

MSR Workshop

Description: The goal of the training session is to demonstrate the application of MOOSE-based tools for coupled neutronics – thermal-hydraulics modeling of liquid fuel molten salt reactors (MSRs). The training session will be focused on developing a multiphysics simulation for a simplified model of the Molten Salt Reactor Experiment (MSRE) by coupling neutronics based on the Griffin neutronics code, and thermal hydraulics based on the Pronghorn code. Steady-state and a flow driven transient will be modeled with demonstration of the delayed neutron precursor impacts.

Presenters: Mustafa K. Jaradat, Mauricio Tano Retamales, Ting Fei

Organizers: Advanced Reactor Technology and Nuclear Energy Advanced Modeling and Simulation Programs

Agenda:

1:00 – 1:30 pm (30 min): Introduction to MSRE (Mustafa)

1:30 – 2:00 pm (30 min): Introduction to cross section preparation & mesh generation for MSRE (Ting)

2:00 – 2:20 pm (20 min): Steady-state Heterogeneous neutronics model of MSRE with Griffin (Ting)

2:20 – 3:00 pm (40 min): Thermal-Hydraulics model of the MSRE with Pronghorn (Mauricio)

3:00 – 3:10 pm (10 min): Coffee Break

3:10 – 3:55 pm (45 min): Multiphysics Steady-state model of MSRE with Griffin/ Pronghorn (Mustafa)

3:55 – 4:40 pm (45 min): Multiphysics transient modeling of MSRE with Griffin/Pronghorn (Mustafa)

4:40 – 5:00 pm (20 min): Demonstration of species transport (Griffin, Pronghorn, & Thermochemica) (Mauricio)