Special Issue

Microstructure and Mechanical Behavior of High-Strength Steel

Message from the Guest Editor

The complexity of phase transformation and the diversity of microstructure in steels give them the potential to continuously improve their mechanical properties. Therefore, it is crucial to study the influence mechanism of microstructure design on mechanical properties. Especially in recent years, the emergence of new microstructure design strategies (e.g., hierarchical substructure, heterostructures, chemical boundary engineering, high-density dislocation engineering, and high-density coherent precipitation) and new preparation technologies (additive manufacturing) has further stimulated more scholars to study the improvement of mechanical properties of steel materials. In addition, in the context of the increasing demand for high-performance steel materials in the fields of aerospace, new energy vehicles, and high-end equipment manufacturing, it is of great theoretical and practical significance to study the influence mechanism of microstructure design under multi-factor coupling of low-cost high-strength steel on mechanical properties.

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Deadline for manuscript submissions

20 January 2026

Metals

an Open Access Journal by MDPI

Impact Factor 2.5
CiteScore 5.3

mdpi.com/si/224033

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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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