Special Issue
Additive Manufacturing of Metals and Alloy Materials

Message from the Guest Editors

Metal additive manufacturing (AM) has evolved from a rapid-prototyping curiosity into a viable route for producing structural and functional components across the aerospace, energy, biomedical, and automotive sectors. Its defining characteristic, i.e., layer-by-layer solidification under steep thermal gradients, rapid cooling, and repeated thermal cycling, creates far-from-equilibrium conditions inaccessible to conventional processing. These conditions open a design space for new alloy compositions and hierarchical microstructures, but they also introduce challenges in defect formation, anisotropy, residual stress, and reproducibility. Realizing the full potential of metal AM therefore requires an integrated understanding of the links between feedstock composition, thermal history, microstructural evolution, and the resulting properties.

This Special Issue invites researchers from academia, industry, and national laboratories to contribute original research articles, perspectives, and reviews on the frontiers of metal additive manufacturing. Topics of interest include, but are not limited to: alloy design and composition–microstructure evolution in AM-specific alloys; mechanical, magnetic, thermal, and multifunctional properties of AM materials; functionally graded and multi-material structures; external field-assisted AM (magnetic, acoustic, electric, and thermal fields); in situ monitoring and multiscale modeling of solidification; post-processing and heat treatment strategies; and defect–property relationships.

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Welcome to Crystals, the journal dedicated to the fascinating world of crystallographic research! Crystals are more than mere decorative elements; they hold the key to understanding the fundamental structure of matter. Our mission is to explore the crucial significance of this research across various fields. From medicine to technology, chemistry to geology, crystals play a vital role. Their structure provides insights into new advanced materials, innovative drugs, and groundbreaking technologies.
Through Crystals, we delve into the microscopic world to discover solutions that will shape the future. Join us on a journey through the crystal, where science merges with beauty and innovation.

Editor-in-Chief

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