doctor for as far back as she could remember, but she fell in love with the concept of preventing illnesses instead of treating them.

“It made so much more sense, and I could help many more people by focusing on prevention as opposed to treatment,” she said.

Mattson graduated from the University of Tennessee, Knoxville, with a Master of Public Health degree and is a master certified health education specialist, one of three people at ORAU to hold that certification.

Mattson has directed public health communication, marketing and research for our ORAU clients, managing large cross-functional teams of employees, partners and subcontractors. She specializes in crafting audience-tailored campaigns and delivering training and technical assistance to aid in campaign implementation.

She is proud of her work on projects in the cancer space. Her dad, grandmother, an aunt, a cousin and one of her best friends were all diagnosed with breast cancer.

“It has been a passion of mine to work on projects that prevent people from having to go through cancer,” Mattson said. “I’ve seen it. It’s terrible. Whatever I can do to prevent anyone from having to go down that path, I’m happy to do it and have an impact.”

Mattson was part of the team that worked on two breast cancer-related projects for the U.S. Centers for Disease Control and Prevention (CDC). “Bring Your Brave” and “Living Beyond Breast Cancer” initiatives helped women better understand their risk factors and how to prevent cancer.

Whether she’s working on communications campaigns and materials for breast cancer prevention, improving the health of school-aged children, or educating the public about harm reduction, Mattson says giving people a platform to share their stories makes a huge difference.

“Storytelling is one of the most impactful ways we can change behavior,” she said. “There’s an art to it. It’s an art and a science.”

Mattson has led the development of a suite of 71 patient-provider health communication materials for programs such as CDC’s “Let’s Talk” initiative, including the creation of a new brand identity. She has also directed communications support for CDC Healthy Schools Program for over a decade, earning a nomination for a CDC Directors’ Award in creative communications.

Since 2016, Mattson’s work has primarily been focused on improving access to information and education about evidence-based harm reduction strategies like overdose prevention and syringe services programs.

Additionally, through her work on the National Institutes of Health’s HEALing Communities Study (where HEAL stands for Helping to End Addiction Long-term), she helped 16 communities across Massachusetts. She led the development of more than 1,250 tailored overdose prevention materials and supported campaign planning and dissemination efforts for eight separate campaigns about naloxone, fentanyl, medication-assisted treatment for opioid use disorder and stigma challenges.

She has also conducted more than 60 interviews and led close to 20 workshops aimed at enhancing the communication capabilities of public health entities, including firefighters, law enforcement and emergency management personnel, on behalf of the CDC, National Institutes of Health, Appalachian Regional Commission, and National Association of County and City Health Officials.

When presented with the opportunity to use her skills to help other people, Mattson is willing, enthusiastic even, to do just that!

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Epidemic of loneliness:

ORAU experts address mental health, addiction drivers with the power of connection

Some experts say that living a life with meaningful social connections—that is, the feeling that you belong to a group and generally feel close to other people—may be getting more difficult to attain for several reasons, including time spent on social media, political polarization and the attrition of friends as we age.

In fact, U.S. Surgeon General Vivek Murthy, M.D., MBA, declared in 2023 that the country is experiencing a loneliness epidemic. Loneliness has significant consequences on our physical and mental health.

In his book, Together: The Healing Power of Social Connection in a Sometimes Lonely World, Murthy writes that loneliness leads to a 29% increased risk of heart disease, a 32% increased risk of stroke, and a 50% increased risk of developing dementia in older adults.

Lack of social connection increases risk of experiencing mental health issues, including substance use disorders, depression, anxiety and stress by as much as 60%. Overall, loneliness increases the risk of premature death by

more than 60%, as much as smoking up to 15 cigarettes a day, Murthy said.

Loneliness and feelings of isolation are not just adult problems. These feelings may be most prevalent in adolescents, 70% of whom say they experience recurring feelings of loneliness much of the time, according to the National Institutes of Health.

Despite these dire statistics, there is hope through the power of connection.

ORAU experts have been demonstrating the power of connection for decades using a community-based approach to their work with several populations, including people with substance use disorders, people experiencing homelessness, women who are pregnant and post-partum and youth and adolescents.

"We know that loneliness and isolation contribute substantially to mental health challenges," said Kristin Mattson, ORAU senior health education specialist. "The risk of developing depression among people who report feeling lonely is often more than double that of people who rarely or never feel lonely."

Mattson does her job remotely. She lived in Minnesota, where she didn't have friends or family nearby. She got pregnant with her son, Noah, and thought she would make "mom friends" from day care, play dates and mom's day-out events.

Then the pandemic hit.

"All of those plans I had to develop these friendships and get out of that feeling of being isolated, those dreams came crashing down because all of the mom groups, the meetups, all of those were cancelled. My son couldn't get into a day care because day cares weren't accepting new kids at the time," Mattson said.

"I remember feeling extremely depressed to the point where I had to seek out help from my health care provider," she said. "It really, truly impacted me on a day-to-day basis, so much so that I ended up moving back to Florida. Florida is where my family is, it's where I grew up, and so I felt that to be the best version of myself, for my family, for my son, I needed a community of people who could support me and lift me up. I can't even begin to tell you what a difference it has made just reestablishing those connections."

Connection and substance use disorders

"Connection with others clearly matters in reducing both feelings of loneliness and isolation. Mental health and substance use disorders are often linked and share some of the same risk factors, including trauma, stress, and genetic predisposition," said Jennifer Reynolds, ORAU senior manager of health communications, marketing and promotion.

ORAU has worked over the past 15 years on projects that demonstrate the power of connection through the development of community-based campaigns, technical assistance projects, peer support tools and resources that reduce stigma around substance use disorders.

For the past five years, ORAU has supported the HEALing Communities (or Helping to End Addiction Long-term) Study of the National Institute on Drug Abuse and the Substance Abuse and Mental Health Services Administration.

"We partnered with community coalitions and all four of the research sites—University of Kentucky, the Ohio State University, Boston Medical Center and Columbia University—to design campaigns on a range of topics," Reynolds said. "topics like educating individuals on how to carry and use naloxone to assist someone experiencing an overdose, available medications for treating opioid use disorder, and steps that can be taken at the community level to reduce stigma."

The team helped expand local capacity to engage communities through the creation of 8,000 campaign materials tailored to different audiences, including organizations that treat substance use disorders, dental and primary health care providers, community organizations and individuals and families struggling with substance use. ORAU's health communication team also created a one-of-a-kind YouTube library of stories of people struggling with substance use who share their advice for how to enter treatment and sustain recovery over the long term. "A common saying in recovery spaces is that 'the opposite of addiction is not sobriety, but connection.' We've been honored to work with national, state, and local partners for more than a decade, to help people access evidence-based treatment and to build the environments and connections that help individuals and families truly heal."

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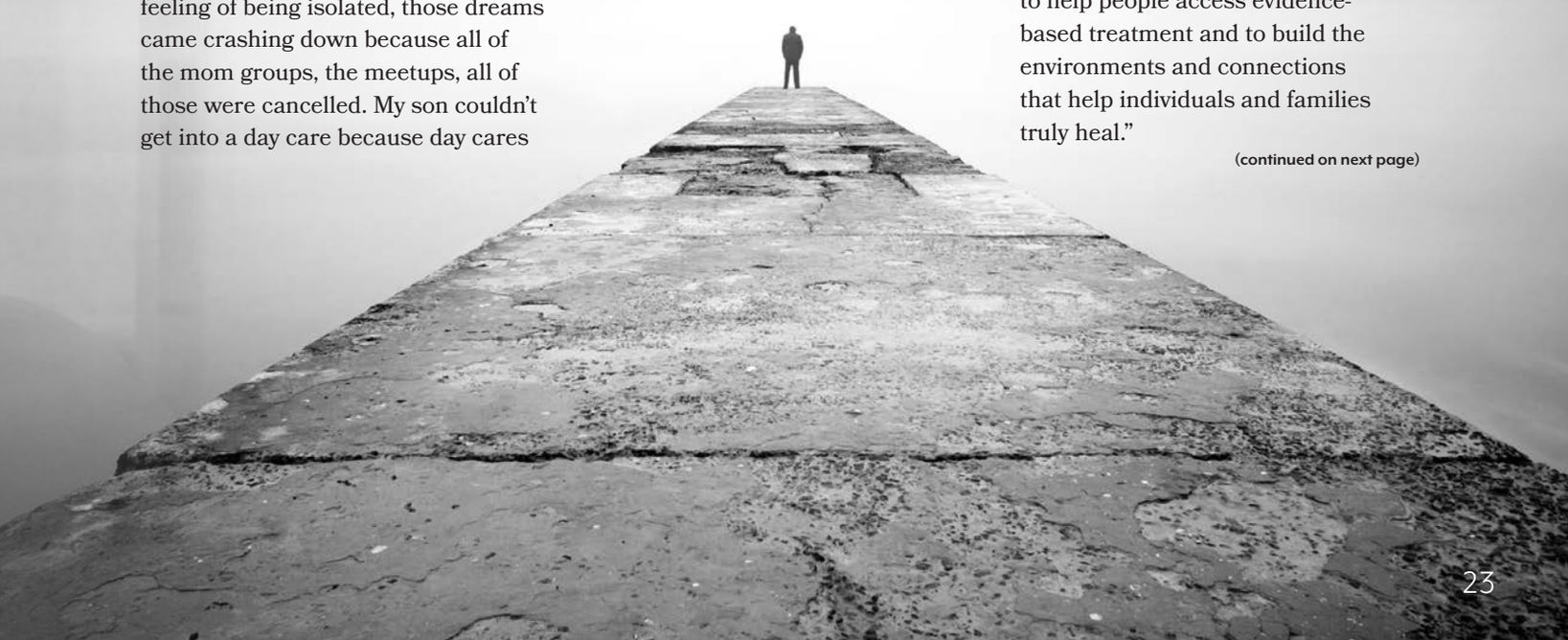

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Mental health and pregnancy-related death

The leading cause of pregnancy-related death in the U.S. is mental health conditions, including suicide and overdose related to substance use, Reynolds said. That's why she's excited about new work focused on maternal and infant health funded by the Centers for Disease Control and Prevention's (CDC) National Center for Birth Defects and Developmental Disabilities and the Division of Reproductive Health.

