

Submission Deadline—October 1, 2018



Plasticity and Fracture at the Nanoscales – Advances in *In Situ* Experimentation Techniques Enabling Novel and Extreme Materials/Nanocomposite Design

Plasticity and fracture of materials at the nanoscales can deviate significantly from the same phenomena in bulk properties, which may have important implications if the materials are to be used in real world engineering systems. Nanoscale materials and composites have been known to have important effects related to size, but today many other emerging materials – due to or enabled by novel manufacturing routes – combine nanoscale effects with 3D microarchitecturing to approach extreme limits of materials properties.

This Focus Issue will look at recent advances in the in situ experimentation of plasticity and fracture, especially those that enable the development and design of materials and nanocomposites with enhanced mechanical properties reaching or approaching the extreme limits of materials properties. All fundamental studies on mechanical properties of nanoscale/extreme materials and nanocomposites including *ex situ* and *in situ* SEM/TEM, synchrotron X-ray experiments, as well as modeling and simulations on relevant length scales will be addressed. Nanomaterials/nanocomposites of interest include metals, ceramics, polymers, amorphous materials and their derivatives containing carbon-based materials.

This JMR Focus Issue will provide readers up-to-date information on the impact of these recent experimentation capabilities – the ability to observe directly how plasticity and fracture events interact with microstructures at the nanoscale – and how it could affect and enable novel and extreme materials and nanocomposite design.

Contributing papers are solicited in the following areas:

- ◆ *In situ* SEM/TEM analysis of deformation behavior
- ◆ *In situ* synchrotron-based experimentation work focusing on deformation behavior
- ◆ Other *in situ* experimentation techniques (Raman, EBSD, etc.)
- ◆ Effects of interfaces on the mechanical properties of metal-matrix nanocomposites
- ◆ Deformation and fracture mechanisms of metals, ceramics, crystalline-amorphous composites
- ◆ Graphene or CNT containing composites for high strength applications
- ◆ Nanocomposites based on lightweight metals, such as Magnesium
- ◆ Hierarchical biocomposite and its fracture/deformation mechanisms
- ◆ Fabrication and analysis of 3D or 4D nanocomposites
- ◆ Simulation and modeling of mechanical behavior

GUEST EDITORS

Arief S. Budiman, Singapore University of Technology & Design (SUTD), Singapore

Nan Li, Los Alamos National Laboratory, USA

Nobumichi Tamura, Lawrence Berkeley National Laboratory, USA

Jessica A. Krogstad, University of Illinois at Urbana-Champaign, USA

MANUSCRIPT SUBMISSION

To be considered for this issue, new and previously unpublished results significant to the development of this field should be presented. The manuscripts must be submitted via the JMR electronic submission system by **October 1, 2018**. Manuscripts submitted after this deadline will not be considered for the issue due to time constraints on the review process. Please select “Focus issue: Plasticity and Fracture at the Nanoscales” as the manuscript type. **Note our manuscript submission minimum length of 3250 words, excluding figures, captions, and references, with at least 6 and no more than 10 figures and tables combined. Review articles may be longer but must be pre-approved by proposal to the Guest Editors via jmr@mrs.org. The proposal form and author instructions may be found at www.mrs.org/jmr-instructions.** All manuscripts will be reviewed in a normal but expedited fashion. Papers submitted by the deadline and subsequently accepted will be published in the Focus Issue. Other manuscripts that are acceptable but cannot be included in the issue will be scheduled for publication in a subsequent issue of *JMR*.

jmr@mrs.org
Please contact jmr@mrs.org with questions.

CALL FOR PAPERS

Submission Deadline—November 1, 2018



(Nano)materials for Biomedical Applications

Nanotechnology has been responsible for an unprecedented positive impact in healthcare advances, by merging fundamental and applied sciences as complementary tools envisioning an enhanced quality of life. Recently, a broader spectrum of high performance nanomaterials and material-based nanosystems has been engineered to address challenges in medical and health-related fields. At the same time, there has been a shift in importance from designing exclusively bioinert materials to instead producing complex bioactive building blocks for mimicking targeted functions. This *JMR* Focus Issue is devoted to the latest advances in biomedical nanomaterials, including: (i) different fabrication approaches and applications, (ii) design and characterization of novel biomedical materials and devices as well as their structure-property relationships with biological responses, and (iii) novel (bio)nanomaterials as potential candidates to integrate multifunctional devices targeting self-assembly materials.

Contributing papers are solicited in the following areas:

- ◆ Nanotechnology and drug delivery
- ◆ Biocompatible materials
- ◆ Implants and coatings
- ◆ Tissue engineering and regenerative materials
- ◆ Fabrication of sensors and biosensors
- ◆ Biomimetics
- ◆ Materials for medical devices
- ◆ Materials in clinical dentistry
- ◆ Materials in orthopedics and biomechanics

