

Nuclear Science Week



Oct. 17 - 21
2022



CNTA
Citizens for Nuclear
Technology Awareness

An advertising partnership publication
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SUBMITTED PHOTO

Congressman Joe Wilson (center) attended the AMC groundbreaking. Others in the photo are Ike White, senior advisor with the Department of Energy Environmental Management office, USC Aiken Chancellor Daniel Heimmermann, former USC Aiken Chancellor Sandra Jordan, Savannah River National Laboratory Director Vahid Majidi, North Wind Construction Services President Brent Brooks, Savannah River Laboratory Office Director Tony Polk, Aiken County Council Chairman Gary Bunker, S.C. Rep. Bart Blackwell, R-Aiken, and Aiken County Commission on Higher Education Chairwoman Teresa Haas.

Advanced Manufacturing Collaborative project soon to become a reality

Ground was broken for the Advanced Manufacturing Collaborative (AMC) project on April 19. Located at the intramural and softball fields at the University of South Carolina Aiken (USC Aiken), this 60,000 square-foot, \$50 million facility is a unique partnership between the university, the Savannah River National Laboratory (SRNL), and the U.S. Department of Energy (DOE). The AMC's design was completed in November 2021, and construction under the leadership of North Wind Construction Services, LLC will finish in 2024.

The AMC will promote manufacturing and advanced research by fostering modern industrial practices, advancing new technologies, and training the region's manufacturing workforce. It will focus on leading edge manufacturing such as robotics, process in-

tensification, smart manufacturing, and computational chemistry. This facility will include laboratories, industrial workspace, a high bay, and associated office and meeting space.

As an innovation hub, the AMC will facilitate SRNL's collaboration with industry and academia by bringing it out from behind the boundaries of the Savannah River Site (SRS) and into the community. This modern, commercially viable, and flexible laboratory space will also allow SRNL to consolidate and reduce its footprint and begin exiting aging facilities that are inadequate for modern technology development at SRS.

"The AMC will embody the modern concepts of manufacturing to include smart and digital manufacturing and remote and autonomous systems embracing the tenets of Industry 4.0 manufacturing," said SRNL Director Dr. Vahid Majidi. "It will accelerate the establishment of SRNL's expanded core competencies by connecting scientists and engineers from across the Battelle Savannah River Alliance partnership."

University students and researchers will in-

teract with SRNL scientists. These innovative partnerships will expand to include the proposed South Carolina National Guard DreamPort at UofSC Aiken; joint faculty appointments; proximity to scholars at other nearby universities and technical colleges; and local science, technology, engineering and math (STEM) programs at the Ruth Patrick Science Education Center, the Aiken Scholar Academy, and UofSC Aiken's own Industrial Process Engineering, Virtual Reality, Applied Gaming, and Cybersecurity programs.

"This innovation hub will provide outstanding research and development opportunities for our students and create limitless opportunities for advancement in the various STEM fields throughout Aiken and the Central Savannah River Area," said UofSC Aiken Chancellor Daniel Heimmermann.

Economically, the AMC will create jobs in South Carolina by catalyzing the development of a technology corridor that will attract further research and development. The AMC's location at UofSC Aiken will link activities at both SRS near Aiken, SC, and at Fort

Gordon near Augusta, GA. This synergy will positively enhance industrial development and technological research in both Aiken County and across the entire region.

These economic growth initiatives will be further leveraged by programs already housed at UofSC Aiken including the Small Business Development Center, the Economic Development Partnership of Aiken and Edgefield Counties, and the UofSC Aiken Entrepreneur Center.

DOE also sees the facility as a major win-win for both the community and its own ongoing programs. "The AMC will generate modern manufacturing approaches for the DOE's cleanup mission," said Department of Energy Environmental Senior Advisor Ike White. "The innovation developed in the AMC will help the DOE better manage risk, improve worker safety, reduce costs, and accelerate schedules for our existing cleanup mission."

Battelle Savannah River Alliance is the managing and operating contractor of SRNL.



SRNL: On a Mission

Savannah River National Lab (SRNL) is on a mission – a mission to broadly engage the Central Savannah River Area (CSRA) community in furthering its awareness and knowledge of science and its role in advancing the quality of life as we know it. Through innovative research and development, SRNL provides real-world solutions to many of the pressing issues facing our nation. And, by being ambassadors of science and involving the local community in its mission, SRNL is helping grow the CSRA into a collaborative and innovative hub for advancing science, technology, engineering and mathematics (STEM) education and job growth in STEM fields.



SUBMITTED PHOTO

SRNL volunteers talk to students at the Aiken Public Library.

Growing SRNL's footprint and capabilities

SRNL broke ground on the Advanced Manufacturing Collaborative (AMC) being built at the University of South Carolina Aiken (USC Aiken). As a center for academic, commercial and government collaboration, the AMC will foster scientific and technology innovation while building the next-generation workforce in a state-of-the-art facility. This modern building will provide new laboratory, office and meeting space suitable for advanced manufacturing research and development, as well as collaborative and research and development spaces for spinning innovative technologies into the commercial sector.

“The AMC will embody the modern concepts of manufacturing to include smart and digital manufacturing and remote and autonomous systems embracing the most up to date tenets of Industry manufacturing,” SRNL Director Vahid Majidi said. “It will also accelerate the establishment of SRNL’s expanded core competencies by connecting scientists and engineers from across the Battelle Savannah River Alliance partnership.”

Innovative research and technology

SRNL’s Laboratory Directed Research and Development (LDRD) Program in-

vests in research that positions SRNL to meet DOE missions while developing a future workforce needed to meet complex technology challenges. One example is the Functionalized Cellular Magmatics project, which explored the fundamentals of engineered synthetic stone of glass and ceramic that replicate natural volcanic materials. These cellular magmatics are an emerging green material, with the potential to help significantly reduce or find valuable uses for municipal wastes. The cellular magmatics project was born from decades of SRNL materials science expertise in support of nuclear waste immobilization.

Another LDRD Program project looks to further develop 3D printing, which has the potential to revolutionize manufacturing. 3D printers offer several advantages over traditional manufacturing, such as rapid iterative changes, small machine footprint, and high-manufacturing agility. These advantages typically come at the expense of part strength, surface finish, and low throughput due to the layerwise paradigm employed by all 3D printers. The layerwise paradigm is thought to be 3D printing’s biggest drawback but SRNL is investigating new techniques to leverage

this into a strength.

The layer-by-layer process of 3D printing affords access to the bulk of parts in a way that traditional manufacturing, such as injection molding, does not. This allows for low penetrative materials and electromagnetic energies, such as process gases and UV light, to make chemical changes deep throughout the part, which ultimately leads to a change in part properties. This technology could have broad application to the community, including the creation of new materials used in consumer end parts, or as a recycling technique that enables reuse and upscaling of materials that would otherwise be stored in a landfill leading to a reduction in both cost and waste.

Community engagement

Battelle Savannah River Alliance, LLC, the manager and operator of SRNL, donated \$20,000 to Friends of the Aiken County Public Library’s capital campaign to help renovate the Aiken County Public Library. In recognition of the donation, a portion of the library housing a collection of books on STEM topics, including science, mathematics, computer science, technology and engineering, was named honoring SRNL.

STEM skills are essential to being competitive in the global race for energy development, creating and maintaining a healthy economy, and fostering innovation and excellence. Partnering with the Aiken County Public Library and others in the community is essential in creating STEM awareness and building students’ skills, content knowledge, and literacy in STEM fields.

Other community engagement and education outreach includes:

- Pairing SRNL volunteers and STEM kits with local school districts and other organizations for demonstrations, STEM nights, etc.
- SRNL employees judging sessions for regional science fairs and presenting at local STEM Exploration Camps
- SRNL employees donating their time as mentors and establishing a mentoring program for a local high school’s robotics team and Civil Air Patrol program
- Supporting the Cyber Education CyberPatriot Summer Camps, free to students
- SRNL employees serving on community boards, supporting local charities and championing many community causes.

