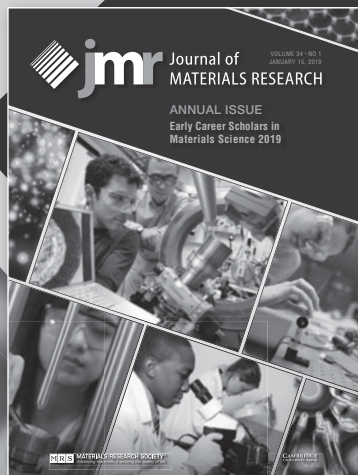


Submission Deadline—June 1, 2019



## Early Career Scholars in Materials Science 2020

The Fifth Annual *JMR* Issue to promote outstanding research by future leaders in materials science

*JMR* invites research and review articles by materials researchers who have completed their Ph.D but not yet achieved full professorship, or equivalent position in non-academic organizations, at the time of submission, for peer review and publication in this special issue. The Annual Issue provides a unique opportunity to be highlighted and promoted early in one's research career. To increase attention, the issue will be published on an **open access** basis. Although papers may have multiple authors, only the Early Career Scholar submitting the paper will be identified with a photo and brief bio on publication.

*JMR* publishes the latest advances about the creation of new materials and materials with novel functionalities, fundamental understanding of processes that control the response of materials, and development of materials with significant performance improvements relative to state-of-the-art materials. *JMR* welcomes papers that highlight novel processing techniques, the application and development of new analytical tools, and interpretation of fundamental materials science to achieve enhanced materials properties and uses.

- ◆ Novel materials discovery
- ◆ Electronic, photonic and magnetic materials
- ◆ Energy conversion and storage materials
- ◆ New thermal and structural materials
- ◆ Soft materials
- ◆ Biomaterials and related topics
- ◆ Nanoscale science and technology
- ◆ Advances in materials characterization methods and techniques
- ◆ Computational materials science, modeling and theory

### GUEST EDITORS

**Gary L. Messing**, The Pennsylvania State University, USA

**Susmita Bose**, Washington State University, USA

**Jürgen Eckert**, Montanuniversität Leoben, Austria

**Linda S. Schadler**, University of Vermont, USA

### MANUSCRIPT SUBMISSION

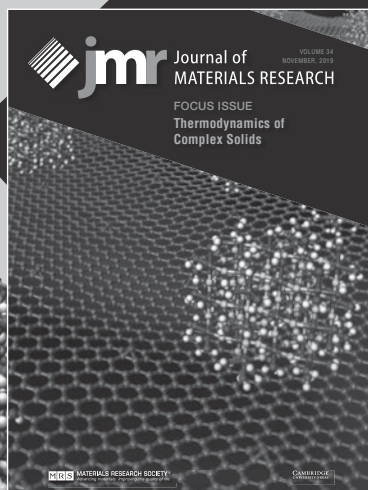
To be considered for the issue, the Early Career Scholar must not yet be a full professor at the time of submission. The manuscript must report new and previously unpublished results. Review articles are invited but must be approved by the editors before submission (see [www.mrs.org/jmr-manuscript-types/](http://www.mrs.org/jmr-manuscript-types/) regarding review articles). Manuscripts must be submitted via the *JMR* electronic submission system by **June 1, 2019**. Manuscripts submitted after this deadline will not be considered for the issue due to time constraints on the review process. Submission instructions can be found at [www.mrs.org/jmr-instructions](http://www.mrs.org/jmr-instructions). Please select "ANNUAL ISSUE: *Early Career Scholars in Materials Science 2020*" as the manuscript type. **Note our manuscript submission minimum length of 3250 words, with at least 6 and no more than 10 figures and tables.** (Additional figures and tables may be submitted as supplemental material.) All manuscripts will be reviewed in a normal but expedited fashion. Papers submitted by the deadline and subsequently accepted will be published in the Special Issue. Other manuscripts that are acceptable but cannot be included in the issue will be scheduled for publication in a subsequent issue of *JMR*.

**Papers must be accompanied by a photo (uploaded as a high resolution TIF or EPS file) and 200-300 word bio of the Early Career Scholar only.** (Bios should NOT include reference to one's publication record nor rationalization of the research area or paper submitted.) These materials must be submitted along with the original submission of the paper.

**[jmr@mrs.org](mailto:jmr@mrs.org)**  
Please contact [jmr@mrs.org](mailto:jmr@mrs.org) with questions.

CALL FOR PAPERS

Submission Deadline—April 1, 2019



## Thermodynamics of Complex Solids

Thermodynamics forms the fundamental underpinning of reactivity, transformation, and stability, which places controls on processes such as synthesis, corrosion and degradation, environmental transport, catalysis, and biological reactivity. Rapid developments in industry have resulted in an increasing need to develop and study the properties of improved and new materials, and for better ways to understand a series of phenomena and process failure on a large scale.

