Special Issue

Mathematical Modelling of the Ironmaking Blast Furnace

Message from the Guest Editors

The blast furnace (BF) is the traditional process in the steel industry for converting the iron oxides in iron ore to liquid iron (hot metal), but the process is facing major challenges because of its environmental impact. During the transition period, when novel, more environmentally benign ironmaking processes are being developed, it is of particular importance to further optimize the operation of the BF to minimize the need for raw materials and energy and to suppress harmful emissions. A key to these improvements lies in mathematical modeling for gaining a deeper understanding of the complex processes involved and for better decision making and control of the state of the BF. This Special Issue focuses on novel developments in the field of modeling of the blast furnace, including detailed first-principles simulation models, control models, and statistical and data-driven models. The intent of the issue is to demonstrate the state of the art of mathematical modeling of the BF and to provide the reader with insight into the latest developments in the field.

Guest Editors

Prof. Dr. Henrik Saxen

Process and Systems Engineering Laboratory, Faculty of Science and Engineering, Åbo Akademi University, 20500 Turku, Finland

Dr. Lei Shao

School of Metallurgy, Northeastern University, Shenyang 110819, China

Deadline for manuscript submissions

closed (31 March 2023)

Metals

an Open Access Journal by MDPI

Impact Factor 2.5
CiteScore 5.3

mdpi.com/si/106126

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

mdpi.com/journal/metals

Metals

an Open Access Journal by MDPI

Impact Factor 2.5
CiteScore 5.3

mdpi.com/journal/metals

About the Journal

Message from the Editorial Board

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.

Editors-in-Chief

Prof. Dr. Hugo F. Lopez
Department of Materials Science and Engineering, College of Engineering & Applied Science, University of Wisconsin-Milwaukee, 3200 N. Cramer Street, Milwaukee, WI 53211, USA

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, China

Author Benefits

High Visibility:

indexed within Scopus, SCIE (Web of Science), Inspec, Ei Compendex, CAPlus / SciFinder, and other databases.

Journal Rank:

JCR - Q2 (Metallurgy and Metallurgical Engineering) / CiteScore - Q1 (Metals and Alloys)

Rapid Publication:

manuscripts are peer-reviewed and a first decision is provided to authors approximately 18 days after submission; acceptance to publication is undertaken in 2.6 days (median values for papers published in this journal in the first half of 2025).

MDPI