In 2022, SRNL volunteers participated in 25 projects and applied countless hours of their time supporting local community organizations, such as United Way, Golden Harvest food Bank, Habitat for Humanity, Children’s Place, Child Advocacy Center, American Heart Association and Toys for Tots

During Nuclear Science Week, virtual tours of SRNL will be available that will demonstrate SRNL work scope and diversity in the workforce. Teachers can also apply to receive STEM kits specific to nuclear science. For more information about the virtual tours or STEM kits, contact Meagan Kinard on 803-522-5001 or at meagan.kinard@srnl.doe.gov.

Through excellence in science and technology, laboratory operations and community service, SRNL continues its mission of being stewards of the Central Savannah River Area by expanding its science and technology efforts and engagement with the community. Do you want to be a part of SRNL’s growing commitment to science, technology and community? Check out what opportunities exist for you by visiting the SRNL website at <https://srnl.doe.gov>.



SRMC starts strong with a new vision: Finish in 2037

BY ANDREA LYON

On February 27, 2022, Savannah River Mission Completion (SRMC) became the new liquid waste contractor at the Department of Energy (DOE) Savannah River Site.

The Liquid Waste Mission remains constant: Safely reduce the risk to the community and the environment of radioactive liquid waste stored in aging waste tanks. However, SRMC is bringing a new, motivating vision: Finish in 2037. To get there, SRMC has a renewed focus on risk reduction. Over the next 15 years, SRMC is committed to reducing operational and environmental risk by aggressively removing curies from the waste tanks and optimizing operations to minimize Liquid Waste Program total life cycle.

SRMC has created an environment founded on its core values – safety, reliability, mutual respect, and continuous improvement – and harnessed by the Power As One – one mission, one vision, one contract, one company, one value set, one safety culture. Developing this mindset among its employees has given SRMC much success in its first months on the job. Here is a look at how the Liquid Waste Program's new vision has started strong in 2022.

Power As One: SWPF joins liquid waste contractor

In March, the Salt Waste Processing Facility (SWPF) became part of SRMC, bringing nearly 400 skilled employees. The only plant of its kind in the nation, SWPF is the facility to process the majority of the remaining tank waste at SRS. With SWPF now an official gear in the system, SRMC is primed to execute the Power As One and process millions of gallons of tank waste – a key priority of DOE.

A major facility upgrade

This summer, the Defense Waste Processing Facility (DWPF) implemented a major improvement in the plant's chemical flow-sheet, significantly improving the vitrification process. The DWPF team replaced formic acid with glycolic acid. This change allows DWPF to have an even safer processing of high-activity radioactive waste and a more efficient conversion of waste into glass. It will also allow DWPF to treat greater quan-



SUBMITTED PHOTO

The Salt Waste Processing Facility became part of SRMC in March.



SUBMITTED PHOTO

SRMC employees performed tasks for various area agencies as part of the 2022 United Way Project VISION Day of Caring, including yard work at Children's Place of Aiken.

ties of waste, which will ensure SWPF can operate at high production rates.

Critical infrastructure improvements

SRMC is improving operational reliability through critical infrastructure replacement, pipe bridges in H Tank Farm. The improvements are part of an ongoing project to install new aboveground infrastructure to replace aging underground utilities that service tanks and facilities located in the tank farm.

Replacing the utility infrastructure improves the reliability of critical utilities, such as steam, air, and water. It also allows the tank farm to better support salt batches for SWPF and sludge batches for DWPF.

A good neighbor

SRMC continues the long-standing SRS tradition of being a good neighbor in the CSRA. In March, the company participated in the 2022 CSRA Heart Walk Campaign where employees raised \$34,832. More than 40 employees participated in the Heart Walk



SUBMITTED PHOTO

SRMC crews installed a new pipe bridge in H Tank Farm that will transport utility services to 2H Evaporator, pictured, which reduces the volume of liquid radioactive waste in the site's 43 remaining operational tanks

at SRP Park in North, Augusta, S.C. Also in March, more than 60 SRMC employees volunteered their time and talents for the annual United Way of Aiken County's Project VISION, a program that focuses on aiding local community members. In June, SRMC raised \$8,296 for Children's Place, Inc. through its own unique take on the area fundraising event, Celebrity Waiter Night. For this event, members of the SRMC executive team served employees as "celebrity waiters" by delivering barbecue sandwich meals onsite.

Investing in the next generation

As part of its community commitment, SRMC supports regional education outreach initiatives. In May, SRMC awarded 15 students, children of SRMC employees, a Family Scholarship of \$3,000 each. SRMC also awarded four local elementary school teachers its first annual Power AS One Mini Grants, allowing teachers to purchase supplies and activities to promote hands-on STEM projects in their classrooms. For 10 weeks over the summer, SRMC hosted 34 college interns to expand their knowledge in the nuclear field. The interns completed tangible tasks and meaningful projects that benefited both our mission and their understanding about SRMC's work.



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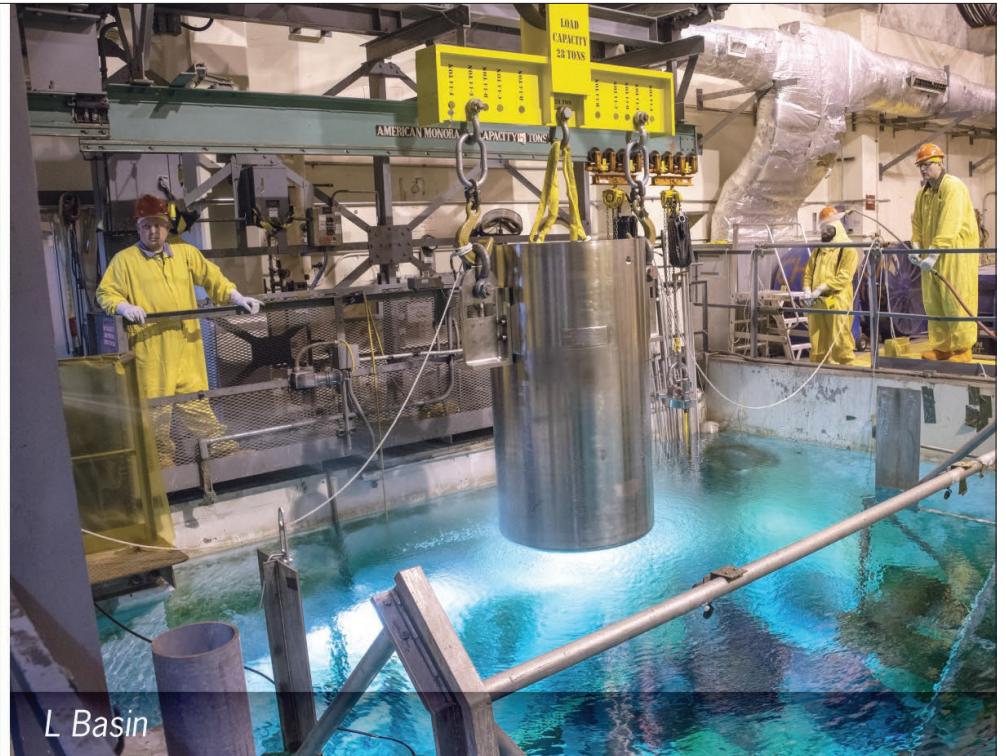
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H Canyon



L Basin

SRS's operations receive approval for accelerated basin de-inventory mission, saving time and money

The Savannah River Site (SRS) received approval from the Department of Energy proceed with a new approach to spent nuclear fuel (SNF) disposition that will result in a lifecycle cost reduction of over \$4 billion dollars and represents a more than 20-year acceleration over the current approach.

Since 1995, the H Canyon chemical separations facility has been used to dissolve SNF from SRS's L Area Disassembly Basin, an underwater facility that safely receives and stores SNF from foreign and domes-

tic research reactors. After dissolution, H Canyon would use complex chemical processes to purify and blend the resulting highly enriched uranium (HEU) with natural uranium to produce low enriched uranium (LEU). The LEU was then used in commercial power reactors to make electricity. This approach made the HEU non-proliferable, or no longer usable for nuclear weapons.

