



Molten Pool Dynamics

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Message from the Guest Editor

Dear Colleagues,

The molten pool is an important feature in the hot working and forming process of metal materials, and its dynamic behavior is closely related to the processing quality. Especially in welding, additive manufacturing, and casting processes, the fluidity and metallurgical behavior of the molten pool directly determine the microstructure characteristics, grain morphology, composition distribution, and defects of the metal parts, ultimately affecting the mechanical properties of parts. This Special Issue aims to collect the most recent research on innovative and pioneering works in welding, additive manufacturing, and casting that cover several aspects such as the mechanism of molten pool formation, numerical simulation of molten pool dynamics, molten pool monitoring and control, the solidification and crystallization of the molten pool, composition distribution, and defects.





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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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