

ORAU Leadership

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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, 2023. These audited financial statements are presented in separately bound reports.

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Message from the President



Alvin Weinberg, Ph.D., a world-renowned nuclear physicist and a former director and distinguished fellow at ORAU, once said, “The strength of [organizations], like ORAU, lies in the interdisciplinary composition of their staffs. Over and over again, it’s been demonstrated that the whole can be greater than the sum of its parts. And that good people from diverse fields working together can make major [advances] that are denied geniuses working in isolation.”

Weinberg’s wisdom from the 1950s and 1960s remains a central tenant of who we are and how we achieve great things at ORAU. Today, our team continues to drive the kind of innovation that benefits our nation and the world.

The cornerstone of making this happen is culture. From a flexible work environment to transparent communications to cross-functional collaboration, we have embraced and have further cultivated an empowered environment. And the positive results are reflected in our 2023 employee survey where 82% of our employees believe ORAU’s organizational culture is either good or very good, and employees believe it will be even better a year from now.

Such a culture encourages innovation from our own team as well as with our consortium of 150+

university partners. For example, Adayabalam Balajee, Ph.D., director of ORISE’s Cytogenetic Biodosimetry Laboratory collaborated with Yong Huang, Ph.D., and his research group at the University of Florida to develop a three-dimensional human tissue that can be used for the realistic assessment of low-dose radiation effects in a tissue-like microenvironment.

We actively encourage such research around the country. This can include providing seed money through the ORAU-Directed Research and Development program or holding the 2nd annual ORISE/Future of Science Awards where program mentors at 16 federal agencies nominated more than 178 participants from which three winners were chosen.

ORISE also hosted its first annual ORISE Postdoctoral Mini Symposium open to members of the ORISE STEM Workforce Development community. The event attracted 487 attendees over five separate professional development sessions. Due to the success of the event, planning already is underway to do it again in 2024.

The contacts built within the research participant community are just as valuable to our participants as the opportunity to conduct the research. That is why our team developed ORISE Connections, an online

“82% of our employees believe ORAU’s organizational culture is either good or very good, and employees believe it will be even better a year from now.”

Source: 2023 ORAU employee survey

platform created for networking, sharing knowledge and resources exclusively for current and alumni ORISE participants and mentors. In its first few months, membership already surpassed 1,000 members.

We also readily seek opportunities to assist our nation. We launched the ORAU STEM Accelerator, created to help the U.S. with becoming more competitive globally by addressing STEM workforce gaps. The NATO Chemical, Biological, Radiological and Nuclear (CBRN) Medical Training Panel teamed up with ORISE and the Radiation Emergency Assistance Center/Training Site to host the Inaugural NATO Chemical, Biological, Radiological & Nuclear Medical Symposium. Two new emergency management tools are being launched in spring 2024. One – Exercise Builder Energy – provides a “one-stop shop” for expediting emergency management exercises. The other – Emergency Manager 360 – is an integrated, online, secure software suite that provides the full cycle of emergency preparedness activities.

It goes without saying that our people are our strongest asset, especially as we continue to grow and expand as an organization. One-third of our workforce has been hired within the last three years, including dozens in the last year. One example is our new chief of staff, Dr. Ken Tarcza. A graduate of West Point, Ken joined ORAU from DOE’s Oak Ridge office earlier this year.

We are placing an even greater priority on diversity by expanding our focus to also encompass equity, inclusion and accessibility, which is being led by our own Dr. Mae Mosley who has overseen ORAU’s employee relations and diversity efforts for nearly a decade. Also, this year, we added our first tribal university, the Navajo Technical University, to our consortium. And ORAU and the Ecological Society of America entered into a Memorandum of Understanding (MOU) that mobilizes our collective resources to advance environmental sciences among the nation’s HBCUs, or historically black colleges and universities.

The strength of our culture, the success of our research and partnerships, and the

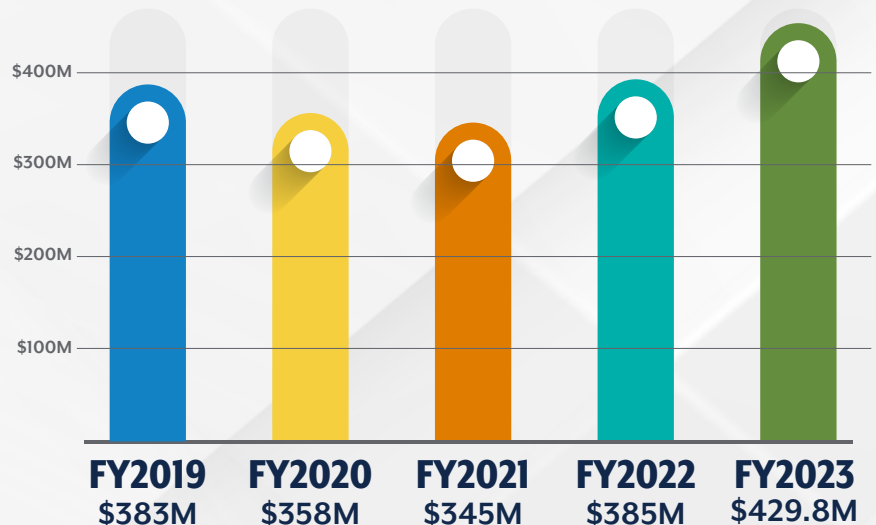
diverse talents of our people have made the past year a success for ORAU. For the first time ever, our revenue exceeded more than \$400M (\$429.8M), a record year for ORAU, and we project FY24 to also exceed the \$400M mark. Growth in areas such as peer review and workforce development are key contributors to this achievement.

Whether it’s our collective team consistently donating more than \$100,000 to the Annual Giving Campaign or our individuals, such Amparo Antencio who is always among the first to lift her hand when there is a need, our employees’ passion for serving our communities shines through in all their efforts. As an organization, ORAU continues its commitment to the community through such activities as Extreme Classroom Makeover, Education Grants and Imagination Library and support for the Secret City 5K run, the American Cancer Society Cancer Action Network, Lights of Hope and the Free Medical Clinic of Oak Ridge.

By any measure, it has been a great year due in large part to the unwavering focus on commitment and dedication of our ORAU team. Working together, ORAU is future-ready to serve our customers and the nation.



Andy Page, ORAU President and CEO



ORAU Revenue

ORAU Overview



982 EMPLOYEES
in 3 locations and across
the country in 37 states



FY23
TOTAL REVENUE:
\$429.8M



150+ MEMBER
UNIVERSITY
CONSORTIUM

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 national needs and strengthen the U.S. scientific enterprise.



Meet Ken Tarcza, Ph.D., Chief of Staff

Hire Date: March 2023

ORAU Role: Working directly with the President/CEO, Tarcza ensures cohesive and unified organizational alignment of ORAU programs and departments to achieve ORAU's strategic objectives. He provides leadership mentoring to other ORAU leaders and employees to promote performance, efficiency, and effectiveness.

Education: B.S. in Mechanical Engineering, United States Military Academy at West Point; M.S. and Ph.D., Mechanical Engineering, University of Texas at Austin

Experience: Manager, U.S. Department of Energy, Office of Science Consolidated Service Center, May 2016 to February 2023; 30 years active-duty military service, retiring as colonel in 2016

Awards and Distinctions

- U.S. Department of Energy (DOE) Voluntary Protection Program (VPP) Star Site for safety, 19th consecutive year
- ISO 14001:2015 recertification of environmental management
- Named Silver Award Recipient of DOE's GreenBuy Program, 4th consecutive year, ORISE
- 2023 Best of the Best Employer, U.S. Veterans Magazine
- 2023 Best of the Best Employer, Black EOE Journal
- 2023 Best of the Best Employer, HISPANIC Network Magazine
- 2023 Best of the Best Employer, DIVERSEability Magazine
- Recipient of Five-Star Electronic Product Environmental Assessment Tool (EPEAT) Sustainable Purchaser Award
- Achieved 22 million+ hours with no significant (Category A) security incidents, culminating in the eleventh consecutive year with no Category A incidents
- Collected nearly five tons of recyclables during annual Earth Day event

Andrews receives Muddy Boot Award



Phil Andrews, ORAU's Chief Financial and Business Operations Officer, received the East Tennessee Economic Council Muddy Boot Award for "leading with integrity, vision, and heart." The award is presented annually to an individual who makes the region stronger through their hard work and community activities.

Simpkins receives HPS President Award



Ali Simpkins received Health Physics Society's (HPS) President Award for her distinguished, long-standing service to the society. Her contributions include serving on numerous committees, the Board of Directors, and as treasurer for two years. Simpkins has been a member of HPS for more than 30 years.

Crumly receives UAB Alumni Award



Julie Crumly, Ph.D., was honored with the University of Alabama at Birmingham's Alumni Award for Practice. This award recognizes an alumnus/alumna who has helped to make a difference in our communities by working with local, state or national public health stakeholders.

Blackmon honored as GMU Distinguished Alumni



Olivia Blackmon, Ph.D., director of ORAU's STEM Accelerator, was honored with the 2023 distinguished alumni award in sociology and anthropology from George Mason University. The award honors alumni who have made outstanding contributions to their fields, communities, and the university.

How did you feel about making the transition from a mostly military career to civilian life at ORAU?

"When you distill it down, whether in uniform or a federal civilian, so much of it is just leadership—how you help individuals, coach them. People are people whether they're in an Army uniform or a golf shirt."

You meet every new hire to ORAU during their onboarding process. Why is this important to you?

"Something that took me longer than it should to learn over the course of my career is that everyone wants to be appreciated. People want to feel like they're

part of something bigger than themselves, whether they realize it or not. Having that initial contact with leadership that tells you, 'Hey, we're really glad you're here,' can make all the difference in the world."

What do you like to do when you're not at work?

"I like to keep myself busy. Yardwork and accumulating dirt under my fingernails is a form of therapy. I also love to travel. I would not have met my wife if not for being stationed in Germany while in the military. She was assigned as an elementary school teacher for the U.S. Department of Defense." 🌱

"People want to feel like they're part of something bigger than themselves."



A symphony playing in the key of ORAU

Like many American businesses, ORAU faced the challenges of a worldwide pandemic and economic uncertainty over the past several years. ORAU had to dramatically adjust its approach to conducting business while also protecting its employees, including moving from a strictly traditional work setting to a flexible work environment, more transparent communications, and cross-functional collaborations.

Because of these adjustments, ORAU emerged with a renewed purpose and direction. The distinguishing characteristic of that renewed purpose is encapsulated in a phrase used throughout the company: One ORAU. The phrase conveys succinctly how all ORAU employees serve a single, cohesive organization despite having many different business lines, customers and contracts.

“One ORAU” isn’t just a buzz phrase or an intangible concept. Employees take it to heart, and its impact has been measured. Internal company-wide surveys show that an overwhelming majority of ORAU employees say they understand the part they play in the company’s larger mission.

Lauren Shaffer, Ph.D., associate manager of human resources information systems, led the team that conducted a satisfaction survey among ORAU employees in April 2023. She said the results paint a clear picture of how ORAU employees view the company and their role in the company. “Ninety-six percent of our employees say they understand how their work supports ORAU’s mission and vision,” Shaffer said. “That is a huge number where they have a clear understanding of why they’re doing what they’re doing and how it supports ORAU.”

Keri Cagle, Ed.D., senior director of scientific peer review, has spent most of her career with ORAU, rising from entry level to management. She says the current state of ORAU’s corporate culture has never been better. In fact, she uses an analogy

to describe how so many diverse employees working together are greater than the sum of their individual parts; she likens ORAU to a symphony orchestra. “ORAU is a very complex organization, but we’re an integrated organization that’s made up of a variety of business units and departments. Really what we are is an orchestra,” Cagle said. “We’re an orchestra of individuals with unique skill sets and perspectives all working together for the greater good of our nation. Even though we may work in a different department or have a different skill set, we’re all unified working together to fulfill ORAU’s mission.”

Andy Page, president and CEO, leans into the orchestra analogy to describe how ORAU functions so well as a single company with many disparate parts. “When the orchestra is playing in tune it makes beautiful music. It produces tremendous outcomes. Part of our current strategic plan emphasis is our number one guiding principle—empowering employees,” Page said.

Page, who has been at the helm of ORAU for 13 years, previously served as a director of one of ORAU’s business units, so he, too, has seen the evolution in the company culture. He has great hope for the coming years.

“This is my second career in terms of public service,” said Page, who came to ORAU after a long career in the U.S. Marine Corps. “I’ve never been more pleased and gratified to be able to work with such a great group of people.”

A great group of people working together to advance the nation’s priorities in science, health and education. That’s what One ORAU is all about. 🏆

AS HEARD ON:
**FURTHER
TOGETHER**
THE ORAU APODCAST

“96% of our employees say they understand how their work supports ORAU’s mission and vision.”

13 ways ORAU has *impacted* the nation and the world since 1946

For 77 years, ORAU has impacted national priorities in science, health and education. Our research enterprise and the more than 150 major Ph.D.-granting institutions that comprise our university consortium help keep ORAU and the nation on the leading edge of science and technology. Likewise, the scientific and technical

solutions we provide to our customers have impacted our nation and the world. In 2023, ORAU's leadership team developed a list of some of ORAU's biggest impacts since our founding in 1946. With this kind of impact in our first 77 years, just imagine what we can do next! 🏆🇺🇸

Trained All Generations of U.S. Health Physicists

ORAU has trained every generation of health physicists, who help protect people and the environment by ensuring that hospitals, nuclear power plants, and other industries use radiation safely. They may also work as instructors or train others in radiation safety.



Ensured the U.S. Nuclear Deterrent

After the discovery of the nuclear chain reaction, the U.S. stockpiled weapons to deter foreign attacks. Since the end of the Manhattan Project, ORAU and ORISE have recruited subsequent generations of scientists and engineers to keep America safe and competitive.



Ensured Federally Funded Scientific Research is Funded with the Utmost Integrity

We manage scientific peer and merit reviews, providing critical, independent assessments of research proposals and program performance. Our processes help ensure that scientific research is funded with the utmost integrity, meets scientific rigor and provides value to our agency customers.



