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SRNL Receives 2 INFUSE Awards

Will Partner with General Atomics and General Fusion to Advance Fusion Energy

AIKEN, S.C. (July 19, 2022) – Savannah River National Laboratory (SRNL) received two Department of Energy (DOE) INFUSE awards with General Atomics and General Fusion to further advance the fusion fuel cycle and development of a commercial fusion power plant.

Sponsored by the Fusion Energy Sciences (FES) program office within DOE's Office of Science, Innovation Network for Fusion Energy, or the INFUSE program, is focused on accelerating fusion energy development through public-private research partnerships.

"These two new INFUSE awards continue SRNL's efforts to deepen industry engagement through public-private partnerships that help industry develop their technologies into viable commercial solutions," said SRNL Fusion Energy Research Program Manager Brenda Garcia-Diaz. "The projects with General Atomics and General Fusion will leverage SRNL's expertise in fusion fuel cycle technologies in unique ways to help design and implement improved systems in significantly different fusion concepts."

General Atomics is developing a modeling workflow for fusion pilot plant (FPP) integrated design and optimization, and is in need of verified and validated models for the tritium fuel cycle. Savannah River National Laboratory will develop two models for General Atomics' use: a reduced model for tritium processing, which will be utilized by General Atomics' FPP systems code, as well as comprehensive Aspen fuel cycle simulations to assess the significance of particular design decisions. General Atomics and SRNL will perform FPP optimizations with these tools and SRNL will provide a relative, initial cost analysis for the tritium processing facilities. The project will be led by General Atomics principal investigator David Weisberg and SRNL scientist Holly Flynn.

"One of the most attractive aspects of a fusion power plant is the environmentally friendly hydrogen fuel, which doesn't require any harmful mining or drilling activities," explains David Weisberg. "But we also need to perfect the way we recycle fuel inside the power plant, and SRNL has expertise to advance the technological readiness of that system."

With General Fusion, SRNL will work to model the total inventory of tritium in General Fusion's future commercial pilot plant (CPP) design. Understanding tritium inventory is a necessary step to design, license, construct, and operate larger and increasingly integrated fusion machines. SRNL will apply its expertise to quantify and streamline tritium processing in the CPP to support General Fusion's pilot plant development to deliver clean, safe, and on-demand fusion power at commercial scale. The project will be led by General Fusion Chief Technology Officer Ryan Guerrero and SRNL scientist George Larsen.

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"General Fusion's practical Magnetized Target Fusion technology is designed with a low start-up tritium fuel requirement and an advantageous breeding ratio to produce sufficient quantities of tritium fuel to sustain the fusion process," said General Fusion Chief Technology Officer Ryan Guerrero. "We look forward to partnering with SRNL, one of the foremost tritium research laboratories, to advance our design for commercial use. General Fusion's technology has the potential to transform the world's energy supply with clean, reliable, and cost-competitive fusion power plants."

Savannah River National Laboratory is the leading DOE Center of Excellence for tritium processing technologies and is uniquely qualified to partner with General Atomics and General Fusion to help develop the fuel cycle for an FPP. As the nation's tritium laboratory, SRNL stewards the U.S. core technical competencies in tritium process systems to meet the requirements of the U.S. nuclear deterrent. And, as a Federally Funded Research and Development Facility, SRNL provides tritium and hydrogen isotope technology to enable other vital national programs, including Fusion Energy Sciences. The unique expertise and sustained ability of SRNL to effectively apply its tritium capabilities have been demonstrated with over 65 years of experience with multi-kilogram quantities of tritium.

"We hope to continue growing our engagement with industry and leverage our expertise to help DOE realize its vision for commercial fusion energy," said Garcia-Diaz. "Public-private partnerships with industry, national labs and universities are essential to further developing fusion as a viable source of energy for the future."

Savannah River National Laboratory is a United States Department of Energy multi-program research and development center that's managed and operated by Battelle Savannah River Alliance, LLC (BSRA). SRNL puts science to work to protect the nation by providing practical, cost-effective solutions to the nation's environmental, nuclear security, nuclear materials management, and energy manufacturing challenges (https://srnl.doe.gov/).

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