

Special Issue

Nanostructured Metallic Materials: Preparation, Properties, and Applications

Message from the Guest Editors

The goal of this Special Issue is to review various applications and technologies of research on nanostructured metallic materials (NMMs), which have been rapidly diversifying in recent years. Recently, the introduction of the nanostructure in advanced engineering alloys is spreading, in the form of new deformation mechanisms being developed or novel concepts such as damage tolerance and self-healing being proposed. In addition, new processes for manufacturing nanoparticles, nanofoams, and nanocomposites have been actively developed. Due to their large surface area, these novel NMMs exhibit high activity as various functional materials, such as electrodes for water splitting and dye degradation, exhibit new phase transformation behavior by affecting phase stability, and improve toughness by inhibiting crack propagation. Furthermore, nanostructure design is emerging as a major concern in additive manufacturing and combinatorial deposition. In this Special Issue, we hope to review the current status of nanostructure design and understand the challenging fundamental issues common to various metallic materials applications.

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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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