



## Recent Advances in Additive Manufacturing and Welding Technologies of Metals: Alloys, Simulation and Monitoring

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### Message from the Guest Editors

Additive manufacturing and advanced welding technologies have received a great deal of academic and industrial interest. One of the most important characteristics of these two technologies is their capability of manufacturing components with high geometrical complexity. However, the characterization of the resultant microstructures is complex, as the structure is the outcome of a rapid cooling process, which affects both solidification and phase transformation, and where the cooling rates usually lie in the range  $10^2$ – $10^6$  K/s.

To better understand microstructure evolution, several approaches can be followed. First, the effect of parameters such as chemical composition or process-related parameters, as well as the physical processes involved, can be studied experimentally by ex situ characterization. Such characterization can be complemented by two different types of studies, that is, simulations (e.g., computational fluid dynamics) and in situ monitoring. Both types of studies can help to obtain information such as temperature distribution or defect characteristics as a function of time, which is why they are highly needed [...]







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## Message from the Editor-in-Chief

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