The newly approved approach, called Accelerated Basin De-inventory (ABD), will use H Canyon to dissolve the SNF and then, instead of processing further into LEU, send it through the Site's liquid waste program to be vitrified and safely stored onsite until a federal repository is identified.

"There are so many reasons that ABD is a better path forward," said Eloy Saldivar, the ABD Program Manager for SRS management and operations contractor Savannah River Nuclear Solutions. "H Canyon is a complex, unique resource and is the only operating production-scale nuclear radiochemical separations facility in the US. But the facility is nearly 70 years old and its expensive to maintain and operate. Add that to the fact that L Basin is nearing its storage capacity, and there are other cheaper sources of fuel for commercial power reactors, so our LEU is no longer needed. ABD is just a cheaper, faster and simpler approach to dispositioning SNF."

ABD allows certain H Canyon systems to be made inactive, saving processing and associated upkeep and maintenance costs. It also allows SRS to disposition the more than 3,000 SNF bundles in L Basin by 2033, when the current operating approach would have taken until the year 2060.

"The Department of Energy and its contractors are committed to reducing costs, completing projects more quickly and safely, optimizing operations, and engaging employees in a highly effective production environment," said SRS Manager for DOE, Mike Budney. "The ABD solution to improve the Savannah River Site cleanup mission embodies this approach."



Essential SRPPF operations system passes first round of testing

A material transfer system that will be central to operations in the Savannah River Plutonium Processing Facility (SRPPF) has successfully completed its first round of testing. The results will help guide the final design of the system, which will transport materials through the facility's various steps in producing plutonium pits needed for the nation's nuclear deterrent.

The Savannah River Site (SRS) is repurposing an unfinished National Nuclear Security Administration (NNSA) facility as the SRPPF. Design work for the conversion is currently underway. "The material transfer system will be the veins and arteries of the SRPPF, moving material from beginning to end of the production process," said Patrick Schneider, SRNS Plutonium Modernization Manager of Operations. "Designing, assembling and testing a prototype of the transfer system now will allow the development of a final system that works seamlessly with the production processes."

A version of the system will also be installed in SRPPF's Training & Operations Center, where training, qualification and procedure development will begin well in advance of operations in SRPPF.

Work in the SRPPF will take place inside gloveboxes, which are enclosures that allow employees to perform work in a protective environment. The material transfer system will move materials, tools and waste through the series of connected gloveboxes.

SRPPF worked with the Savannah River National Laboratory (SRNL) on the system. The partnership among SRPPF Operations, SRPPF Maintenance, SRPPF Project Engineers and SRNL researchers was one of the keys to the testing program's success.

Schneider said, "Bringing together this cross section of functional organizations at this early stage in the project will support our future success."

SRNL began by researching available technologies for moving materials and items through the system. They evaluated the different technologies to determine which would be the most effective, have the fewest moving parts, and be the easiest to maintain. After looking at pulley-driven, chain-driven and others, a magnetic drive was selected as the best option because it does not present maintenance challenges like chains that need lubrication or belts that stretch over time.

SRNL assembled the first version of the system and operated it in the lab to make sure it would run. It was then transferred to an existing facility that will eventually become SRPPF's Training & Operations Center, where a three-person operations team began putting it through its paces. The prototype had to demonstrate movement laterally and around corners. The final test was a multi-phase endurance test to ensure that it could transport more than the required weight over a four-week period.

Each phase required the system to run 24/7 for a week. The test began with a nearly 10-pound empty cart operating for the first week. A 10-pound bag was added to the cart for the second week, then another 10-pound bag was added for week three, and finally, a third 10-pound bag was added to complete the month-long test. "When we got to 40 pounds, it was still operating and functioning, so we know it can do what's needed," Schneider said. "The magnetic-driven technology proved to be efficient and low maintenance."

Information gained from testing has been shared with the glovebox design team. They will update the system's design, based on improvements indicated by the testing. Then the updated system will be assembled, and testing will begin again.



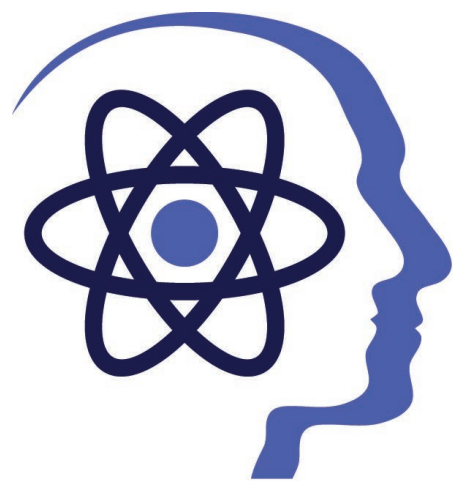
SUBMITTED PHOTO

Kristen Phillippi, Operations Support Specialist – SRPPF, loads a 10-pound bag into the test transport container that sits on a cart driven by magnetic technology within the prototype of the material transfer system.



SUBMITTED PHOTO

A prototype of the material transfer system that will be used to move material and items during the plutonium pit production process in SRPPF.



WORC

WORKFORCE OPPORTUNITIES IN REGIONAL CAREERS

Generating a new “WORC” force

Ian Murray has been working since he could earn a paycheck to better his opportunities. Like many in his generation, he is willing to work exceptionally hard, but also striving to efficiently balance life and career. He is a chemistry student at the University of South Carolina Aiken and a WORC scholarship recipient. Ian is part of a growing population of well-educated, skilled workers that are finding pathways to Savannah River Site (SRS) careers because of the WORC Program.

WORC stands for Workforce Opportunities in Regional Careers (WORC). The program was envisioned by the non-profit Savannah River Site Community Reuse Organization (SRSCRO) to help local citizens develop skills for local careers.

Since 2016, \$15M has been awarded to the SRSCRO by the Department of Energy Environmental Management (DOE-EM) and National Nuclear Security Administration (NNSA) for workforce development near SRS. The grants are serving local communities through WORC partners including Aiken Technical College, Augusta Technical College, Augusta University, Claflin University, University of South Carolina Aiken, and University of South Carolina Salkehatchie.

Over 2,000 student scholarships have been given because of WORC. Yet, scholarships are only one part of the broad program. Funds from WORC are also used to provide student success coaching, classroom supplies, equipment, undergraduate research opportunities and science, technology, engineering, and math (STEM)



Dr. Karina Liles



Ian Murray



Brooke Stagich



Mike Violette

“The WORC grant and Augusta University’s Nuclear Science Program made up a significant part of shaping my future. They opened the door to a long road of opportunities that eventually led to my current career path. I know I wouldn’t be where I am today without Dr. Newton at Augusta University, the nuclear program, and the WORC grant providing me with that initial chance.”

Brooke Stagich, senior scientist at the Savannah River National Laboratory (SRNL) and a graduate of Augusta University’s Nuclear Science Track in Chemistry

outreach programs in rural areas.

Like Ian, many WORC scholarship recipients are first-generation college students. For example, Brooke Stagich is a Senior Scientist, at the Savannah River National Laboratory (SRNL) and a graduate of Augusta University’s Nuclear Science Track in Chemistry. She is a first-generation college student who learned about nuclear science and SRNL because of the WORC grant.

“The WORC grant and Augusta University’s Nuclear Science Program made up a significant part of shaping my future,” said Brooke. “They opened the door to a long road of opportunities that eventually led to my current career path. I know I wouldn’t be where I am today without Dr. Newton at Augusta University, the nuclear program, and the WORC grant providing me with that initial chance.”

“It’s important that students see someone that looks like them.”

**Dr. Karina Liles,
Interim Department Chair of
Mathematics and Computer
Science and Associate Professor
of Computer Science at
Claflin University**

WORC scholarships are also helping people like Mike Violette make important career changes. Mike found his scientific identity while working as a college administrator. He changed careers with help from WORC scholarships at Augusta Technical College and discovered his passion both technically and as a manager for others. Mike is a Group Manager for the Site Services Electrical Shops for Savannah River Nuclear Solutions at SRS.