GUEST EDITORS

Mariana Amorim Fraga, Universidade Brasil, Brazil

Stephen E. Saddow, University of South Florida, USA

Bruno V. Manzolli Rodrigues, Universidade Brasil, Brazil

Jorge A. de Moura Delezuk, Instituto Federal Paraná, Brazil

Rodrigo Sávio Pessoa, Instituto Tecnológico de Aeronáutica, Brazil

Sachin Khapli, New York University, Abu Dhabi, UAE

MANUSCRIPT SUBMISSION

To be considered for this issue, new and previously unpublished results significant to the development of this field should be presented. The manuscripts must be submitted via the *JMR* electronic submission system by **November 1, 2018**. Manuscripts submitted after this deadline will not be considered for the issue due to time constraints on the review process. Please select "Focus issue: *(Nano)materials for Biomedical Applications*" as the manuscript type. **Note our manuscript submission minimum length of 3250 words, excluding figures, captions, and references, with at least 6 and no more than 10 figures and tables combined. Review articles may be longer but must be pre-approved by proposal to the Guest Editors via jmr@mrs.org. The proposal form and author instructions may be found at www.mrs.org/jmr-instructions.** All manuscripts will be reviewed in a normal but expedited fashion. Papers submitted by the deadline and subsequently accepted will be published in the Focus Issue. Other manuscripts that are acceptable but cannot be included in the issue will be scheduled for publication in a subsequent issue of *JMR*.

jmr@mrs.org
Please contact jmr@mrs.org with questions.

CALL FOR PAPERS

MATERIALS RESEARCH SOCIETY®

2018 Board of Directors

Officers

Sean J. Hearne, *President*
Susan Trolier-McKinstry, *Past President*
Michael R. Fitzsimmons, *Vice President*
Eric A. Stach, *Secretary*
David J. Parrillo, *Treasurer*
Todd M. Osman, *Executive Director*

Directors

Griselda Bonilla
Li-Chyong Chen
Matt Copel
Paul Drzaic
Dawnielle Farrar-Gaines
Yury Gogotsi
Claudia Gutiérrez-Wing
Young-Chang Joo
Lincoln Lauhon
Paul C. McIntyre
Christopher Schuh
Rachel Segalman
Magaly Spector
Molly M. Stevens
Ehrenfried Zschech

2018 Publications Committee

S.P. Baker, *Chair*
T.J. Balk, *Editors Subcommittee*
A.J. Hurd, *New Publication Products Subcommittee*
R.J. Nemanich, *Publications Quality Subcommittee*

2018 MRS Committee Chairs

TBD, *Academic Affairs*
A. Polman, *Awards*
K. Whittlesey, *Government Affairs*
T. Aselage, *Meetings*

S.M. Haile, *Member Engagement*
E. Kupp, *Public Outreach*
S.P. Baker, *Publications*

MRS Headquarters

T.M. Osman, *Executive Director*
J.A. Dillen, *Director of Finance and Administration*
D. Dozier, *Director of Government Affairs*
P.A. Hastings, *Director of Meeting Activities*
E.M. Kiley, *Director of Communications*

Journal of Materials Research Founding Sponsors

Allied-Signal Inc.
Xerox Corporation

About the Materials Research Society

The Materials Research Society (MRS®) is a not-for-profit scientific association founded in 1973 to promote interdisciplinary goal-oriented basic research on materials of technological importance. Membership in the Society includes over 14,000 scientists from industrial, government, and university research laboratories in the United States and abroad.

The Society's interdisciplinary approach to the exchange of technical information is qualitatively different from that provided by single-discipline professional societies because it promotes technical exchange across the various fields of science affecting materials development. MRS sponsors two major international annual meetings encompassing many topical symposia, as well as numerous single-topic scientific meetings each year. It recognizes professional and technical excellence, conducts tutorials, and fosters technical exchange in various local geographical regions through Section activities and Student Chapters on university campuses.

Disclaimer: Authors of each article appearing in this Journal are solely responsible for all contents in their article(s) including accuracy of the facts, statements, and citing resources. Facts and opinions are solely the personal statements of the respective authors and do not necessarily represent the views of the editors, the Materials Research Society, or Cambridge University Press.

MRS journals maintain a proud tradition of editorial excellence in scientific literature. The *Journal of Materials Research*, the archival journal spanning fundamental developments in materials science, is published twenty-four times a year by MRS and Cambridge University Press. *MRS Bulletin* is a premier source for comprehensive research trends and a timely scan of professional activities. *MRS Communications* is a full-color letters and perspectives journal focused on groundbreaking work across the spectrum of materials research. *MRS Energy & Sustainability*—publishes reviews on key topics in materials research and development as they relate to energy and sustainability. *MRS Advances* is a peer-reviewed online-only journal featuring impactful and emerging research, designed to reflect the way materials researchers work, write, publish and share their results.

The *Journal of Materials Research* is free electronically to all MRS regular and student members. See inside front cover for subscription rates for *Journal of Materials Research*.

MRS is an Affiliated Society of the American Institute of Physics and participates in the international arena of materials research through associations with professional organizations.

For further information on the Society's activities, contact MRS Headquarters, 506 Keystone Drive, Warrendale, PA 15086-7573; telephone (724) 779-3003; fax (724) 779-8313.



Postmaster—Send change of address notice to:

Cambridge University Press
One Liberty Plaza, 20th Floor,
New York, NY 10006

A publication of the
MRS MATERIALS RESEARCH SOCIETY
Advancing materials. Improving the quality of life.

Periodical Rate Postage Paid at New York, NY
and Additional Mailing Offices

ISSN: 0884-2914