2015 SEM Conference & Exposition on Experimental & Applied Mechanics

Hilton Orange County/Costa Mesa, Costa Mesa, CA
June 8-11, 2015

Abstract Deadline: October 1, 2014

Abstract Submission:
http://www.sem.org/Conference-Abstract-Submission.cfm?ConfNumber=100207

Track 2:

Challenges in Mechanics of Time-Dependent Materials

Sponsored by the SEM Time Dependent Materials and Composite, Hybrid and Multifunctional Materials Technical Divisions

Organized by: Alex Arzoumanidis, *Psylotech*; Bonnie Antoun, *Sandia National Laboratories;* Meredith Silberstein, *Cornell University*; Alireza Amirkhizi, *University of Massachusetts Lowell*; Jevan Furmanski, *ExxonMobil*; H. Jerry Qi, *Georgia Institute of Technology;* Hongbing Lu, *University of Texas-Dallas;* Richard Hall, *Air Force Research Laboratory*

We are soliciting papers involving constitutive, time (rate)-dependent behavior of all materials, including metals, biomaterials, polymeric materials, non-metallic materials and organic materials and modeling of the mechanics of processing/fabrication of all materials. The materials systems' time-dependent mechanical responses should be non-negligible in cases involving non-mechanical fields.

Papers dealing with modeling and experimental aspects of the subject area are sought. A wide range of topics are solicited and organized. Papers in the following general technical research areas are included:

- Metallic and Polymeric Materials
  - Effects of Extreme Environments including Temperature, Radiation Resistance, Damage, Degradation and Aging
  - Challenges in Time-dependent Behavior Modeling of Low, Moderate and High Strain Rates
  - Effects of Inhomogeneities on the Time-Dependent Behavior
- Composite, Hybrid and Multifunctional Materials
  - Challenges in Time-dependent Behavior Modeling Viscoelastoplasticity and Damage
  - Effects of Interfaces and Interphases on the Time-Dependent Behavior

- Mechanics of Materials from Advanced Manufacturing, including Additive Manufacturing
    - Property characterization from AM
    - Process modeling and simulations of AM
    - Material design using AM
- Time-dependent Effects at Variable Length Scales

Possible topics include, but are not limited to: characterization and modeling of behavior at multiple scales; viscoelasticity, viscoplasticity; transport, chemically and electronically active processes; multiphase and biomaterial systems; thermodynamics; shape memory; mechanics of testing; aging effects; radiation effects; dynamic rate-dependent behaviors; large deformations; residual stresses; time (rate)-dependent damage and failure; time (rate)-dependent polycrystalline, single crystal and nanocrystalline behaviors; multifunctional materials; mechanics of processing; design methods; environmental interactions; experimental methods and techniques; linear and non-linear time-dependent behavior; time (rate)-dependent composite materials of all types; numerical analysis; rheological properties; temperature, pressure, and moisture effects on time dependence; damping.

Keynote Presentations:

Robert S. Chambers, Sandia National Laboratories
Isaac Daniel, Northwestern University
Nancy Sottos, University of Illinois at Urbana Champaign
Allan Zhong, Halliburton