ORAU has partnered with Faces and Voices of Recovery, a nonprofit recovery advocacy organization, to create peer support training focused on ways to best support women who are pregnant and postpartum and parents of children up to the age of two.

"The ORAU team has spent the past year doing formative research, including literature reviews, surveys, convening an expert advisory group and doing focus groups with pregnant and postpartum women facing substance use challenges. "We are learning that three-to-six months postpartum is an especially dangerous time when new parents are at high-risk for returning to use and subsequent overdose death. Trained peer supporters can truly save lives by providing non-judgmental support when it's needed most," Reynolds said. "Armed with all of those insights, we are ready to create the training program in 2025, and we can't wait."

Adolescents and the role of connectedness

ORAU has worked for more than a decade with the CDC's Division of Adolescent and School Health (formerly CDC's School Health Branch) to create and promote tools and resources that schools and parents can use to increase connectedness among youth, including through family engagement and community involvement, professional development opportunities for staff and promoting involvement in school-led clubs and sports activities.

"We know that connectedness is an important protective factor for student health," Mattson said. "Students who feel more connected are less likely to engage in risky behaviors, including violence, sexual activity that could lead to teenage pregnancy or sexually transmitted diseases, and substance use. The ones who feel connected are more likely to engage in positive health behaviors like physical activity and healthy eating. They are also more likely to have higher grades, higher test scores and better school attendance and are more likely to graduate from high school."

Mattson said this work serves as a primary prevention opportunity for youth by helping them combat loneliness and feelings of isolation and create strong bonds with people at school, their peers and teachers.

"Our youth spend most of their time in schools. So schools really are an ideal place to implement these types of primary prevention measures."

Reversing isolation and lack of connectedness

So how do we reverse the epidemic of loneliness? ORAU's experts contend the answer is in seeking real, live connection. Screen time, especially social media, can be a contributing factor to heightened mental health and isolation issues, said Reynolds.

"Social media can be a helpful tool to connect with old friends or find local interest groups or volunteer opportunities. But too many people, especially young people, are using social media excessively and at the expense of forming real social relationships. We're very quick to compare ourselves to influencers or others online. Their lives look and sound better than ours, and we aren't keeping up. That comparison game can take a toll on our mental health," Reynolds said.

Community organizations and support groups, church activities, volunteer opportunities and hobby clubs can be great starting points for finding connection with other people—whether you're a student, a pregnant mother struggling with mental health issues, or someone generally struggling with substance use disorder. If joining a new group is outside of your comfort zone, Reynolds recommends leaning into the people in your life, even if you're not particularly close to them.

"Call and check on someone," she said. That simple act can make a world of difference and may be the start of a new connection that could save someone, possibly even save their life.

She added that government agencies and other public health and philanthropic foundations should prioritize funding local communication and capacity-building initiatives to combat the loneliness epidemic. "Investing in programs that foster inclusive connection and collaboration with organizations already addressing some of the public health issues we spoke about ensures that we're creating culturally relevant, accessible, and sustainable solutions will that ultimately lead to enhanced resilience and healthier, happier populations."

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Driven by excellence:

Jim Sears joins ORAU as senior vice president after over 3 decades in U.S. military

It seems like a big change to go from a military career of more than three decades to senior vice president at ORAU. But Jim Sears intends to bring every ounce of dedication and passion from his time in the U.S. Air Force (USAF) to his new position at ORAU.

"After a fulfilling career in the U.S. Air Force, I was drawn to ORAU," said Sears. "I believe deeply in our mission to advance national priorities and serve the public interest by integrating academic, government and scientific resources globally."

Sears was named ORAU's new senior vice president in August 2024. In his role, he leads a dedicated team who implements ORAU's mission, overseeing a diverse portfolio of programs covering areas such as workforce solutions, public health, epidemiology and exposure sciences, and emergency preparedness to name a few, guiding a large team to deliver innovative solutions. He explained that he is grateful to have joined ORAU and to be taking part in this work that serves so many of our federal customers.

"I'm honored and humbled to be leading such a talented team in delivering a diverse offering of services and solutions to our clients," Sears said.

During his distinguished career in the USAF, Sears served as the chief executive of several large organizations and was an accomplished combat pilot. With more than 3,600 flight hours across 11 different aircraft, Sears flew missions in Bosnia, Yemen, Iraq and Afghanistan. Notably, Sears commanded the 455th Air Expeditionary Wing in Afghanistan and the Air Force Operational Test and Evaluation Center. Nearly half of his career was dedicated to developing the next generation of airmen, where he excelled as both an instructor and senior executive. His commitment to excellence and innovative leadership earned him a range of top military honors, including the Distinguished Service Medal for exceptionally meritorious service in roles of great responsibility, the Legion of Merit award for outstanding services and achievements, the Distinguished Flying Cross for heroism in aerial flight, and the Bronze Star Medal for meritorious service in ground combat operations.

Sears holds a Bachelor of Science degree in International Affairs from the United States Air Force Academy, a Master of Arts degree in Human Resource Development from Webster University, and a Master of Science degree in Strategy and Joint Campaign Planning from National Defense University.

"Jim's impressive background, leadership and strategic experience are helping ORAU remain at the forefront of addressing critical national challenges with excellence, innovation, collaboration and integrity," said ORAU President and CEO Andy Page. "He is already driving his team's success in meeting complex challenges with effective, evidence-based strategies."

Sears has high, but straightforward expectations for the employees on his team: "Integrity and excellence will drive our actions, we will all know the ORAU mission and our roles in it, and we will make everything we touch better," he said.

After his retirement from the USAF, Sears and his wife decided to move to Tennessee to be closer to their daughters. Their younger daughter is following in her father's footsteps as a test engineer for the USAF at Arnold Air Force Base in Middle Tennessee. Their older daughter attended the University of Tennessee Nursing School in Knoxville. The family has moved 16 times to accommodate the military, but after settling down in East Tennessee, they have fallen in love with the area. ORAU is thankful to have Sears, as he is already bringing integrity, drive and passion not just to our clients but to our company as well.

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Upon further review: How ORAU is pursuing innovative solutions for continued peer review effectiveness, integrity

Each year, federal agencies award billions of dollars to fund research proposals and projects that are determined to show the most promise. With many qualified contenders, how can these agencies effectively decide which proposals are the best? The most time-tested and widely accepted method is peer review. ORAU is an independent third party with decades of experience managing all phases of scientific peer and merit reviews. While managing a fully integrated peer review and grants management system, known as PeerNet, our peer review team is always looking for innovative solutions to improve on current processes and capabilities.

Enhancements to PeerNet

PeerNet, ORAU's proprietary system, is specifically designed to facilitate effective peer reviews through an easy-to-navigate online portal. Short for Proposal Evaluation and Electronic Review Network, PeerNet is a structured system where data is delivered quickly to inform decision making, where review scores and comments from subject matter experts are entered, and where common criteria and scoring methods allow for reliable comparisons. Recently, the PeerNet development team made several enhancements to the core product, including 1) a new integrated database that provides access to more than 50,000 subject matter experts for assignment to evaluations, 2) a preview mode that allows peer reviewers to see collection and evaluation questions much earlier in the peer review process, and 3) a modification that allows for downloading a copy of the evaluation in Microsoft Word to make working offline easier. The team continuously improves PeerNet's functionality based on feedback received from customers, reviewers and system administrators.

Researching how AI and machine learning can enhance peer review

With the evolving technologies of artificial intelligence (AI) and machine learning, ORAU's peer review team began researching how these technologies could potentially translate to a more effective peer review process. The team authored a white paper on which aspects of the peer review recruitment and science writing work could be positively enhanced by AI. The team identified steps in their processes that would be amenable to AI solutions, providing brief context and identifying potential tools. Importantly, a section was also devoted to how AI has and could be used to address accessibility for all. A final section discussed ethical considerations as well as risks when implementing AI into systems and processes such as a peer review.

Developing early career scientists/researchers to become reviewers through learning modules

Developing early career scientists and researchers to become reviewers is critical to broadening future reviewer pools. ORAU's peer review team is working to develop a reviewer education curriculum targeting early career scientists and others less experienced with peer review. The curriculum will provide resources to develop and/or improve skills related to evaluating grants, proposal applications and funded projects. Educational topics will range from general subjects like how to be a reviewer to more complex topics focused on reviewer integrity and fairness, protecting research integrity and other areas specific to scientific peer review processes. The curriculum will be developed in alignment with other federal agency peer reviewer guidance best practices.

