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TMS 2025
154th Annual Meeting & Exhibition

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MGM Grand Las Vegas
Hotel & Casino
Las Vegas, Nevada, USA
#TMSAnnualMeeting


## SUBMIT AN ABSTRACT FOR THE FOLLOWING TMS2025 SYMPOSIUM:

### NUCLEAR MATERIALS

# Composite Materials for Nuclear Applications III

Composite materials are of growing interest for nuclear fusion and fission due to their combined excellent physical and mechanical properties that are compatible with extreme radiation and high temperature environments. With the development of next-generation fission reactors and fusion power, materials that can withstand higher neutron flux/thermal load/thermal mechanical stresses and more aggressive environments in terms of oxidation, corrosion/erosion, and tolerance to transmutation elements are required. This requirement makes it necessary to (i) understand the operational limits and degradation mechanisms of existing composite materials and (ii) develop and qualify new materials designs. There is a strong overlap in materials research between fission and fusion in terms materials design, processing, characterization, and modelling. This symposium aims to bring scientists and engineers together to share ideas and so join the effort in both fields at an international level for the development of these crucial composite materials and to enable collaborations across groups and countries.

The design/processing/modelling/joining of the following materials, as well as their physical/mechanical characterization using ex situ and/or in situ techniques, are encouraged:

- Design, processing, and joining of composites for advanced fission and fusion reactors
- Modeling over multiple length scales
- Material physical and mechanical properties characterization using ex-situ and in-situ techniques
- Irradiation effects on materials properties and performance
- Chemical compatability reactor relevant environments
- Hydrogen transport and trapping
- Composite materials systems can include (but are not limited to):
- Graphite/carbon-based composites
- Ceramic-based composites
- Metal-matrix composites* Composite nuclear fuels and claddings

**ORGANIZERS**

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