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TMS2019
148th Annual Meeting & Exhibition

CALL FOR ABSTRACTS

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

SUBMIT AN ABSTRACT TO:

MATERIALS DESIGN

Advances in Computational Methods for Damage Mechanics and Failure Phenomena

This symposium aims to gather researchers at the intersection of computational/applied mechanics, materials science, multi-scale modeling, and numerical techniques to discuss the state-of-the-art, challenges, and research trends in the modeling of damage phenomena in materials. The symposium will provide a forum for researchers across the community to exchange ideas and accelerate the development and advancement of these emerging damage modeling techniques.

Topics of interest include (but are not limited to):
- Recent advancements in extended finite element methods (XFEM), cohesive zone method (CZM), and related techniques
- Multiscale mechanics and multiphysics aspects of damage modeling
- Crack propagation and fracture modeling using peridynamics and phase-field methods
- Meshless methods and recent trends in hybrid formulations for extreme deformation scenarios
- Novel approaches for coupling damage behavior at different time and length scales; scale-bridging and parameter estimation approaches
- Physical/experimental underpinning of material models and determination of model parameters
- Recent advances in discrete dislocation dynamics simulations and incorporating for dislocation interactions with interfaces (e.g. grain boundaries and twin boundaries)
- Computational/algorithmic aspects and benchmark studies on high-fidelity simulation of damage from nano-to-macroscale; interaction of damage with microstructure
- Quantification of uncertainties in damage prediction; verification and validation studies

Due to the potential interdisciplinary nature of research under this theme, studies involving theoretical/computational/applied research are welcome. Multiscale/multiphysics aspects of damage modeling in scenarios like: environment-assisted cracking, thermo-mechanical failure, diffusion induced fracture, mechanically driven microstructure evolution, and materials processing are of special interest. Collaborative efforts involving simulation and experiments are also encouraged.

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