

## Special Issue

# High Performance and Advanced Crystal Plasticity Methods in Metals and Metallic Alloys

### Message from the Guest Editor

Advanced theoretical and computational crystal plasticity methods in crystalline materials are well-defined means of discovering and analyzing the underlying dislocation mechanisms used to develop constitutive models. Crystal plasticity finite element (CPFE) methods are used to employ some of the extensive knowledge gained from the experimental and theoretical studies of single crystal behaviors, such as plastic deformation and dislocation activities, in order to inform the further development of continuum field theories of deformation. The high performance crystal plasticity frameworks expedite and enhance the efficiency of the computations, which can be utilized in hierarchical multi-scale schemes to bridge length scales to simulate and design metallic alloys for superior mechanical properties. Enormous progress in these fields has been achieved in recent years, initiating novel theoretical, analytical, and experimental approaches to illuminate prospective paths. In this Special Issue, research, improvements, and ideas in the subsequent fields in metals and metallic alloys are welcomed.

---

### Guest Editor

Dr. Shahriyar Keshavarz

National Institute of Standards and Technology, Gaithersburg, MD 20899, USA

---

### Deadline for manuscript submissions

closed (20 December 2024)



## Materials

---

an Open Access Journal  
by MDPI

---

Impact Factor 3.2  
CiteScore 6.4  
Indexed in PubMed



[mdpi.com/si/142708](https://mdpi.com/si/142708)

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

[mdpi.com/journal/  
materials](https://mdpi.com/journal/materials)





# Materials

---

an Open Access Journal  
by MDPI

---

Impact Factor 3.2  
CiteScore 6.4  
Indexed in PubMed



[mdpi.com/journal/  
materials](https://mdpi.com/journal/materials)



## About the Journal

### Message from the Editorial Board

*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 (Metallurgy and Metallurgical Engineering) /  
CiteScore - Q1 (Condensed Matter Physics)