Building bridges between HBCUs, MSIs and partners in government and private sector research

In 2024, Desmond Stubbs, Ph.D., director of broading engagement strategies for ORAU, had numerous opportunities to help advance ORAU's mission by strategically engaging and leveraging the strengths of HBCUs and MSIs to expand ORAU's reach and impact among traditionally underserved groups in science, especially for partnerships in government and private sector research.

JACKSON STATE UNIVERSITY (JSU)

During the summer of 2024, Stubbs had a unique opportunity to connect with new students at Jackson State University, which is both an ORAU Consortium and an ORAU HBCU Working Group member. Stubbs, along with Manon Fleming (pictured below) from the ORISE K-12 Education group, were special guests at JSU's THEE Aristocrats STEM and Health Sciences Program, a two-week "boot camp" designed to help rising freshmen prepare for the rigors of succeeding in STEM academic majors. Fleming led a fun, hands-on STEM activity called the Barbie Drop where students designed and created bungie cords at a scale to fit a Barbie doll by using only rubber bands. The students then tested their designs by fastening the cords to the dolls' feet and dropping them bungie-jump-style from greater and greater heights to see which design best protected the Barbies from crashing into the ground. After that exercise, Stubbs spoke to the students about the importance of hands-on research internships they would need to pursue during their academic careers. He then introduced them to Zintellect, the ORISE-managed web platform that allows university students to search for and apply for internships and fellowships at dozens of federal research laboratories.

XAVIER UNIVERSITY

In collaboration with ORAU colleagues John Dolynchuk and Arminta Mack, Stubbs also provided critical technical assistance in proposal development to Xavier University of Louisiana, resulting in transformative research capacity-building support. Stubbs has helped Xavier secure more than $30 million in new research funding, spotlighting the unique capabilities of minority-serving institutions and fostering impactful partnerships that promote inclusive innovation.

EXXON MOBIL PARTNERSHIP

In May 2024, representatives from ORAU and ExxonMobil (EM) signed a memorandum of understanding that established a working relationship between the two companies for the purpose of connecting HBCUs and MSIs with the environmental research enterprise at EM. This agreement led to an outreach event facilitated by Stubbs and hosted at EM's Baton Rouge Chemical North facilities where undergraduate students and faculty learned about three focus areas of EM research:

- Environmental justice, focusing on community health and the development of green spaces such as water gardens and parks
- Bioremediation, exploring nature-based solutions to environmental challenges
- Biodiversity monitoring and reporting, with a focus on biomonitoring and remote sensing technologies

Students and faculty attending the event learned about EM's research projects in those areas discussed potential research opportunities with EM in those areas, and collaborated with each other on creating proposals to bring those research ideas to fruition.

KENNEDY SPACE CENTER PARTNERSHIP

Through a Space Act agreement with NASA's Kennedy Space Center, Stubbs, alongside Frank Pasztor from ORAU's Business Development team, spearheaded several events with NASA, all intended to help HBCU/MSI faculty members learn about the ways they could connect with NASA on their research initiatives. Stubbs reached out to HBCU/MSI faculty from around the country and invited them to attend a series of three webinars hosted by ORAU. Each webinar featured NASA research staff and allowed HBCU faculty members to meet NASA scientists, learn about the initiatives they are pursuing and discuss ways they could partner on those research projects.

Stubbs said he hopes all these efforts in 2024 will represent just the start of even more work by ORAU to build bridges between HBCUs, MSIs and a growing number of partners in government and private sector research.

"Together, these efforts broaden ORAU's influence in advancing national priorities in science, health and education," Stubbs said. "ORAU's commitment to engaging HBCUs and MSIs with the federal research enterprise and the private sector couldn't be stronger."

ATDD: 50 Years of excellence and a forecast of sunny skies

The Atmospheric Turbulence & Diffusion Division (ATDD) is one of the oldest research laboratories within the National Oceanic and Atmospheric Administration (NOAA). ORAU has been providing staff and expertise to ATDD since 1974, which means we celebrated 50 years of partnership in 2024. ATDD is a division within NOAA's Air Resources Laboratory (ARL). In supporting ARL, ATDD is part of ORAU's scope of work.

ATDD was initially established as a field station in Oak Ridge, Tennessee, just after World War II ended. At the time, ATDD's primary mission was to provide specialized expertise in the event of an accident or incident where radionuclides were dispersed in the atmosphere. Since that time, ATDD has focused on critical national research in the fields of air quality, atmospheric dispersion and climate science.

ATDD's main strength lies in the breadth and diversity of backgrounds of the staff: most have been trained in meteorology and engineering, with a few specializing in fields such as forestry and ecology. This experience has facilitated ATDD's involvement in a variety of opportunities, such as supporting air shows and launching weather balloons. More significantly, ATDD manages climate monitoring stations for the U.S. Climate Reference Network (USCRN). In 2024, there were 143 stations (116 in the continental U.S., 25 in Alaska and 2 in Hawaii). Each station is designed to primarily measure precipitation and temperature and, secondarily, wind speed, surface temperatures, solar radiation, relative humidity and moisture and temperature of the soil as well. The ORAU team assisted NOAA by installing and continually monitoring and maintaining these stations. "Our team is on the road at least 150 days a year servicing the USCRN towers," ORAU Manager Mike Rutherford said. "We touch each tower in the network annually (and more often if needed) to ensure all instrumentation is working optimally and our readings are as accurate as possible."

Considering the design and resulting data of the USCRN, ATDD noted a gap in research. Whereas the USCRN weather stations gather data from mostly rural, untouched areas of the country, scientists and engineers also wanted to study weather and climate impacts in more populated neighborhoods. Building UrbanNet was the answer, which involved installing similar weather stations in metropolitan areas. There are now four locations in Washington, D.C., and one in College Park, Maryland. In urban settings, there are more variables, such as vehicle emissions and heat from asphalt and concrete buildings. With the ability to collect data from cityscapes, ATDD can extrapolate valuable information about weather patterns in locations where more people live.

Behind the achievements ATDD has had with programs like UrbanNet are innovative thinkers and problem solvers. "As much as we have to highlight in our 50 years, it's really our people—not just our programs—who have positioned ATDD as a leader in environmental science," said Kathy Rollow, ORAU director, ecology and environment operations. "We get the job done because we can answer challenges with innovative solutions."

To name a few examples of ingenuity over the years, longtime engineer ATDD Research Manager Randy White designed a custom fitting that resembles a hockey puck for ATDD's weather station towers. All the

instruments the team uses to gather data are necessary accessories, but add-ons must be attached with care so that the integrity of the tower is not compromised. “Think of it this way,” White explained. “If you squeeze the sides of an aluminum soda can, what happens? It’s easy to crush, right? We don’t want to risk weakening our towers as we crank U-bolts, which is usually what’s used. That’s fine on a 10-foot section, but with most of our towers rising 30 feet, we needed a safer solution. As I thought through it, I wanted a design that perfectly matches the radius of the pipe. That way, when it’s squeezed, as we’re attaching any instrument add-ons, it won’t create a dent in the tower.” The “puck” has revolutionized this past problem for ATDD towers. White has constructed more than 30 pucks on site in the ATDD machine shop and can make more as needed.

Meanwhile, Dominick Christensen is a newer engineer to the team. He was collecting data from a long-term research tower when he realized it would benefit ATDD if they could visualize the data as it comes into the system. If an outlier is there, it may be hard to spot on an Excel sheet, but if it was on a graph, it would be quicker and easier to identify. So, he built a website that plots the data points on a graph. Right away, analysts noticed intermittent spiking, which led them to address an issue with an instrument.

Engineer David Senn similarly recognized a couple of needs and developed two inventions in response. One idea was to design and build soil temperature probes that are inserted into the ground, measuring a subsurface temperature profile from one inch below ground level down to 39 inches beneath. Measuring at different depths produces a more complete picture of the data. Additionally, Senn designed and constructed a circuit board with two-way communication between the board and the intelligent soil probes. ORAU owns the rights to this board, and other researchers are now using this technology!

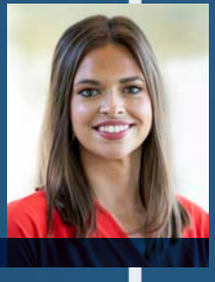
Upon retirement of ATDD’s drone pilot in 2023, Senn raised his hand and took on unmanned aircraft flights. He became a private pilot in 1982 and has earned his commercial pilot certificate for both airplanes and gliders. (He even owned a company that flew banners around the University of Tennessee, Knoxville’s famous Neyland Stadium!) Since he began flying, Senn has accumulated 1600 hours as a pilot in command of an aircraft. One love led to another, and he soon began flying radio-controlled model aircraft. With the opportunity to fly drones for NOAA, Senn earned his remote pilot certificate. The drones he operates are equipped with instruments and cameras designed to gather data specifically for the atmospheric boundary layer, the lowest portion of Earth’s air layer directly impacted by the planet’s surface.

With ORAU’s support over the decades, ATDD has played a pivotal role in advancing the scientific community's understanding of atmospheric processes and their implications on weather, climate and air quality. Leaning into ORAU’s consortium, ATDD has collaborated extensively with universities, other NOAA labs and international organizations to address some of the most pressing environmental challenges. The partnership between ORAU and NOAA-ATDD has been strategic and has led to invaluable research results. With forward-thinking leaders, both ORAU and ATDD foresee sunny skies as the team produces quality data that will continue to drive the future of atmospheric science for years to come.