Inspired New Generations of Minority Scientists and Engineers

ORAU supports efforts to recruit and train future scientists and engineers from underserved and underrepresented communities. Recent examples include hosting HBCU listening sessions for NASA and leading a technical workshop on behalf of the National Institutes of Health Path to Excellence Initiative.



Aided the Fight Against Opioid Use Disorder

ORAU experts have been helping to find solutions to reduce opioid overdose deaths, especially in Appalachia, and reduce stigma around opioid use disorders, enabling communities to more effectively communicate and work together toward ending the opioid crisis.



Verified Decommissioned Government Sites are Safe for Public Use

ORISE is a leading provider of environmental cleanup verification. This means land is safe to re-use because ORISE has verified that it is clean. As the government decommissions its sites, we ensure cleanup has followed Nuclear Regulatory Commission standards.



Encouraged More Effective Health Policies

Through our contract with Centers for Medicare and Medicaid Services, the government has more effective health policies because of our research. ORAU provides technical assistance to better improve how health system billing and coding processes are interpreted, which makes Medicare and Medicaid more effective for the people who receive these services.



Helped Mitigate Damage of Radiological Disasters Around the World

Either directly (in responding) or indirectly (through training others), we have been the boots on the ground for the medical management of many of the most significant radiological disasters around the world. ORISE's Radiation Emergency Assistance Center/Training Site (REAC/TS) assists any type of radiation accident, incident or terrorist attack.



Helped Former Energy Workers Secure Compensation for Occupational Disease

Since program launch in 2002, ORAU has completed and submitted more than 66,000 dose assessments, conducted more than 192,000 interviews with claimants or their survivors and taken more than 730 trips to identify and secure relevant data as part of managing the National Institute for Occupational Safety and Health (NIOSH) Radiation Dose Reconstruction Project.



Helped Bring Terrorists to Justice

At the Terrorist Explosive Device Analytical Center at Quantico, ORAU's forensic experts employed methods such as lifting latent fingerprints off the back of duct tape to help identify and find terrorist bomb makers.



Improved Veterans' Access to Government Resources

The ORAU-developed Performance Improvement Management System (PIMS) helps the Veterans Health Administration deploy resources (supplies and volunteers) where veterans hospitals need them during times of crisis, like natural disasters or pandemics.



Informed Climate Strategies

In partnership with the National Oceanic and Atmospheric Administration (NOAA) Atmospheric Turbulence and Diffusion Division (ATDD), ORAU experts collect data from climate monitoring stations across the country. These data offer key insights into the nation's climate and informs climate-impact research.



Improved STEM Opportunities Through Workforce Development

We recruit the best and the brightest scientific talent from around the world for roles in research participation programs at more than 250 national laboratories and federally funded research centers. Our multigenerational scientific pipeline includes education programs for kindergarten students through post-doctoral researchers, including summer programs, Extreme Classroom Makeovers and more.



AS HEARD ON:
FURTHER TOGETHER
THE ORAU & PODCAST

Davyda Hammond's mission in life, work is

helping others



Davyda Hammond, Ph.D., began working for ORAU in the company's safety culture program back in 2014, but the path that she took to get where she is today has been filled with twists and turns and challenges, but also plenty of opportunities.

Hammond received her bachelor's degree in mechanical engineering from Auburn University. She then went on to get her master's degree in mechanical engineering from the University of California, Irvine. She completed her education path by earning her doctorate degree from the University of Alabama at Birmingham in environmental health engineering.

Her husband also received his degree from the University of Alabama at Birmingham but later felt called to work as a full-time minister. For the next several years, Hammond and her husband moved around looking for the best opportunity for them both. These stops included North Carolina,

where Hammond worked for the Environmental Protection Agency, and then to Virginia, where she worked at a community college. She was able to help Germanna Community College build their engineering program.

The door opened to bring her family to Oak Ridge when her husband was called to pastor a local church. Hammond was excited because she had heard about Oak Ridge and the opportunities that existed there. After a couple of interviews with ORAU, Hammond got a call from Jeff Miller, who would become her manager. "Jeff said the position was a little different than what I was used to, but if I was willing to try something new, that I would be a great fit, and I'm so glad I did," said Hammond.

Hammond manages ORAU's safety culture program, which helps organizations protect the safety of their workforce and create a better culture. A customer may be looking for information about where to target their efforts to improve their safety culture, whether that be emphasis on new employee training programs or other ways to communicate safety changes. The safety culture program also conducts comprehensive surveys of the workforce for customers, which sometimes leads to dedicated focus groups and additional interviews with managers.

"We investigate the culture at companies as a whole. If you can build the right culture, then you can reduce the number of injuries and illnesses that you have on site, and that protects the community and the workforce," said Hammond.

The idea of helping others is something that Hammond also takes with her outside of work, as she is heavily involved in community service programs both with her church and in the community. Hammond serves in the church alongside her husband and also serves on the board of the Oak Ridge Breakfast Rotary Club, which does a ton of outreach with Oak Ridge High School.

"We have this great program where students who are considered borderline in terms of graduation or that have challenges going on at home or in school can get the help they need," said Hammond. "We set them up with internships during the school year, and that has shown to give them some stability. I love helping the students, and that is just another way I try to give back to the community."

Whether it's working with organizations to create safer environments or working with at-risk students in the community to create more stability in their lives, Hammond's greatest mission in her life and work is to use her talents to help others. 🌟



Winners of ORISE Future of Science Awards *honored* for contributions to science

The winners of the second annual ORISE Future of Science Awards were announced in October 2023. These prestigious awards recognize excellence performed by ORISE participants in the areas of scientific achievement, professional growth, project contributions and leadership in three categories: undergraduate student and post-baccalaureate,

graduate student and post-masters, and postdoctoral. Each winner received a cash prize of \$1,000, an award plaque and recognition from ORISE. Senior Vice President and ORISE Director Dr. Jim Vosburg presented the 2023 ORISE Future of Science Awards during a virtual ceremony to the ORISE participant winners listed below. 🎉

ANNIE PRICE Undergraduate Student & Post-Baccalaureate Award

Price (pictured right) is a researcher at the Air Force Research Laboratory, working within the high-speed systems division. Her research focus is on ramjet inlet design and analysis. She graduated from Princeton University in May 2022 with a Bachelor of Science degree in engineering. She is a former participant in the Air Force Institute of Technology program under the U.S. Department of Defense with Jose Camberos, Ph.D., and Ramana Grandhi, Ph.D., as her mentors.



REESE TIERNEY Graduate Student & Post-Masters Award

Tierney (pictured left) is an epidemiologist in the Enteric Diseases Epidemiology Branch at the Centers for Disease Control and Prevention (CDC). During her tenure in CDC's ORISE Research Participation Program, Tierney assisted CDC scientists with several high-priority projects, including the development of foodborne illness source attribution estimates, investigation of disparities in foodborne illness and analysis of social and environmental factors associated with salmonellosis. As a key member of the Interagency Food Safety Analytics Collaboration, Tierney also collaborated with scientists in multiple federal agencies. Tierney's goal is to continue to build a career in public health with an emphasis on the epidemiology of foodborne, waterborne and environmental

diseases. She holds a Bachelor of Science degree in public health from Georgia Southern University and a Masters of Public Health in epidemiology from Georgia State University. Tierney participated in the National Center for Emerging and Zoonotic Infectious Diseases program at the CDC with Erica Rose, Ph.D., and Beau Bruce, M.D., Ph.D., as her mentors.



JENNY PAUL, PH.D. Postdoctoral Award

Paul (pictured right) is an ORISE postdoctoral fellow with the Environmental Protection Agency's (EPA) Gulf Ecosystem Measurement and Modeling Division in Gulf Breeze, Fla., and EPA's Gulf of Mexico Division in Gulfport, Miss. She received her doctoral degree in zoology from the Center for Fisheries, Aquaculture, and Aquatic Sciences at Southern Illinois University. As an ecotoxicologist, her work is focused on understanding how environmental stressors and pollution affect aquatic ecosystems. At the EPA, Paul is developing rapid assessment tools using marine invertebrates to better assist natural resource managers and monitoring programs in the northern Gulf of Mexico. These include techniques like sediment profile imaging, which takes pictures that are later scored for animal activity, and approaches using environmental DNA to evaluate the benthic community. She is also an instructor for a live-aboard marine biology techniques course taught during semester breaks through Southern Mississippi University and the EPA. Paul performs her research through the EPA's Gulf of Mexico Program Office with Janet Nestlerode, Ph.D., as her mentor.



Making the investment:

Experts and academic partners receive funding to advance knowledge, research

The ORAU-Directed Research and Development (ODRD) investment program funds research on topics where ORAU capabilities intersect with member universities' research interests. The hope is that these projects result in new sponsored research jointly performed by ORAU and partner universities.

ORAU Thought Leadership Research Awards support the completion of publications sent to peer-reviewed journals or time and travel to attend conferences where original research and concept papers are presented.

Both awards make an impactful investment in advancing scientific knowledge and research. 🌟

FY23 ODRD AWARD WINNERS AND PROJECTS



Adayabalam Balajee, Ph.D.

ORISE Cytogenetic Biodosimetry Laboratory, and Columbia University
Evaluating cellular DNA damage responses to FLASH radiation to identify potential improvements in therapeutic applications.



Brenda Blunt, D.H.A.

ORAU and Virginia Commonwealth University
Exploring practitioner-based complementary and alternative medicine offerings and their use from both consumer and provider perspectives.



Praveena Krishnan, Ph.D.

ORAU and University of Tennessee, Chattanooga
Developing a predictive framework for how harsh environmental conditions impact mammalian social organization.



Chris Nelson, Ed.D.

ORAU and Southern Illinois University-Carbondale
Evaluating how cultural values influence young learners' response to climate change education to inform curriculum development.

FY23 ORAU THOUGHT LEADERSHIP AWARD WINNERS AND PROJECTS



Tiffani Conner, Ph.D., PMP, AHIP, CF-APMP

ORAU
Presented a poster in collaboration with Laura A. Murray, MIS, MBA, AHIP, Univ. of South Florida, entitled, "Trends in Biomedical and Scientific Grants Peer Review."



Ashley Golden, Ph.D.

ORISE
Delivered a presentation entitled, "Findings from the Million Worker Study" at the International Society of Radiation Epidemiology and Dosimetry 2023 annual meeting in Sitges, Spain.



Michael Holtz, APR, MPRCA

ORAU
Authored a white paper entitled, "Meeting the Moment: Aligning ORAU's capabilities with the federal government's priorities to end cancer as we know it" that has been published on orau.org.



Michelle Schaur, MPH

ORAU
Developed a paper, in collaboration with CDC, on building rapid capacity for community engagement in emergency response-case examples in Hispanic/Latino populations in multiple states.



Betsy Smither, MPH

ORAU
Researched and prepared a manuscript for journal submission, entitled "Understanding Faith-Based Leaders' Opinions on Syringe-Services Programs and Other Services for People with Substance Use Disorders."



Alexander Stemer, Ph.D.

ORAU
Developed an internal research paper entitled, "Systematic analysis of impact of COVID-19 pandemic on Nuclear Safety Culture."

Accelerating U.S. efforts to *strengthen* the STEM talent pool



STEM Accelerator

*Strengthening America's
Global Leadership in STEM*

America's nuclear energy industry faces a critical problem that the ORAU STEM Accelerator (OSA) hopes to solve.

The drive toward a carbon neutral clean energy future is anticipated to spur the growth of advanced nuclear reactors that are smaller, simpler to construct, more cost-effective to operate than existing facilities and offer high-quality career opportunities. However, there is a critical shortage of the skilled professionals needed to oversee manufacturing, construction and operation of these facilities.

OSA was created to help bridge this gap by convening a diverse network of two- and four-year academic institutions, industry, nonprofit, professional organizations, labor unions and government partners with the aim of addressing the toughest challenges in STEM education, training, research and innovation.

“OSA will focus its work in three sectors: nuclear science and technology, space manufacturing and critical national infrastructure,” Olivia Blackmon, OSA director said. “We’re focusing on nuclear science and technology first, because the current need is so great, with a piloted program in nuclear energy.”

The U.S. nuclear energy industry faces significant challenges in attracting and retaining qualified talent.

“Retirements, retention issues, inflation, shifting demographics, etc. This is all documented from the Nuclear Energy Institute (NEI), and projections are suggesting worsening labor market conditions over the next decade extending into 2060,” Blackmon said, adding that something needs to be done and quickly to reverse this trend.

To that end, OSA is already plugged into some major national efforts in collaboration with the NEI and other partners to help solve these critical challenges, including the following:



“Our goal is to drive research and development, advocate for innovative training and education solutions, shape policy and deliver tangible outcomes to strengthen the United States STEM workforce,” Blackmon said.

Bringing together the stakeholders involved in shaping the nation’s scientific enterprise will result in innovative solutions for one of the nation’s critical issues, the need for improved STEM education, training, research and innovation.

AS HEARD ON:



ORAU Consortium

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

Through partnerships with our university members, ORAU works with government agencies, national labs and private industry to advance scientific research and other critical missions. Being a member includes access to unique vehicles for funding research, professional growth and development opportunities as well as fruitful collaborations, including the

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. ▲

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
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
Indiana University
- Purdue University Indianapolis
Iowa State University
Jackson State University*
Jefferson 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
Oregon 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*
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-Columbia
 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 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

ORAU adds first tribal university to its consortium in 2023: Navajo Technical University

Villanova University
 Virginia Commonwealth University
 Virginia Tech
 Wake Forest University
 Washington University in St. Louis
 Wayne State University
 Western Kentucky University
 Western Michigan University
 Wichita State University
 Yale University

*** 35 Members are Minority-Serving Institutions Research Council members**

Includes 16 HBCUs and 1 Tribal University

Biogas ‘plant’ purchase helped reduce carbon footprint of ORAU 2023 Annual Meeting



Photo credit: Myclimate, Biogas Project India

One of the many highlights of the ORAU 2023 Annual Meeting of the Council of Sponsoring Institutions was the purchase of carbon offsets, a method by which an organization can compensate for the carbon emitted by an event, for example, by reducing or removing carbon somewhere else.

