Department of Engineering Physics
UNIVERSITY OF WISCONSIN–MADISON

INSTITUTE FOR NUCLEAR ENERGY SYSTEMS

Presents:

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Advancements in System-level Thermal-hydraulics Analysis of High Temperature Gas-cooled Reactors

Abstract: Due to their high thermal efficiency, inherent safety, and potential to provide high-temperature process heat, high temperature gas-cooled reactor (HTGR) designs are among the advanced reactor concepts that have attracted worldwide interests. There are two main types of HTGR designs, i.e., pebble bed design (such as X-energy's Xe-100) and prismatic design (such as GA's MHTGR). For modeling and simulation, the multi-dimensional and multi-scale thermal fluid phenomena involved in the steady state operation and transient events of HTGRs makes them challenging cases to model in the system-level using system analysis codes. To address these challenges, we are developing new theories, new code capabilities, and new modeling strategies with SAM, an advanced system code being developed at Argonne National Laboratory for advanced non-LWR reactor safety analysis. This presentation will be focused on these modeling and simulation advancements related to HTGR applications.

Biography: Dr. Ling Zou is a Principal Nuclear Engineer in the Nuclear Science and Engineering Division of Argonne National Laboratory, where he is contributing to a variety of projects mainly in the field of nuclear reactor thermal-hydraulics. At Argonne, he is leading R&D activities to support the Nuclear Energy Advanced Modeling and Simulation (NEAMS) program and ARPA-E's Modeling-Enhanced Innovations Trailblazing Nuclear Energy Reinvigoration (MEITNER) program. As one of the main code developers of Argonne's award-winning nuclear reactor safety analysis code, SAM, he has made contributions to SAM code development and its applications in the analyses of various types of advanced reactor designs. His main research interests include R&D of next-generation reactor system analysis code, reactor safety analysis, thermal-hydraulics analysis to support advanced reactor designs, modeling and simulation of two-phase flow, and numerical methods development in two-phase flow simulations.

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Zoom
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