7 years of success

solving the government's need for top talent

To help meet the needs of our federal government customers for STEM talent and a tech-savvy workforce who could take the first steps toward a long-term federal career, ORAU formally created the Workforce Solutions team. It initially consisted of a small group of recruiters who brought a deep level of experience in finding the exact type of early-career professionals these agencies needed. Over the past seven years since its creation, that team has grown each year both in the size of the team and in the number of customers they have successfully served.



2018: FORMATION OF ORAU WORKFORCE SOLUTIONS

ORAU Workforce Solutions was initially founded with a focused mission to address the challenges of recruiting top-tier STEM talent for government sectors. However, recognizing the evolving needs of the workforce, we have successfully expanded our expertise beyond our original scope. Today, we take pride in our proven track record of recruiting superior STEM talent as well as high-caliber executives, skilled craft laborers, dedicated contracts staff, innovative HR talent and beyond. This strategic expansion of our services has enabled us to meet the growing and diverse needs of our clients more effectively.

2019: NNSA RECRUITING CONTRACT ACHIEVEMENT

Building on its foundational year, the Workforce Solutions team achieved a major milestone in 2019 by securing a contract allowing them to provide recruiting services to multiple National Nuclear Security Administration (NNSA) sites. This accomplishment underscored the team's capability and commitment to supporting vital national security missions through strategic talent acquisition.

2020: CONTINUATION OF U.S. EPA'S NATIONAL STUDENT SERVICES PROGRAM

In 2020, the Workforce Solutions team continued its growth trajectory by winning a follow-on, five-year award to manage the U.S. Environmental Protection Agency's (EPA) National Student Services Contract (NSSC). With over 200 employees on the contract, this achievement demonstrated ORAU Workforce Solutions' expertise in recruitment and early career staffing.

2021: LEADERSHIP ENHANCEMENTS AND TEAM GROWTH

The year 2021 marked a pivotal moment for the Workforce Solutions team with the addition of two members to its management team. Under the guidance of Workforce Solutions Director Michelle Goodson, the duo of Associate Manager Geri Philpott and Manager Chelsea Hill (pictured, top, middle and bottom, respectively) embarked on the next step of the group's journey. The new leadership team played a crucial role in more than doubling the number of team members/recruiters in one year. This expansion was instrumental in enhancing the capacity and capabilities of the team to meet its clients' evolving needs.

2022: RECORD HIRING FOR NNSA CUSTOMERS

Demonstrating its growing effectiveness in recruitment solutions, the Workforce Solutions team achieved a new milestone in 2022 by hiring more than 870 permanent employees for its NNSA customers. This accomplishment not only showcased the team's commitment to supporting national security but also its proficiency in navigating the complexities of the STEM labor market.

2023: SUSTAINED EXCELLENCE IN NNSA STAFFING

Continuing its track record of excellence, the Workforce Solutions team successfully hired more than 1,300 permanent employees for NNSA customers in 2023. This accomplishment reaffirmed the team's role as a trusted partner in addressing the critical staffing needs of the NNSA, further solidifying its reputation in the scientific and technical staffing arena.

2024: U.S. EPA TEAM'S EXCEPTIONAL PERFORMANCE RECOGNITION

This year, the Workforce Solutions staff responsible for managing the EPA Student Services contract was honored with its sixth consecutive "Exceptional" Contractor Performance Assessment Reporting System score. This recognition highlighted the team's consistent excellence and unwavering commitment to delivering high-quality services, reinforcing its position as a leader in government contracting for staffing.

Calculated Innovation:

ORAU health physicist develops app to guide survey planners to best tools, techniques

Calling it fun and nerdy, David King, C.H.P., (pictured, lower right) an ORAU senior health physicist, used to create a new calculation each time he determined which radiation detector works best for which kind of contamination. Then, he had an idea: what if an online calculator tool existed? King thought if there was a way to standardize and simplify the complex steps and mathematics that go into preparing for a radiation survey, it would help countless health physicists who do the same kind of work. King's concept was to build an application that would guide people during the planning stage of a radiation survey as to what techniques and tools they use.

"Different radionuclides emit different types of particles—alpha particles, beta particles, etc.—and there are different instruments that are better or worse for measuring those emissions," King explained. "If you have the wrong detector or the wrong technique, you may not find the contamination. Which detector is best for finding radium contamination in soil or uranium contamination of a lab benchtop, for example? The online tool helps survey planners make good choices."

With more than 30 years of experience as an environmental health physicist, King took his proposal for a new tool to ORISE's virtual institute. Excited about the potential for this innovative application, the ORISE executive committee decided to fund the development of King's online tool in fiscal year 2023. Aptly named, it was the birth of the HP Calculator. This product is available as a complimentary app on the ORISE website at-https://oriseapps.orau.gov/hpcalculator.

King is one of the instructors in ORAU's Professional Training Programs (PTP). ORAU has long distinguished itself as a teaching organization and currently offers more than 30 classes a year between in-person and online courses. Of these opportunities, King is often involved in at least a couple each month. In those classes, King offers participants the link to use his HP Calculator at any point they may need it in the future. "I usually direct PTP class participants to this online tool to help them understand more deeply the things we can't cover during the course," King said.

The app user can plug in information about the work area: will it be a soil survey or a structural survey? The process is intuitive as the tool prompts the user to provide answers. The HP Calculator even defines terms, such as the index of sensitivity, if they're unsure what to input.

"It's a complicated method, and even experienced health physicists may struggle to understand all the details. The website is laid out to help users understand each step of the calculation, what the terms mean and how everything fits together. We want to teach health physicists how to select the right radiation instrument and provide an effective tool that does not require special software, experience or expertise to operate."

ORAU has been a leader in radiation safety and health physics for more than 75 years. The HP Calculator is an innovative, educational and instructional offering that keeps us at the forefront of the industry.

FURTHER TOGETHER
THE ORAU PODCAST
SCAN HERE TO LISTEN

Rising researchers in focus

ORAU helps rising researchers—whether students, early-career postdocs or up-and-coming scientists—bridge their academic education and experience with opportunities to make a real impact on critical national missions through major federal agency programs managed by ORAU, such as the NASA Postdoctoral Program (fellowships) and the U.S. EPA Student Services Program (employment). Below are just a few of the individuals in these fellowships and jobs whose research endeavors in support of NASA and EPA missions really shine.

U.S. EPA Student Services Program

DANIEL ASHAT

School: University of Florida, master's in medical physiology and pharmacology

Photo Credit: EPA

Job/Agency/Location: Human Research Specialist/ Program Analyst, EPA Office of Research and Development, the Office of Science Advisor, Policy and Engagement, and the Program in Human Research Ethics and Oversight, in Washington, D.C.

Research: Ensure rights and welfare of human research subjects are protected through communication of science and the public's trust in the scientific research process.

CAMERON ALEXANDER

School: North Carolina State University, bachelor's in molecular and structural biochemistry.

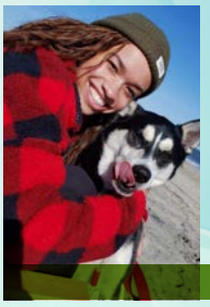


Photo Credit: EPA

Job/Agency/Location: Cell Line Support Lab Technician, EPA Office of Research and Development, Center for Computational Toxicology and Exposure, Biomolecular and Computational Toxicology Division, Advanced Experimental Toxicology Models Branch in Research Triangle Park, North Carolina.

Research: Develop a biomarker for the glucocorticoid receptor to identify chemicals that activate or inhibit the receptor.

ALEXANDER DANIELSEN

Photo Credit: EPA

School: Oregon State University, master's in natural resources

Job/Agency/Location: Unmanned Aircraft Systems, Aerial Researcher, EPA Office of Research and Development, Center for Environmental Measurement and Modeling in Research Triangle Park, North Carolina.

Research: Collect emission and weather data during varying prescribed burn practices on the Konza prairie.

NASA Postdoc Program

CLAUDIA ALVAREZ CARRENO, Ph.D.

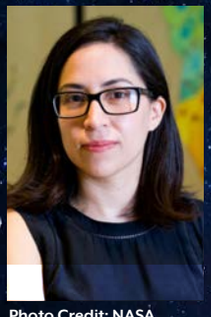


Photo Credit: NASA

School: Universidad Nacional Autonoma de Mexico, doctorate in biomedical sciences

Agency/Location: NASA, Center for the Origin of Life

Research: Study patterns of proteins across all living organisms to help understand past events

KELLY LUIS, Ph.D.

School: University of Massachusetts, doctorate in marine science and technology

Agency/Location: NASA, Jet Propulsion Laboratory

Research: Aquatic remote sensing

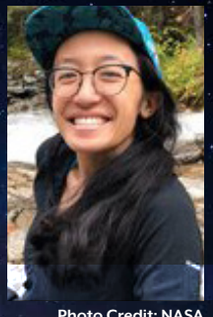


Photo Credit: NASA

HYUNJU CONNOR, Ph.D.

Photo Credit: NASA

School: University of New Hampshire, doctorate in physics

Agency/Location: NASA Goddard Space Flight Center

Research: Magnetic reconnection in the boundary between the solar wind and Earth's magnetosphere.

ORISE-managed *research participation* and *career development* programs in focus

SAMANTHA BELL

College/University: Stockton University

Program: Department of Homeland Security Transportation Security Laboratory

Research: Studying methods to quality control hydrogen peroxide using nuclear magnetic resonance

Photo Credit: Amanda Werner, William J. Hughes Technical Center

ZACHARY ENDERSON, Ph.D.