According to Dr. Karina Liles of Claflin University, the WORC program helps diversify STEM fields of study. Dr. Liles serves as Interim Department Chair of Mathematics and Computer Science and Associate Professor of Computer Science at Claflin University. “It’s important that students see someone that looks like them,” she explained with respect to expanding diversity in fields such as computer science.

Already, 75% of the WORC scholarships have been awarded to minority or non-traditional students.

Learn more about WORC at www.srscro.org.

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- ▶ Great Salary
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Programs Offered at SIX Area Educational Partners

- ▶ Aiken Technical College
- ▶ Augusta Technical College
- ▶ Augusta University
- ▶ Clafin University
- ▶ University of South Carolina Aiken
- ▶ University of South Carolina Salkehatchie

WORC Scholarship Opportunities

Workforce Opportunities in Regional Careers (WORC) scholarships are available, in varying amounts, at six area educational institutions. Scholarships focus on programs that align with long-term workforce needs that support Department of Energy's Office of Environmental Management and National Nuclear Security Administration nuclear missions.

MISSION

CNTA serves to educate the public by providing objective information on the value of nuclear technology with respect to our health, economy, environment, and national security.

VISION

CNTA will become the recognized avenue for the collective engagement of its members in increasing the awareness and support of nuclear technology and its benefits to the public.

VALUES

Through inclusiveness and engagement, CNTA and its volunteers create a voice to provide the public with factual, objective information on nuclear subjects, while also providing opportunities for its members' personal and professional growth.

Join CNTA

Citizens for Nuclear Technology Awareness (CNTA) needs your help to continue to provide quality nuclear education to our region. There are many ways to contribute to CNTA, including joining as a member and volunteering on a committee or for a one-time event. If you are interested in joining us, email cnta@bellsouth.net for more information.

Communications Committee

The Communications Committee is responsible for providing accurate and timely information to the media, stakeholders and the public that reflect the goals and objectives of CNTA. They write all CNTA press releases and publish the Nuclear Science Week Insert in the Aiken Standard every year.

Speaker's Bureau

The Speaker's Bureau identifies experts on topics in nuclear technology to deliver presentations to groups, clubs and organizations that request speakers on such topics.

Education Committee

The goal of the Education Committee is to educate the public on the benefits, uses and facts of nuclear technology through initiatives that include: "Bringing Nuclear into the Classroom," Nuclear Blitz teach-ins; the Lifelong Learning Academy;

and awarding scholarships and grants to students and teachers.

Young Professionals Committee

The purpose of the Young Professionals Committee is to recruit and engage young professional members by providing them with mentorship and professional development opportunities, as well as raising funds to allow free memberships for those under 40. They oversee the fall Oyster Roast fundraiser, which provides funds for these endeavors, and the Tap Into Nuclear series.

Membership Committee

The Membership Committee aims to create innovative initiatives to provide and promote value to members and retain current membership while working to attract new members.

Golf Committee

The Golf Committee is responsible for planning the annual Charity Golf Tournament, which includes soliciting sponsors and raffle items, marketing and managing concession sales. The tournament is held in May each year. The Annual CNTA Golf Tournament is the organization's largest fundraiser, raising an average \$20,000 annually. Volunteers are also needed at the tournament!

CNTA's 2022 Board of Directors



Steve Sheetz, Chair

Stephen O. Sheetz is a mechanical engineer who is now providing consulting services on tritium and pit programs for the Savannah River National Laboratory.



Dr. Forest Mahan, Vice-Chair

Dr. Forest Mahan is currently the fifth president of Aiken Technical College.



Charlie Hansen, Treasurer

Charlie Hansen is a retired contractor and federal senior executive who served for 46 years in the Naval Nuclear Propulsion Program, commercial nuclear power generation and in U.S. Department of Energy waste management programs.



Dr. Jeff Allender

Jeffrey S. Allender is an Advisory Scientist and Program Manager at SRNL.



Jimmy Angelos

James G. Angelos is Senior Vice President of National Nuclear Security Administration Plutonium (Pu) Programs and Operations for SRNS. He is responsible for establishing the enduring Pu pit production program and future operations organization.



Sally Bartelmo

Sally Bartelmo is a Project Owner in the Tank Farms for Savannah River Mission Completion.



Roger Burnett

Roger R Burnett is a Chief Project Controls Specialist at Parsons.



Dean Campbell

Dean Campbell is the Manager of Media and Project Communications for Savannah River Mission Completion, the liquid waste contractor at the Savannah River Site.



Wyatt Clark

Wyatt Clark is the Chief Operations Officer for Savannah River Mission Completion at the Savannah River Site.



Dr. Paul Cloessner

Paul Cloessner is the Vice President, National Nuclear Security Administration Chief Business Officer for SRNS.



Dr. Musa Danjaji

Musa Danjaji is a full professor of Nuclear Engineering at South Carolina State University.



Alan Dobson

Alan Dobson has worked in the Nuclear Industry since 1975 and is a Vice President of Bechtel National Inc.



Jhivaun Freeman-Pollard

Jhivaun Freeman-Pollard is a Senior Director for Jacobs and is based out of Richland, Washington.



Dara Glass

Dara V. Glass is Community Affairs lead for Savannah River Mission Completion at the Savannah River Site.



Joyce Hopperton

Joyce Hopperton is Director, Environment, Safety, Health, and Quality Assurance for Centerra-Savannah River Site.



Fred Humes

Fred Humes is the President/CEO of the Applied Research Center.



Joel Leopard

Joel Leopard serves as a Communications Coordinator for Plant Vogtle.



Karl Lutterloh

Karl G. Lutterloh is Vice President and Trust Officer at Security Federal Bank.



Jesus "Zeus" Mancilla

Jesús "Zeus" Mancilla is the Deputy Manager, K Area Complex Nuclear and Criticality Safety Engineering at SRS.



Craig McMullin

Craig W. McMullin has more than 40 years of experience in the field and recently retired as a Senior Program Manager of Special Projects at SRNL for SRNS.



Nick Miller

Nick Miller is the Deputy Vice President of Environmental Management Operations for Savannah River Nuclear Solutions, the managing and operating contractor at the Savannah River Site.



Lindsey MonBarren

Lindsey MonBarren is a Principal Communications Specialist for the Environmental Management Operations Department at Savannah River Nuclear Solutions.



Chuck Munns

Charles L. Munns is a member of the board for Orano Federal Services and is South Carolina's trustee to the Southern Association of Colleges and Schools.



Aherial Polite

Aherial Polite is the department chair of Chemistry, Physics, and Nuclear Science at Aiken Technical College.



Dr. Daren Timmons

Dr. Daren Timmons is University of South Carolina-Aiken's Provost and Executive Vice Chancellor of Academic Affairs.



Dr. John Veldman

John Veldman retired as Associate Laboratory Director for National and Homeland Security at SRNL after 38 years of service.



Tim Worrell

Tim Worrell is the Quality Assurance Manager for Merrick.



Dr. James Marra, Executive Director

Dr. James C. Marra is a veteran in the nuclear industry. He began his nuclear career at SRNL as a Senior Engineer and progressed to the level of Advisory Engineer. He also spent time as a Senior Scientist for the U.S. Department of Energy's Office of Environmental Management.



Dr. Allison Hamilton Molnar, Director of Operations

Dr. Allison Hamilton Molnar has been involved with local governments and non-profit work since high school. At CNTA she organizes events, is the point of contact for members, provides payroll and accounting services and works behind the scenes so CNTA can function efficiently. She also currently serves as CNTA's webmaster.

Citizens for Nuclear Technology Awareness Awards 2022 Educator Grants

Citizens for Nuclear Technology Awareness (CNTA) awarded five grants to local teachers to help fund science-related curriculum in their classrooms.

The grants, each about \$500, will be used to fund projects that promote an increased understanding of science, technology, engineering, and math (STEM); atomic and nuclear fundamentals; radiation and nuclear materials safety; and applications of nuclear technology.