Substantial improvements in the range, accuracy, and convenience of thermal analysis equipment, the development of a commercial calorimeter, and the ability to make accurate cryogenic heat capacity measurements, have renewed interest for thermodynamic measurements. Developments in experimental thermochemistry are paralleled by rapid progress in computational methods, integrating calculations based on density functional theory (DFT) and new molecular dynamics simulation methods for characterizing energy and free energy landscapes. There are strategies for coupling DFT results and experimental data within the framework of free energy modeling of phase diagrams and thermochemistry in complex multicomponent systems (e.g., the CalPhaD approach).

This Focus Issue will bring together experimentalists in thermodynamics and their interactions with a wider circle of computational and structural scientists to understand the fundamental science of complex materials, and apply this understanding to a rich variety of scientific and technological problems.

### Manuscripts are solicited in the following areas:

- ◆ Catalysts
- ◆ Functional materials
- ◆ Soft and hybrid materials
- ◆ High temperature refractories
- ◆ Environmental and geological materials

### GUEST EDITORS

**Di Wu**, Washington State University, USA

**Mark Asta**, University of California, Berkeley, USA

**Kristina Lilova**, University of California, Davis, USA

**Alexandra Navrotsky**, University of California, Davis, 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 April 1, 2019. Manuscripts submitted after this deadline will not be considered for the issue due to time constraints on the review process. Please select "Focus issue: Thermodynamics of Complex Solids" as the Focus Issue designation. **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](mailto:jmr@mrs.org). The proposal form and author instructions may be found at [www.mrs.org/jmr-instructions](http://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](mailto:jmr@mrs.org)**

Please direct questions to [jmr@mrs.org](mailto:jmr@mrs.org)

CALL FOR PAPERS



Submission Deadline—March 1, 2019



## Building Hierarchical Materials via Particle Aggregation

Hierarchical materials have attracted increasing attention due to their unique physical and chemical properties, which strongly depend on their morphologies and size. Particle aggregation is an important methodology to synthesize hierarchical materials of complex regular architectures. To date, numerous hierarchical materials have been built by particle aggregation, including metals, alloys, metal oxides, metal sulfides, carbonates, organic clusters, and others, and applied in fields such as energy conversion, energy storage, catalysis, optics, water purification, CO<sub>2</sub> sequestration, and many more.

Unlike either a classical crystal growth pathway via monomer-by-monomer addition or Ostwald ripening where larger crystals are grown at the expense of smaller through dissolution and reprecipitation, crystal growth through particle aggregation is particle-by-particle addition to form larger crystals. In addition, self-assembly of nanoparticles or organic clusters can be used to build hierarchical materials. For instance, advanced luminescent materials have been prepared by aggregation-induced emission (AIE) of intrinsically non-emissive organic clusters. One of the fundamental challenges facing this fast growing field is the fundamental understanding of the process that involves interaction of particles in a growing media and the resulting response dynamics.

This *JMR* Focus Issue will provide a platform for interdisciplinary researchers from physics, chemistry, geology, biology, engineering, and materials science to share their approaches to understanding and controlling particle-based mechanisms of hierarchical material formation and design to synthesize novel hierarchical materials.

### Contributing papers are solicited in the following areas:

- ◆ Building hierarchical materials (such as 1 D wires, 2 D plates, and 3 D networks) by oriented attachments
- ◆ Self-assembly of hierarchical materials, such as nanoparticle superlattices, nano-flowers, and branched nanocrystals
- ◆ Colloidal interactions and crystallization
- ◆ Particle aggregation-induced emission (AIE)
- ◆ Crystallization through particle-based assembly in biomolecular systems
- ◆ Interfacial structure between particle surfaces
- ◆ Morphologies and size controlled synthesis of hierarchical materials
- ◆ Mechanism study of growth of hierarchical materials via particle aggregation
- ◆ Modeling of particle aggregation
- ◆ Applications of hierarchical materials prepared via particle-based crystallization and self-assembly in areas including, but not limited to, catalysis, energy storage, solar cells, microelectronics, and optical devices

### GUEST EDITORS

**Xin Zhang**, Pacific Northwest National Laboratory, USA

**Chongmin Wang**, Pacific Northwest National Laboratory, USA

**Xianwen Zhang**, Hefei University of Technology, China

### 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 March 1, 2019. Manuscripts submitted after this deadline will not be considered for the issue due to time constraints on the review process. Please select "Focus issue: Building Hierarchical Materials via Particle Aggregation" as the Focus Issue designation. **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](mailto:jmr@mrs.org). The proposal form and author instructions may be found at [www.mrs.org/jmr-instructions](http://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.

CALL FOR PAPERS

[jmr@mrs.org](mailto:jmr@mrs.org)  
Please direct questions to [jmr@mrs.org](mailto:jmr@mrs.org)

# 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.



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

Postmaster—Send change of address notice to:

ISSN: 0884-2914

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