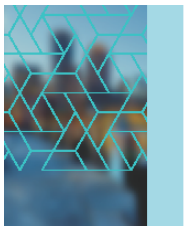

2019 MRS FALL MEETING & EXHIBIT
December 1–6, 2019 | Boston, Massachusetts
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Abstract Submission Opens—May 13, 2019
Abstract Submission Deadline—June 13, 2019 (11:59 PM ET)
REMINDER: *In fairness to all potential authors, late abstracts will not be accepted.*

Symposium MS03: Mechanics of Nanocomposites and Hybrid Materials

This symposium will cover the mechanical behavior of current and emerging nanocomposites and hybrid materials. The significant growth in structural nanocomposites and hybrid materials is driven by the demand for structures with excellent mechanical performance that are lightweight, and have multifunctional properties. This symposium is aligned with the growing emphasis on advanced manufacturing in the U.S. and abroad, and demands for load bearing structures and functional devices that can operate under extreme conditions of stress, temperature, pressure and chemical reactivity such as in space and within living matter.

The first part of this symposium will focus on engineering materials and composites (EM), including new insights into conventional deformation mechanisms, as well as novel phenomena (e.g. size-dependent brittle-to-ductile transition) in ceramic and metallic nanocomposites. Special emphasis will be placed on atomistic and nanoscale structure and defect dynamics due to recent advances into mechanical behavior at these length scales. Materials of interest include ceramic oxides, carbides, silicides, polymer-derived ceramics, biominerals, structural metals, lightweight alloys, high entropy alloys, and metallic glasses. Fundamental research into mechanical behavior as well as novel top-down and bottom-up synthetic methods (e.g. colloidal self-assembly, nanoscale additive manufacturing) will be accepted to this symposium.

The second part of this symposium focuses on biological and bioinspired materials (BM). Natural and synthetic hybrid materials that effectively combine disparate materials (e.g. ceramics and lightweight metals, metals and biopolymers) to achieve synergistic properties (e.g. high strength and toughness) will be highlighted. Topics also include stimulus responsive materials and adaptive structures with tunable structural and mechanical response to environmental changes.

Topics will include:

- Metallic nanocomposites and multilayers
- Hybrid ceramic materials
- Biological and bioinspired nanocomposites
- Cellular and nanoporous materials
- Stimulus responsive materials (e.g. self-healing, adaptive structures)
- Periodic, anisotropic and gradient composite architectures
- Materials for extreme environments
- Characterization and mechanics of interfaces
- Mechanics across length and time scales
- In-situ measurement using X-ray and electron microscopy
- Novel synthesis routes (e.g. colloidal self-assembly, additive manufacturing)

Invited speakers include:

Niaz Abdolrahim	Rochester University, USA	**Julia Greer**	California Institute of Technology, USA
Rainer Adelung	Christian-Albrechts-Universität zu Kiel, Germany	**Erica Lilleodden**	Helmholtz-Zentrum Geesthacht, Germany
Joanna Aizenberg	Harvard University, USA	**Alvaro Mata**	Queen Mary University of London, England
Eduard Arzt	Leibniz Institute for New Materials, Germany	**Kazuki Nakanishi**	Kyoto University, Japan
Francois Barthelat	McGill University, USA	**Warren Oliver**	Nanomechanics, Inc., USA
Markus Buehler	Massachusetts Institute of Technology, USA	**Rodney Ruoff**	UNIST, Republic of Korea
Maenghyo Cho	Seoul National University, Republic of Korea	**Clement Sanchez**	College de France, France
Horacio Espinosa	Northwestern University, USA	**Nancy Sottos**	University of Illinois at Urbana-Champaign, USA
Xi-Qiao Feng	Tsinghua University, China	**Andre Studart**	ETH Zurich, Switzerland
Huajian Gao	Brown University, USA	**Marcus Worsley**	Lawrence Livermore National Laboratory, USA

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