

## 2023 RaDIATE Collaboration Meeting



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# Non-destructive Characterization of Nuclear Materials Through X-ray Absorption And Diffraction Contrast Tomography: Case Study on Surrogate TRISO Particle

*Tuesday, June 27, 2023 9:00 AM (40 minutes)*

X-ray scattering techniques coupled with the world-class brightness of the National Synchrotron Light Source II (NSLS-II) at Brookhaven National Laboratory (BNL) enable exceptional opportunities for non-destructive studies of nuclear materials such as uranium alloys. Materials for Energy Applications group at Nuclear Science & Technology Department at BNL partners with 28-ID-2 beamline (XPD) of NSLS-II for providing synchrotron-based characterization resources for nuclear science community under the umbrella of Nuclear Science User Facilities (NSUF). The XPD beamline can focus the x-ray beam down to ~25  $\mu\text{m}$  in a high-energy regime ( $>60$  keV) and is intended to be a crosscutting tool that will enable multi-modal studies of high-Z materials, a crucial capability for nuclear materials research. In this talk, I will present examples of previous studies conducted as a result of this partnership. Emphasis will be placed on absorption contrast and diffraction contrast tomography of a surrogate TRi-structural ISOTropic particle fuel (TRISO) particle which is known as “the most robust nuclear fuel on earth.”

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**Session Classification:** Talks