The 2022 grant winners are:

- Jayne Andrews, 6th grade, Riverside Middle School;
- David Kassner; 10th-12th grade, Lakeside High School;
- Donita Legoas, 6th grade earth science and STEM, A.R. Johnson Health Science and Engineering Magnet School;
- Nasiba White and Anna Reed; 2nd-8th grade, Savannah River Academy; and,
- Kristina Istre, 8th grade physical science and STEM, A.R. Johnson Health Science and Engineering Magnet School.

In addition to CNTA, sponsors of the CNTA Educator Grants Program are American Nuclear Society-Savannah River, Huntington Ingalls Industries, Battelle Savannah River Alliance/Savannah River National Laboratory, and a private gift from anonymous donors.

CNTA is honored to continue this important grant program to facilitate more local educational outreach by the organization, said Dr. Jim Marra, CNTA Executive Director.

"These grant awards are part of our continued partnership with area educators to provide instruction in the areas of science and math," Marra said. "We hope students find these activities informative, interesting, and fun, and spark an interest in pursuing a future career in the STEM fields."

2022 Robert Maher Memorial Scholarship winner announced

Citizens for Nuclear Technology Awareness (CNTA) and Savannah River Mission Completion (SRMC) has announced University of South Carolina (U of SC) student Robert Demuth as the winner of the 2022 Robert Maher Memorial Scholarship.

The scholarship is sponsored by SRMC, the liquid waste contractor for the U.S. Department of Energy (DOE) at the Savannah River Site (SRS).

Demuth, who is from Gray Court, S.C., is a senior pursuing a bachelor's degree in aerospace engineering with a minor in nuclear engineering. He is also pursuing an accelerated Master of Science in nuclear engineering.

CNTA Executive Director Jim Marra said CNTA is proud to award this \$5,000 scholarship to such an ambitious, enthusiastic, and deserving student.

"Robert has a great passion to pursue nuclear research and grow his knowledge and experience in the field," Marra said. "All these go-getter qualities make him the ideal candidate to award this scholarship. No doubt Robert will be an exemplary addition to the nuclear industry."

In 2019, Robert was offered a position as an undergraduate research assistant and began training in U of SC's Advanced Nuclear Materials Laboratory.

In 2020, he began his first independent research project in a joint collaboration project between U of SC, Savannah River National Laboratory, and Idaho National Laboratory. This project involved engineering-scale spent nuclear fuel drying tests, which were performed to evaluate the effectiveness of two distinct drying processes on spent nuclear fuel in preparation for long-term dry storage.

In 2021, he assisted in a Westinghouse research study of the cracking behavior of uranium and Advanced Doped Pellet Technology (ADOPT) fuel.

In 2022, he undertook the lead position in a research endeavor between U of SC, DOE, and Westinghouse. This project aims to provide a robust solution to analyzing the safety of long-term spent fuel storage. His portion of the project entailed designing a proprietary nuclear fuel drying system capable of testing Westinghouse equipment under commercial nuclear fuel drying conditions.

He is currently the lab manager for the Used Fuel Storage and Disposition Laboratory at USC.

"Ever since I was a child, I have always been fascinated by outer space and witnessing mankind extend its reach into the universe," Demuth said. "Now I desire to actively par-

ticipate in this endeavor while ensuring that safety and public health remain a top priority, along with reducing the environmental impact of our actions. I strive to accomplish this goal with a career at NASA in the nuclear field. My interests are primarily in Nuclear Space Reactors and Nuclear Thermal Propulsion. These two highly advanced technologies present unique challenges that I wish to assist in overcoming."

He has been involved in many school and community activities, including local chapter of the American Cancer Society as Communications Officer, Habitat for Humanity, and many church activities, such as the praise band, food pantry, and mission trips.

The Robert Maher Memorial Scholarship is a joint project of CNTA and SRMC. Maher, Vice President and General Manager for Strategic Mission Development at SRS, passed away in 2002 after a 48-year career at the Site. A visionary with a broad view of the Site's potential, Maher helped shape SRS.

The annual scholarship was established in Maher's memory to support students pursuing science and engineering degrees in preparation for careers in the nuclear field. Details on the scholarship can be found at: <https://cntaware.org/maher-memorial-scholarship/>.

Six win scholarships from 2022 CNTA essay contest

Six area high school students won scholarships resulting from their winning entries in the 2022 Citizens for Nuclear Technology Awareness (CNTA) High School Essay Contest. Two students won \$1,000 apiece, two won \$750 apiece, and two students won \$500 apiece.

The winners of the 16th annual writing contest are:

\$1,000 Winners

- Dillon Hammell, Aiken High School, for "Isotopes in Medicine: How They are Used and Where we get them"
- Adam Wallace, Richmond County Technical Career Magnet School, for "Nuclear Energy and Space Exploration"

\$750 Winners

- Matthew Miller, Spring Valley High School, for "Uses of Radioisotopes in Medicine and U.S Dependence on Foreign Supply"
- Tyler Sims, Davidson Fine Arts Magnet

School, for "The battle for power: Nuclear energy vs. fossil fuels"

\$500 Winners

- Kaytlin Sturkey, Richmond County Technical Career Magnet School, for "Nuclear Technology and Space Exploration"
- Azaria Martin, Richmond County Technical Career Magnet School, for "Discuss how electricity generated from nuclear power versus fossil fuels can impact global warming."

The goal of the CNTA Essay Contest is to increase high school student awareness of nuclear technologies and their impact on society. Each student picked one of four topics for this year's contest:

1. This past year has seen much progress toward sustained fusion power ... discuss the progress and remaining roadblocks.
2. Discuss the use of nuclear technology in space exploration (past, present, and future).
3. Discuss the importance of isotopes in

today's medicine and the U.S. dependence on foreign supply.

4. Discuss how electricity generated from nuclear power versus fossil fuels can impact global warming.

"We were very impressed with the quality of the essays we received from all the students this year," said Dr. Marissa Reigel, Chair of the CNTA Essay Committee. "It was exciting to see the breadth of information the students included in their essays."

The contest was open to high school juniors and seniors in Aiken, Allendale, and Barnwell counties in South Carolina and Burke, Columbia, and Richmond counties in Georgia; homeschool students; and students of CNTA member families. The winning students, their parents, and school representative will be honored guests and recognized at an upcoming CNTA event later this year.

Over the course of the Essay Contest program, CNTA has awarded over \$65,000 to deserving students.



Nuclear Power

Reliable, Clean Energy for Now and the Future!

The effects of climate change are evident as the daily news cycle reports on historic high temperatures, droughts and flood events across our nation and the world. It is now clear that minimizing carbon emissions is paramount to stemming continuing changes to our climate. Our transformation to clean and renewable energy is moving forward but likely not at the pace needed. In 2020, renewable energy (mainly in the form of hydro and wind) made up nearly 20 percent of U.S. electricity generation. This is good news as a basketful of clean energy sources is welcome.

However, we know that the wind doesn't always blow and the sun doesn't always shine. Moreover, widespread droughts are impacting our waterways and the hydropower that is produced from these sources. Water levels at Lake Mead are at an historic low, now just at 27 percent capacity, threatening sustained operations of Hoover Dam and the power supplied to over 1 million people.

There is a solution to increase our energy security and to provide clean, consistent power. The answer is Nuclear. Nuclear power has the highest capacity factor of any source. More specifically, nuclear power plants are producing maximum power more than 93% of the time.

The best news is that the benefits of nuclear energy are beginning to gain traction here in the U.S. and around the world. The recently enacted Inflation Reduction Act includes provisions to support existing nuclear power plants and emerging future nuclear technologies. Specifically, the act supports pro-



DR. JAMES MARRA
Executive Director,
Citizens for Nuclear
Technology Awareness

duction tax credits for existing nuclear plants, financing support through expanded loan guarantees, funding to support domestic uranium fuel production, and tax credits for new nuclear energy technologies.

