



call for papers

JOM is seeking contributions on the following topics for 2022. For the full Editorial Calendar, along with author instructions, visit www.tms.org/EditorialCalendar.



February 2022

Manuscript Deadline: September 1, 2021

Topic: Artificial Intelligence and Machine Learning in Energy Storage and Conversion Materials

Scope: Artificial intelligence (AI) and machine learning (ML) have emerged as important tools for material scientists aimed at finding optimum solutions to complex scientific dilemmas. This special topic invites papers from industry, academia, and national labs that focus on AI and ML advances in field of materials design, characterization, and applications for energy storage and conversion.

Editors: Simona Hunyadi Murph and Surojit Gupta

Sponsor: Energy Conversion and Storage Committee

Topic: Bauxite to Aluminum: Automation, Data Analytics and New Processes

Scope: This topic covers automation and data analytics, fostered by developments and implementations of Industry 4.0, and also new processes or engineering technologies used throughout the primary aluminum production chain, from bauxite to aluminum. Papers are invited focusing on novel developments aiming to improve those processes, or on scientific/innovative approaches within these areas.

Editors: Jayson Tessier and Hong Peng

Sponsor: Aluminum Committee

Topic: Characterization of Waste-Derived Materials

Scope: Papers are invited on the latest achievements in exploration of novel value-added materials derived from various wastes. In particular, papers on characterization and modification for those originated from mineral/metallurgical/material processing are welcome. Of interest are multifunctional slag/tailing-based materials with unique combinations of desirable thermo-mechanical-chemical performance for sustainable industrial and municipal applications.

Editors: Zhiwei Peng, Yunus Eren Kalay, Rajiv Soman, and Jian Li

Sponsor: Materials Characterization Committee

Topic: Exploring the Relationships Between Plastic Deformation and Heat

Scope: This topic will explore experimental, computational, and theoretical methods to understand heat generation and

heat transfer in materials, through the interactions between phonons, electrons, and dislocations. Manuscripts are invited that examine factors (composition, microstructure, etc.) that determine the fraction of work converted into heat, mechanisms of converting deformation to heat, role of “phonon radiation” of dislocations as they move at high velocities, etc.

Editors: Aashish Rohatgi, Sean Agnew, and Thomas Bieler

Sponsor: Shaping and Forming Committee

Topic: Plasmonics in Nanocomposite Materials

Scope: Plasmonic nanocomposites are an emerging class of materials that integrate a plasmonic metallic nanoparticle with an assortment of other similar/dissimilar nanostructures leading to new multifunctional systems with improved functionalities and properties. This special topic will cover recent achievements in the design, fabrication, and application of plasmonic nanocomposites in fields including material science, medicine, and industry.

Editors: Nasrin Hooshmand and Simona Hunyadi Murph

Sponsor: Composite Materials Committee

March 2022

Manuscript Deadline: October 1, 2021

Topic: Additive Manufacturing with Light Alloys

Scope: Additive manufacturing (AM) with light alloys, especially Al-based alloys, is both desirable and challenging. This is a rapidly growing research field with a clear impact on future manufacturing. Papers are invited on the development and adaptation of AM Al-based alloys, development of an AM process for mitigating technological issues such as hot and cold cracking, porosity, grain growth texture and compositional segregation, post-processing of AM parts, and advanced characterization and testing of AM parts.

Editor: Dmitry Eskin

Sponsor: Aluminum Committee

Topic: Decarbonization of Pyrometallurgical Processes

Scope: Pyrometallurgical processes require energy to heat the feed material up to the temperature required for reactions and phase separation to occur. Additionally,

pyrometallurgical processes can also require reductants for the desired reactions to proceed. This energy and reductant can be derived from a variety of sources, with hydrocarbons commonly used. This topic focuses on techniques and technology to prevent or significantly reduce CO₂ emissions.

Editors: Stuart Nicol and Akbar Rhamdhani

Sponsor: Pyrometallurgy Committee

Topic: Environmental Degradation of Additively Manufactured Alloys

Scope: Given the significantly different microstructures of additively produced materials as compared with traditional materials, evaluation of their environmental degradation is essential for the prediction of performance and life in harsh environments. This special topic welcomes papers focused on how additively produced materials degrade in: (i) corrosive environments; (ii) high-temperature, oxidizing environments; (iii) harsh environments while under mechanical stress; and (iv) high-radiation environments.

