Special Issue

Advances in Microstructural Characterization of Metallic Alloys

Message from the Guest Editor

Microstructural characterization is essential to understand the behavior of any kind of material. This Special Issue will focus on metallic alloys, because alloy development is an essential factor for obtaining new classes of materials for advanced applications in new transportation systems, new energy efficient systems, and prothesis development. Lightweight alloys like Ti, Al, and Mg alloys have been heavily investigated in recent years, revealing their excellent properties.

Advanced methods to characterize a microstructure combine imaging methods with diffraction methods. The aim of all methods is to obtain detailed information of the 2D or, even better, 3D microstructure (grain size distribution; grain orientation distribution; precipitation distribution; 1D-, 2D-, and 3D-defect distribution; macro- and microstrain distribution; grain boundary information). Beside standard techniques, advanced in situ methods have been implemented for high-temperature studies and applied strain investigations, among others. These methods are based on optical microscopy, electron microscopy, X-ray diffraction, synchrotron radiation, and neutron radiation.

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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