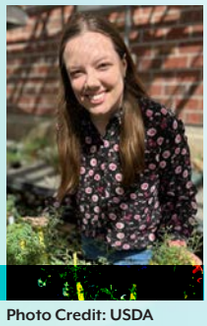
College/University: Georgia Institute of Technology

Program: Intelligence Community Postdoctoral Fellowship

Research: Infrared detectors using artificial moiré quantum materials

Photo Credit: Office of the Director of National Intelligence

AMANDA FANELLI DE SOUZA, Ph.D



College/University: University of São Paulo

Program: United States Department of Agriculture Agricultural Research Service

Research: Testing approaches to make alfalfa cell walls easier to break down for dairy cow digestion

Photo Credit: USDA

JAKE KRAUSS

College/University: Rice University

Program: Environmental Protection Agency Office of Water

Research: Social media campaign to increase estuary awareness to close the gap between general audiences and the importance of wetlands and estuaries

Photo Credit: EPA

ZACHARY LAMAS

College/University: University of Maryland

Program: United States Department of Agriculture Agricultural Research Service

Research: Ways to improve beekeeping management and the sustainment of honeybee colonies

Photo Credit: USDA

CYNNEY WALTERS

College/University: Kennesaw State University

Program: Centers for Disease Control and Prevention, PulseNet, Reference, Outbreak and Surveillance Team

Research: Foodborne illnesses caused by bacterial pathogens

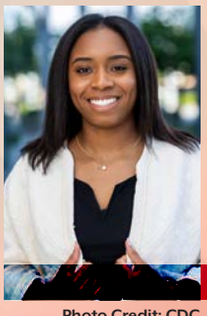


Photo Credit: CDC

MYLA WORTHINGTON

College/University: Morgan State University

Program: National Nuclear Security Administration Minority Serving Institutions Internship Program

Research: Studying color changing assays for detection of deadly disease

Photo Credit: Dr. Frank Denaro, Morgan State University

DIONNE MITCHAM

College/University: University of Georgia

Program: Centers for Disease Control and Prevention Division of Global Migration Health

Research: Preparedness and response activities to public health crises to develop evidence-based travel recommendations

Photo Credit: CDC

Furthering their creative craft:

5 talented employees pen their passions as published authors

Further Together. That's our tagline at ORAU and something that wouldn't be possible without our employees bringing their skills, talent and dedication to the job every day. But that talent also extends beyond the workplace. ORAU and ORISE are home to several authors whose creativity has been sparked outside of the office. From history to fantasy, fiction to non, and everything in between, their writing talent leaps off the page.

AMORY CANNON

Medical Laboratory Scientist Amory Cannon has been a published author since 2015, but she has been using writing as a hobby and form of creative expression since she was in elementary school. In early 2024, she finished the third book in the "Narrow Gate" trilogy, a young adult "romantasy"—or romance fantasy—series. The three books in the trilogy are titled "The Broken Crown," "The Desolate Reign" and "The Ancient Heir." She loved reading popular YA series such as "Harry Potter" and "The Hunger Games" and wanted to create a world of her own that readers could get lost in. For her own work, Cannon was partially inspired by the biblical story of Esther and wanted to include faith-based elements in the series.

"It was really interesting and fun for me to explore a world where religion, no matter what you believe, plays a big role in the characters' development," she explained.

Aside from the "Narrow Gate" trilogy, which Cannon described as her main work, she has also written two novels in the suspense genre: "Warzone" and "Learning to Die." You can find her Amazon author page at https://www.amazon.com/stores/author/B00NRY68LQ

RICK FARNSWORTH, Ph.D.

Richard "Rick" Farnsworth, Ph.D., is the senior science advisor at ORAU as well as a published horror author. Farnsworth has three novels to his own name—"Gift of the Bouda," "Succumbing to Gravity," and "Outside the Wire"—and has contributed to three horror anthologies. He explained that he was drawn to the challenge of writing and publishing a novel-length work as well as the need for a creative outlet.

Farnsworth is a lieutenant colonel in the Army Reserves and spent a year deployed in Iraq from 2003 to 2004. This time in his life inspired his chosen genre: "I wanted to work out some themes that were rolling around in my subconscious," he said. "The speculative fiction/horror genre seemed the most appropriate at the time. I enjoy Dean Koontz, and his writing seemed to fit what I was thinking."

You can find his Amazon author page here: https://www.amazon.com/stores/author/B005GIOKHK/allbooks?ingress=0&visitId=63fd4844-be19-48e8-9595-fe2e8e71b185&ref_=dbs_a_mng_rwt_scns_share

CHAD WILLIAMSON

Chad Williamson, who is an education project manager at ORISE, publishes under the pseudonym James D.F. Hannah. He chose his pen name based on his two children's names, and added the "D.F." to help distinguish himself from another writer. Since 2015, he has published seven novels and around 20 short stories. Most of Williamson's novels focus on private eye Henry Malone.

"The books are very influenced by writers like Robert B. Parker and the Spenser novels, and Lawrence Block's Matt Scudder novels, but set in small-town West Virginia," said Williamson, "which gives me a chance to explore themes particular to rural Appalachia, like the post-coal industry economic struggle and the opioid epidemic." Despite the dark subject matter, Williamson describes his work as "edged with humor."

You can find Williamson's website at https://www.jamesdfhannah.com/

LIZ GARCIA, Ph.D.

Liz Garcia, Ph.D., works as an instructional designer in ORAU's HR Department. Garcia explained that she has always been passionate about writing for children, so she earned a Master of Fine Arts in Children's Literature "just for fun." Garcia is a long-time educator and has published 70 short stories and informational texts for use in classrooms. She has also "leveled" these works, or as she put it, "created numerous versions of the same text at different difficulty levels so that students with varied degrees of skill and confidence within the same class can all experience the same content."

Garcia worked as both a developmental editor and writer on the "Bricks Before Brown" project. This collection of 100 true stories compiled the experiences of families of color who had sued for the right to better education before Brown v. Board of Education. "These stories are used in social studies classes to help children understand the complexity of our nation's journey toward integration," said Garcia.

In 2016, Garcia served as an Artist in Residence of the Great Smoky Mountains National Park, where she created a therapeutic poetry workshop for teens in the Job Corps program.

Garcia does not have a virtual storefront, but you can learn more about the "Bricks Before Brown" project at https://www.bricksbeforebrown.com/

LINDA HOLMES

Retired Associate Director for Science Education in STEM Workforce Development Linda Holmes has turned a precious family keepsake into a nonfiction book about her ancestor's experience as a Union soldier in the Civil War. "If I Am So Lucky: A Portrait of a Man in Perilous Times, 1862—1865" is the result of six and a half years' work as Holmes contextualized her great-great uncle's 52 letters and two diaries for modern readers. The letters were passed down through Holmes' family for 160 years, a direct link to Corporal Nathan Allen who served in the 142nd Pennsylvania Volunteer Infantry. Holmes began work on the project shortly after starting her retirement.

"It's amazing," Holmes said. "My family kept these things because, obviously, they meant something. I thought, 'I have time now. I can try to save the words that this man intentionally wrote down and preserve them from the ravages of time.'"

Holmes drew not just from Corporal Allen's documents, but also conducted research on the era so that she could understand what her great-great uncle was going through.

In addition, Holmes has published some of her poetry in literary journals. She is also working on content for a poetry chapbook which she hopes to publish in the near future.

You can purchase "If I am So Lucky" through Amazon at https://www.amazon.com/If-Lucky-1862-1865-Pennsylvania-Volunteer/dp/0788428985 and HeritageBooks.com.

ORAU's blog explores rich history and current-day impact

Then & Now
THE ORAU BLOG

In February 2024, ORAU communications and marketing professionals Amber Davis and Matthew Underwood launched a new channel on our website—Then & Now: The ORAU Blog— to explore ORAU's rich history and highlight the current-day impact of our people and programs. "Then & Now was created to educate, engage, and endear readers to our organization and our mission," said Davis. According to Underwood, the blog is "a great resource for learning about how our people, programs and partners are making a huge impact, serving our country and giving us the competitive edge on the world stage" in the areas of STEM education, workforce solutions, exposure science, health education, disaster preparedness, forensic science and more. Some of the things readers will find on the blog include behind-the-scenes videos, features on some of the items in ORAU's Museum of Radiation and Radioactivity, profiles on some of ORAU's historical figures, and guest-written blogs. For example, one blog covers a historical look at ORAU's South American marmoset colony that began in 1967 and lived on for many years. Another blog takes a look at some of the departments at ORAU and examines how they each contribute to the overall mission of the organization. Whether you want to learn more about the early history of ORAU that dates back to the Manhattan Project during World War II or stay up to date on the latest things happening around the organization, Then & Now is a great resource!

Check it out at **orau.org/blog.**

Commitment in action:
Investing in STEM education

Part of ORAU's mission is to advance critical national priorities by integrating academic resources. This commitment is made clear in how ORAU supports K-12 education. Between ORAU Education Grants and the ORAU Extreme Classroom Makeover program, we have given more than a million dollars' worth of science, technology, engineering and math (STEM) resources to local schools since 2002, and 2024 was a banner year across East Tennessee.

In the past school year, ORAU awarded a total of more than $30,000 in education grants to nine teachers for projects in traditional classrooms and beyond. In fact, a special education program, Junior Reserve Officer Training Corps (JROTC) cadets, and even an elementary school's library received a STEM boost through ORAU funding.