Purchasing carbon offsets made perfect sense for the 2023 meeting, the theme of which was “Climate Security and Environmental Justice: Pathways to Achieving the 2050 Carbon Net-Zero Goal.”

Annual meeting attendees were encouraged to calculate their personal carbon footprint using

calculators on the myclimate.org website. Additionally, ORAU’s Research and University Partnerships Office calculated the carbon footprint for the entire meeting.

“We added the two numbers together to arrive at a carbon footprint of 16 metric tons,” said Casey Thomas, program manager. “The overall calculation includes carbon emissions from travel, heating and air conditioning, food preparation, energy consumption, printing and other metrics.”

ORAU purchased a small biogas plant-like operation in India, which uses agricultural waste, manure, food waste and other biodegradable materials to produce methane, which can be used for cooking. The biogas plant makes it possible to cook without firewood and eliminates a family’s exposure to soot particles. Organic fertilizer is a by-product of the plant, which replaces harmful chemical fertilizers.

“Purchasing carbon offsets was a big hit with our attendees,” Thomas said. “We’ll be doing it again for 2024, and I would assume every meeting moving forward.” 🌱

Delivering value

to ORAU university consortium members



ORAU continuously works to deliver on its value proposition to expand opportunities for the 153 members of the university consortium to engage with a growing list of industry partners and the federal agencies with which we do work.

“A more diverse mix of partners are connecting with us because of the science and technology innovations that our university consortium can bring to their strategic mission areas,” said Cathy Fore, ORAU senior director of university partnerships.

One example of this is a recent task order from the U.S. Centers for Disease Control and Prevention focused on wastewater surveillance for tracking the spread of communicable illnesses, such as COVID-19 or influenza. Work under the task order partners ORAU experts in public health and health care with researchers from Arizona State University (ASU). Fore says it’s a situation where everyone involved benefits: ORAU and ASU receive funding for their contributions to the work, and both organizations get to demonstrate their capabilities for a federal agency partner.

ORAU’s Research and University Partnerships Office led the development of Basic Ordering Agreements (BOAs) with a select group of member universities. The BOA provides all the required documents and templates that will benefit both ORAU and the member university in proactively pursuing and executing research and other professional services support. BOAs were fully executed with four universities: Arizona State University, Florida International University, George Mason University and Ohio State University. A CDC-funded task order was

awarded to Arizona State University through the executed BOA. Additional BOAs are in the process of being signed, and many more universities have expressed interest in entering into a BOA agreement with ORAU.

Another example is ORAU’s role in establishing an external steering committee for the Oak Ridge Enhanced Technology Training Center (ORETTC), a state-of-the-art U.S. Department of Energy (DOE) facility that supports the training of personnel in a variety of areas, including nuclear safety and emergency radiation response. The steering committee consists of subject matter experts representing member universities and private industry. Training may include virtual and augmented reality platforms and real-time hands-on simulations, evaluating the effectiveness of existing training, and creating new training options.

“We were able to leverage the ORETTC example to demonstrate future opportunities with private industry,” Fore said. “As you can see, there’s a lot of matchmaking among our member universities and industry partners.”

More direct matchmaking happens with ORAU’s member grant programs, including the Ralph E. Powe Junior Faculty Enhancement Awards and the Innovation Partnerships Program.

The Powe Awards program offers seed money to junior faculty at member universities to start research projects. ORAU awards \$5,000 to 35 junior faculty members annually (see story on page 19). That award is matched by the researcher’s university. Fore is recruiting industry partners to join in funding Powe awards. General Dynamics Information Technology (GDIT) and AREA (Augmented Reality for Enterprise Alliance) are two partners joining in supporting Powe Awards for 2024. GDIT’s research interests focus on supply chain innovation; AREA focuses on augmented reality in the workplace.

“It’s not just that these research partners cover the cost of the awards,” Fore said. “They are helping expand their research portfolios through engagement with our member schools. The universities then expand their reach into industry’s strategic research goals.”

The Innovation Partnerships Program (IPP), fosters meaningful collaborations for university consortium members and ORAU subject matter experts around a particular topic area, such as climate change, health equity and the future of the scientific workforce. Consortium members receive \$4,000 to support their event.

“In 2023, grant funds were used to support focused workshops or conferences that highlight each awarded member university’s strategic research and education growth areas,” said Tracie Curtright, who manages the Innovation Partnership Grant (IPG) program.

Examples of IPG grants in 2023 include:

- University of Central Florida’s NanoFlorida event, a live technology jobs recruitment webinar that was recorded

and can be shared with the entire student population, not just those who attended the event.

- Pennsylvania State University held a Shale Network workshop on environment and policy change that led to a successful ORAU-Directed Research and Development Grant application.
- Villanova University launched a program to train students at Jefferson Institute for Bioprocessing in cell culture processing for a local pharmaceutical company.

None of this would be possible without strong relationships with university consortium members at the highest levels, Fore said, adding that RUPO will continue to shape its university engagement business model to demonstrate the best value for consortium members, our industry partners, and the federal agencies we work with. 🏔️

The power of a *new generation* of peer reviewers

Peer review—like those ORISE manages for DOE and other government agencies—is the evaluation of scientific work by subject matter experts from the same or a related field. Peer review is used to evaluate scientific research proposals, ongoing research or a submitted paper based on research. Subject matter experts are selected to evaluate, comment and score proposals based on their knowledge of the subject and understanding of the impact each proposal would make if funded.

“Peer review has been the gold standard for determining the quality of research for decades now,” said Ethan Pratt, who works in science and research support for ORAU. In most cases, peer reviewers are selected from a database on the basis of prior experience and area of expertise. While these reviewers have shown themselves to be capable and dependable, a new generation of subject matter experts and researchers offers fresh perspectives

and provides a continued supply of expert reviewers as the more seasoned reviewers move on to new endeavors.

“It’s important for the early career reviewers to have the chance to sit on the panels of peer review because they learn a lot from the people who have been there a long time and know how things operate,” said Pratt. “The value is that they may find connections to collaborate on future research and build their network.”

The new generation of reviewers may also use the opportunity to learn about the peer review process and apply that to their own proposal submissions years later.

“Being a reviewer is a great way to break new people into the application process. It exposes them to new ideas that they may not have thought about before being selected to be a reviewer, and they can take that knowledge back to their career field,” said Pratt.

The push to bring in a new generation of reviewers requires a tremendous



amount of research into who they are and where to find them.

“One way we are finding fresh talent is looking at programs we manage and who is new in the field,” Pratt said. “With the NASA postdoc program, once the fellows finish their two-year fellowship, we can add them to our database as a new generation of intelligent peer reviewers. Also, with our new database, we are looking at ways to incorporate machine learning tools to match proposals with reviewers with the goal of reaching a larger pool of qualified candidates.”

With the growing need for peer reviewers in a variety of scientific subject areas, the pursuit of the next generation of experts is one that is evolving quickly and one where ORAU is providing significant leadership. 🏔️

Drawing from every experience:

Smart discusses his career, support for the NIOSH project



He calls himself Bill Nye the Finance Guy, but everyone else knows him as Archie Smart. Smart, a project manager on the National Institute for Occupational Safety and Health (NIOSH) Dose Reconstruction Project, has been with ORAU for more than 20 years working on the NIOSH Project doing a little bit of everything in operations.

Since 2002, the NIOSH Project has submitted more than 66,000 dose assessments and conducted more than 192,000 claimant interviews, in addition to thousands of other documents and trips so that workers' claims can be processed. Smart manages the program management support team, making sure that everyone on the NIOSH Project has everything they need to do their jobs well.

"The NIOSH Project is the case study for a lot of things," Smart said. "When ORAU was automating the process that we use now to approve requisitions, they came to the NIOSH Project and asked if we would test the system before they rolled it out to everybody because of the high number of requisitions that we do on a monthly basis."

While he earned a degree in history with an English minor from South Carolina State University in Orangeburg, South Carolina, Smart has always worked in finance, operations, or project management. "I look back over my career now and say, 'how did I get here?'" Smart said. "Well, I think we can blame it all on the Army."

Smart attended college on the Basic Education Opportunity Grant, now called the Pell Grant, and was involved in ROTC. He was contracted to go into service after he graduated, and he became an Adjutant General (AG) Officer with a Regular Army Commission.

Archie oversaw the financial management of military operations of gyms and bowling allies in three separate locations in Germany: Pirmasens; Budingen, and Gelnhausen. He also oversaw the finances of a rod and gun club and a fleet of 10 armored (CMSF) vehicles. These skills followed him throughout his career.

"I don't know how, but I always ended up in funds management in some form or fashion," Smart said. "When I came to this job at ORAU, I was hired based on my operations experience. When I interviewed here, there was someone else who had HR civilian experience. I had military HR experience. So the hiring manager decided to hire both of us. My coworker did the personnel work, and I managed the operations work. And that's how I got the job that I currently have now for the NIOSH Project."

Smart considers himself a workaholic, and he also recently earned an MBA from Southern New Hampshire University in Organizational Leadership, graduating summa cum laude. When he's not thinking about work, he and his wife Millette are very involved with their family and in Greater-Works Church. They are in the process of adopting Millette's niece's son, Mason, whom they've been raising since he was four months old. Mason turned five in June 2023. "We never had any children, and we got this little four-month-old, and he has totally changed our lives," Smart said. "'Papi' has to come in every day and play with Mason."

He may not have known how he got here, but Smart knows it's good to be part of something greater than himself. Whether at home with his family, pursuing an MBA, or at work on the NIOSH Project, Archie draws from every experience and pours himself into the people and work most important in his life to help them succeed. 🏔️

Making an *impact* on cancer personally and professionally

AS HEARD ON:

**FURTHER
TOGETHER**

THE ORAU PODCAST

For Michael Holtz, creating the deliverable for his ORAU Thought Leadership Research Award was almost as important as writing his thesis for the Master of Science degree he received in 1998.

“Kind of like grad school, this project was the culmination of a lot of things,” said Holtz, a senior communications and marketing specialist for ORAU. “It involved research into ORAU’s early history of running a cancer hospital back in the 1950s when the organization was known as ORINS, or the Oak Ridge Institute for Nuclear Studies, my professional and volunteer experience as a cancer policy advocate, and all of the time I have spent over the years meeting fellow cancer survivors.”

Holtz is a 12-year survivor of stage IIIB rectal cancer. He serves on the National Ambassador Team for the American Cancer Society Cancer Action Network, and volunteers for Fight Colorectal Cancer, the National Coalition for Cancer Survivorship and Man Up to Cancer.

He applied for and received a Thought Leadership Research Award to develop a white paper aligning ORAU’s cancer capabilities with the federal government’s agenda in the cancer space. The paper recommends ideas for seven possible ORAU-Directed Research and Development projects:

- Improve cancer screening rates among underserved communities, especially black and LGBTQIA+ communities that have higher cancer risk and mortality rates.
- Study and improve the processes for collecting patient-reported outcome measures between treatment visits.
- Identify best practices for communication to improve awareness of low-dose CT for lung cancer screening. Lung cancer is currently at the highest rates of diagnosis and death in the United States.
- Focus on cancer-related stigma and the preference for or against using militaristic language, like cancer fight or cancer battle, to describe a patient’s cancer treatment experience.
- Ensure inclusion of the special needs of cancer patients in disaster preparedness guidelines.
 - Focus on the benefits of peer-to-peer support to the mental health and quality of life of men diagnosed with cancer.
 - Develop and test messaging to patients who may wish to request a blood test to screen for colorectal cancer rather than submit to a colonoscopy.

During his treatment journey, Holtz underwent radiation therapy. Learning about the ORINS cancer hospital, which established ORAU

as a pioneer in the field of nuclear medicine and cancer treatment, has been a full circle experience, he said.

ORAU started working in the cancer space when the Atomic Energy Commission (AEC) asked ORINS to stand up a hospital to study how research into the radioisotopes that had been produced as part of the Manhattan project could be used to treat cancer. The ORINS cancer hospital, which opened in 1950, was one of three the AEC set up around the country. The others were located at Brookhaven National Laboratory and Argonne National Laboratory. During the 24 years the hospital was open, 3,500 patients were treated, most of whom were considered terminal.

Since the hospital closed in 1974, ORAU has continued to work on cancer in other areas, including epidemiology and exposure science, radiation studies, health physics and radiation safety training, peer review and health communications. Holtz is hopeful his recommendations can have an impact on both ORAU’s research enterprise and in ending cancer as we know it.

“We can do great things and impact cancer risk, survivorship, early detection and prevention, and quality of life for cancer patients and their families,” he said. ▲



Bringing the talent home:

Four top students participate in ORAU Summer Internship Program

ORAU's Research & University Partnerships Office introduced its brand-new ORAU Summer Internship Program in 2023, bringing high-caliber students in-house to collaborate with ORAU and ORISE. The four interns who were selected represent vastly different

disciplines and skillsets and are currently enrolled or are graduates at schools within our university consortium. This educational opportunity was a 10-week, hands-on experience through the summer and tasked participants with on-the-job projects.

THE INTERNS WHO PARTICIPATED INCLUDED:

ADAM DELAHOUSSAYE, a senior at the University of Tennessee pursuing a degree in communication studies with a minor in political science, interned with ORAU's Communications and Marketing team. Specifically, Delahoussaye learned the ropes of public relations and employee communications.



"I want experience telling stories and communicating about things not directly in my wheelhouse. I write about music and the arts for my student newspaper. Here, I got thrown into this world of research and development, STEM programs and a bunch of stuff that I know nothing about. The ability to walk into a room that you don't know anything about, learn your way through it and still be able to tell a cohesive and entertaining story is probably one of the best traits a writer can have."

- Adam Delahoussaye

KAYLA LACEY interned remotely with ORAU's safety culture program. She is a graduate student attending the University of Nebraska at Omaha studying industrial organizational psychology. In this internship, she supported the team that manages safety culture evaluations for the Department of Energy contracted sites. Lacey even came to Oak Ridge to participate in data collection for the survey of one evaluation.



"I walked away with a better understanding of analyses and the way that IO (Industrial and Organizational) psychology works in the real world. I wanted to gain a lot of experience and understanding of what it's like to work in a non-corporate space and get some clarity on whether the thing that I am most interested in is the actual implementation or the research. I think that no matter what kind of field I'm in, I'll still like to do research and share research."

