

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To be considered for this issue, new and previously unpublished results significant to the development of this field should be presented.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

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Please contact 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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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/ 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. 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—August 1, 2018

Nanocrystalline High Entropy Materials: Processing Challenges and Properties

High entropy material (HEMs) as a materials science research field has matured in recent years. HEMs include multicomponent and multiprinciple metallic alloys and entropy stabilized multicomponent oxides and borides. The inherent nature of the process of preparing nanostructured HEMs via the liquid state route is extremely difficult. Solid state processing methods, mechanical alloying followed by sintering and severe plastic deformation, are more attractive for obtaining nanostructured HEMs in the bulk form. However, the processing of these materials possesses many challenges. The properties of the bulk materials strongly depend on the microstructural length scale; thus, retaining nano-sized grains is required by inhibiting grain growth during processing. Powder metallurgical processing using advanced sintering techniques is considered an apt approach to obtain nanostructured HEMs and composites, but it opens up many challenges of incorporation of a variety of second phase particles such as soft dispersoids, oxides, harder particles, etc. Likewise, the processing methodology involving severe plastic deformation using high pressure torsion requires an understanding of the deformation behavior of HEMs at very high strain and strain rates. In order to take stock of the advancement on processing and properties of nanostructured HEMs, this Focus Issue will provide the researchers in this rapidly advancing field the present status and future directions.

Contributing papers are solicited in the following areas:

- ◆ Processing challenges using P/M methods
- ◆ Bulk nanostructured HEAs by high pressure torsion
- ◆ Nanostructured high entropy composite produced by high-pressure torsion
- ◆ Severe plastic deformation induced multiphase high entropy alloys
- ◆ Microstructure and mechanical properties of nanocrystalline HEAs
- ◆ Low density nanocrystalline high entropy alloys
- ◆ Nanostructured entropy stabilized oxides and borides and their properties
- ◆ Nanostructured high entropy alloy coatings

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MANUSCRIPT SUBMISSION

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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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