In a complete 180, California state leaders are moving to extend the life of the Diablo Canyon Plant beyond the current 2025 planned shutdown date. Diablo Canyon supplies about 10% of California's electricity and accounts for 17% of the states' zero-carbon energy. The proposed legislation could keep the plant open until 2035. Additional states are embracing nuclear, too. Illinois and New Jersey passed clean energy bills that look to keep existing nuclear plants operating for the foreseeable future. West Virginia and Montana have lifted moratoriums on nuclear power and seven additional states have enacted legislation to evaluate advanced nuclear power to facilitate clean energy generation.

Other countries, around the world, are also getting on board. France, Japan, and South Korea are again considering new nuclear after backing away for a decade. The United Kingdom is going all in and



New nuclear technologies are also rapidly advancing. Two new nuclear reactors are scheduled to go on-line at Plant Vogtle (just south of Augusta) over the next two years. When combined with the two current operating reactors, the new reactor additions will make Vogtle the largest nuclear plant in the U.S. NuScale is leading the way in Small Modular Reactor (SMR) deployment. The NuScale reactor design has received Nuclear Regulatory Commission approval and a plant is on schedule to be on-line in Idaho by the end of the decade. Terrapower, a company founded by Bill Gates, is not far behind.

has pledged to complete eight new nuclear power plants by 2050. Similar to California, Germany is reevaluating its proposed plan to shutter all nuclear reactors by the end of this year. More than 60% of German citizens favor keeping the existing nuclear plants in operation.

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cale reactor design has received Nuclear Regulatory Commission approval and a plant is on schedule to be on-line in Idaho by the end of the decade. Terrapower, a company founded by Bill Gates, is not far behind. The Terrapower molten salt cooled Sodium reactor is working on a demonstration project in Wyoming. Terrapower just raised \$750 million to support development of their reactor technologies to support clean energy and radioactive medical isotope production.

So, through the operation of existing reactors and development of new, advanced technologies, the solution to reliable, clean energy is clear – Nuclear!

NUCLEAR TECHNOLOGY IN THE 1940s

- **DECEMBER 2, 1942**
The first **self-sustaining nuclear chain reaction** occurs at the University of Chicago.
- **JULY 16, 1945**
The U.S. Army's Manhattan Engineer District (MED) tests the first atomic bomb at Alamogordo, New Mexico, under the code name **Manhattan Project**.
- **AUGUST 6, 1945**
The atomic bomb nicknamed Little Boy is dropped on Hiroshima, Japan. Three days later, another bomb, Fat Man, is dropped on Nagasaki, Japan. Japan surrenders on August 15, **ending World War II**.
- **AUGUST 1, 1946**
The **Atomic Energy Act** of 1946 creates the Atomic Energy Commission (AEC) to control nuclear energy development and **explore peaceful uses of nuclear energy**.
- **OCTOBER 6, 1947**
The AEC first investigates **the possibility of peaceful uses of atomic energy**, issuing a report the following year.
- **MARCH 1, 1949**
The AEC announces the selection of a site in Idaho for the **National Reactor Testing Station**.

NUCLEAR TECHNOLOGY IN THE 1950s

- **JUNE 14, 1952**
Keel for the Navy's **first nuclear submarine**, Nautilus, is laid at Groton, Connecticut.
- **DECEMBER 8, 1953**
President Eisenhower delivers his **"Atoms for Peace" speech** before the United Nations.
- **JANUARY 10, 1955**
The AEC announces the Power Demonstration Reactor Program. Under the program, **AEC and industry will cooperate in constructing and operating experimental nuclear power reactors**.
- **JULY 12, 1957**
The **first power from a civilian nuclear power unit** is generated by the Sodium Reactor Experiment at Santa Susana, California. The unit provided power until 1966.
- **OCTOBER 1, 1957**
The U.N. creates the International Atomic Energy Agency (IAEA) in Vienna, Austria, to **promote the peaceful use of nuclear energy and prevent the spread of nuclear weapons around the world**.
- **MAY 22, 1958**
Construction begins on the world's **first nuclear-powered merchant ship**, the N.S. Savannah, in Camden, New Jersey. The ship is launched July 21, 1959.
- **DECEMBER 20, 1951**
In Arco, Idaho, Experimental Breeder Reactor I produces the **first electric power from nuclear energy**, lighting four light bulbs.
- **MARCH 30, 1953**
Nautilus **starts its nuclear power units for the first time**.
- **AUGUST 30, 1954**
President Eisenhower signs **The Atomic Energy Act of 1954**, the first major amendment of the original Atomic Energy Act.
- **JULY 17, 1955**
Arco, Idaho, population 1,000, becomes the **first town powered by a nuclear powerplant**, the experimental boiling water reactor BORAX III.
- **SEPTEMBER 2, 1957**
The Price-Anderson Act provides **financial protection to the public** and AEC licensees and contractors if a major accident occurs at a nuclear powerplant.
- **DECEMBER 2, 1957**
The world's **first large-scale nuclear powerplant begins operation** in Shippingport, Pennsylvania.
- **OCTOBER 15, 1959**
Dresden-1 Nuclear Power Station in Illinois, **the first U.S. nuclear plant built entirely without government funding**, achieves a self-sustaining nuclear reaction.

NUCLEAR TECHNOLOGY IN THE 1960s

- **EARLY 1960S**
Small nuclear-power generators are first used in remote areas to **power weather stations** and to **light buoys for sea navigation**.
- **AUGUST 19, 1960**
The **third U.S. nuclear powerplant**, Yankee Rowe Nuclear Power Station, achieves a **self-sustaining nuclear reaction**.
- **NOVEMBER 22, 1961**
The U.S. Navy commissions the world's largest ship, the U.S.S. Enterprise. It is a **nuclear-powered aircraft carrier** with the ability to operate at speeds up to 30 knots for distances up to 400,000 miles without refueling.
- **DECEMBER 12, 1963**
Jersey Central Power and Light Company announces its commitment for the Oyster Creek nuclear powerplant, **the first time a nuclear powerplant is ordered as an economic alternative to a fossil-fuel plant**.
- **AUGUST 26, 1964**
President Lyndon B. Johnson signs the Private Ownership of Special Nuclear Materials Act, which **allows the nuclear power industry to own the fuel for its units**. After June 30, 1973, private ownership of the uranium fuel is mandatory.
- **APRIL 3, 1965**
The **first nuclear reactor in space** (SNAP-10A) is launched by the United States. SNAP stands for Systems for Nuclear Auxiliary Power.
- **OCTOBER 3, 1964**
Three nuclear-powered surface ships, the Enterprise, Long Beach, and Bainbridge, complete "Operation Sea Orbit," an around-the-world cruise.



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5 FACTS ABOUT FOOD IRRADIATION

795
MILLION
PEOPLE

ONE IN NINE PEOPLE WERE SUFFERING FROM CHRONIC UNDERNOURISHMENT IN 2014. WITH THE HELP OF FOOD IRRADIATION, THE NUMBER OF THOSE SUFFERING FROM MALNOURISHMENT CAN BE DECREASED.



FOOD IRRADIATION IS THE PROCESS OF EXPOSING FOODSTUFFS TO GAMMA RAYS TO KILL BACTERIA THAT CAUSE DISEASE AND TO INCREASE SHELF-LIFE.



IT HAS THE SAME BENEFITS AS WHEN FOOD IS HEATED, REFRIGERATED, FROZEN, OR TREATED WITH CHEMICALS, BUT DOES NOT CHANGE THE TEMPERATURE OR LEAVE RESIDUE.



ASTRONAUTS USE THIS PRESERVATION TECHNIQUE FOR THE FOOD THEY TAKE ON SPACE EXPEDITIONS.



THERE ARE OVER 60 COUNTRIES THAT ARE CURRENTLY USING NUCLEAR TECHNOLOGY TO IRRADIATE THEIR FOOD IN ORDER TO MAKE THEIR AGRICULTURE MORE SUSTAINABLE.

