Special Issue

Alloy Design and Its Performance Trade-Offs

Message from the Guest Editor

Alloy design can be a crucial step in developing advanced metallic materials, directly affecting their performance and application. Balancing properties such as strength, ductility, formability, and conductivity is essential for creating high-performance alloying systems. Modern metallurgy focuses on enhancing these properties simultaneously through innovative manufacturing processes and thermomechanical treatments. Understanding the relationships between alloy chemistry, microstructural features, and processing parameters is key to achieving optimal performance. Recent research in this field has allowed for significant advancements, particularly in nanostructured metallic materials and advanced thermomechanical processing techniques. These developments have important implications for alloy design and optimization, offering improved performance across various applications.

Topics of interest include novel alloy systems, the effects of processing techniques on properties, the role of microstructure in performance, and strategies for balancing conflicting properties through experimental and computational platforms.

Guest Editor

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Deadline for manuscript submissions

closed (31 July 2025)

Metals

an Open Access Journal by MDPI

Impact Factor 2.5
CiteScore 5.3

mdpi.com/si/205416

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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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