Special Issue

Crystallographic Aspects and Microstructure Design in Titanium and Its Alloys: Processing–Structure–Property Relationships

Message from the Guest Editors

Titanium alloys have gained increasing attention in various high-performance industries such as aerospace, defense, biomedical, and energy sectors due to their exceptional combination of high specific strength, excellent corrosion resistance, and biocompatibility. In recent years, considerable efforts have been devoted to understanding and optimizing the crystallographic features of titanium alloys, including phase transformation, texture evolution, grain boundary characteristics, and deformation mechanisms. These crystallographic aspects play a critical role in governing the microstructure and, consequently, the mechanical performance of titanium alloys. In this Special Issue, we welcome original research and review articles focusing on microstructure design and processing strategies for titanium alloys, with special emphasis on crystallography-driven approaches. Contributions may include studies on alloy design, thermomechanical processing, phase transformations, texture control, advanced characterization, and predictive modeling to better understand and optimize the structure and performance of titanium alloys.

Guest Editors

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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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