5 FACTS ABOUT NUCLEAR TECHNOLOGY IN INSECT CONTROL

10%

DESPITE WIDESPREAD USE OF INSECTICIDES, LOSSES ARE LIKELY TO BE OF THE ORDER OF 10% GLOBALLY AND OFTEN NOTABLY HIGHER IN DEVELOPING COUNTRIES.



RADIATION IS USED TO CONTROL INSECT POPULATIONS THROUGH THE STERILE INSECT TECHNIQUE. WHICH IS THE REARING OF BUGS THAT ARE STERILIZED VIA IRRADIATION, AND ADDING THEM TO NATURAL POPULATIONS.



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Our Vision
To complete the liquid waste mission by 2037

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A busy year at SREL

BY DR. GENE RHODES

It has been an exciting year at the University of Georgia's (UGA's) Savannah River Ecology Laboratory (SREL). We have experienced turnover in faculty and staff positions due to retirements and new job opportunities, as well as new hires to replace those employees.

We congratulate Dr. John Seaman on his retirement, and we wish Dr. Guha Dharmarajan and Mr. Pacifico Perea the best of luck in their new positions.

To fill these gaps, the SREL has conducted a number of nationwide searches to fill open faculty positions in biogeochemistry and disease ecology, with each position respectively having an individual based at the SREL and one at the UGA campus.

We are also seeking an individual to fill a newly created position, an assistant director of outreach and education.

Additionally, we are embarking on another search this fall to add yet another faculty member in 2023 who will have expertise in analytical and simulation modelling. As you can imagine, it has been a very busy time for everyone as we have conducted these searches and interviews to find our new colleagues.

Our two newest SREL-based faculty members are Dr. Brennan Ferguson and Dr. Dan Peach.

Dr. Ferguson is a biogeochemist who received her Ph.D. at Clemson University and has worked extensively with subsurface chemistry and mobility of radionuclides. She is very well positioned to contribute to SREL's mission on the Savannah River Site (SRS) through research on the fate and longevity of



GENE RHODES
Director of SREL

various radionuclides that reside in the soils on the SRS and the development of remediation technologies that can help in the cleanup of these legacy wastes.

Dr. Ferguson is a tenure-track assistant professor who has a joint appointment with the SREL and the Department of Geology in the Franklin College of Arts and Sciences on the UGA campus.

Dr. Dan Peach is an ecologist

who studies insect vectors for disease transmission, mosquitoes in particular. Peach received his Ph.D. at Simon Fraser University. He has conducted extensive research in the ecology of mosquitoes and mosquito repellants. He will add to the SREL's strong expertise in ecology, and he has great potential to utilize the vast habitats of SRS to explore how our nation can use

knowledge of mosquito ecology and behavior to reduce the transmission of vector borne diseases like Zika, West Nile Fever, Dengue and a host of other zoonotic diseases carried by these insects. Peach is a tenure-track assistant professor. He has a joint appointment to the SREL with the Department of Infectious Diseases in the College of Veterinary Medicine at the UGA campus.

Ferguson and Peach will conduct research as well as graduate and undergraduate education through student mentoring, experiential learning, and course instruction.

The new assistant director of outreach and education will assist with the educational efforts of our entire faculty and lead our outreach program.

With the lessening

of restrictions on in-person programming, our outreach program is once again working within the schools to reach local K-12 audiences and to hold our highly successful Ecologist for a Day programs at the UGA Conference Center. With the growth of our graduate program and plans to expand our experiential learning offerings at SREL, we are seeking to find someone who

can take the reigns of our formal and informal education programs and help us to grow them strategically while increasing the breadth and depth of the content we offer.

Lastly, I would like to introduce you to the new University of Georgia Research Institute (UGARI). As the Interim co-director of UGARI, I am working with faculty at the SREL and on the main UGA campus to increase UGA's ability to work directly with mission-driven agencies like Department of Energy, the Department of Defense, and others to pursue applied research questions and to respond to the needs of these federal agencies efficiently.

While the primary focus for UGARI is engaging faculty on the main campus in these efforts going forward, the SREL serves as an excellent example of how to develop productive, accountable relationships with federal agencies that need effective, practical solutions to real world problems, like those we face at SRS.

We look forward to another busy, productive year at the SREL and as always, we greatly appreciate the support of our local communities and our many partners in the Central Savannah River Area.

Dr. O.E. (Gene) Rhodes is director of SREL, a professor at the Odum School of Ecology, and interim co-director of UGARI. He specializes in wildlife ecology and genetics, including the application of genetic tools to issues in wildlife management and conservation; disease ecology; molecular genetics as a tool for examining wildlife behavior and population structure; sustainability of wildlife species in human-dominated landscapes and resolution of human-wildlife conflicts.

“ We look forward to another busy, productive year at the SREL and as always, we greatly appreciate the support of our local communities and our many partners in the Central Savannah River Area.



Cleanup plan for 25-mile contaminated stream corridor at SRS approved by state and federal regulators

SRS contractor Savannah River Nuclear Solutions (SRNS) has reached an important agreement with South Carolina and federal environmental regulators on the final cleanup of a 25-mile long stream corridor at the Savannah River Site (SRS) radiologically contaminated as a result of operations during the Cold War

The corridor consists of Par Pond, nine miles of canals adjacent to the pond and a stream named Lower Three Runs. The stream begins near the center of the Site, just above Par Pond and winds its way southward across SRS.

The Record of Decision (ROD) agreement specifies what protective and cleanup actions are required along with assurances of long-term monitoring to ensure the corridor remains within environmentally safe standards. This ROD acknowledges the successful completion of a comprehensive SRNS cleanup strategy following the decommissioning and closure of both P and R Area. Operations involving P and R Reactor facilities had contributed to the contamination of the Lower Three Runs stream corridor.

“This is the first Record of Decision that we’ve ever agreed upon with the regulators and the public that outlines the final closure for a large parcel of stream systems,” SRNS Director, Environmental Cleanup and Area Closure Projects Chris Bergren said. “We’ve accomplished much of the cleanup related to this part of the Site over the years, and now we have determined the remaining actions necessary to achieve final cleanup.”

SRNS Engineer and Project Technical Lead Jim Kupar explained that much of the remaining work involves ensuring additional fencing and signage are in place to warn site workers and the public that potential hazards may be present. “Though it is illegal for the public to cross the fencing onto SRS, our first priority is always their safety,” said Kupar. “This will be especially true when we work to remove the few areas of elevated contamination in the canal system, beginning in 2023.”

Kupar said that surveying 25 miles of waterways, especially Lower Three Runs, was often challenging and sometimes potentially hazardous within the forest. “We used aerial detection equipment along with taking on-site readings every 1,000 meters along Lower



SUBMITTED PHOTO

A Savannah River Nuclear Solutions subcontractor technician takes radiological readings of soil near Lower Three Runs, part of a major project to complete the cleanup of a contaminated 25-mile long stream corridor at the Savannah River Site.

“The cleanup of surface water and groundwater at SRS is one of our most important missions.

The list of significant environmental remediation achievements at SRS, over just the last 10 years alone, is long and impressive. It serves as a testament to the effectiveness of our relationship with regulators and our mutual commitment to continuous improvement and safety.”

**Thomas Johnson Jr.,
former DOE-Savannah River Deputy Site Manager**

Three Runs, often involving difficult terrain. Tripping hazards, feral hogs, snakes, spiders and bees could appear at any time. Though

the survey is complete and active controls are now in place, we continue to conduct inspections along the stream corridor,” he said.

“Everything – from characterization of potential contamination through final negotiation with our regulators – was important, to successfully achieve, as a team, this Record of Decision. It’s a big deal. We want to be sure that the public is confident that we’ve fully taken care of the Cold War legacy issue,” Bergren said.

“The cleanup of surface water and groundwater at SRS is one of our most important missions,” Thomas Johnson, Jr., DOE-Savannah River Deputy Site Manager, said. “The list of significant environmental remediation achievements at SRS, over just the last 10 years alone, is long and impressive. It serves as a testament to the effectiveness of our relationship with regulators and our mutual commitment to continuous improvement and safety.”



