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## Project Title

High-Temperature Thermomechanical Characterization of Nuclear Materials

**PI:** Heng Ban, University of Pittsburgh

**Program:** Scientific Infrastructure Support for CINR

**Collaborators:** Albert To, Wei Xiong, Brian Gleeson, University of Pittsburgh

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### ABSTRACT:

This project aims to purchase a Gleeble system equipped with extreme environmental capabilities to strengthen core nuclear capability in strategic thrust areas in fuel performance, additive manufacturing of nuclear components, high-temperature corrosion, and reactor materials at the University of Pittsburgh (Pitt). The equipment will fill a regional infrastructure gap in high-temperature thermomechanical property characterization because there is no Gleeble system in academia in western Pennsylvania, southeastern Ohio, and northern West Virginia. The system will enhance research closely aligned with, yet complementary to, DOE/INL programs and local industries. The four PIs have leading expertise in fuel thermophysical properties, transient fuel performance, additive manufacturing, alloy development, and high-temperature corrosion. They support DOE nuclear energy programs and local nuclear industries such as Westinghouse, Curtiss-Wright, Holtec, and Naval Nuclear Laboratory. The equipment will be heavily used in several current DOE-NE projects and benefit many faculty members involved in nuclear research. The Gleeble system will be creatively used to provide data on nuclear fuel fracture under rapid heating/cooling and thermomechanical behavior of structural materials at high temperatures. It will offer opportunities for innovative additive manufacturing techniques for reactor applications. The capability will help attract and train undergraduate and, more importantly, graduate students to nuclear research and enhance nuclear education at Pitt. The equipment from this project will be part of the overall effort to solidify nuclear research in the Stephen R. Tritch Nuclear Engineering Program at the University of Pittsburgh.