

THE WORLD COMES HERE.
TMS 2025
154th Annual Meeting & Exhibition



March 23–27, 2025
MGM Grand Las Vegas
Hotel & Casino
Las Vegas, Nevada, USA
#TMSAnnualMeeting



SUBMIT AN ABSTRACT FOR THE FOLLOWING TMS2025 SYMPOSIUM:

MECHANICS OF MATERIALS

Mechanical Behavior Related to Interface Physics IV

Interfaces constitute a key microstructural variable for tuning materials behavior across a wide range of length scales from nano to macro in single and multiphase systems, including structural and functional materials. The advent of novel multi-phase/multi-interface/composite structures holds great potential for enabling unparalleled performance under coupled extremes. Interfaces often dominate the material response in nanostructured systems and produce unique combinations of properties, ranging from enhanced elastic-plastic material properties through tunable fracture properties to electro/thermal functional properties. A fundamental understanding of interfacial physics and coupled phenomena impacting mechanical behavior is necessary to harness new concepts and methodologies in interface design of novel, multifunctional layered and composite structures. This symposium aims to discuss interface physics that governs mechanical behavior and coupled phenomena in interfacially-driven multifunctionality in both single and multiphase materials and composites. Talks are solicited that cover synthesis, characterization, and modeling of materials with deliberately designed interfaces and material combinations with particular emphasis on new insights into fundamental mechanisms, analysis of defects, and their implications for multifunctional performance. Abstracts on recent developments in mechanical testing techniques (e.g., in situ straining in TEM, micropillar testing, etc.) and in high-fidelity modeling techniques (e.g., ab initio, finite elements, etc.) are also solicited.

Topics of interest include, but are not necessarily limited to:

- Influence of interface structure and chemistry on deformation mechanisms in single and multiphase nanomaterials/nanocomposites
- Mechanical behavior of low dimensional materials (e.g., thin films, nanowires, nanotubes, and nanoparticles) described both experimentally and via modelling
- Physics of phase boundaries in multiphase systems, such as crystalline-amorphous composites, nanolaminates, nanoparticle/matrix composites, and nano-porous materials
- Mechanical behavior of grain boundary engineered nanomaterials (e.g. solute stabilization, grain boundary complexion formation, duplex and gradient nanostructures)
- Micro, meso, and macroscale modeling of deformation processes and coupled phenomena as they relate to interface physics (including multi-scale modelling)
- In situ testing methodologies for investigating mechanical behavior and coupled extremes such as mechanical and irradiation of small volumes of material

ORGANIZERS

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QUESTIONS?

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