Editors: Kinga Unocic, Bai Cui, and Wenjun Cai

Sponsor: Corrosion and Environmental Effects Committee

Topic: Low-temperature Technology for Electronic Packaging and Interconnects

Scope: This special topic focuses on low-temperature technology for electronic packaging and interconnects.

Editors: Albert T. Wu and Babak Arfaei

Sponsor: Electronic Packaging and Interconnection Materials Committee

Topic: Powder Metallurgy of Non-Ferrous Metals: Striving Toward Technology Advancement

Scope: Papers are invited exploring all aspects of powder metallurgy of non-ferrous metals. Example topics include: (i) powder processing of light and reactive metals, high entropy alloys, and functionally graded materials and composites; (ii) advances in powder consolidation processes, e.g., spark plasma and microwave sintering, powder forging and extrusion, and cold spray forming; (iii) novel process development, and robustness; and (iv) modelling and simulation.

Editors: David Yan and Kathy Lu

Sponsor: Powder Materials Committee

Topic: Recovery of Rare Earth and Critical Metals from Unconventional Sources

Scope: This topic invites submissions on science discoveries and emerging technologies that enable sustainable extraction, processing, and separation of rare earths and other co-product metals from unconventional sources, including to mine tailings, acid drainage, coal ash, and oil field brines. Manuscripts that address advances in separations science, metals refining, process intensification, and technology scale-up are a good fit.

Editors: Chukwunwike Iloeje, Joseph Hamuyuni, Fiseha Tesfaye, and Alexandra Anderson

Sponsors: Process Technology and Modeling Committee, Energy Committee, and Recycling and Environmental Technologies Committee

April 2022

Manuscript Deadline: Nov. 1, 2021

Topic: Computational Design of Alloys for Energy Technologies

Scope: This special topic covers design, development, and lifetime modeling of materials for extreme operating conditions in energy technologies. Advanced materials that resist elevated temperatures, corrosive environments, and a range of static and dynamic stresses are needed to improve the efficiency and reduce the environmental impact of energy technologies. Articles will cover the use of computational modeling using techniques including machine learning and experiments to close the design loop and accelerate materials discovery and advanced manufacturing.

Editors: Ram Devanathan, Jeff Hawk, and Laurent Capolungo

Sponsor: ICME Committee

Topic: Computational Modeling of Metallurgical Furnaces

Scope: Computational modeling continues to play an increasingly important role for evaluating and improving metallurgical furnace design and operation. Metallurgical furnaces typically involve complex transport phenomena, multi-phase chemical reactions and phase transformations, which make modeling efforts challenging. This special topic invites original research on high-fidelity simulations of industrial metallurgical furnaces. Papers that address gas, liquid, and solid phase interactions are encouraged.

Editors: Alexandra Anderson, Fiseha Tesfaye, Chukwunwike Iloeje, and Stuart Nicol

Sponsors: Process Technology and Modeling Committee; Pyrometallurgy Committee

Topic: Energy Efficiency and Low Carbon Footprint in Metals Processing

Scope: Metal production technologies are carbon and energy intensive, but it can be argued that the bulk of carbon footprint of metal processes comes from energy sources and reductants. In this case, decarbonizing is closely intertwined with energy consumption of processes. This special topic covers energy efficiency in relation to decarbonization of metal production. Manuscripts should address energy efficiency, carbon capture and reducing the carbon footprint of metals processing, as well as life cycle assessment.

Editors: Joseph Hamuyuni, Fiseha Tesfaye, Chukwunwike Iloeje and Alexandra Anderson

Sponsors: Energy Committee, Recycling and Environmental Technologies Committee, and Process Technology and Modeling Committee

Topic: Phenomena and Scales Influencing Alloy Solidification Microstructures

Scope: This topic focuses on numerical predictions and experimental observations of the coupling/interaction of processes that occur across varying length and time scales simultaneously during solidification. Examples include microstructure simulations to characterize macroscopic properties such as permeability or experiments such as bulk stirring that influence solidification.

Editor: Andrew Kao

Sponsor: Solidification Committee