Special Issue

Metal-Based Additive Manufacturing: Processes, Characterization and Applications

Message from the Guest Editors

Additive Manufacturing (AM) represents a paradigm shift in how metallic, ceramic, and polymeric materials are designed, processed, and applied across industrial sectors. This Special Issue aims to gather high-quality contributions that deepen the understanding of AM process–structure–property relationships and promote the integration of AM technologies into functional and optimized designs. Topics include process parameter optimization, defect formation and control, microstructural and mechanical characterization, and advanced testing of AM components. The role of Design for Additive Manufacturing (DfAM) is highlighted as a key enabler for exploiting AM's geometric freedom, enabling lightweight structures, internal cooling channels, and topology-optimized components. Emphasis is placed on both melting and sintering-based AM routes, hybrid processes combining additive and subtractive manufacturing, and novel material systems such as high-entropy alloys, metal–ceramic composites, and functionally graded materials. Studies involving simulation, digital twins, or in situ monitoring for process prediction and control are particularly welcome.

Guest Editors

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Dr. José M. Costa
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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.

Editor-in-Chief

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