- Kayla Lacey

KELSEY O'BRIEN was tapped to report to the ORISE Cytogenetic Biodosimetry Laboratory (CBL). O'Brien is currently pursuing her undergraduate degree in genetics with a focus in biochemistry from Iowa State University. With a background in research and having the opportunity to present internationally, O'Brien jumped right in with the team of CBL scientists studying radioactive medicine and the effects of nuclear exposure on the body.



"I'm super-fortunate to have been given so many opportunities here. I have been able to shadow Dr. Balajee, Maria Escalona and Terri Ryan at the lab to see what they do independently of one another as well as what they do collectively on big projects. I have been more than fortunate to have researched on the flash project (doing a little bit of scoring for those donors). I've been learning everything that there possibly is to learn."

- Kelsey O'Brien

TONY ZBYSINSKI, III, joined ORISE's Health Studies team. Zbysinski is an epidemiologist and a Ph.D. student at Colorado State University in Environmental Health Epidemiology as well as a Mountains and Plains Education and Research Center occupational ergonomics and safety trainee. His internship focused on radiation epidemiology, and specifically, the Million Person Study in which ORISE is heavily involved.



"It's a study that now has more than a million people who have worked with radiation in some capacity and tries to further our understanding of how occupational low-dose ionizing radiation exposure may lead to adverse health outcomes. This study is how I connected with ORAU, and we're the data stewards. I say 'we' because I'm part of the team through this internship. I got this wonderful training for radiation epidemiology."

- Tony Zbysinski, III

The results of these four internships have exceeded expectations and proved to be mutually beneficial. ORAU's Research & University Partnerships Office is already talking about future opportunities and hoping to grow the program next year. To hear more of the interviews with these interns, listen to "Episode 119: Meet the interns: Four talented young people and their summer at ORAU" on Further Together: The ORAU podcast at orau.org/news/podcast.html. 📻 🎧



Photo credit: Kristin Dyer

Zoonotic researcher, Daniel Becker, Ph.D., used all his Ralph E. Powe Junior Faculty Enhancement Award monies in one place: to microchip Mexican free-tailed bats. As an assistant professor in the School of Biological Sciences at the University of Oklahoma, Becker is studying pathogens that bats in the Americas might carry that are a possible threat to human or wildlife health.

Zoonotic refers to pathology—that is, any animal disease that is communicable to humans. Specifically, Becker is tracking Mexican free-tailed bats that migrate between Oklahoma and Mexico, characterizing the pathogens they carry and their immune systems.

TO THE BAT CAVE!

Powe award winner Becker studies viruses in wild bats and their potential to infect humans

The Ralph E. Powe Junior Faculty Enhancement Award is designated for emerging faculty members who are in the first two years of their tenure track and work in a STEM discipline. ORAU selected 35 recipients in 2023. As one of those winners, Becker used his \$10,000 seed money to purchase the microchips they implant in the bats and a receiver for the cave where the bats roost. This equipment helps him monitor the movement of the bats when the animals migrate.

Becker cites deforestation and climate change for more bat-human interaction today than in previous generations. He wants to help scientists predict which bats and which bat-borne viruses are likely to infect humans through cross-species transmission.

"There is a lot of interest right now in what bats are doing and how wildlife health impacts human health," Becker said. "We've known for decades that most emerging human diseases come from wildlife species," he continued. "If we can understand how something like migration, when animals are spending energy to go from A to B, affects their immunity and their infections, that could help us predict when bats might be more likely to be in an infectious state."

Since the Powe award program's inception 33 years ago, ORAU has given 875 grants totaling more than \$4 million to fund and enhance early career researchers' professional growth. Including the matching funds from member institutions, ORAU has facilitated grants worth more than \$8 million. 📻

What's with the monkeys?

A historical look at ORAU's marmoset colony



In 1961, Chief Scientist Nazareth Gengozian, Ph.D. (pictured bottom left)—who worked for ORAU's predecessor ORINS—blazed a new trail when he established a colony of South American marmosets in Oak Ridge, Tenn., for his research supporting the Atomic Energy Commission. Gengozian had been working as a biologist at Oak Ridge National Laboratory (ORNL) studying irradiated mice in the Mammalian Recovery program before coming to ORINS.

Because of his years of studying the effects of ionizing radiation on immune processes, Dr. Gengozian was a leading expert in this newly forming field of medicine. He had heard about a lab in Miami studying marmosets to learn about nutrition, so ORAU gave him the green light to study the same primates to learn about transplant immunology. What he found moved cancer research forward in significant ways.

The research value in marmosets lies in the fact that marmosets are the only non-human primates that regularly produce fraternal twins (with a high frequency of 80-85%). In utero, the twins exchange tissues and develop natural tolerance to the foreign tissue of the other.

A set of studies showed that animals successfully transplanted with marrow genetically different from their own continued to have an impaired immune system. This indicated a critical need for finding the right donors for compatibility.

Dr. Gengozian also discovered that radiation delivered over a period of a few minutes was more effective for immunosuppression than the same amount of radiation delivered over the course of an hour. Thus, he developed the immunological basis for bone marrow grafting as we do it today, which led to one of the first successful bone marrow transplants for a leukemia patient.

The original intent for the marmoset research was limited, but success after success opened the door to more research opportunities. An unexpected finding was that spontaneous colon cancer and acute colitis occurs in cotton-top tamarins (an endangered marmoset species). This is the only known mammal other than humans to develop colon cancer spontaneously.

Dr. Gengozian died in 2020, but not before he was able to enjoy witnessing the long-term results of his findings in bone marrow transplants, colon cancer treatments and, most recently, successful stem cell options at the Thompson Cancer Survival Center. Thank you, Dr. Gengozian, for your curiosity and your commitment to science. Studying monkeys at ORAU proved invaluable in scientific discovery. 🦍🦍

READ MORE AT:

Then & Now
THE ORAU BLOG

Research shines

in ORAU-managed programs for NASA & EPA

Whether students, early-career postdocs, or up-and-coming scientists, ORAU helps researchers 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 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! 🌟

LAURA FACKRELL, PH.D.

School: University of Georgia, doctorate in planetary science and geology

Agency/Location: NASA Postdoctoral Program Fellowship at the Jet Propulsion Laboratory

Research: The role of nitrogen in lunar habitats for the potential of humans living on the moon



KALEB WILKES

School: North Carolina State University, bachelor's in physics

Job/Agency/Location: Engineering Support Modeler, Environmental Protection Agency (EPA) Office of Research and Development and Center for Environmental Measurement and Modeling

Research: Comparing the products of incomplete combustion of short-chain per- and polyfluorinated substances and how they behave in comparison to their chlorinated homologues



CONNER BALLEW, PH.D.

School: Caltech, doctorate in electrical engineering

Agency/Location: NASA Postdoctoral Program Fellowship at the Jet Propulsion Laboratory

Research: Applying 3D metaoptics design and fabrication techniques to terahertz spectroscopy applications



CARTER THUNE

School: North Carolina State University, bachelor's in computer science

Job/Agency/Location: Bioactivity Application Developer, EPA Office of Research and Development Center for Computational Toxicology and Exposure team

Research: Developing new computational tools and providing quantitative analysis for improving environmental risk assessments and regulatory decisions under the Chemical Safety for Sustainability research program



RAYNA ELLISON

School: Oklahoma State University, bachelor's in environmental science and water resources

Job/Agency/Location: Environmental Research Assistant, EPA Office of Research and Development Center for Environmental Solutions and Emergency Response

Research: Analyzing water quality with high-grade technological machinery and working in the metal lab at the Kerr Lab research facility



Rising stars

in ORISE-managed research participation and career development programs

ELLE WINFIELD

School: George Mason University, master's degree in forensics

Program/Location: DoD Walter Reed Army Institute of Research fellow, Entomology Branch's Vector-Borne Diseases team

Research: Mosquito breeding to study essential oil-based larvicides

Photo Credit: Eden Winfield



NANA ZHOU, PH.D.

School: Chongqing University, doctorate in power engineering

Program/Location: Hybrid Performance Project, National Energy Technology Laboratory (NETL) Postgraduate Research Program

Research: Novel and more efficient power generation systems

ISABEL DUNN

School: University of Wisconsin-Stevens Point, bachelor's degree in fisheries and water resources

Program/Location: Environmental Protection Agency Great Lakes National Program Office

Research: Tracking Great Lakes restoration and protection efforts

Photo Credit: University Communications and Marketing, University of Wisconsin-Stevens Point



PAMELA MICEUS

SCHOOL: Manhattan College, master's in mechanical engineering

PROGRAM/LOCATION: Mickey Leland Energy Fellowship (MLEF) Program at the National Energy Technology Laboratory (NETL)

RESEARCH: Thermal energy storage system for integration into coal-fired power plants



MARIANA SORROZA AGUILAR

School: University of Central Florida, bachelor's degrees in mechanical engineering and international and global studies

Program/Location: National Nuclear Security Administration Minority Serving Institution Internship Program

Research: Soft skills in STEM, including communication, conflict resolution and time management



ERICA YANG

School: State University of New York at Buffalo, master's in geology

Program/Location: Environmental Protection Agency, Great Lakes National Program Office

Research: Monitoring the health of the Great Lakes from a research vessel

Photo Credit: EPA

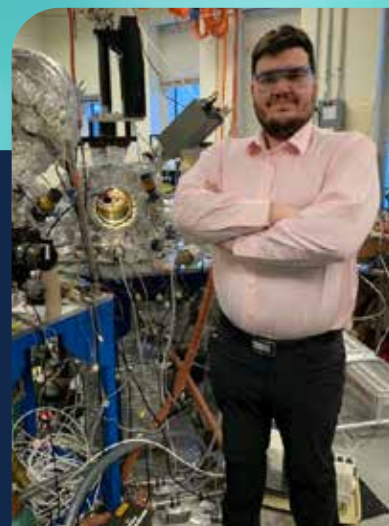
DOMINIC GORONZY, PH.D.

School: University of California-Los Angeles, doctorate in chemistry

Program/Location: Office of the Director of National Intelligence Community Postdoctoral Research Fellowship Program

Research: Studying the chemical/physical properties of novel and ultra-thin materials, such as borophenes.

Photo Credit: Ky Lamarca, Northwestern



ALEXANDRIA SPARKS

School: Georgia State University, bachelor's degree in chemistry

Program/Location: Centers for Disease Control and Prevention (CDC) Division of Laboratory Sciences (DLS) Research Participation Program

Research: Urinary biomarkers from harmful chemical exposures



Social media-like 'ORISE Connections' platform *connects* ORISE interns, fellows, mentors around STEM experiences



New in 2023, ORISE has created an online platform, ORISE Connections, to encourage all current and former ORISE interns, fellows and mentors to join together for networking, expanding knowledge and sharing STEM experiences. A social-networking-type platform, ORISE Connections has registered more than 1,000 members in just a few months and provides a convenient way for them to access professional development opportunities, online and in-person events, and the latest news and upcoming happenings for the ORISE community.

Every year, ORISE connects thousands of college students, post-graduates and faculty with paid internship and fellowship opportunities at premier national laboratories, scientific facilities and research centers, and universities across the U.S. ORISE Connections fills a gap in keeping them connected during their internships and fellowships as well as long after their ORISE research experiences have ended.

“ORISE had received feedback that both alumni and current participants want a place to network with each other, find resources and share experiences,” said Leslie Fox, ORISE Outreach and Engagement, STEM Workforce Development manager. “So, our team developed the ORISE Connections virtual platform to achieve this. It’s designed for both alumni and current participants and mentors and makes it easy for them to build and revisit connections across STEM disciplines and research interests, start conversations about shared interests, explore exclusive resources and keep up with ORISE news and events. We invite all current and past interns, fellows and mentors to join today!” Learn more at: oriseconnections.org 🌟



ORISE Connections

Emergency Manager 360:

mission critical



tool helps prepare for the unthinkable

Who will benefit from using EM 360? “As the title suggests, emergency managers from any market, whether that be health care, business, or academia. Facilities management in any sector. Any organization with fixed facilities required to follow safety and security requirements and guidelines. If you have required fire drills, you need EM 360,” Connelly said.

For emergency managers, their never-ending mission is to think about the unthinkable, prepare for the worst, and help their employers be ready for any scenario. This requires planning, testing those plans, evaluating what works and what doesn’t, and circling back to the planning phase with lessons learned to begin the process again.

While the cycle of preparing for emergencies can be dizzying at times, ORAU launched a new product in 2023 designed to help emergency managers stabilize that planning process and do so with incredible efficiency. Emergency Manager 360, or EM 360, has joined the growing list of products and services developed by ORAU to help America’s emergency preparedness workforce do their jobs well.

For many years, ORAU has helped the Veterans Health Administration (VHA) with a software solution known as the Performance Improvement Management System (PIMS). PIMS was specially designed for the needs of the emergency planners at the VHA, but the framework had enormous potential to help other kinds of agencies and institutions manage their own emergency preparedness and exercise efforts. ORAU’s Mary Connelly, who oversees both products, says EM 360 takes the best parts of PIMS and adds great adaptability for any organization or agency that has emergency preparedness as part of their mission.

“Much code and structure has been repurposed from VHA PIMS, and many lessons learned from prior development have been incorporated into the new version,” Connelly said. “EM 360 focuses on designing and building a more dynamic PIMS with flexibility considerations throughout to allow for client implementation in any market segment.”

The “360” part of the name represents how the product supports every phase of the Emergency Management Cycle, from incident tracking to preparedness activity tracking to exercise improvement action tracking. EM 360 will allow emergency planners to share resiliency data throughout a customizable organization structure; track performance measures and regulatory standards; create exercises, drills, and incidents consistent with Homeland Security Exercise and Evaluation Program (HSEEP) standards; improve consistency and standardization; and assess emergency preparedness.

Although EM 360 just launched in 2023, Connelly said she believes in coming years it will help make a measurable difference in how America’s emergency response planners keep the country ready for any scenario.