Students in Oliver Springs High School's special ed program in Roane County, Tenn., now have a composting system complete with raised garden beds and a worm farm. From start to finish, these students will be hands-on when learning about natural cycles in biology because their teacher, Carrie Giles, saw an opportunity to offer tangible learning experiences.

Lt. Col. Timothy Vowell (ret.) of the Air Force JROTC program at Clinton High School in Anderson County, Tenn., wanted to inspire more students to consider careers in aviation, so his grant project included a flight simulator. Forty percent of Vowell's program focuses on aerospace science.

Believing that critical thinking belongs in every corner of education, librarian Judy Carson at Huntsville Elementary in Scott County, Tenn., requested STEM activities to accompany story time. When students hear the tale of a troll under a bridge, they will have the opportunity to construct their own bridge to meet the challenge of avoiding the troll.

Additional teachers who received 2024 ORAU education grants include Ligia Boundy of Clinton High School, Rebekah Bozeman of Lake City Elementary School, Tracy Burton of Clinton Elementary School, Chad Feiock of Anderson County Career & Technical Center, Dallas Freeman of Clinton High School, and Brandi Poore of Clinton Elementary School.

For the 2024 Extreme Classroom Makeover program, the $25,000 grand prize was timely for Sevier County Junior High School computer science teacher Shelby Woods (pictured lower left) because state standards placed a new emphasis on this discipline starting in the 2024-2025 school year. Computer science is the process of solving complex organizational problems using technical solutions. It develops computational critical thinking and problem-solving skills that show students how to create and use new technologies.

"The reason that this is such an important field is that computers and technology are integrated into virtually every sector in our economic industry," Woods explained.

For her classroom, she requested new desktop computers, hydroponic plants, 3D printers, robots, iPads and more.

ORAU awarded Elk Valley STEM School teachers Madison Young and Mary Beth Seiber $7,500 combined for winning Extreme Classroom Makeover runner-up and the viewers' choice prizes. The Campbell County, Tenn., school faced a major setback when fire ripped through its brand-new portable STEM lab in 2023. The money they won went toward replacing the technology that was lost.

SCAN HERE TO WATCH

Central Intelligence Agency champions STEAM education with $90,000 in "Mission Possible" awards for classroom technology upgrades

For some of us, the most advanced piece of classroom technology we needed was a computer. As technology continually advances, however, it's important for teachers to make sure their students have access to the best possible teaching aids and equipment they can get. Unfortunately, that's not always possible, and many students never get access to the science, technology, engineering, art, or math (STEAM) classroom technology that could inspire them to become the leaders of tomorrow.

Thanks to the Central Intelligence Agency (CIA) Mission Possible: Makerspace Nation contest, which was planned and managed for the agency by ORISE, through the U.S. Department of Energy's Strategic Partnership Projects program, four educators from three schools in the Midwest were chosen to receive a total of $90,000 to turn their educational spaces into a "makerspace" and engage their students with STEAM. In April 2024, these three schools located in Chicago, Ill., Omaha, Neb., and Kansas City, Mo., were surprised with checks for $30,000 each, helping them create the makerspaces of their dreams.

Pam Krecek, a librarian at Oak Valley Elementary in Omaha, said she was in shock to receive her award.

"I can't thank ORISE and the Central Intelligence Agency enough," she said, as she fought back tears. "This is so amazingly special. I'm beyond grateful."

Krecek talked about purchasing a laser printer, a 3D printer, science kits and circuit sets for her makerspace.

"Anything that helps support the curriculum and helps the students collaborate together," she said. "I just want them to be able to explore and have fun."

Tesa Davis and Jennifer Warneke, who won for Piper Middle School in Kansas City, are making sure to include the "arts" in STEAM.

"We have a lot of students that are interested in fashion design, interior design, a lot in the medical field," explained Davis.

"We just have Chromebooks, and a lot of kids want to do online arts and designing with specific apps that we can't host on Chromebooks," said Warneke. "So now we'll have a space to do that, and woodworking. We don't currently have anything, so we'll be able to allow them that opportunity thanks to this award."

"I'm a little speechless," said Kyle Nowicki, who teaches at Little Village Elementary in Chicago. "What this is going to mean for our awesome students and providing them with the resources that I think we need to stay ahead of the curve—it's just awesome."

Nowicki is passionate about finding different ways to engage with his students' interests, giving them opportunities to create stop motion films, make jewelry and sew. He also encouraged other educators to submit applications for CIA Mission Possible.

"It's important to remember there are people out there who want to help teachers, who want to help public schools," said Nowicki. "There are tons of organizations out there that want to see our students succeed; and the help is out there, but you have to seek it. But once you do, the rewards that we see from it are awesome."

SCAN HERE TO WATCH

Doing the most good:

Giving back, paying it forward in the communities where we live, work

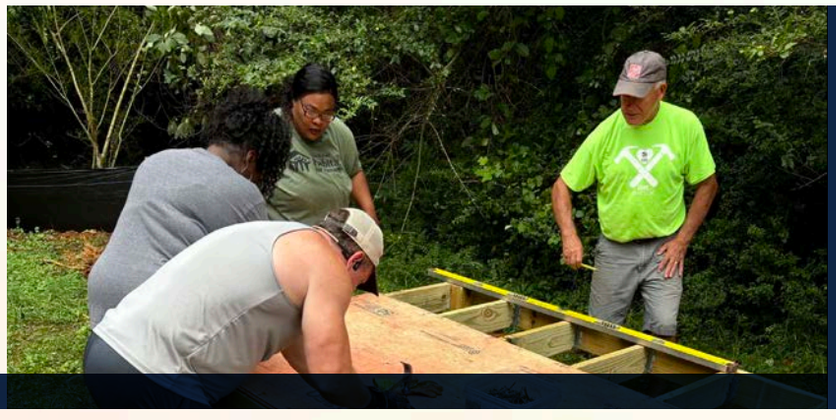
Being a good corporate citizen means supporting the communities where we do business and in the places we live. In simple terms, ORAU believes in giving back and paying it forward, whichever can do the most good. For many years, ORAU has demonstrated a strong community commitment, and our employees share this passion for helping others by participating in community initiatives. Here are some of the community-led initiatives that ORAU supports.

ANNUAL GIVING

Each year, ORAU takes part in an internal annual giving campaign that benefits the United Way and Community Shares nonprofit organizations. ORAU has raised more than $1 million over the past 10 years through this campaign.

DOLLY PARTON'S IMAGINATION LIBRARY

ORAU has supported the program in Anderson County since 2001. Dolly Parton's Imagination Library is a book program that mails free books to children from birth to age 5, no matter their family's income.



HABITAT FOR HUMANITY BUILD

ORAU sponsored a Habitat for Humanity house this year that was built in Oak Ridge. Over the span of several months, many ORAU employees spent a Saturday volunteering on the construction site, performing many tasks such as building a shed and a porch, installing siding and more.

HOLIDAY BUREAU

Each year, employees volunteer time at the Holiday Bureau in Oak Ridge, an organization that provides toys, books, bicycles, games, home goods, food and more to underserved families in Anderson County, Tennessee.

LIGHTS OF HOPE

ORAU hosted a Lights of Hope Across America event on its main campus in Oak Ridge, Tennessee. The event gave community residents the opportunity to honor and remember their loved ones, family and friends who have faced cancer.

SECRET CITY HALF MARATHON AND 5K

ORAU was once again proud to sponsor the Secret City Half Marathon. The race takes place each November in Oak Ridge and benefits Girls Inc., which delivers life-changing programs and experiences that equip girls to overcome barriers to grow up strong, smart and bold.

SOLAR ECLIPSE EVENT

2024 was a unique year because in April the United States experienced a solar eclipse. Oak Ridge experienced 89% totality during the event, and ORAU hosted a viewing for employees, and their families and friends, complete with viewing glasses and Moon Pies®.

At ORAU, our mission and the communities we serve are everything. Being a good corporate citizen makes a difference, and doing the most good in our community has always been, and will continue to be, an important part of the ORAU culture.

Summer fun down to a science

As students of all ages were taking time off from the school year for their summer vacation, our K-12 STEM Team was hosting programs across the country to keep students' minds engaged with science, technology, engineering and math (STEM). Whether it was a one-to-two-day mini-academy, or a residential program as long as two weeks, these students spent the summer sharpening their minds, learning new skills and having fun.

ARTIFICIAL INTELLIGENCE MINI-ACADEMY

As artificial intelligence (AI) becomes more accessible, it's important to teach students what it is and how to use it properly. This two-day program for middle schoolers guided students in discussions on the ethical uses of AI and helped them train their own AI programs.

BOE-BOTS ACADEMY

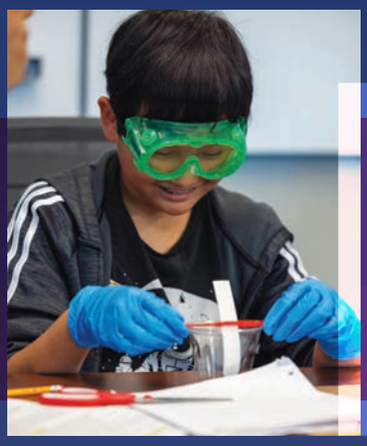
Students from around East Tennessee spent a week building and programming their very own robots, or Boe-Bots, in this academy. The teams of rising 7th through 9th graders worked together to complete new challenges each day, growing in their critical thinking and developing a love of STEM learning.

