



SUBMIT AN ABSTRACT FOR THE FOLLOWING SYMPOSIUM

MECHANICS OF MATERIALS

Microstructure-Sensitive Modeling Across Length Scales: An MPMD/SMD Symposium in Honor of David L. McDowell

The mechanical behavior of materials is an inherently multiscale problem that involves complex interactions between microstructural features at different length scales. In metallic materials, key features include point defects, dislocations, dislocation networks, grain boundaries, triple junctions, and interfaces between different material phases. The development of physically-based constitutive models to predict the performance of metals during engineering service requires a deep understanding of how microstructural feature densities, statistical distributions and their evolution contribute to strength, hardening and ductility for different modes and rates of loading. This symposium will honor the contributions of David McDowell, Regents' Professor Emeritus at the Georgia Institute of Technology, to the fields of mechanics and materials science and provide a forum for the work of others who have been inspired by him and his accomplishments.

Professor McDowell has devoted his career to the development of microstructure-sensitive constitutive models for metallic materials. His research has impacted several key areas:

- computational strategies for modeling material fatigue damage processes in realistic 3D microstructures
- multiscale modeling of dislocation plasticity in metals from atomic scale to applications
- coarse grained atomistic methods and generalized constitutive modeling of metals and alloys
- systems-based materials design exploration
- uncertainty quantification for multiscale modeling and materials design. Applications of interest span lightweight structural materials, materials for hot sections of aircraft gas turbine engines, titanium alloys, ferritic and austenitic alloys, and nanocrystalline materials, among others.

This honorary symposium will feature invited presentations from colleagues and collaborators of Professor McDowell, as well as contributed presentations from members of the mechanics and materials science community who employ modeling and simulation methods to gain fundamental insights on microstructure-sensitive properties across length scales. Contributions should present work that connects microstructural phenomena to mechanical properties. Special consideration will be given to abstracts that highlight how work by Professor McDowell has inspired current developments and lines of scientific inquiry.

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QUESTIONS?

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