PURDUE UNIVERSITY | School of Nuclear Engineering

Nuclear Engineering Seminar

Dr. Elizabeth Sooby,

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3:30 pm | Virtual Zoom

Assessing Thermochemical Stability and Fission Product Mobility in Advanced Nuclear Fuels

Abstract

Many novel reactor designs include the use of unqualified, advanced nuclear fuels. In order to enhance economic viability of these designs, vendors propose either modified TRISO kernels or high uranium density fuel such as UN. In each of these cases, there are knowledge gaps which need to be bridged for qualification of these next generation fuel designs. In the case of UN, fission product behavior, thermochemical stability, and mobility in the fuel form are largely unknown. For modified TRISO fueled reactor designs, extending cycle lengths or operational windows beyond the AGR qualified fuel form necessitates an understanding of SiC corrosion by select fission products. Presented here will be microstructure and thermodynamic data to both motivate future phenomenological investigations as well as to enhance the current state of knowledge of fission product behavior in advanced reactor fuels.

Dr. Elizabeth Sooby is an Associate Professor and Lutcher Brown Endowed Faculty Fellow in the departments of Physics and Astronomy and Mechanical Engineering at the University of Texas at San Antonio. She received a 2022 DOE Early Career Award, the 2023 ANS Landis Award, and was honored by the UTSA Presidential Achievement in Research award in 2021. Dr. Sooby is an expert in fuels synthesis and testing, particularly uranium compound fabrication and high temperature steam oxidation testing. Prior to coming to UTSA in 2017, Dr. Sooby was appointed as a staff scientist at Los Alamos National Laboratory where she also held a Seaborg Postdoctoral Fellowship in Actinide Science following graduation with her Ph.D. in Physics from Texas A&M in December 2014. She received her Bachelor of Science degree in Physics from Millsaps College in Jackson, MS. She is the principle investigator of the Extreme Environments Materials Laboratory, a unique facility she developed at UTSA over the last 6.5 years, which is a 2,000 square foot radiological laboratory space dedicated to nuclear materials fabrication and testing.