

## Special Issue

# Modeling and Simulation of Metal Additive Manufacturing

### Message from the Guest Editor

This Special Issue will delve into high-fidelity, multi-physics modeling approaches that capture the core phenomena across the metal additive manufacturing process chain. Its scope encompasses simulations at the meso-scale, including the modeling of material feeding such as powder spreading, powder delivering, or wire feeding to predict the performance of metallic material feeding. A central focus is placed on advanced coupled modeling techniques, specifically the integration of the discrete element method with computational fluid dynamics to resolve the critical interaction between metallic materials and heat source. Furthermore, this Special Issue covers the thermo-mechanical modeling of the build process for predicting transient and residual stress evolution, plastic deformation, and resultant part distortion. Finally, it includes the simulation of solidification phenomena across scales, from microstructure evolution—modeling dendritic and cellular growth, grain morphology, and phase transformations—to establishing process–structure–property relationships for predicting mechanical performance.

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### Guest Editor

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### Deadline for manuscript submissions

closed (25 April 2026)



## Metals

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## About the Journal

### 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.

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### Editor-in-Chief

Prof. Dr. Yong Zhang

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