



call for papers

JOM is seeking contributions on the following topics for 2020. For the full Editorial Calendar, along with author instructions, visit www.tms.org/EditorialCalendar.



November 2020 Manuscript Deadline: June 1, 2020

Topic: Aluminum and Magnesium: Casting Technology and Solidification

Scope: This topic covers the formation of structure, defects, and properties during casting and solidification of aluminum and magnesium alloys, with technologies including shape, continuous, direct-chill casting, and rapid solidification. The topic also covers new technological approaches to improve the quality of cast metal through optimization or changing of casting hardware or procedures.

Editor: Dmitry Eskin

Sponsor: Aluminum Committee

Topic: In Situ Synchrotron and Neutron Characterization of Additively Manufactured Alloys

Scope: This special topic focuses on the in situ characterization of additively manufactured alloys using synchrotron- and neutron-based scattering, diffraction, and imaging techniques. Papers are solicited in areas including phase transformation and microstructure evolution during post-build heat treatment or mechanical testing, time-resolved x-ray imaging or diffraction during the build stage, residual stress evolution, and defect monitoring.

Editors: Fan Zhang, Dhriti Bhattacharyya, and Lianyi Chen

Sponsor: Advanced Characterization, Testing, and Simulation Committee

Topic: Machine Learning Applications in Advanced Manufacturing Processes

Scope: This special topic focuses on reducing waste, energy usage and carbon emissions, and spurring innovation in materials development and production. Advances in digital manufacturing, process control, predictive maintenance, and automation can be realized by integration of data analytics and validated models to ensure product quality, optimize operations, enhance productivity, and improve efficiency.

Editors: Donna Guillen, Edward Herderick, Judy Schneider, and Srikanth Patala

Sponsors: Energy Committee, Additive Manufacturing Committee, and Computational Materials Science and Engineering Committee

Topic: Nanomechanics of Low-dimensional Materials

Scope: Low-dimensional materials, such as nanoparticles, nanofibers, and nanotubes have at least one dimension small enough for their physical properties to lay between individual atoms and bulk material. The dimensional constraints of these materials result in a large surface-area-to-volume ratio that allows free surface and nanoscale structural features to dominate their physical response to mechanical deformation. Papers are invited on experimental fabrication, characterization and testing, and computational modeling of mechanical behaviors of low-dimensional materials.

Editors: Jiyoung Chang and Wei Gao

Sponsor: Nanomaterials Committee

Topic: Nanostructured Materials under Extreme Environments (By Invitation Only)

Scope: This invited topic focuses on the response of nanostructured metals, ceramics, and composite materials in extreme environments (radiation, temperature, and mechanical loading). Materials with designed micro- and nanostructures may have unusual responses to such extreme environments. The investigation of the microstructural evolution in nanostructured materials through combined experimentation and modeling/simulation has proven crucial in establishing the understanding and design of this novel class of materials for future engineering applications under extreme conditions.

Editors: Youxing Chen and Jin Li

Sponsor: Invited

Topic: Process Design and Materials Development for High-Temperature Applications

Scope: Due to their unique characteristics, refractory materials are of specific interest for functional and structural high-temperature applications. The focus of this topic includes the design, development, and processing of refractory metals, alloys, and compounds. Contributions are invited from authors working on high-temperature materials to share their experimental and theoretical results.

Editors: Ravi Enneti and Chai Ren

Sponsor: Refractory Metals and Materials Committee

Topic: Silicon Production, Refining, Properties, and Photovoltaics (By Invitation Only)

Scope: This invitation-only topic focuses on silicon for solar cells, energy production, and other technologies. All technologies of Si production, refining, and characterization are covered. Life-cycle assessment of solar silicon processing, recycling of solar silicon components, solar cells and electronic components, and characterization of silicon materials for solar cells and other technologies are subjects of great interest for this collection.