CODER'S QUEST MINI-ACADEMY

Coder's Quest gave rising 4th through 6th graders the opportunity to learn the language and applications of coding. Working in teams, the students maneuvered Sphero robots through difficult obstacle courses, learning critical thinking skills in addition to coding along the way.

KINDERCODING MINI-ACADEMY

This mini-academy introduced elementary school students to the basics of coding in a way that was engaging and appropriate for their age levels. Rising 1st through 3rd graders used Sphero robots to complete obstacle courses and learn about STEM.



FORENSIC CHEMISTRY MINI-ACADEMY

This two-day course for middle school students helped students make observations, use critical thinking, test theories and draw conclusions as they solved the mystery of a lost animal skull and learned to analyze substances in a forensic environment. A student favorite!

ORISE ROBOTICS ACADEMY

This week-long academy encouraged teamwork, critical thinking and complex problem-solving in high school students as they designed, built and programmed robots. Through trial and error, the students worked in teams to create robots they could be proud of and gained skills to become the STEM leaders of tomorrow.

CIA ROBOTICS ACADEMY

This week-long day camp for rising 7th, 8th and 9th grade students was filled with exciting and challenging activities. Working in small teams, students designed, built and programmed a robot. Students had an opportunity to see robotics equipment in action and learned from robotics and engineering research scientists.

JOINT SCIENCE AND TECHNOLOGY INSTITUTE WEST

ORISE hosted high school students from all over the country at the University of New Mexico in Albuquerque while they took part in this two-week, fully funded residential STEM research experience. Participants worked in teams to solve research questions while being mentored by scientists and subject matter experts.

JOINT SCIENCE AND TECHNOLOGY INSTITUTE EAST

JSTI East is a two-week residential program open to high school students and teachers, with a one-week program for middle school students. ORISE hosted participants at Towson University in Baltimore, where they were exposed to scientific research through hands-on projects and worked with U.S. Department of Defense scientists and STEM experts.

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MATH & MOVEMENT MINI-ACADEMY

Combining kinesthetics (or the study of body movements) with education helps kids get excited about learning and can help remove math-based anxieties. That's the goal of the Math & Movement curriculum. As elementary school students jumped and played, many of them didn't realize they were doing math.

APPALACHIAN STEM ACADEMY AT OAK RIDGE—BRIDGE PROGRAM

This two-week, fully funded academy gives students who previously completed the Appalachian STEM Academy as middle school students another hands-on learning experience. Students worked with university researchers to explore practical applications of their current studies.

APPALACHIAN STEM ACADEMY AT OAK RIDGE—MIDDLE SCHOOL

This one-week, residential science academy is a unique opportunity for students to work collaboratively with their peers and experienced teachers while answering a research question. Participants gained skills in teamwork, investigation and problem-solving.

APPALACHIAN STEM ACADEMY AT OAK RIDGE—HIGH SCHOOL

In this two-week, residential academy, high school students and teachers conducted short-term research projects under the guidance of mentor scientists from Oak Ridge National Lab and ORAU. Participants then showcased their findings through a verbal presentation and research poster.

SCAN HERE TO WATCH

Hands-on math:

Seeing the way to a better education is a family affair for the Rutherfords

At ORAU, we understand the importance of family. Whether that means our work family—the people we spend eight hours a day, five days a week with—or the people we come home to, who we're bonded to by blood and marriage.

Two members of the ORAU extended family—Mike Rutherford and his daughter Campbell—have a unique understanding of that bond. Mike is an ORAU manager and engineering technician at the National Oceanic and Atmospheric Administration's Atmospheric Turbulence and Diffusion Division. Campbell is a junior at Harvard University, majoring in applied mathematics on the biological sciences track.

The path to Harvard wasn't a simple one for the Rutherford family. While Campbell is very academically talented, she faced challenges in the public school system that hindered her accessibility to learning materials. Campbell was born with Leber congenital amaurosis, a condition that causes blindness. And unfortunately, her school system wasn't always equipped with accessible learning materials.

"I was just going to be sitting in the classroom with nothing to do once I got out of elementary school," Campbell explained. Tennessee School for the Blind is in Nashville, four hours from the Rutherfords' hometown in Dandridge, Tenn., meaning that Campbell would have had to live away from home during the week if she had decided to enroll.

"That was a non-starter for us," Mike said.

"We didn't want to move out to Nashville either because our whole extended family is in East Tennessee, and we kind of depended on that network, and they were such a huge part of my childhood," Campbell continued. "So we said, 'Okay, we'll try homeschooling for a year.' So we tried it and ended up loving it because I had so much more academic freedom than I'd had before."

Mike and Campbell both talked about the importance of their immediate and extended families.

"I can't overemphasize how important it was for me and my wife Liza to be in this together," said Mike. "For my job, especially early on, there was a lot of travel that was involved, and the long commute meant that there were many days that I was leaving for work before anybody else was awake. It's been such a team effort and the fact that my parents and Liza's parents were both healthy and around and able to help was huge. That's been a big deciding factor in not moving closer to Oak Ridge. That's why we stayed in Dandridge—because our parents were just a few minutes away."

In addition to those commitments, Campbell remembers her father playing a crucial role in her passion for math.

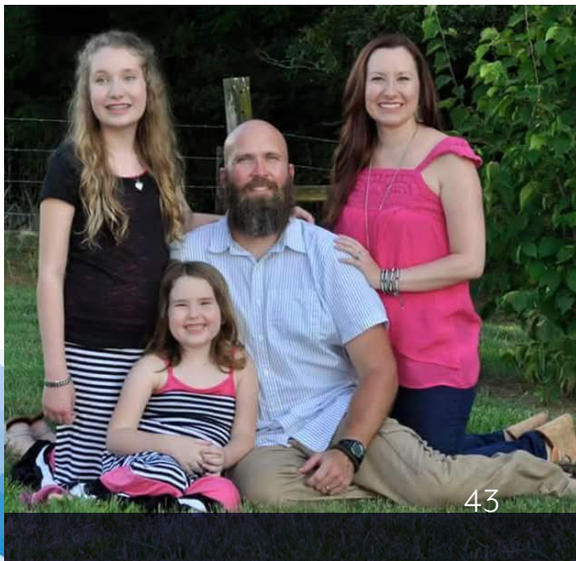
"My dad played a pretty significant role in my math education," she said. "Especially as I was getting into things like graphing and stuff in basic algebra. Because that didn't make immediate sense to me. One day I said 'I really don't understand how to graph linear inequalities.' And so he figured out a way for me to do it in a hands-on way using a cookie cooling rack that was a grid shape with little pieces of plastic or wire tied to it to be the X and Y axes, and then magnets to be the points, and then metal rods to be the lines. And then if you had to shade an area like you would for a linear inequality, we'd put a paper towel over where the shaded area needed to be. So that really helped me understand how graphing worked. And honestly, it really set the course for the rest of my study in math. Because if you don't understand that, then there's no way you're getting any farther in algebra or beyond."

Mike discussed being humbled by Campbell's achievements, while Campbell explained that the skills she's acquired to accommodate her disability aren't superpowers.

"I do still freak out over homework and things like that," she said. But her father was also passionate about the fact that throughout Campbell's life, it was important not to let her blindness hinder her.

"One of the most frustrating things in trying to get Campbell educated and then working with other people who were educating other disabled children, is that there are pretty low expectations in the education system," said Mike. "And it bleeds over into the rest of people's lives. I think a lot of us are capable of a lot more than what we realize. Harvard was not on our radar at all. And there may be some kids out there right now who are looking at schools, and Ivy Leagues or 'prestigious schools' are not on their radar, but it's like, somebody's got to get in. You might be surprised."

Though there's quite a distance between East Tennessee and Cambridge, Massachusetts, the Rutherford family continues to stay close. Mike and Liza recently visited Campbell during Harvard's family week, and Campbell fondly recalls how well her parents' active role in her homeschooling prepared her for Harvard as well as bonding them together as a family. Through reading books together, and finding ways to make lessons accessible, the bonds that bound the Rutherford family became even more tightly woven.



Select *leadership* distinctions, published works & presentations

Becky Aloisi, Kristy Diffenderfer-Stewart, Mark Ervin, Ronald Goans M.D., Carol Iddins M.D., co-authors, "Cutaneous Radiation Injuries: REAC/TS Clinical Experience," *Disaster Medicine and Public Health Preparedness*, February 2024.

Adayabalam Balajee, Ph.D., session chair, "Radiation Biodosimetry," 16th International Radiation Protection Association Conference, Orlando, Florida, July 2024; presenter, "Radiobiological Effects of FLASH Radiation on Human Cells," 16th International Radiation Protection Association Conference, Orlando, Florida, July 2024; presenter, "Improved Cytogenetic Tools for Rapid Triage Biodosimetry," 7th Coordination Satellite Meeting of WHO BioDoseNET, Hirosaki, Japan, September 2024; session chair, "Radiation Emergency Triage and Response," EPR BioDose Meeting, Hirosaki, Japan, September 2024; presenter, "Radiobiological Effects of Ultra-High Dose Rate Radiation on Human Cells," EPR BioDose Meeting, Hirosaki, Japan, September 2024; co-author, "Neural Network Ensemble to Detect Dicentric Chromosomes in Metaphase Images," *Applied Science*, November 2024.

