

The 2009 Joint ASCE-ASME-SES Conference on Mechanics and Materials

June 24-27, 2009 · Blacksburg, VA

CALL FOR PAPERS

Materiomics - materials science of biological protein materials

The Society of Engineering Science (SES)

This symposium focuses on experimental, theoretical and computational analyses of biological materials, specifically of protein materials. A particular emphasis is on materials failure phenomena, their role in the biological context (e.g. in infectious and genetic disease, injuries, trauma), as well as the transfer of materials concepts observed in biology towards technological innovation (e.g. through *de novo* bioinspired or biomimicking structures). The symposium will emphasize multi-scale analyses that cover multiple length- and time-scales, from nano to macro, reflecting the hierarchical nature of biological protein materials. Fundamental questions of robustness, self-healing ability, flaw tolerance, changeability/mutability, adaptability and optimality will be discussed.

Materiomics is defined as the systematic study of the material properties of biological materials (e.g. hierarchical protein structures and materials, mineralized biological tissues, etc.) and their effect on the macroscopic function and failure in their biological context, linking processes, structure and properties at multiple scales through a materials science approach.

Topics of interest include, but are not limited to:

- Physiological and pathological molecular, cellular, tissue and organ failure phenomena
- Cell and molecular mechanics, bionanomechanics, nanobioscience
- Materials phenomena in genetic and infectious diseases
- Materials phenomena in amyloid diseases (e.g. Alzheimer's, Parkinson's, type 2 diabetes mellitus)
- Multi-scale modeling and simulation and integration with multi-scale experiments
- Computational and experimental high-throughput characterization approaches
- *De novo* materials design (e.g. peptide materials, engineered protein materials)
- Deformation and failure mechanisms of biological tissues and materials (e.g. bone, tendon, skin, spider silk)
- Imaging and visualization of deformation and failure mechanisms
- Tissue engineering applications of materials

Organizer: Markus J. Buehler, Civil and Environmental Engineering, Massachusetts Institute of Technology, Phone: 617-452-2750, E-mail: mbuehler@MIT.EDU

Conference URL: <http://www.cpe.vt.edu/mech09/index.html>

This conference provides a major forum for the exchange of ideas and discussion of recent developments in all mechanics and materials research fields. The technical sessions and symposia on fundamentals, tools and applications serve to highlight and promote educational needs, emerging thrusts, novel techniques, and innovative applications in areas that span across many engineering disciplines.

Important dates:

- Abstract submission deadline: **March 15, 2009**
- Abstracts should not exceed 3,000 characters (including spaces) or a one-page PDF. Please make sure to include a title, presenter's name and contact information, and list of contributors.
- Online submission site: <http://scholardesk.com/abstracts/VT/mech09>
- Abstract acceptance notification deadline: **April 15, 2009**
- Early registration deadline: **April 25, 2009**