Editor: Shadia Ikhmayies

Sponsors: Recycling and Environmental Technologies Committee and Materials Characterization Committee

December 2020

Manuscript Deadline: July 1, 2020

Topic: Additive Manufacturing for Energy Applications (By Invitation Only)

Scope: This invited topic will feature manuscripts based on experimental and computational approaches including the following topic areas: Processing-microstructure-property relationship of AM fabricated materials for structural components in energy sectors; in-situ sensor development and in-situ processing and characterization; advances in AM design methodologies, new material designs and AM techniques; modeling and simulations for design of high-performance AM fabricated materials. Only papers presented at the Additive Manufacturing for Energy Applications II symposium at the TMS 2020 Annual Meeting & Exhibition will be considered for this topic.

Editor: Isabella van Rooyen

Sponsors: Additive Manufacturing Committee and Nuclear Materials Committee

Topic: Advances in Surface Engineering

Scope: This special topic aims to capture recent advances in processing, characterization, simulation/modeling, and applications related to surface engineering of materials. Areas of interest include surface protection from wear and corrosion, surface characterization techniques, surface alloying, and nanostructured surfaces.

Editors: Tushar Borkar, Rajeev Kumar Gupta, Sandip Harimkar, and Arif Mubarak

Sponsor: Surface Engineering Committee

Topic: Augmenting Physics-based Models in ICME with Machine Learning and Uncertainty Quantification

Scope: This topic will include papers on modeling complex material behavior and failure characteristics at multiple scales, using ICME and physics-based simulation tools augmented by machine learning and uncertainty quantification. Machine learning using datasets from experiments and validated simulation tools can unravel novel material models and physical phenomena. It is necessary to couple these predictions with uncertainty quantification to understand levels of error and ways to mitigate uncertainty.

Editors: Somnath Ghosh, David McDowell, and James Saal

Sponsor: ICME Committee

Topic: Machine Learning and Other Emergent Paradigms in Computational Materials Research

Scope: Computational materials science has been applying essential concepts of machine learning such as guessing and iteratively optimizing solutions, interpolating functions in high-dimensional space, and manipulating patterns in data, since its inception. Recent developments in learning theory and practice, along with the proliferation of data and cheap computing, have resulted in other promising new methods and enhanced embodiments of established techniques. This special topic features papers presented at the Computational Thermodynamics and Kinetics Symposium during the TMS 2020 Annual Meeting & Exhibition.

Editors: Jorge A. Muñoz, Sara Kadkhodaei, and James R. Morris

Sponsor: Invited

Topic: Mesoscale Materials Science

Scope: This topic invites contributions in the area of advanced characterization techniques and computational approaches for understanding the nucleation and evolution of mesoscopic structures in varied class of materials.

Editors: Saurabh Puri and Amit Pandey

Sponsor: Invited

January 2021

Manuscript Deadline: August 1, 2020

Topic: Graphene-based Composite Materials and Applications

Scope: Graphene-based composite materials consist of an inorganic host solid, graphene, that is coupled with an assortment of one or more dissimilar materials. The beauty of the composite materials lies within the multifunctionality rendered by the novel design structures that often have improved properties that are not available in the original component materials. Manuscripts on recent developments of all aspects of preparation, characterization, and novel applications of advanced graphene-based composite materials are invited.

Editor: Simona Hunyadi Murph

Sponsor: Composite Materials Committee

Topic: Recent Advances in Functional Materials and 2D/3D Processing for Sensors and Electronic Applications

Scope: Additive manufacturing and direct-write printed electronics technologies employing metal, dielectric, polymer, and ceramic materials have the potential to enable new products and markets. This special topic will highlight emerging concepts for the processing of nanomaterials and custom 2D/3D structures. Invited and contributed papers will discuss advances in material synthesis and process technology. Topics related to functional materials, low-temperature processing, large area manufacturing, and electronic applications are within the scope of the focus issue.

Editors: Pooran Joshi, Nugehalli M. Ravindra, Kostas Sierras, Tolga Aytug, and Sufian Abedrabbo

Sponsor: Thin Films and Interfaces Committee