

SCHOOL OF MECHANICAL & MATERIALS ENGINEERING
GRADUATE SEMINAR SERIES

Modeling and Simulation of Microstructure Evolution and Deformation in an Irradiated Environment

Presented by

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Abstract

The ability to predict the behavior of structural components in a nuclear power plant is critical to the nuclear industry. Structural metals in the primary loop of nuclear power plants must endure challenges such as irradiation and mechanical and thermal loading, and these structural metal components must continue to function in potential transient and accident conditions throughout the operational lifetime of the power plant. This extreme operational environment changes the metal microstructure by creating additional defects. The physical interactions of dislocations with these defects govern how the metal will respond to future conditions. Therefore predicting the mechanical response of these metals requires a set of physically based and reliable models of dislocation and defect interactions. These microstructure elements include glide mobile and immobile dislocations, geometrically necessary dislocations, twinning dislocations, irradiation defects, and thermal aging defects.

Biography

Stephanie Pitts has been a Graduate Student Intern at Idaho National Laboratory since 2016, where she is one of the primary crystal plasticity developers for the MOOSE modules. She is also a primary contributor to the multi-year process of migrating from vector-based continuum mechanics code to tensor-based continuum mechanics code, which enables the implementation of nonsymmetric tensors to describe mechanical material behavior. She will complete her Ph.D. in Mechanical Engineering in May 2019.

Thursday, April 4th, 2019

11:00am to Noon

ETRL room 101

Meet the speaker before the seminar in ETRL room 119, 10:30am to 10:50am. Light refreshments will be served.



The complete schedule of the MME Seminar Series can be found at <https://mme.wsu.edu/events/>.

