

Materials Science & Engineering Graduate Seminar

Wednesday, October 23 2019, 4:10-5:00PM, WEB 1230

Dr. Troy Munro

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Nuclear Fuels: Material Science in Extreme Environments

The current fleet of nuclear reactors have been using uranium dioxide (UO₂) fuel for over 50 years. While in a reactor, the creation, migration, and chemistry of fission products in the presence of strong thermal gradients and radiation induced damage combine into a complex puzzle. Despite decades of research and use, the behavior of UO₂ and other nuclear fuels continue to surprise us with new mysteries, such as the piezo-magnetic character of UO₂. This presentation will be focused on new insights into actinide physics, multi-level modeling efforts, and structure-property research on nuclear fuels and future research directions needed to meet society's need for carbon-free energy.



Dr. Troy Munro joined the Mechanical Engineering department at BYU as an assistant professor in 2016. He received a concurrent BS/MS from Utah State University in 2012 and a dual PhD from Utah State University and the Katholieke Universiteit (KU) Leuven in 2016 in both Mechanical Engineering and Physics. His background is in microgravity boiling behavior, thermal property measurement technique development (applied to natural and synthetic spider silks), optical fiber-based laser furnace for high temperature thermal property measurements, and fluorescence thermometry. His research is focused on the thermal behavior of materials and energy systems, along with developing the instrumentation needed to measure these systems. Current specific research areas include development of improved, non-contact in situ temperature sensing systems and spatial resolution of the thermophysical properties of materials.