

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

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To be considered for this issue, new and previously unpublished results significant to the development of this field should be presented.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

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

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### 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.**

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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

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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.

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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