

Special Issue

Modeling and Simulation of Metal Processing

Message from the Guest Editor

Components manufactured using metal processing routes are becoming more and more complex for increasingly high technology industries. As such, the methods employed by, and the equipment and skills of, these manufacturers increase in response to the demand. In order to support the development of these manufacturing routes, new tools that can inform us about process stress, strain, distortion, and microstructure are necessary. Computational modeling and simulation of these metal forming processes offers virtual tools to monitor a workpiece during the forming operation in ways that traditional process monitoring cannot. These modeling tools can assist with process development, reduce the expense of experimental trials, reduce material waste, and allow for process optimization. Multi-scale modeling methods can, therefore, allow for a greater understanding of the process at the component (macro-scale) level, as well as micro- and nano-levels. Given the inherent process parameter–microstructure–material properties inter-relationship, modeling and simulation can, therefore, offer a detailed description of fundamental material behavior.

Guest Editor

Dr. Richard Turner
School of Metallurgy and Materials, University of Birmingham,
Birmingham B15 2TT, UK

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

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Message from the Editor-in-Chief

Metallic materials play a vital role in the economic life of modern societies; contributions are sought on fresh developments that enhance our understanding of the fundamental aspects related to the relationships between processing, properties and microstructure – disciplines in the metallurgical field ranging from processing, mechanical behavior, phase transitions and microstructural evolution, nanostructures, as well as unique metallic properties – inspire general and scholarly interest among the scientific community.

Editor-in-Chief

Prof. Dr. Yong Zhang

Beijing Advanced Innovation Center of Materials Genome Engineering,
State Key Laboratory for Advanced Metals and Materials, University of
Science and Technology Beijing, 30 Xueyuan Road, Beijing 100083,
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