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TMS 2023

152nd Annual Meeting & Exhibition

MARCH 19–23, 2023
SAN DIEGO CONVENTION CENTER &
HILTON SAN DIEGO BAYFRONT
SAN DIEGO, CALIFORNIA, USA
#TMSANNUALMEETING

SUBMIT AN ABSTRACT BY JULY 1 FOR THE FOLLOWING TMS2023 SYMPOSIUM:

NANOSTRUCTURED MATERIALS

Deformation Mechanisms, Microstructure Evolution, and Mechanical Properties of Nanoscale Materials

Understanding the mechanisms that govern deformation at small length scales provides a basis for exploring new multiscale phenomena that originate at these length scales but bridge to large scales in advanced technological bulk materials. Studying these mechanisms in the context of their unique microstructures and their evolution will shed light on the effects of size on the macroscopic mechanical strength and deformation mechanisms. This symposium will focus on experimental, theoretical, and computational studies of deformation mechanisms and mechanical properties of small-volume and low-dimensional materials, as well as bulk nanocrystalline aggregates and nanoscale-based hierarchical materials. Studies on emerging topics in novel mechanical testing techniques, in situ imaging, diffraction and spectroscopy, high-and low-temperature deformation mechanisms, and mechanical property characterization of materials, as well as recent advances in atomistic and multiscale modeling of nanomaterials, are welcome.

Topics will include:

- Size effects on elastic properties, strength, plasticity, fracture mechanisms, adhesion, tribology, and fatigue behavior in small-volume and low-dimensional systems including nanopillars, nanowires, nanoparticles, nanostructured fibers, 2D materials, thin films, multilayered materials, and nanoarchitectured systems
- Size effect on deformation- and stress-induced phase transformations
- Changes in deformation types or patterns due to changes in scale, changes in density and types of interfaces, as well as evolution of defects
- Advancements in ex-situ and in-situ small-scale characterization techniques for extreme conditions such as high temperatures, high pressure, and/or high strain rates
- Modeling and simulation of deformation processes and mechanical properties at the nanoscale, including coupling to meso/microscale methods

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QUESTIONS?
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