Special Issue

Multiscale Design and Optimisation for Metal Additive Manufacturing

Message from the Guest Editors

This Special Issue aims to collect cutting-edge research focused on multiscale modelling, simulation-driven design, and physics-based as well as data-driven optimisation strategies for metal AM processes. Contributions addressing atomistic and mesoscale modelling, phase-field and CFD simulations, thermal–mechanical process modelling, and integrated multiscale frameworks linking process parameters with microstructure and mechanical performance are particularly encouraged.

Special attention will be given to advanced optimisation methods, including artificial intelligence and machine-learning-assisted modelling, process monitoring, parameter optimisation, and design of alloys and structures tailored for metal AM. Publications addressing post-processing treatments (e.g., heat treatment, surface engineering, chemical and mechanical finishing) as well as the application of novel AM equipment and machine architectures are also within the scope of this Special Issue. Studies combining numerical simulations with in situ monitoring, μ-CT, and experimental validation for process optimisation and quality control are highly welcome.

Guest Editors

Dr. Bartłomiej Wysocki
Prof. Dr. Joseph Buhagiar
Prof. Dr. Jian Chen

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

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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

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