“My hope is that agencies and organizations will see EM 360 as a mission critical tool, just as VHA emergency managers do with PIMS, and that they will take advantage of this simple yet robust system, which provides a practical approach to increasing readiness and resilience,” Connelly said. “We hope using EM 360 will allow emergency managers more time to focus on fixing problems and implementing real change.”

By helping emergency managers increase readiness and resilience, they and their organizations will be better able to respond when the unthinkable occurs. 🗓️

**Emergency
Manager 360**
Build. Evaluate. Track. Improve.

REAC/TS hosts NATO training for *'events they hope will never happen'*

Not once but twice in 2023, ORISE's Radiation Emergency Assistance Center/Training Site (REAC/TS) coordinated with NATO in radiation emergency training events. In June, organizers with NATO's Chemical Biological Radiological Nuclear (CBRN) Medical Symposium selected Oak Ridge for the first time ever to host its annual two-day training event.

REAC/TS was a sponsor and featured in one of the agenda sessions. The event's purpose was critical planning: to share resources and research. Industry, civilian and NATO CBRN military personnel were invited to get together and discuss common strategy and to train—to prepare for events that they hope will never happen, but to plan for them as if they will.

Robbie Beech, a military emergency care nurse from the United Kingdom, leads the ongoing NATO CBRN Training Panel and

was instrumental in planning the symposium. Beech explained that the specialists and experts in Oak Ridge and at REAC/TS are second to none.

"Oak Ridge is not your normal option for a big NATO conference," Beech said. "However, for the last eight to 10 years, I've been coming to Oak Ridge to participate in a REAC/TS course (either Advanced Radiation Medicine or the Radiation Emergency course). There's a reason why we come here from a radiation point of view. It's historic. You've got the birthplace of nuclear warfare. The specialists are here. You can't get a direct flight from Europe, but it's worth it. The bang for the buck is worth it."

ORISE's Adayabalam Balajee, Ph.D. (pictured opposite page), was a featured speaker of the symposium. As Director of ORISE's Cytogenetic Biodosimetry Laboratory—which is part of REAC/TS—Dr. Balajee addressed radiation exposure in an increased global threat environment and the necessity for accurate dosimetry for medical response. This symposium marked an important opportunity for leaders to share best practices to prepare for events where large numbers of people could be exposed to chemical, biological, radiological or nuclear elements. Dr. Balajee's team is leading the way in preparing for rapid response in a mass casualty event involving weapons that cause radiation exposure.

Just a few months later, in early November, it was REAC/TS' turn to host a NATO workshop: Software tools for Triage of the Acute Radiation Syndrome (StTARS 2023). Described as a practical workshop, it was the second time NATO representatives were in Oak Ridge at the Pollard Technology Conference Center to train emergency response leaders from around the world. This time, it was a four-day event that included speakers who developed the featured software. This workshop offered insight into the diagnostic and therapeutic strategies that are under development for radiation emergency response. Like NATO's goal with the medical symposium, this event brought together civilians, military personnel and those tasked with dealing with medical decision-making in the field of radiological or nuclear threats.

Carol Iddins, M.D., Director of REAC/TS, has attended these NATO events for years. She was the key influencer in bringing the StTARS 2023 workshop to REAC/TS. "The world is safer and more prepared because of the work of NATO members and participants of events like these," Iddins said. "At REAC/TS, we want to lead the way when it comes to the level of investment and response in the areas of chemical, biological, radiological and nuclear threats. It requires ongoing education and innovation. We hope these emergency events never happen, but we will be ready if and when they do." ■

AS HEARD ON:



3D-printed human tissue may hold *answers* to health impacts of diagnostic low-dose radiation exposures

Until recently, it was challenging for doctors and scientists to assess health risks of diagnostic low-dose radiation exposures, such as from X-rays, because of the lack of appropriate model systems that mimic tissue microenvironments. With funding provided by the ORAU-Directed Research and Development program, Adayabalam Balajee, Ph.D., director of ORISE's Cytogenetic Biodosimetry Laboratory—which is part of ORISE's Radiation Emergency Assistance Center/ Training Site (REAC/TS)—is collaborating with Yong Huang, Ph.D., and his University of Florida research group to address this challenge. They are developing 3D human tissue constructs, similar to bio prints, that can be used for the realistic assessment of low-dose radiation effects in a tissue-like microenvironment.

“Human exposure to low doses of radiation—especially through medical diagnostics—has become inevitable,” Dr. Balajee explained. “Also, sporadic instances of diagnostic overexposures emphasize the need for understanding how low-dose radiation exposure affects our tissues and organs and what would be the health consequences in the long run.”

While radiation biology isn't new—X-ray diagnostics were discovered in the late 1800s—the use of 3D bioprinting technology in this way is highly innovative and novel. Also leading edge, tissue engineering emerged around the turn of the millennium and has become more sophisticated in approach and application in recent years. For this project, Dr. Huang and his research group adapted his design-engineering process toward radiation exposure research. Much like 3D printing in an advanced manufacturing environment, developing tissue constructs for research involves combining multiple layers of cellular and other gel matrix material to create 3D human equivalent tissue.

“We aim to develop and improve various printing technologies for the fabrication of 3D heterogeneous soft structures and constructs (with or without cells) made from difficult-to-print materials or fluids using ink jetting, laser-induced forward transfer, extrusion, and/or stereolithography,” Dr. Huang said. “Our printed tissue constructs may provide a unique in vitro platform to study some interesting cellular and/or molecular biology problems including what we are currently investigating.”



Previously, scientists looked at individual cells or a monolayer of 2D cells to determine radiation-induced damage. However, as Dr. Balajee explained, judging the reaction of individual cells to damage is less accurate than studying the damage in a tissue because the diverse intercellular communication in a tissue context is relevant for predicting potential low-dose radiation-induced health risks including cancer.

“Intercellular communication is the greatest in a 3D tissue microenvironment relative to a 2D monolayer of cells,” Dr. Balajee said. “Experimental studies have shown less induction of DNA damage and gene mutations in 3D systems compared to 2D systems.”

It took Dr. Huang's team about six months of trial and error to optimize the printing process so that the cells aren't damaged before going into the construct. Now, that part is standardized, and these bio prints can be used to study anything from UV damage to exposure to various chemicals, radiation sensitizers and mitigators. Scientists can even learn more about how cells become carcinogenic after radiation exposure.

Dr. Balajee is excited about what he has learned and is hopeful about future applications. “In this study, the researchers used only one cell type to see how the 3D bioprinting concept works. In future experiments, they will utilize different cell types in the bioprinting to mimic different organs such as the heart, brain and lungs,” he said.

The Balajee/Huang team has published an article on these initial accomplishments using 3D human tissue bio prints in the September 2023 edition of the *Health Physics Journal*. 📖



Preparing *everyone* for the worst: DEIA in emergency planning

When it comes to national preparedness, ORAU works diligently with the federal government creating resources to equip communities for emergency response. ORAU Health Education Specialists Jennifer Burnette, Will Artley and Matthew Schnupp understand that diversity, equity, inclusion and accessibility (DEIA) means we must pay attention to a wide variety of people who live/work in settings that put them at higher risk, especially when it comes to national preparedness.

Emergency Planning Discussion Guides

One of the resources ORAU has helped create includes a Centers for Disease Control & Prevention (CDC) discussion guide series for emergency planners. The guide encourages local leaders to consider five social determinants of health—economic stability, education access and quality, health care access and quality, neighborhood and built environment, and social and community context—in their preparedness planning.

Every September during Preparedness Month, CDC and other agencies try to increase awareness of pre-planning. In 2023, CDC featured the discussion guides Burnette and Artley worked on as a resource for planners. But, what about personal preparedness? In addition to what CDC was doing, a Ready.gov campaign focused on preparing older adults for disasters, specifically older adults from communities that are disproportionately impacted by all-hazard events. Senior adults can face greater risks when they live alone, are low-income, have a disability or live in rural areas.

Rural communities hit by an emergency can have unique challenges also. Forethought and ingenuity can go a long way toward a successful emergency response.

“In remote places like Alaska, emergency planners use the Iditarod sled dogs to deliver medicine and other life-saving supplies to the hardest to reach areas. It’s not just a tradition,” Burnette explained. “They use it as an emergency preparedness tool to prepare for emergencies when the power goes out. Planning exercises help us think through scenarios like this so we can anticipate needs of older adults and those who are homebound.”

To help planners like these, Burnette and Artley worked with CDC to include in the online discussion guides any

social and community context considerations as well as scenario overviews, lessons learned, potential barriers, discussion questions and action steps.

Responsive Mental Health Planning in Emergencies

Another important part of national preparedness that ORAU is addressing is how best to communicate with and assist people during a crisis. This can be emergencies of scale like natural or nuclear/radiological disasters, or individually related to mental illness and chronic homelessness. ORAU Health Education Specialist Matthew Schnupp is raising awareness about these challenges and the gravity of planning ahead with a mental health and DEIA lens in mind.

Most recently in the context of COVID-19, Schnupp says the pandemic amplified the strain on health care providers and particularly those who serve patients with mental illnesses. This is on top of an astonishingly high background prevalence of mental illness. The CDC says one in five adults live with mental illness (whether it’s anxiety, depression or something else) and one in 25 say the affliction is serious enough to interfere with daily life in a major way. Providers and responders are not immune to mental health stressors. According to one study by Burrowes et al about the impact of COVID-19, Schnupp says 37% of health care providers say they intend to leave the field in the next five years. Preparedness and burnout mitigation needs to start now, as finding providers for disruptive events is already challenging.

Schnupp highlights the importance of preparedness planning with an intentional focus on mental health, socioeconomic and DEIA factors. In exercises that walk through scenarios like sheltering in

place for storms or other threats, it's imperative to ask questions about whether response plans accommodate different demographics in rural/urban settings; how access to food, water, safety and health care will be provided and triaged; how we will consider the mental health component of emergency response (for both the general population and responders); how we will reach and help those who are homeless and transient; and how might long-term sheltering in place—which is linked to loneliness—affect suicidal ideation.

A common denominator Schnupp kept returning to in his research and projects is the need to build relationships before an emergency hits: “Plans break in an emergency, but the worst mistake people can make is to not have a plan and key relationships in the first place,” Schnupp said. He continued that this is especially important with populations at increased risk for harm—like those who are homeless, experiencing social or economic disadvantages or those with medical conditions. It's critical for community leaders and emergency responders to know each other so they have a voice of influence when the time comes, and shared guidance will be better communicated and potentially more effective.

Schnupp points to the importance of emergency planners engaging these community partners. “Be brave enough to care. Be intentional about closely listening to what is important for community and faith-based organizations, so we can build trust and confidence,” Schnupp said.

While emergencies are usually unexpected, we can do our best to anticipate the what-ifs like natural disasters and large-scale accidents. As we proactively plan our response to these incidents, it's our responsibility to consider every population including all neighborhoods, demographics and health statuses. ORAU is leading the charge to ensure no one is overlooked. 🌱



AS HEARD ON:
**FURTHER
TOGETHER**
THE ORAU PODCAST

Building on *30 years* of diversity: Mosley appointed to new director of DEIA position

ORAU has a rich history of embracing diversity and promoting “all the ways in which we differ” as a core value of our culture and how we conduct business. For more than 30 years, the ORAU Diversity Council has advanced diversity through cultural education and informational events. Looking to the future, ORAU took this commitment one step further in naming Mae Mosley, Ph.D., its new director of DEIA. Formerly ORAU's Director of Employee Relations and Diversity, Mosley says the future of our company relies greatly on how well we are prepared to attract the coming workforce and customers. “We must ensure ORAU is positioned to compete where diversity, equity, inclusion and accessibility are viewed as essential business acumen,” she said.

In September 2023, ORAU launched the office of Diversity Equity Inclusion and Accessibility (DEIA). The office will operate as a defined



point of contact and resource for all things DEIA under the leadership of Mosley. ORAU now has a dedicated team seeking to enrich our company culture through the advancement of DEIA. This team will form internal collaborative relationships to strengthen ORAU's culture as well as external relationships to expand the company brand in the communities we serve. 🌱

Leveling up:

ORAU continues its commitment to the nation's HBCUs

ORAU is committed to fostering relationships between historically black colleges and universities (HBCUs) and minority-serving institutions and federal government partner agencies. In 2023, the below initiatives and several others were launched or expanded to help reach the untapped talent that can be found at these institutions.

Proposal development and capture support to Xavier University

ORAU has offered support to the Xavier University of Louisiana's (XULA) Office of Sponsored Research for three years. To date, this support has led to more than \$36 million in research funding, including a \$24 million National Institutes of Health (NIH) Research Centers in Minority Institutions grant. Our partnership with XULA establishes a model at a manageable scale that demonstrates how organizations can partner with HBCUs to generate business for both parties while creating much needed support infrastructure with which these institutions can thrive. The ORAU-XULA model has been presented to NASA, the National Science Foundation, NIH and the U.S. Department of Transportation as a proof of concept that can easily be adopted by each agency.

MSI Research Council helps advance research at member institutions

ORAU places a high priority on fostering relationships between MSIs and federal government agencies across the country, so that the best and brightest are part of advancing the nation's science, education, workforce development and health priorities. ORAU's 35-member MSI Research Council represents a core group of ORAU's university consortium and serves as an advisory forum to address the research and education challenges of MSIs. The Council's mission is to represent a model framework for leading partnerships of excellence that will advance the research and education capabilities of its members.

Thurgood Marshall College Fund Memorandum of Understanding renewed

ORAU extended its working relationship with the Thurgood Marshall College Fund (TMCf) in 2023 by renewing the Memorandum of Understanding (MOU) first signed in 2019. This renewal expands the ORAU-TMCf partnership to include a series of co-branded activities designed to amplify efforts in recruiting the best minds from our combined HBCU consortia and develop strategic technical delivery mechanisms to support them. TMCf is the nation's premier higher education organization dedicated to supporting more than 300,000 students and faculty among 53 of the nation's HBCUs.

Ecological Society of America Memorandum of Understanding begins

ORAU and the Ecological Society of America (ESA) entered a MOU relationship in August 2023 that mobilizes the collective resources of both organizations to advance environmental sciences among the nation's HBCUs. ORAU and ESA co-sponsored an Atlanta workshop in September on "Climate Resiliency" that was led by faculty and students from Georgia Tech and Spelman College. The ORAU and ESA alliance was also featured at ESA's annual meeting during sessions hosted by the ESA Career Center.