SUBMITTED PHOTO

The third cohort of the SRNS/Aiken Technical College (ATC) Nuclear Operator Apprenticeship Program was recognized in a ceremony on Tuesday, July 27, at Aiken Technical College.

STEM education outreach from the Savannah River Site

The U.S. Department of Energy's (DOE) Savannah River Site (SRS) and its contractors provide a variety of science and educational outreach programs by funding and coordinating the efforts of several organizations. The primary goal of these programs is to enhance interest in science, technology, engineering and mathematics (STEM) and to support improvements in education by using the unique resources available at the Site.

SRS education outreach programs reach students and educators of all grade levels by providing educational enhancement opportunities, hands-on experiences and additional resources. Outreach efforts also include educational grants and scholarships; job shadowing, internships and co-op opportunities, as well as, funding for non-profit education institutions.

Site employees work together to combine their resources to further enhance the overall success of an education outreach

program or event. These employees come from the Department of Energy; Savannah River Nuclear Solutions (SRNS), the SRS managing and operating contractor; Savannah River Mission Completion (SRMC), the SRS liquid waste contractor; the Savannah River National Laboratory (SRNL); and University of Georgia's Savannah River Ecology Laboratory.

The Department of Energy

Some of the programs supported financially by the Department of Energy Savannah River include the Annual Aiken County Scripps National Spelling Bee; the DOE Savannah River Regional Science Bowl; and the Future City Competition. Additionally, DOE sponsors the CSRA College Night, an annual opportunity for students to learn about education and financial aid opportunities available from colleges and universities. Approximately 6,000 students attend annually and more than \$300,000 in scholarship funding has been offered to students attending past CSRA college nights.

DOE Savannah River also supports regional higher education. In 2011, DOE awarded a \$5 million grant for the purpose that the Savannah River Site Community Reuse Organization

provide the necessary approach to support the regional needs for developing the pipeline of talented workers in the CSRA to support the demand resulting from workforce restructuring in the next decade. Under this grant, SRSCRO, in partnership with five-post secondary institutions is supporting the project administration of a program directed at workforce pipeline development called the Workforce Opportunities in Regional Careers (WORC) program.

Savannah River Nuclear Solutions

SRNS education outreach has been sharing its diverse science, technology, engineering and math (STEM) outreach programs with local public and private schools since 2008. To date, SRNS has provided more than \$5 million for education outreach, supporting more than 300,000 students and teachers throughout seven counties near SRS.

The SRNS STEM-intensive offerings traditionally include a traveling science program, virtual field trips, workshops, tours, talks, demonstrations and other content. SRNS also

Please see **STEM**, Page 19T



STEM, from 18T

offers annual mini-grants to financially support special projects for area teachers. To date, SRNS has contributed more than \$825,000 to educators in the region.

To reach local adults pursuing higher education degrees, SRNS has signed memorandums of understanding with local technical colleges, historically Black colleges and universities, and other four-year degree institutions such as the University of South Carolina Aiken and has established apprenticeship profiles in 15 different fields, to help develop the workforce needed for the future.

Savannah River Mission Completion

SRMC is committed to developing the next generation through education outreach and STEM involvement. SRMC supports elementary through high school students through Power As One Mini Grants for local teachers to promote STEM projects in their classrooms and Family Scholarships to graduating seniors, who are children of SRMC employees. SRMC invests in college students and universities through summer internships, capstone project mentoring, a nuclear operator apprenticeship program, and a co-oping program where former interns can continue to work for SRMC while finishing their schooling. SRMC also has strong relationships with Historically Black Colleges and Universities (HBCUs), including Denmark Technical College (DTC). SRMC and DTC signed a Memorandum of Understanding earlier this year with the goal of helping prepare students for their future careers at the Savannah River Site.

Savannah River National Laboratory

The SRNL Laboratory Community Relations and Educational Outreach program embodies SRNL's commitment to our community. Elements of the program include:

- STEM Ambassadors
- STEM Scholarships and Mentoring for CSRA students

Our support to the community comes in the form of volunteers and in funds. The Battelle Foundation Fund at The Columbus Foundation, on behalf of SRNL, is poised to invest \$250,000 for community-based and school-system initiatives with a focus on serving underrepresented communities.

An example of this investment is BSRA's donation of \$20,000 to Friends of the Aiken County Public Library's capital campaign to help renovate the Aiken County Public Library. In recognition of the donation, a portion of the library housing a collection of books on STEM topics, including science, mathematics, computer science, technology and engineering, was named honoring SRNL. Team SRNL volunteers also provided STEM demonstrations for young students at the library's kids day. Partnering with the Aiken County Public Library and others in the community is essential in creating STEM awareness and building students' skills, content knowledge, and literacy in STEM fields.

SRNL manages the Department of Energy Office of Environmental Management's (EM's) Minority Serving Institutions Partnership Program (MSIPP). The program was designed to help address EM's future workforce needs by partnering with academic, government, and DOE contractor organizations to mentor future minority scientists and engineers in the research, development, and deployment of new technologies that address EM's environmental cleanup challenges.

EM was appropriated \$56 million in fiscal year 2022 for MSIPP. EM envisions using the funding for:



SUBMITTED PHOTO

A team from Lakeside High School, Evans, Georgia is this year's Regional DOE Science Bowl® champs, overcoming 18 teams from across South Carolina and the greater Augusta, Georgia area.

- Competitive research awards: Research contracts awarded on EM mission-related research and award recipients will partner with national laboratories.

- Internships: Ten-week summer internships hosted at DOE national laboratories, SRS, and EM Headquarters.

- Savannah River Environmental Sciences Field Foundation: Ten-week hands on summer program offering course credits. Research projects would be affiliated with SRNL.

- Consortium Program: This consortium builds on the program's success, and expands activities to create jobs, job training and advancing education in STEM, cybersecurity, manufacturing, health and environmental science, and technology development.

- Technology, Curriculum, and Professional Development Program: Grants and contracts potentially awarded related to instrumentation and specialized equipment. Workshops and site visits will be provided to ensure professional development training.

- EM/Minority Serving Institutions (MSI) Shared Interest Research Partnership Program: Grants or contracts potentially awarded on targeted research. Collaboration with MSIs within proximity of EM cleanup sites.

- Postdoctoral Fellows Program: Candidates who obtain their PhD or their undergraduate from a MSI are eligible to apply. Opportunities will be available across the EM cleanup complex.

- Graduate Fellowship Program: This is year-long fellowship program that includes salary, travel for conferences, and professional networking events.

Engagement with Minority Serving Institutions (MSI) and Historically Black Colleges and Universities provides an opportunity to inform students on the real challenges of the EM mission and position a future workforce "pipeline."

University of Georgia's Savannah River Ecology Laboratory (SREL)

Experiential graduate, undergraduate and public education programs are critical components of the Savannah River Ecology Laboratory's (SREL) mission at SRS. In 2022, SREL allocated more than \$2 million of its funding to support graduate and undergraduate education programs and public outreach activities. For example, in 2022, SREL's 13 faculty members mentored more than 100 graduate students as they conducted research at SRS. As a result, these students gained the knowledge and experience needed to launch careers in the environmental sciences. SREL faculty also contribute significantly to undergraduate experiential learning and mentor many students from underserved populations who have limited access to opportunities for scientific inquiry at their home institutions. Over the past decade, a large number of the undergraduate students who came to SREL to participate in experiential learning have transitioned into graduate school with SREL faculty serving as their mentors. SREL conducts a variety of outreach and education programs for the public, including activities for K-12 population and adult audiences. The focus of the outreach program is to increase environmental stewardship and awareness and increase the number of individuals trained for careers in the environmental sciences. Although temporarily constrained by the recent pandemic, the lab's outreach activities in the community resumed in June of 2021 with a steady increase in the number of individuals reached. In fact, SREL outreach staff have already engaged with 13,000 individuals in less than seven months since resuming in-person activities. The current trend in numbers indicates the team will provide outreach education programming to over 50,000 individuals in the local Central Savannah River Area by the end of the year.

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