



Department of
Engineering Physics
UNIVERSITY OF WISCONSIN-MADISON

INSTITUTE FOR
NUCLEAR
ENERGY SYSTEMS

Presents:

Boone Beausoleil
Nuclear Science & Technology –
Nuclear Fuels Design & Development
Idaho National Lab



Challenges in Designing & Qualifying New Materials for Advanced Reactors

Abstract:

The Nuclear Materials Discovery and Qualification initiative (NMDQi) focuses on the development of tools and capabilities to support the accelerated discovery and engineering qualification of new materials for advanced nuclear reactors. Outside the nuclear industry, methods are available that have demonstrated an increase in the efficiency and rate of materials discovery for accelerated technology commercialization. These accelerated development efforts often focus on rapid fabrication capabilities supporting combinatorial materials development, artificial design approaches utilizing computational methods to model performance, and granular databases that become an essential resource for the community to explore candidate materials for next generation designs. Existing toolsets are inadequate for commercial-grade nuclear materials research because the extreme reactor environments require unique experimental capabilities and modeling approaches to study material evolution. For this reason, recapitalization of existing fabrication and experimental facilities to support high-throughput campaigns for irradiated materials and fuels are an essential component of this initiative and are required for its success. In addition, novel physics-based modeling and modern data science approaches must also be developed and harnessed to support not only material discovery, but qualification as well. This presentation summarizes the internal developments focused on the discovery, optimization, and utilization of nuclear materials research and design approaches required to realize the next shift in nuclear materials research, development, and deployment.

Biography:

Boone Beausoleil is a staff scientist within the Fuel Design and Development Department in NS&T. His current research primarily involves leading irradiation projects for the Advanced Fuels Campaign, NNSA fuel development, and the Nuclear Materials Discovery and Qualification Initiative. Boone is also involved in the characterization of irradiated materials including fuel and structural core materials. Prior to working at INL, Boone was an engineer at Newport News Shipbuilding where he worked in refueling and plant overhaul of aircraft carriers and submarines for the Naval Nuclear Propulsion Program. Boone earned both his masters in science in materials science at Boise State University and studied perovskites for use in gas separation membranes. He also earned his bachelors in physics at Boise State and contributed to the development of dilute metal semi-conducting nano materials for medical applications.

Tuesday, 10/13/2020
BBCollaborate Ultra
12:00 PM