Gamble appears on NIH PEI Small Business Office podcast

Wanda Gamble, ORAU chief business development officer, appeared on a 2023 episode of "Equity and Inclusion," the NIH podcast about contracting with HBCUs and minority-serving institutions. Gamble's interview was part of ORAU's ongoing work as a member of the NIH Path to Excellence Initiative (PEI) cohort 2.0. The PEI initiative helps address the challenges faced by HBCUs and MSIs pursuing federal contracting opportunities. The cohort includes 21 HBCUs and 46 small business contractors. ORAU has been part of the cohort since 2021.

Stubbs serves as guest editor for special issue of American Chemical Society journal

Desmond Stubbs, director of STEM diversity initiatives for ORAU and ORISE, served as one of three guest editors for a special issue of *Accounts of Chemical Research*, the scientific journal of the American Chemical Society. The special issue, "Research at HBCUs" published in June 2023, focused on the importance of advancing research at the more than 100 HBCUs across the country and their role in maintaining the nation's competitiveness in science and technology. Stubbs also co-organized an accompanying symposium on the topic of research at HBCUs held during the American Chemical Society's annual meeting.




Stubbs serves on key advisory boards, steering committees

Stubbs' assignment to represent ORISE on the Jump into STEM Advisory Board has been renewed, where he provides guidance on HBCU faculty and student recruitment and engagement. Jump into STEM is a national student competition for undergraduate and graduate students in the technical field of building science and is sponsored by the U.S. Department of Energy, Oak Ridge National Laboratory, the National Renewable Energy Laboratory and the Pacific Northwest National Laboratory. Stubbs also represents ORISE on a steering committee for the ESA's BIO-LEEP Design Track proposal on equity in the biological sciences. In his role, Stubbs supports efforts to align existing program missions with building career pathways for underrepresented students in the biological sciences.

ORAU hosts HBCU Listening Sessions for NASA

ORAU hosted two "HBCU Listening Sessions" as part of our Space Act Agreement with NASA. The listening sessions were designed to inform and shape current and future NASA opportunities by engaging HBCU faculty and executives in NASA's research priorities. The first session featured Janet Petro, Kennedy Space Center (KSC) director, and Barbara Brown, KSC director of exploration research and technology programs. The second focused on KSC's Small Business Innovation Research/Small Business Technology Transfer program and the Cube Satellite Launch Initiative, which provides a low-cost pathway for educational institutions and other organizations to conduct scientific investigations and technology demonstrations in space.

ORAU sponsors UIDP HBCU Engage Conference

ORAU was a sponsor of the University-Industry Demonstration Partnership (UIDP) 2023 HBCU Engage Conference in April. Cathy Fore, senior director of university partnerships, served on the planning committee and moderated workshops on Partnering with National Labs. She is assisting UIDP in planning the 2024 HBCU Engage conference. 

ORAU helps National Library of Medicine reach

All of Us

in health data initiative



The National Library of Medicine (NLM) is committed to capacity building, technical assistance support, and partnership development with minority-serving institutions (MSIs). ORAU has been at the forefront in helping NLM achieve these initiatives.

NLM is one of the 27 institutes in the National Institutes of Health and the world's largest biomedical library. Most researchers will recognize the NLM by its PubMed database, which contains more than 36 million citations and abstracts of biomedical and life sciences literature.

ORAU has supported the work of NLM for more than 30 years. We specifically support the NLM User Services and Collection Division, which collects, curates, and connects the world to scholarly biomedical literature, health information, and data resources. One of the programs ORAU supports is the Environmental Health Information Partnership, or EnHIP.

"EnHIP in particular is noteworthy because it supports a collaboration of 24 minority-serving institutions, including historically black colleges and universities, predominately black institutions, hispanic-serving institutions, tribal colleges and universities, and also Alaska native-serving institutions," said Kelli Bursey, ORAU health education specialist project manager.

In 2023, ORAU began working with NLM on a collaboration with the All of Us Research Program, which seeks to enroll one million or more participants in a multiyear initiative to create the most diverse health database in history. Researchers can use the data to learn how our biology, lifestyle and environment affect health.

"The overall goal for All of Us is to advance health research and discoveries and enable new kinds of individualized health care through the data being


collected," said LaFrancis Gibson, ORAU associate manager for health promotion.

ORAU is helping to build and strengthen the research capacity of libraries at institutions with a significant percentage of students from groups that are underrepresented in the biomedical workforce through the Data Training and Engagement for Academic Libraries Program. Libraries are often the heart of campus life at historically black colleges and universities (HBCUs) and MSIs, gathering places for faculty, students, researchers and local community members. This makes them perfect places to respond to the needs of academic institutions for data-driven research. Libraries can provide access to a diverse, longitudinal dataset, utilize training materials to assist campus communities, introduce the All of Us database to researchers from various disciplines, and, with the right training, provide basic instruction in applied data science skills to early career and seasoned researchers, faculty, and students.

The ORAU team offers one-on-one support to MSIs including hands-on and skills-building training to help library workers understand and use the All of Us Researcher Workbench, a secure cloud-based platform where health researchers can access and analyze the data collected from participants.

Gibson says the training for libraries is comprehensive, as HBCUs and MSIs often don't have opportunities to conduct research on the scale All of Us will present. Training and support covers everything from how to navigate the Researcher Workbench to procuring the technology and software required to access the data. Funding will be provided for institutions to support data-related infrastructure needs.

"This program is getting HBCUs and MSIs up to speed to have the capabilities to even have a seat at the table and have the opportunity to apply for research funding," Bursey said.

When everyone has a seat at the table, when it comes to providing and researching health data, that's better for all of us. 

AS HEARD ON:
FURTHER TOGETHER 
THE ORAU A PODCAST

Blunt takes *challenges* head-on at work and throughout life

When you are met with a challenge or obstacle in life, it's easy to run in the other direction and make excuses to not continue. However, that's not a mindset that Brenda Blunt, senior director of Health Policy at ORAU, takes with her.

Whether at work or one of her many extracurricular activities, Blunt looks at every challenge as an opportunity to learn something.

"Even in your most challenging situations, there's always something to learn, so whether you're faced with challenging people or just a challenging situation that you can't wait to get rid of, there's always something to learn," said Blunt. "I found that if you start looking for. What is it that I can learn or take away from this?, that it makes it easier to get through."

Blunt has learned this lesson both during her two plus years with ORAU and during the other stops along her career path. Before coming to ORAU, Blunt was executive director for health at Customer Value Partners, a government contractor based in Fairfax, Va., where she provided subject matter expertise to project teams working with a wide range of federal agencies related to health care quality, federal health care policy, and clinical workplaces.

She has also served as a division director for the Centers for Medicare and Medicaid Services (CMS), where she was tasked with leading and directing staff involved in the monitoring and research evaluation of section 1115 Medicaid demonstration projects, and the startup, development and creation of a new workgroup within CMS dedicated to section 1115 Medicaid demonstration projects.

In her current position with ORAU, Blunt's responsibilities include work with CMS and ORAU-Directed Research and Development Projects. While each new challenge and opportunity has led Blunt to where she is today, she points back to her time as a nurse as a major contributor to her career.

"Being a nurse and being in health care, my goal is always looking for those roles that have a purpose and really have an impact on people," said Blunt. That was one of the contributing factors in choosing ORAU, along with the opportunity to work for a great company surrounded by amazing people. "I really appreciate that ORAU is a nonprofit, and I love the mission, but I also love the people. I love how they are committed and passionate about their work, as well as about each other."



When Blunt isn't at work, you can find her outdoors. She lives on a 147-acre farm and enjoys getting outside with her livestock and dogs. As of now, her farm includes four dogs, chickens, ducks, geese, and a couple of goats. Blunt plans to expand even further with the addition of pigs and cows. Besides tending the farm, she also enjoys trying out new recipes in the kitchen.

"I love to cook, and I make a lot of things from scratch," said Blunt. "I have been learning bread making, and I also enjoy making my own cheeses and jarring and canning foods."

As Blunt pursues her career at ORAU and continues to grow her farm, one thing is certain: she won't back away from any challenges or obstacles that come her way. After all, challenges are what make life exciting, and it's the best way to grow to where you want to be. 🌱

Wading into new waters



Wade Morris paused to look down at the radiation detector beeping rhythmically in his hand. Outside the decommissioned nuclear power station where he was, the Pacific Ocean's waves could be heard crashing on the shore. Halfway through another 12-hour day of taking radiation measurements at the San Onofre Nuclear Generating Station (SONGS), he realized once again that he was a long way from home. But there was no place he would rather have been.

A week earlier, Morris had been in his very comfortable home office in Cincinnati, Ohio, where he works on the National Institute for Occupational Safety & Health (NIOSH) Dose Reconstruction Project, managed by ORAU and its partners. That job entails managing data collection, research and analysis to support the writing of technical documents that aid the ORAU Team's health physicists that perform dose reconstruction for energy employees who may have contracted cancer as a part of their work for the government.

Morris wound up spending a week in southern California in early 2023, helping with ORISE's assessment of the Unit 2 and 3 intake structures at the SONGS facility. The former nuclear power plant stopped operations in 2013. When the decommissioning project is complete, the land will be returned to the original owner, the United States Navy.

But how did Morris get from his office job in Ohio to this decommissioned nuclear power facility on the Pacific coast halfway between Los Angeles and San Diego? It all began when Derek Hagemeyer, ORISE director of the Independent Environmental Assessment and Verification (IEAV) team, put out a call for help among the wider

ORAU workforce. The IEAV team performs field work at locations all across the United States where they verify that former nuclear facilities have been cleaned up correctly and are safe for unrestricted use. With many active projects that could benefit from additional hands, Hagemeyer put out the call for assistance, and Morris said his ears perked up immediately.

"My undergraduate degree was in environmental geography and geology, and I had years of experience performing asbestos surveys, indoor air quality assessments, lead-based paint surveys, and groundwater monitoring, so I thought my skillset might be a decent fit," Morris said.

Morris said his supervisor in Cincinnati fully supported his plan to assist the IEAV team. And even though conducting data analysis at a desk and traipsing through a retired nuclear power plant with a radiation detector in hand are vastly different activities, Morris said he found plenty of overlap between the two because they both fall under the broad umbrella of health physics, which deals with the health of people who work with radioactive material.

"It was beneficial to step away from the NIOSH Project, support another project, and broaden my hands-on health physics perspective. With that broadened perspective, I was able to return and better articulate questions and identify issues that pertained to my role on the NIOSH Project," Morris said. "All in all, I performed some of the work that claimants on the NIOSH Project performed, and that understanding lends itself to the creation of better research and development of the dose reconstruction technical basis documents."

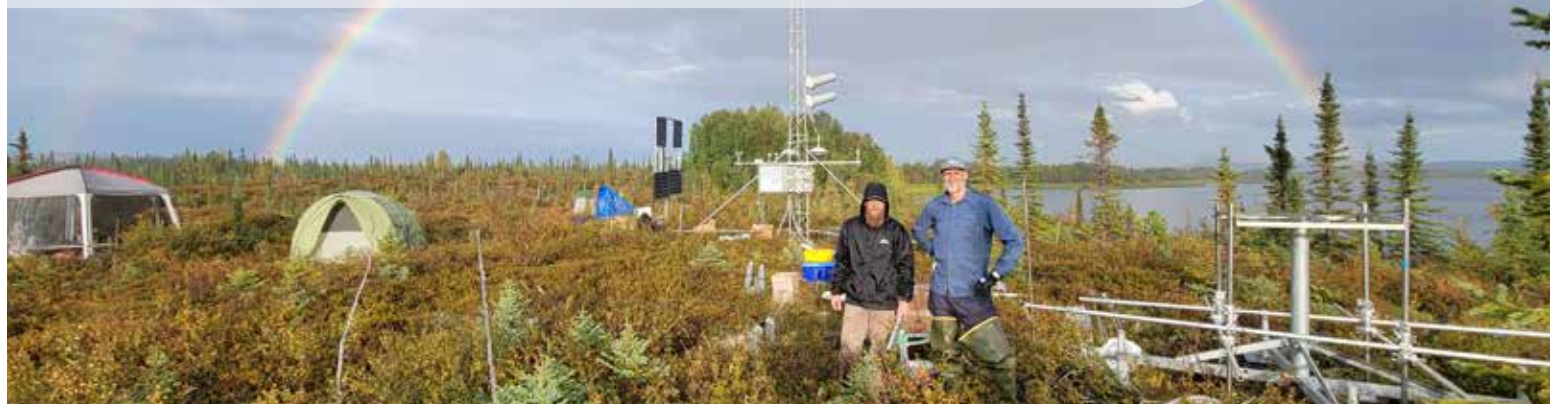
Morris said his week in California not only benefitted the IEAV project, but it also served as an eye-opening experience for him.

"I learned many valuable things while supporting this trip," Morris explained. "I learned about the interactions between federal, state, local, utility, and facility representatives. Our folks were phenomenal in how they worked with everyone as a team."

Would he do it again given the chance?

"If I'm fortunate enough to, yes! It was an invaluable experience for me," Morris said. 🏔️ 🇺🇸 🇨🇦

Summer of climate research: from Alaskan field monitoring to NYC emissions work and beyond



In the world of climate research, you never know where the work may take you, even to the wilds of Alaska. In summer 2023, ORAU atmospheric scientists supporting NOAA's Air Resources Laboratory (ARL) Atmospheric Turbulence & Diffusion Divisions (ATDD) traveled to the 50th state to expand the U.S. Climate Reference Network (USCRN). The USCRN comprises more than 143 climate monitoring stations that provide critical information for monitoring climate trends, which supports climate-impact research.

One of the installation sites was the remote region around Huslia, accessible only by sea plane. Such an isolated area is ideal for monitoring stations because it minimizes the risk of development or other activity that could impact the station and its data. Even before the team reaches the installation stage, a great deal of work is needed. One task is testing how well the equipment will withstand the extreme Alaskan conditions. This requires the use of a cold test chamber, similar to a big walk-in freezer, except the cold test chamber can go as low as minus 40 degrees Fahrenheit.

