

Submission Deadline—June 1, 2018



## Early Career Scholars in Materials Science 2019

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

This fourth Annual Issue invites full length research and review articles by materials researchers, who have completed their Ph.D but not yet achieved full professorship at the time of submission, for peer review and publication in the January 2019 issue. Ph.D students are not eligible to submit. The Annual Issue provides a unique opportunity to be highlighted and promoted early in one's research career. To increase attention to these papers, this issue will be published on an **open access** basis. Although some papers may have multiple authors, only the Early Career Scholar submitting the paper will be identified with a photo and brief bio when the paper is published. Authors from around the world are invited to submit papers that span the topical coverage of *JMR* including advanced ceramics, metals, polymers, composites, and combinations thereof related to energy, electrical, magnetic, optical, and structural properties and related applications and reporting on:

- ◆ Advanced characterization methods and techniques
- ◆ Computational materials science when coupled with experimentation
- ◆ Fundamental materials science
- ◆ Interfacial science as relates to material process understanding and improvements
- ◆ Material property enhancements through advances in materials processing
- ◆ Material property enhancements through material design (especially Materials Genome related)
- ◆ Material combinations and design that improve system performance
- ◆ Nanoscience and nanotechnology

### LEAD EDITORS

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

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

**Jürgen Eckert**, Montanuniversität Leoben, Austria

**Linda S. Schadler**, Rensselaer Polytechnic Institute, 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. Also, the manuscript must report new and previously unpublished results. Review articles are invited but must be approved by the issue 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, 2018. 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 2019*" 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 separately as a high resolution TIF or EPS file) and 200-300 word bio of the Early Career Scholar only. 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, 2018



## Catalytic Engineered Materials for Commercial and Industrial Energy Applications

Environmental pollution due to combustion of fossil fuels and other chemical energy components has been a major worldwide challenge for decades, leading to extensive energy research with mainstays of upgrading bitumen and coal, and hydro-processing fuels. Refining processes that exploit the efficiency and long life span of catalytic materials can (1) lower the high content of heterogeneous atoms such as sulfur and other pollutants, (2) improve methane reforming, and (3) enhance water splitting efficiency. Editors for this JMR Focus Issue invite the materials community to share research on catalytic materials as a fundamental pillar in the development of fuel components, including commercial liquid fuels, hydrogen production and methane reforming as detailed below.

### Contributed articles are sought in the following areas:

- ◆ Computer assisted density functional theory simulations
- ◆ Novel chemistry methods of synthesis (e.g., Fischer-Tropsch, hydrogenation, hydrothermal, sol-gel, etc.)
- ◆ Characterization including *in-situ*, *operando*: UV-vis, HRTEM, SEM and XRD
- ◆ Fabrication, integration, and scaling
- ◆ Industrial commercialization and energy production

### GUEST EDITORS

**Manuel Ramos**, Universidad Autonoma de Ciudad Juarez, México

**José Manuel Dominguez Esquivel**, Instituto Mexicano del Petróleo, México

**Xiaodong Wen**, Synfuels China, Institute of Coal and Chemistry, China

**Jorge Ramírez Solís**, Universidad Nacional Autónoma de México, México

### 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, 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: *Catalytic Engineered Materials for Commercial and Industrial Energy Applications*" as the manuscript type. **Note our manuscript submission minimum length of 6000 words, with a maximum of 6-8 figures. Review articles must be pre-approved by proposal to the Editor-in-Chief. 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**  
Please contact [jmr@mrs.org](mailto:jmr@mrs.org) with questions.

CALL FOR PAPERS

Submission Deadline—July 1, 2018



## Understanding Water-Oxide Interfaces to Harness New Processes and Technologies

The 2017 U.S. Department of Energy Basic Research Needs report acknowledged the relevance of gaining an understanding of “chemical processes and materials underlying the interdependence of energy and water,” with an underlying question on “the affinity and reactivity at interfaces in aqueous systems.” Water adsorption, water film formation, and water-mediated reactions on metal oxide interfaces are fundamentally important processes in environmental chemistry, catalysis, and processing of materials, as well as for the control and performance of functional nanocrystalline oxides. With increasing water content, the adsorption layer covering surfaces evolves from a solid/vacuum interface to a solid/bulk liquid one. This transition is associated with a radical increase in the level of complexity with regards to the physical-chemical description of the materials system which is not fully understood.

This JMR Focus Issue will provide readers up-to-date information on the impact of thin water films – and the confinement of related interfaces – on structure, stability, and transformation behavior of oxide materials from different perspectives spanning materials sciences, thermodynamics, catalysis, and geochemistry.

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

- ◆ Water adsorption and the stability of water-nanomaterials interfaces
- ◆ The effect of water on densification and growth of oxide structures
- ◆ Dissolution recrystallization processes during materials synthesis and sintering
- ◆ Oriented attachment and water-assisted self-assembly of oxide nanostructures
- ◆ Water film induced activation of oxide (electro-photo) catalysts
- ◆ Geochemical processes mediated by thin water films
- ◆ Experimental challenges in description of thin water films
- ◆ Thermodynamics at water-oxide interfaces
- ◆ Advances in modeling and simulation of water adsorption and film formation

### GUEST EDITORS

**Kevin M. Rosso**, Pacific Northwest National Laboratory, USA

**Oliver Diwald**, Universität Salzburg, Austria

**Ricardo H. R. Castro**, 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 **July 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: *Understanding Water-Oxide Interfaces to Harness New Processes and Technologies*” 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 contact [jmr@mrs.org](mailto: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