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TMS 2026

155th Annual Meeting & Exhibition

March 15–19, 2026
San Diego Convention Center
and Hilton San Diego Bayfront
San Diego, California, USA
#TMSAnnualMeeting

SUBMIT AN ABSTRACT FOR THE FOLLOWING SYMPOSIUM

MATERIALS DEGRADATION AND DEGRADATION BY DESIGN

Nanostructured Materials in Extreme Environments IV

Applications in critical fields like nuclear, aerospace, and defense often require operation in harsh conditions, characterized by extreme temperatures, intense mechanical stress, rapid strain-rate deformation, corrosive atmospheres, and heavy irradiation. These severe conditions present formidable challenges to the materials used. Nanostructured materials have emerged as a promising solution, offering exceptional properties such as high mechanical strength and superior resistance to irradiation. Their enhanced characteristics make them promising candidates for use in these demanding environments. This classification encompasses ultrafine-grained and nanocrystalline materials, along with nanocomposites, including nanolaminates, and nanoparticle/nanoprecipitation-strengthened materials. However, these materials face challenges due to a tendency towards coarsening or compound formation, driven by the high density of interfaces within them. Thus, it's crucial to develop methods to stabilize these nanostructures.

This symposium aims to deepen our understanding of how nanostructured metallic, ceramic, and composite materials behave under extreme conditions. We welcome abstracts on a range of topics related to nanostructured materials, although our interest is not limited to these areas.

- Materials response in high temperature environment
- Materials response under high or ultrahigh mechanical load/pressure
- Materials response under high strain-rate deformation
- Irradiation-induced microstructure evolution
- Evolution of mechanical and physical properties under extreme conditions
- Corrosion, erosion, and/or stress corrosion cracking resistant nanomaterials and coatings
- Stress corrosion cracking of nanomaterials
- In-situ characterization of materials response in harsh environments
- Response in simultaneous and coupled multiple extreme environments
- Strategies for stabilizing nanostructure in extreme environments
- Theory and computational modeling of defect generation and interactions with interfaces under harsh environment

SPONSORED BY:
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