Special Issue

Phase Transformations and Grain Boundaries of Metals and Alloys

Message from the Guest Editor

The direct microstructure–properties relationship in metallic materials is now well established—in other words, a “good” microstructure consisting of “good” phases results in “good” properties. Together with chemical composition, grain size, size, morphology, and distribution of second phase precipitates, grain boundaries (GBs) represent a unique and intrinsic parameter which can be used to control the properties of metallic polycrystalline materials. Due to the global tendency toward miniaturization (in nanoelectronics, for example) and intensive research on nanograined metals, GBs have manifested a multitude of features to act on properties, as they are preferential nucleation sites, part of matter with different composition and significantly increased rate of diffusion and, more recently, with specific phase transitions, as compared to the bulk. The objective of the present Special Issue is to present recent achievements in the investigation of interaction between phase transformations and grain boundaries in metallic alloys. Experimental and theoretical (and/or modeling) aspects are both covered.

Guest Editor

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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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