Special Issue

Numerical Simulation of Casting Solidification

Message from the Guest Editor

With the development of numerical techniques and computer technology, the simulation of metal casting is playing a significant role in material preparation and processing. The simulation of casting solidification allows modern foundries to shift from conventional trial-and-error to proof-of-concept approach in the product development paradigm. It is also to generate a temporal and spatial description of the movement of the solid-liquid interface, and consequently predicting the solidification microstructure related to product qualities and material properties. This Special Issue is to collect related works ranging from processes (e.g., traditional and advanced casting, liquid metal engineering) to research approaches (e.g., theoretical, experimental, computational). Topics of interest include, but are not restricted to, the following:

- Macro-scale simulation including macrosegregation, shrinkage, cavity, cracks, etc.
- Micro-scale simulation including as-cast grain structure, dendrite morphology, microsegregation and consequent precipitation, etc.
- Nano-scale simulation including nucleation, interfacial energies, etc.

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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