# Special Issue

# Microstructure Engineering of Materials for Advanced Metal-Ion Batteries

## Message from the Guest Editors

Microstructure engineering provides an effective strategy for overcoming the intrinsic limitations of battery materials. Rational regulation of particle size, morphology, porosity, crystallinity, phase composition, defects, grain boundaries, heterointerfaces, and hierarchical architectures can significantly improve reaction kinetics, accommodate volume variation, suppress undesirable side reactions, and enhance structural integrity. Nanostructuring and porous architecture construction can shorten ion-transport pathways and increase the number of electrochemically active sites, while defect engineering, heteroatom doping, and interfacial modification can regulate the electronic structure and adsorption behavior of key intermediates. In addition, core–shell structures, hollow structures, gradient architectures, and three-dimensional conductive networks can facilitate charge transfer and alleviate mechanical degradation. This Special Issue is closely aligned with the scope of the journal, focusing on the fundamental relationships among microstructure, physicochemical properties, electrochemical behavior, and practical battery performance.

## Guest Editors


Prof. Dr. Haoqi Yang

College of Electrical, Energy and Power Engineering, Institute of Technology for Carbon Neutralization, Yangzhou University, Yangzhou 225127, China

Dr. Zhimeng Hao

College of Chemistry, Tiangong University, Tianjin 300387, China


## Deadline for manuscript submissions

31 March 2027


Materials

an Open Access Journal by MDPI

Impact Factor 3.7
CiteScore 7.0
Indexed in PubMed

mdpi.com/si/284438

*Materials*
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
materials@mdpi.com

mdpi.com/journal/materials

# Materials

an Open Access Journal by MDPI

Impact Factor 3.7
CiteScore 7.0
Indexed in PubMed

mdpi.com/journal/materials

# About the Journal

## Message from the Editor-in-Chief

*Materials* (ISSN 1996-1944) was launched in 2008. The journal covers twenty-five comprehensive topics: biomaterials, energy materials, advanced composites, advanced materials characterization, porous materials, manufacturing processes and systems, advanced nanomaterials and nanotechnology, smart materials, thin films and interfaces, catalytic materials, carbon materials, materials chemistry, materials physics, optics and photonics, corrosion, construction and building materials, materials simulation and design, electronic materials, advanced and functional ceramics and glasses, metals and alloys, soft matter, polymeric materials, quantum materials, mechanics of materials, green materials, general. *Materials* provides a unique opportunity to contribute high quality articles and to take advantage of its large readership.

## Editors-in-Chief

Prof. Dr. Maryam Tabrizian
1. Department of Biomedical Engineering, Faculty of Medicine and Health Sciences, McGill University, Montreal, QC H3A 2B6, Canada
2. Faculty of Dentistry and Oral Health Sciences, McGill University, 3640 Rue University, Montreal, QC H3A 0C7, Canada

Prof. Dr. Yuguang Ma
State Key Laboratory of Luminescent Materials and Devices, South China University of Technology, Guangzhou 510640, China

## Author Benefits

**Open Access:**

free for readers, with article processing charges (APC) paid by authors or their institutions.

**High Visibility:**

indexed within Scopus, SCIE (Web of Science), PubMed, PMC, Ei Compendex, CaPlus / SciFinder, Inspec, Astrophysics Data System, and other databases.

**Journal Rank:**

JCR - Q2 (Materials Science, Multidisciplinary) / CiteScore - Q1 (Condensed Matter Physics)

MDPI