PURDUE UNIVERSITY | School of Nuclear Engineering

Nuclear Engineering Seminar

Dr. Ruchi Gakhar,

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Wednesday, November 19 2025
3:30 pm | WTHR 200

Tracking Chemistry in Motion: Spectroscopy and Flowloop Testbeds for Molten Salt Systems

Abstract

In this talk, Dr. Ruchi Gakhar will explore the chemical analysis of molten salts across liquid, aerosol, and vapor phases using combinatorial spectroscopy approaches. These techniques enable in-situ, high-temperature diagnostics critical for understanding salt behavior in extreme environments. In addition to spectroscopic methods, Dr. Gakhar will present the design and operation of a molten salt flowloop testbed developed for sensor integration and performance evaluation. Together, these efforts support advanced reactor technologies and fuel cycle applications by providing deeper insight into salt chemistry and system dynamics.

Dr. Ruchi Gakhar is a research scientist in the Advanced Technology of Molten Salts Department at Idaho National Laboratory (INL). She leads several Department of Energy (DOE)-funded projects focusing on molten salt chemistry, structure, and property characterization, including thermophysical property evaluation, optical and Raman spectroscopy, molten salt corrosion, and flow loop instrumentation. Dr. Gakhar serves as the principal investigator and thrust lead on the Energy Frontier Research Center (EFRC) - Molten Salt in Extreme Environments (MSEE) project, sponsored by the DOE Office of Science. Her collaborative efforts extend to universities, industries, and other national laboratories through this and other programs. Dr. Gakhar has commissioned several unique capabilities at INL for in-situ investigation of molten salt chemistry in bulk, aerosol, and vapor phases using coupled spectroscopy and electrochemical techniques. With extensive experience in material synthesis and property characterization, she addresses technical challenges related to molten salt nuclear reactors and spent fuel reprocessing technologies.