Once the installation phase is underway, which takes nearly a week, the team must stage everything needed in Galena, using either river or air transportation. From there, it takes multiple flights to transport the equipment and supporting gear. This includes camping gear for the team to live onsite while installing the station.

“Even in August, this type of field work is challenging due to unanticipated conditions,” said John Kochendorfer, ATDD Director (pictured far right, above). “For example, when stepping out of the sea plane that transported us to the site, one team member found himself sunk up to his

waist in a soft-bottomed lake, flooding his hip boots. It's definitely not the same as working in a lab.”

In other work, in collaboration with University of Maryland, University Research Foundation, Yale University and Princeton University, the NOAA ATDD team participated in the Atmospheric Emissions and Reactions Observed from Megacities to Marine Areas field campaign in New York and Connecticut. Data will characterize the meteorology and chemistry leading to air pollution events and emissions of greenhouse gases in the New York City and Long Island Sound area, and will provide scientific basis for effective air quality and climate policies.

Also, a team of scientists from Colorado State University (CSU) visited ATDD to collaborate on measurements of size-resolved aerosol fluxes. This project will help reduce the uncertainties associated with predicting aerosol concentrations in the atmosphere, thereby improving climate, weather and air quality predictive models. With the help of engineers Mark Heuer and Dominick Christensen at ATDD, the CSU scientists installed a Portable Optical Particle Scanner (POPS) near the top of the 60-meter tower near Oak Ridge, Tenn. The POPS instrument can accurately measure aerosol particles over a size range of 120 nanometers to 3 micrometers. The installation is part of a multisite network called the Fluxes of Aerosol Continuous Observing Network that is funded by DOE.

Whether working in the wilds of Alaska or our own backyard in Oak Ridge, Tenn., this team contributed greatly to the body of knowledge in this area and delivered on a successful summer of climate research. 🌊

Fickle fate: Jamie Stalker reflects on finger of fate: career and work in NSSP



When Jamie Stalker, M.D., graduated high school, she had no idea what twists and forks in the road her career held for her.

Stalker is the senior director and principal investigator for the National Supplemental Screening Program (NSSP) in Arvada, Colorado, which ORAU manages for the U.S. Department of Energy (DOE). But when Jamie began her college education, she intended to become a music teacher. Jamie has been a classical piano player since the age of five and has loved singing as a creative outlet for as long as she can remember.

Jamie attended Indiana University's Jacobs School of Music in Bloomington, Indiana, one of the country's most prestigious music schools. However, during her first summer break, she realized that many art education jobs were being cut, so she decided to change her major. Fortunately, Jamie had always loved biology and decided to pursue a biology degree.

"I think it's rare that folks stay on a single path," Jamie said.

Jamie worked in a lab in college but did not love it, and she was encouraged by a mentor to become a medical doctor rather than pursuing research. Jamie discovered she loved internal medicine during her clinical rotations in medical school, saying that it was like solving puzzles.

After obtaining her medical degree, Jamie went into practice in the Chicago area, working constantly as a doctor while also being a mother of young children. After hearing from multiple patients in her very busy practice that the medical department at Argonne National Laboratory was hiring, Jamie eventually applied and got the job. She was at the lab for 20 years and was a chief medical officer when she left to join the NSSP in 2021. The NSSP coordinates evaluations of former DOE workers who may have been exposed to hazardous substances through the course of their work.

"We get all their health screening results, such as their blood work, chest X-rays, breathing tests, et cetera. And then we summarize those results in a letter and we help guide them," Jamie explained. "We don't diagnose, but we'll state advice such as, 'You said you worked with asbestos. Since your X-ray findings are potentially consistent with asbestosis, you should contact this Department of Labor Resource Office as you might be eligible for Department of Labor benefits.' We are trying to facilitate benefits for these former workers."

Jamie is grateful for the people she gets to work with, both in the office and in the different organizations that partner with the NSSP.

"The NSSP is not just this Arvada office," Jamie said. "We work with our partners—University of Colorado, National Jewish Health, Acuity International—and with radiology groups that do the B reads for our X-rays. So it's not just this office, but it's actually a very complex organization."

Jamie is an incredibly creative person. Outside of work, she continues to sing in a local choir, a hobby she has always kept up with, and she gardens, draws, paints and makes ceramics as well.

When discussing her career path, Jamie referenced the fickle finger of fate. It was indeed a winding path that brought Jamie to the NSSP program, but ORAU is all the better to have her talent and experience on our team. ▲

Beauty from ashes:

how Amparo Atencio's volunteer spirit is reborn

Amparo Atencio, a 27-year ORAU employee, is always among the first to lift her hand when there's a need. Volunteering to help ORAU's Employees' Club, Diversity Council or a company committee, Atencio's name has been on many lists. She has participated in several ORAU-supported events over the years including a Habitat for Humanity build; sponsored a co-worker who was raising money for cancer research; joined another co-worker in a walk to raise awareness for juvenile diabetes; distributed toys at the Holiday Bureau of Anderson County's annual event; helped package meals during ORISE's Rise Against Hunger event; picked up litter at Clark Center Park as part of ORAU's Go Green initiative; and regularly serves as a timekeeper for the Tennessee Science Bowl.

Outside of ORAU, Atencio has mentored high school students in the Tennessee Promise program, cleaned up river banks with Ijams River Rescue, pulled weeds at the Tennessee Arboretum in Oak Ridge and donated supplies to Aid to Distressed Families of Appalachian Counties (ADFAC).

After reading this list, people may be surprised to learn that Atencio says she hasn't always been an eager volunteer. Her passion for helping others went through a dry spell and was reignited about seven years ago as she was healing through personal tragedy. On Aug. 8, 2011, she lost all purpose when she lost her 22-year-old son.

"When I was told that my only child had been murdered, that was the beginning of the world going dark," Atencio said. The grieving mother described her life after that day as though she was walking through a fog. For a while, she dropped volunteering and activities she used to love.

"My son would have been my legacy, but not having a child [on Earth] and not having family in Tennessee, I had to start thinking about what kind of purpose and what kind of meaning my life would have if I was going to move forward."

She says she trudged forward just one step at a time, and after several years, she was able to see a little more clearly. "I could see that I was going to live, but I didn't know how," Atencio explained.

As the fog lifted, Atencio started to reengage causes that matter and have meaning to her. It was through meditative

walks and hikes that she started to feel alive again.

Because she felt most connected to her son in nature, she picked back up with clearing the holly bush gardens at the UT Arboretum on volunteer days.

She loves animals, so she returned to ORAU's Helping Paws Animal Network (HPAN). She's now the HPAN board's secretary, a position she's held for several years. In fact, Atencio loves this organization so much, she wanted to fill more of her time with helping animals. That led her to being a volunteer dog walker and helping to socialize cats at the Oak Ridge Animal Shelter before she decided the best way she could serve animals is to adopt senior cats, giving them shelter and comfort in their golden years.

In speaking of her experience with the Holiday Bureau of Anderson County, Atencio described it like this: "It seems like it's just a long day of being on your feet, grabbing a bag and filling it repeatedly. But it's not just that moment in time," she smiled. "It's that you get to the end of the aisles, and you see the gratitude on a mama's face—knowing that she's going to be able to provide Christmas gifts for her kids."

Atencio says she knows her legacy is richer now that her goals are focused outward. "My life will matter because I made a difference, at least to that one little kitty. At least to that one mama. At least to that one community that now has a road with fewer cans and wrappers all over." It's beauty from ashes, and Atencio hopes it inspires everyone around her. 🌸



Two ORAU programs help STEM teachers make

tech advances in their classrooms



Part of ORAU's mission is to keep our nation on the leading edge of science and technology. One way we contribute toward that goal is providing opportunities for educators across East Tennessee to improve their classrooms through two incredible programs: ORAU's Extreme Classroom Makeover competition and the ORAU Education Grants program.

ORAU started the Extreme Classroom Makeover competition in 2009 to strengthen and

encourage STEM education throughout East Tennessee. ORAU has awarded more than \$470,000 to area schools since the program launched.

In 2023, fourth grade teacher Danielle Roderick (pictured above) of Catlettsburg Elementary in Kodak, Tennessee, was the winner of the \$25,000 grand prize. In addition, she was selected to receive the viewer's choice award for an additional \$2,500. With the funds, Roderick purchased new technology to incorporate into her lessons, including an interactive projector that turns the floor into a giant touch-screen computer, iPads, a podcasting set-up, robotics and coding equipment, virtual reality headsets, and a large-scale laser printer.

"It feels amazing that someone like ORAU would care enough about our kids and the future, because we spend so much of our own money on things for our classrooms," Roderick said.

ORAU's Education Grants program is another way that the organization gives back to the community and influences the next generation of STEM talent. Educators in Anderson, Campbell, Roane, Morgan and Scott counties are invited annually to submit proposals for ORAU to fund STEM programs at their schools.

Six educators received education grants for their classrooms in 2023. They were Rebekah Bozeman of Lake City Elementary School, Lori Irwin of North Clinton Elementary School, Janie Shanafield (pictured left) of Jefferson Middle School, Aimee Wallace of Petros Joyner School in Oliver Springs, Brittany Farris of Jacksboro Elementary School, and Eva Robbins from Oliver Springs High School.

Each recipient decided how to spend the funds. Some of the purchased items were iPad minis, robotics kits, earthworm dissection kits, 3D printer pens, and interactive globes. Since the introduction of the program in 2002, ORAU has funded more than \$521,000 in grants to area schools for projects that support the enrichment of STEM education.

STEM education is part of ORAU's DNA, and these programs help teachers continue to be able to shape new visions of STEM education in their classrooms and their curricula. ▲



Creating world *changers:* CIA awards teachers with nearly \$400,000 in 'mission possible' classroom upgrades

For children, the only limits should be their imagination, and that's especially true when it comes to education. As technology becomes more advanced, so do teaching methods to make sure that students are empowered to learn more about the world around them and the technology they use every day.

Thanks to the Central Intelligence Agency (CIA) Mission Possible contest, eight educators across the United States were awarded a total of \$390,000 to engage their students with STEAM (basically STEM + the arts), helping teachers build students' confidence and introduce them to career opportunities. Mission Possible is sponsored by the CIA and managed by ORISE with the goal of supporting the future STEAM workforce.

Mission Possible: Makerspace Nation awarded \$30,000 each in Makerspace equipment to teachers in Chicago, Illinois; Omaha, Nebraska; and Kansas City, Missouri. Mission Possible: Operation Advance Technology awarded \$60,000 each of classroom technology to teachers in Illinois, West Virginia, Montana, Texas and New Jersey.

"It's vital to give students access to STEAM education," said ORISE Associate Manager Jennifer Tyrell. "We want to prepare students for future careers in STEAM that will encourage problem-solving and perseverance. By making advanced technology accessible to students from a young age, students can take their imaginations from 2D to 3D, and gain skills that will help them throughout their lives."

To enter the contests, educators submitted videos passionately demonstrating the need and use for upgraded technology in their classrooms. After carefully reviewing all the entries, ORISE representatives travelled across the United States for several weeks, surprising the winners in their classrooms with giant checks. The winners were overjoyed to learn that they'd soon be receiving \$60,000 worth of classroom technology or a \$30,000 Makerspace.

Wesley Bryant, who teaches at KIPP KC Legacy High School, won Mission Possible: Makerspace Nation for Kansas City. Bryant said he was overwhelmed with joy at the opportunity to provide his students with the space and materials to bring their ideas to life. Bryant shares a teaching space, which makes storage limited for his students.

"My cheeks are hurting because I just can't stop smiling," Bryant said when he accepted his prize. "My students have so many wonderful ideas, and they also have the skills to make them come true. However, we have sometimes lacked the materials that we needed. I just don't want to feel like I'm cheating my students out of opportunities to make an impact."

Tiffany Pace's students were almost as happy as she was with the surprise delivery of her \$60,000 Mission Possible: Operation Advance Technology check. Pace teaches at Cross Lanes Elementary School in Charleston, West Virginia. She planned to use her prize to teach her students coding and give them the opportunity to collaborate with students around the world.

