

Special Issue

Solidification Microstructure Evolution and Formation in Metallic Alloys: Casting, Welding and Additive Manufacturing

Message from the Guest Editor

Metal casting has been employed throughout the last few millennia of human history, while other metal-solidification-related techniques such as soldering, brazing, and welding have become indispensable manufacturing methodologies. Solidification is also the underlying process behind modern metal additive manufacturing. Thermal and chemical interactions during solidification largely control the metallic alloy microstructure evolution and formation. Thus, the solidification process significantly dictates the strength, properties, and resilience of the products. Therefore, an improved understanding of metal solidification processes is crucial to enhance solidification processing capacities. This Special Issue's scope includes studies of solidification microstructure evolution and formation in metal casting, welding, and additive manufacturing. It aims to cover a broad perspective on recent advances in metal and alloy solidification, ranging from fundamental concerns such as nucleation and growth to engineering aspects such as process control.

Guest Editor

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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.

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