Adayabalam Balajee, Ph.D., Maria Escalona, Terri Ryan, co-authors, "Application of FISH Based G2-PCC Assay for the Cytogenetic Assessment of High Radiation Dose Exposures: Potential Implications For Rapid Triage Biodosimetry," *PLoS ONE*, October 2024.

Wayne Baxter, John Crapo, Meghan Dieffenthaller, Joshua Hayes, Ph.D., Dillon Vogt, co-authors, "Disaster in Goiânia," *CBRNe World Magazine*, August 2024.

Liv Blackmon, Ph.D., Mae Mosley, Ph.D., Casey Thomas, co-presenters, "Pillar 3: Higher Education," *STEMM Equity and Excellence 2050*, White House Summit, May 2024.

Pam Bonee, board member, United Way of Anderson County; board secretary, Clinch River Habitat for Humanity.

Andrew Crain, board member, Practitioner Advisory Board, MRDC's National Rural Higher Education Research Center.

John Crapo, Meghan Dieffenthaller, Joshua Hayes, Ph.D., Dillon Vogt, co-authors, "Forgotten History," *CBRNe World Magazine*, April 2024; poster presentation, "Rapid Dose Estimation Techniques for Initial Patient Triage," the International Radiation Protection Association's (IRPA) 16th International Congress, Orlando, Florida, July 2024.

Meghan Dieffenthaller, presenter, "Rapid Dose Estimation Techniques for Initial Patient Triage," the International Radiation Protection Association's (IRPA) 16th International Congress, Orlando, Florida, July 2024.

Betsy Ellis, Ph.D., and Ashley Golden, Ph.D., co-presenters, "Harmonization of Exposure Estimation Procedures in the Cohorts Participating in the International Pooled Analysis of Uranium Processing Workers (iPAUW)," the International Radiation Protection Association's (IRPA) 16th International Congress, Orlando, Florida, July 2024.

Betsy Ellis, Ph.D., Ashley Golden, Ph.D., and Sara Howard, M.P.H., co-presenters, "Harmonization of Exposure Estimation Procedures in the Cohorts Participating to the International Pooled Analysis of Uranium Processing Workers," the International Radiation Protection Association's (IRPA) 16th International Congress, Orlando, Florida, July 2024; co-authors, "Mortality Follow-up of Fernald Feed Materials Production Center Workers Exposed to Uranium from 1951 to 1985," *Occupational and Environmental Medicine*, September 2024.

Dray Gentry, Ashley Golden, Ph.D., and Sara Howard, M.P.H., co-presenters, "Utilization of Statistical Methods of Data Simulation for Use in Biokinetic Modelling—Simulating Individual-Level Data from Aggregated Animal Experiment Results," the International Radiation Protection Association's (IRPA) 16th International Congress, Orlando, Florida, July 2024; co-presenters, "Analyzing Radionuclide Distribution in Mice: Impact of Distribution Assumptions on Predictive Model Methods," Radiation Research Society's (RRS) 2024 Annual Meeting, Tucson, Arizona, September 2024; co-presenters, "A Novel Framework for Biokinetic Model Development with Ensemble Learning on Mice Data for Intake Reconstruction," Radiation Research Society's (RRS) 2024 Annual Meeting, Tucson, Arizona, September 2024.

Erin Gilliland, panelist, "Making the Most of Your Degree: Finding Employment After Graduation," Tennessee Technological University Department of English, April 2024.

Ron Goans, M.D., presenter, "Chronic Inflammation in a Radium Dial Painter Cohort: Elevated Neutrophil to Lymphocyte Ratio and Radiation-Induced Hearing Loss," the International Radiation Protection Association's (IRPA) 16th International Congress, Orlando, Florida, July 2024.

Ashley Golden, Ph.D., co-presenter, "International Pooled Analysis or Uranium Workers: Overview of Study Aims, Cohorts, and Methods," the International Radiation Protection Association's (IRPA) 16th International Congress, Orlando, Florida, July 2024.

Ashley Golden, Ph.D., and Sara Howard, M.P.H., co-authors, "Adjustment for Duration of Employment in Occupational Epidemiology," *Annals of Epidemiology*, June 2024; co-authors, "Revisiting the Historic Strontium-90 Ingestion Beagle Study Conducted at the University of California Davis: Opportunity in Archival Materials," *Radiation Research*, June 2024; co-presenters, "The Importance of Data Repositories in the Million Person Study and Radiation Epidemiology Research," the International Radiation Protection Association's (IRPA) 16th International Congress, Orlando, Florida, July 2024; co-presenters, "Radiation Risk in the Rocky Flats Cohort of the Million Person Study: Sensitivity Analyses and Comparisons with Other Occupational Cohorts," Radiation Research Society's (RRS) 2024 Annual Meeting, Tucson, Arizona, September 2024; co-presenters, "Smoking in the Million Person Study: A Nested Analysis of Smoking Data and Its Adjustment Epidemiologic Risk Estimates," Radiation Research Society's (RRS) 2024 Annual Meeting, Tucson, Arizona, September 2024; co-authors, "Machine Learning-Enhanced Stochastic Uncertainty and Sensitivity Analysis of the ICRP Human Respiratory Tract Model for an Inhaled Radionuclide," *Journal of Radiological Protection: Official Journal of the Society for Radiological Protection*, October 2024.

Ashley Golden, Ph.D., and Gregory Nichols, co-presenters, "The Beryllium Associated Worker Registry: An Underutilized Tool for Occupational Safety and Health Practice and Policy?" the Beryllium Health and Safety Committee 2024 Fall Symposium, Las Vegas, Nevada, October 2024.

Michele Goodson, board president, Hardin Valley Academy Athletic Council.

Davyda Hammond, Ph.D., poster presenter, "Towards a Better Understanding of Unmet Healthcare Needs: Women's Experience Journey with Conventional vs. Complementary and Alternative Medicine Healthcare Providers," American Medical Association Winter Academic Conference, St. Pete Beach, Florida, February 2024; poster presenter "Complementary and Alternative Medicine: Improving Access to Wellness Resources for Women," American Medical Association Marketing and Public Policy Conference, Washington, D.C., June 2024; poster presenter, "Towards a Better Understanding of Unmet Healthcare Needs: Women's Experience Journey with Conventional vs. Complementary and Alternative Medicine Healthcare Providers," AcademyHealth Annual Research Meeting, Baltimore, Maryland, June 2024; board member, Oak Ridge Fund for Achieving Community Excellence (ORFACE); board vice chair, Auburn Black Alumni Council; secretary, Oak Ridge Breakfast Rotary Club.

Joshua Hayes, Ph.D., presenter, "Simulated Radiation Detection Equipment," the International Radiation Protection Association's (IRPA) 16th International Congress, Orlando, Florida, July 2024; coauthor, "A Review of Criticality Dosimetry at the Y-12 National Security Complex and Practical Importance of Dose Accuracy in Emergency Response," *Radiation Measurements*, September 2024.

Michael Holtz, board member, Man Up to Cancer; co-author, "Radiation Therapy for Rectal Cancer: An Astro Clinical Practice Guideline Focused Update," Practical Radiation Oncology, November 2024.

Sara Howard, M.P.H., co-author, "Spatial Patterns and Sociodemographic Predictors of Chronic Obstructive Pulmonary Disease in Florida," *PeerJ*, August 2024.

Carol Iddins, M.D., plenary speaker, "Understanding the Impact of Radiological/Nuclear Incidents on Understudied Populations: Lessons from Atomic Bomb and Chernobyl Cohorts," National Institutes of Health/National Institutes of Allergy and Infectious Diseases, April 2024; presenter, "Overview of ionizing radiation injuries and illnesses," 16th International Radiation Protection Association Conference, Orlando, Florida, July 2024; presenter, "Primer on Radiological Injuries and Illnesses for the Emergency Physician," Frontiers in Advanced Emergency Care, September 2024.

Ann Martin, Ph.D., co-chairperson, NASA Science Mission Directorate (SMD) Science Activation Evaluators Group.

Nicole Merrifield, Leadership Oak Ridge 2024 graduate; chairperson, Community Reuse Organization of East Tennessee (CROET) Board of Directors.

Wade Morris, mens president, Cincinnati Radiation Society.

Gregory Nichols, moderator, headline panel, "STEM Management and Leadership in the Federal Landscape," ORISE Postdoc Mini-Symposium, September 2024; guest lecturer, "Explaining Federal Contracting Opportunities for Public Health Careers," University of Tennessee, September 2024.

Tarah Polattie, chapter training director, Association of Certified Fraud Examiners, Knoxville chapter.

Terri Ryan, presenter, "Radiological Effects of Ultra High Dose Rate (UHDR) Radiation in Human Blood Lymphocytes," Radiation Research Society's (RRS) 2024 Annual Meeting, Tucson, Arizona, September 2024; board member, Anderson County Library.

Margaret Scheiner, author, "Embracing Volunteer Opportunities Can Lead to Growth and Development," National Association of Colleges and Employers, April 2024; board member, Charles L. Sommers Alumni Association, Inc.

Ali Simpkins, associate editor, *Health Physics Journal*; Nuclear Engineering Alumni Development Board for Missouri University of Science and Technology.

Jennifer Tyrell, Education Committee chair, Children's Museum of Oak Ridge; treasurer, Southern Appalachian Science and Engineering Fair.

Wendy West, board member, Methodist Medical Center foundation, Covenant Health.

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