"We try to provide every opportunity possible to ensure our students will have success," said Pace, who could barely contain her excitement. "And with Operation Advance Technology, we're going to create world changers. They don't have to wait until later to become world changers, they can change the world today." 🌟



Staying engaged with STEM: A summer of

learning and discovery

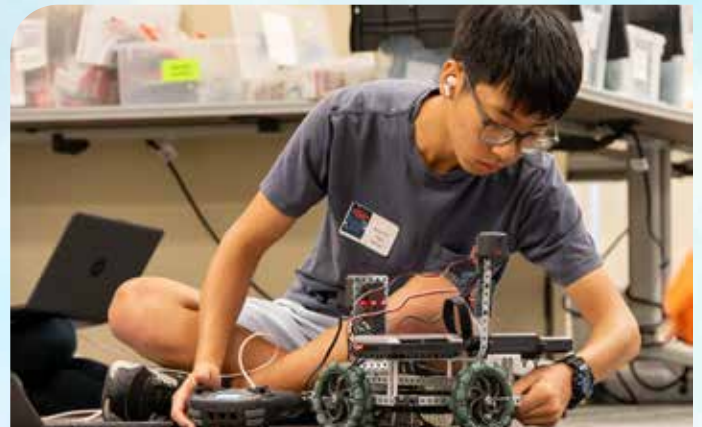
As students and teachers leave school for summer break, it's important for them to exercise their minds so that they stay sharp when school's not in session. The STEM Summer programs offered by ORISE and ORAU make learning fun so that students of all ages and from all over the United States stayed engaged with the subjects

they learned in school. Professional development workshops gave teachers the opportunity to learn new ways they can incorporate STEM into their lesson plans. From math to robotics to programming and beyond, dozens of learners spent June and July making the most of their summer break. 🌟🌟



MATH EXPLORATION DAY

Rising first through sixth graders spent two days in June sharpening their math skills and learning “Math is in everything they do.” From the Fibonacci sequence to shapes and patterns, the students had fun connecting numbers and engaging in critical reasoning. 🌟



ADVANCED ROBOTICS ACADEMY

Students who had previously taken part in the ORISE Robotics Academy went from nuts and bolts to Battle of the Bots, building and programming robots that competed in various tasks at the end of the week. 🌟



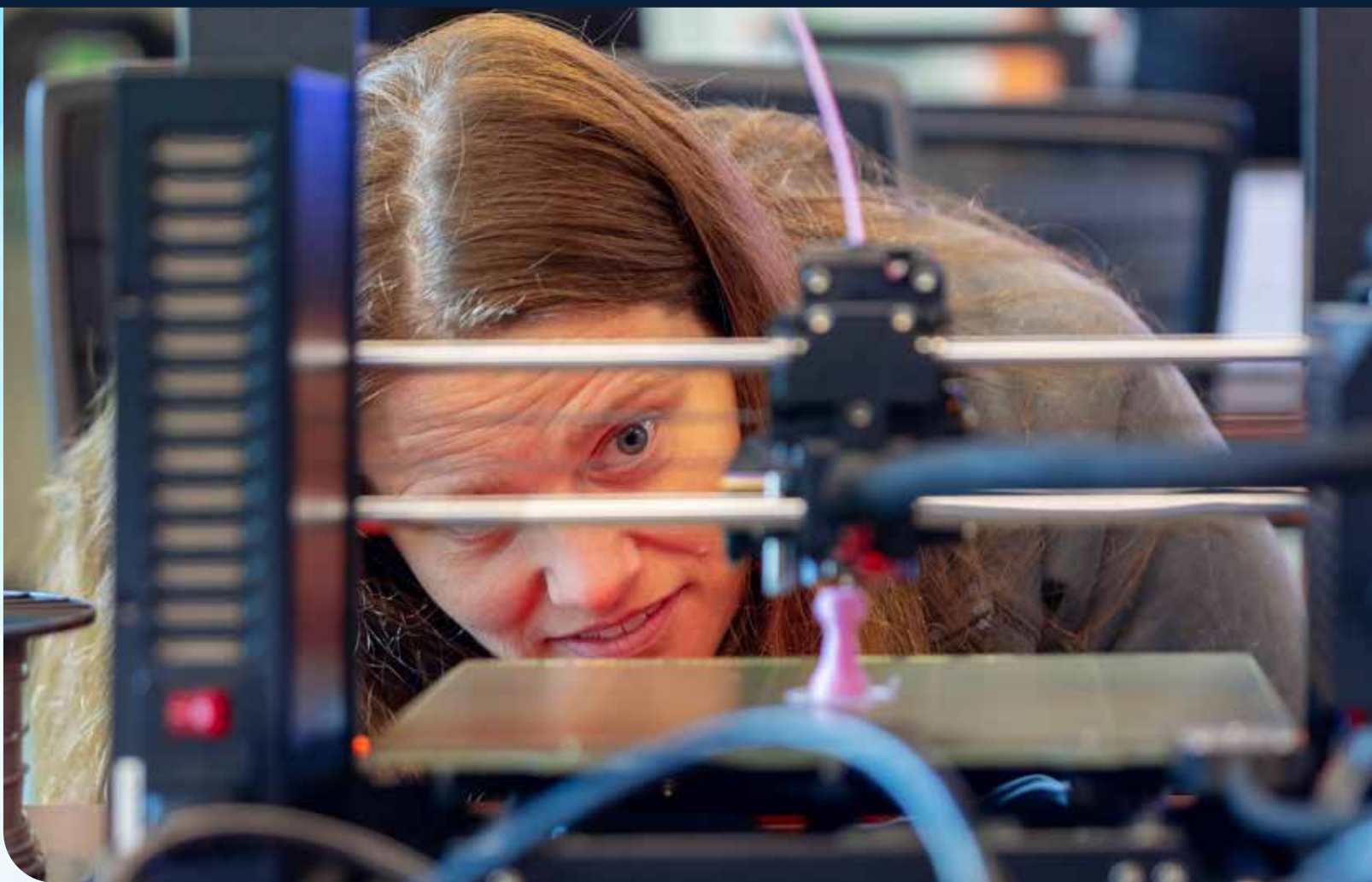
SCRATCH PROGRAMMING MINI-ACADEMY

Scratch programming software gave middle school students everything they needed to learn coding from scratch. This mini academy made programming accessible to students by using block coding, a technique that creates blocks of code corresponding to different parts of a program. 🌟



BOE-BOTS ACADEMY

Rising seventh, eighth and ninth graders learned about the backbone of modern coding language and built robots from Boe-Bots Robot kits that followed their instructions. Participants learned about trial and error and persistence through making mistakes in coding. 🌟



3D DESIGN MINI-ACADEMY

This day-long course for teachers helped educators unlock the possibilities of 3D design and showed them how to incorporate it into lesson plans. Now their students' big ideas can go from 2D to 3D! 🌟



ARTIFICIAL INTELLIGENCE MINI-ACADEMY

Rising seventh, eighth and ninth graders learned about the good and bad parts of artificial intelligence (AI), and the different ways it can be applied. Students used AI apps to look at plants and animals, and even facial recognition apps to learn about the different applications of AI and how it works. 🌟



KINDERCODING

Coding is becoming more and more accessible, and the rising first through third graders who participated in KinderCoding learned that there isn't an age limit to learning programming. Using Sphero Bolt robots, the students programmed the robots to follow their instructions and complete various tasks. 🌟



MATH AND MOVEMENT

Math can be a dreaded subject for some students, but the Math and Movement Summer Program used energetic games to make math fun. Rising first through sixth graders played games, both indoor and outdoor, to learn math and to relieve math anxieties. 🏆



ARC APPALACHIAN STEM ACADEMY

This annual residential program for middle schoolers, high schoolers, and high school teachers engages learners from the Appalachian region with STEM. Participants get the chance to take part in STEM research and visit different colleges and research facilities in the Oak Ridge area. 🏔️



JSTI EAST (Maryland)

Joint Science and Technology Institute (JSTI) East is open to middle school students, high school students, high school teachers and alumni of the JSTI program. By working with scientists and researchers, participants were exposed to career opportunities in the STEM field. 🏠

JSTI WEST (New Mexico)

This two-week residential program offers high school students from all over the United States the opportunity to be mentored by scientists and STEM subject matter experts while taking part in research projects. Participants increased STEM literacy and engaged in hands-on research. 🏠



SHARING SECRETS TO OUTDOOR LEARNING

This professional development workshop for teachers showed educators how to bring education outdoors. The workshop was led by Annie Roth, who manages teacher networks at the Great Smoky Mountains Institute at Tremont. Teachers were encouraged to think outside the box and observe the nature around them. 🏔️



Adayabalam Balajee, Ph.D., coauthor, “Radiation Biodosimetry: Current Status and Future Initiatives,” *Cytogenetic Genome Research* online ahead of print, November 2023; “Evaluation of a Low-dose Radiation-induced DNA Damage and Repair in 3D Printed Human Cellular Constructs,” *Health Physics*, September 2023; “RENEB Inter-Laboratory Comparison 2021: Inter-Assay Comparison of Eight Dosimetry Assays,” *Radiation Research*, June 2023; “RENEB Inter-Laboratory Comparison 2021: The Dicentric Chromosome Assay,” *Radiation Research* online ahead of print, April 2023; “Validation of a High-Throughput Dicentric Chromosome Assay Using Complex Radiation Exposures,” *Radiation Research*, January 2023; “Ionizing Radiation-Induced DNA Damage Response in Primary Melanocytes and Keratinocytes of Human Skin,” *Journal of Cytogenetic and Genome Research*, December 2022; coeditor, “Radiation biodosimetry: Current Developments and Future Initiatives,” *Cytogenetic and Genome Research Journal* thematic special issue, 2023.

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

Kelli Bursey, M.P.H., Kristin Mattson, M.P.H., Jennifer Reynolds, M.P.H., coauthors, “Communicating effectively with people experiencing homelessness to prevent infectious diseases,” *Journal of Infectious Diseases*, October 2022.

Rebecca Crowe, presenter, “Doing Business with ORISE,” U.S. Department of Energy Small Business Forum and Expo, July 2023.

Betsy Ellis, Ph.D., Ashley Golden, Ph.D., and Sara Howard, M.P.H., copresenters, “Updates from Recently Published and On-going Analysis of Department of Energy (DOE) cohorts in the US Million Worker Study,” October 2022.

Betsy Ellis, Ph.D., and Sara Howard, M.P.H., coauthors, “Deep Breaths: A Systematic Review of the Potential Effects of Employment in the Nuclear Industry on Mortality from Non-Malignant Respiratory Disease,” *Radiation Research*, October 2022.

Ashley Golden, Ph.D., and Sara Howard, M.P.H., copresenters, “Impacts of Uncertainty in Cause of Death Outcomes for Mortality Studies of Radiation Workers – A Simulation Study,” Radiation Research Society Conference, October 2022, Scholar-In-Training Travel Award; “Pooling Radiation Cohorts – Epidemiologic Challenges for Radiation Studies in the Big Data Era,” International Congress for Radiation Research August 2023, Scholar-In-Training Travel Award; “Million Person Study (MPS) Rocky Flats: Epidemiologic Analysis,” Health Physics Society Conference, July 2023; “Preliminary Results from a Mortality Study of Rocky Flats Nuclear Workers: A Million Person Study Cohort,” International Society of Radiation Epidemiology and Dosimetry Conference, May 2023.

Michelle Goodson, panelist, “Tennessee’s Nuclear Workforce Strategy, Training and Advancements,” East Tennessee Economic Council Nuclear Opportunities Workshop, August 2023.

Davyda Hammond, Ph.D., and Jeff Miller, Ph.D., coauthors, “Understanding the relationship between safety culture and safety performance indicators in US nuclear waste cleanup operations,” *Safety Science*, October 2023.

Davyda Hammond, Ph.D., coauthor, “Spatiotemporal estimation of TROPOMI NO₂ column with depthwise partial convolutional neural network,” *Neural Computing and Applications*, 2023; board member, Oak Ridge Breakfast Rotary Club; board member, Auburn University Black Alumni Council.

Darcie Holcomb, appointed board member, City of Oak Ridge’s Environmental Quality Advisory Board.

Michael Holtz, board member, Man Up to Cancer.

Sara Howard, M.P.H., committee member, Scholar-In-Training Committee of the Radiation Research Society.

Zac Hubbell, Ph.D., presenter, “Total Worker Health® in the Context of a U.S. Department of Energy Former Worker Medical Screening Program (FWP),” 3rd International Symposium to Advance Total Worker Health, October 2022.

Carol Iddins, Ph.D., presenter, “The Importance of Recognizing Sentinel Signs of Radiation Exposure,” 11th International Conference on Disaster and Military Medicine, November 2023; program host, NATO Software Tools for Acute Radiation Syndrome (StTars), November 2023; panel co-chair, “Internal contamination assessment and management,” 17th Annual World Health Organization (WHO) Radiation Emergency Medical Preparedness and Assistance Network (REMPAN) Meeting, September 2023; presenter, “Clinical Case Management of Americium Inhalation,” 17th Annual WHO REMPAN Meeting, September 2023; member, REMPAN Internal Contamination Assessment and Management working group; Subject Matter Expert, International Atomic Energy Agency National Training Course on Advanced Medical Response to Nuclear and Radiological Emergencies, May 2023.

Joaquina Kankam, Ph.D., presenter, “Leading Learning Agendas: Effective Practices to Maximize Impact,” American Evaluation Association, October 2023; “Program Planning—From Theory of Change to Impact Reporting,” American Evaluation Association, October 2023.

Kristy Kistner, speaker, “Get your ducks in a row, improve your productivity, and reduce your stress level,” 31st Annual ISO 9000 & Audits World Conference, March 2023.

Jeff Miller, Ph.D., invited presenter, “What I Learned from Surveying 50,000 People on Safety Culture,” American Industrial Hygiene Association, Tennessee Valley Section, February 2023; vice chair, Board of Global EHS Credentialing (BGC) Ethics Review Committee; member, Knoxville Track Club Covenant Health Knoxville Marathon Organizing Committee.

Wade Morris, president, Cincinnati Radiation Society.

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

Jennifer Reynolds, M.P.H., presenter, “Building Evidence-Based and Community Tailored Communication Campaigns: Lessons from the HEALing Communities Study,” 2023 Rx Illicit Drug Summit, April 2023; panelist, “Actions with Impact – Stigma Reduction Panel Discussion,” Learning Collaborative – HEALing Communities Study Ohio, November 2023; keynote speaker, “Building Evidence-Based and Community Tailored Campaigns To Combat Stigma and Turn the Overdose Misinformation Tide,” Kansas Overdose Date to Action Peer-to-Peer Summit, July 2023.

Margaret Scheiner, Ph.D., officer, National Association of Colleges and Employers.

Matthew Schnupp, M.S.P.H, and Betsy Smither, M.P.H., coauthors, “Increasing Access to Vaccines for the Most Vulnerable: Vaccinating Adult Observation and Short-Stay Patients at Two Urban Atlanta Hospitals,” American Public Health Association Annual Meeting, November 2023.

Matthew Schnupp, M.S.P.H, presenter, “Increasing Access to Vaccines for the Most Vulnerable: Vaccinating Adult Observation and Short-Stay Patients at Two Urban Atlanta Hospitals,” American Public Health Association Annual Meeting, November 2023.

Michael Sharpe, board member, Helping Paws Animal Network; board member, FIAT Club of America; EM Stewardship Chair and board member, Oak Ridge Site Specific Advisory Board.

Ali Simpkins, recipient of Presidential Award, Health Physics Society 68th Annual Meeting; Associate Editor, *Health Physics Journal*; board member, 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, Covenant Health

WHERE CAN YOU FIND US IN 2024?

We attend more than **25** conferences and professional meetings each year across the country to meet our customers where they are. In 2024, these are a few of the major conferences where you will find us.

Contact us at business.development@orau.org if you’d like to connect!



HPS: Health Physics Society
July 7-12, 2024 • Orlando, FL



ESA: Ecological Society of America
August 4-9, 2024 • Long Beach, CA



APHA: American Public Health Association
October 27-30, 2024 • Minneapolis, MN



AGU: American Geophysical Union
December 9-13, 2024 • Washington, D.C.

