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TMS2019

148th Annual Meeting & Exhibition

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March 10–14, 2019
San Antonio, Texas, USA

JOIN US FOR THIS TMS2019 SYMPOSIUM:

NANOSTRUCTURED MATERIALS

Mechanical Behavior Related to Interface Physics III

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. The advent of novel multi-phase/multi-interface nanomaterials 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 that derive from the physics of grain boundaries, phase boundaries, and/or surfaces. A fundamental understanding of interfacial physics and coupled phenomena impacting mechanical behavior is thus needed to harness new concepts and methodologies in interface design for multifunctional performance.

This symposium aims to discuss interface physics that govern mechanical behavior and coupled phenomena in interfacially-driven multifunctionality in both single and multiphase materials. Talks are solicited that cover fabrication, characterization, and modeling of materials with deliberately designed interfaces 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, molecular dynamics, etc) are also solicited.

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

- Influence of interface structure and chemistry on deformation mechanisms
- Mechanical behavior of low dimensional materials (e.g., thin films, nanowires, nanotubes, and nanoparticles)
- Physics of phase boundaries in multiphase systems, such as crystalline-amorphous composites, nanolaminates, nanoparticle/matrix composites, and nanoporous 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
- In situ testing methodologies for investigating mechanical behavior and coupled extremes such as mechanical and irradiation of small volumes of material

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