



SUBMIT AN ABSTRACT FOR THE FOLLOWING SYMPOSIUM

NUCLEAR MATERIALS

Interrelated Extremes in Materials Degradation for Fission and Fusion Environments

The fast-growing energy demand and the need to limit greenhouse gas emissions have led to the acknowledgment of the importance of increasing nuclear energy efficiency. This necessitates the development of nuclear materials that can withstand increasingly extreme environments. Advances in both fission and fusion reactors create exceptionally harsh working conditions for materials, requiring them to operate at higher temperatures and endure more intensive radiation doses while maintaining integrity in chemically aggressive environments. In some cases, these environmental effects can even couple with each other, further degrading material performance, and thus requiring fundamental improvements. However, improving materials for nuclear applications is a daunting challenge, especially in the absence of a comprehensive understanding of material behavior in complex and highly coupled extreme environments.

Various approaches are employed to explore materials degradation, including the integration of in-situ experimental characterization, multiscale modeling, and machine learning prediction, etc. These methods open new avenues for better understanding the interplay of coupled extremes in materials degradation within nuclear fission and fusion environments. This symposium seeks to explore the impact of interrelated extremes on materials degradation in nuclear environments, providing a platform for discussing emerging insights, experimental observations, and theoretical advancements. By bringing together researchers from diverse disciplines, this symposium will enhance our collective understanding of coupled degradation mechanisms and inform the development of more resilient nuclear materials.

Abstracts are solicited in, but not limited to, the following areas:

- Coupling of radiation and mechanical stress effects on materials degradation.
- Interplaying of radiation and corrosion effects on materials degradation.
- Effects corrosion and mechanical stress on materials response.
- Combined effects of radiation, corrosion, and mechanical stress on materials degradation.
- Novel methods development in tackling coupled extremes environment.
- Experimental, modeling, and combined experimental-modeling studies are of interest.

SPONSORED BY:

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QUESTIONS?

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