Special Issue

Microstructure, Properties and Characterization of Aluminum Alloys

Message from the Guest Editors

Aluminum alloys exhibit diverse microstructural features, from grain refinement, intermetallic phase evolution, and precipitation hardening to the influence of defects and inclusions, that directly govern their mechanical strength, corrosion resistance, fatigue behavior, and thermal stability.

This Special Issue welcomes both experimental and computational studies that shed light on the fundamental mechanisms controlling alloy behavior. Contributions may address multi-scale characterization (from atomistic resolution to component-level assessment), in situ observation of phase transformations, or the advanced modeling of microstructure–property relationships. We particularly encourage submissions on emerging alloy systems, innovative processing routes such as additive manufacturing and severe plastic deformation, and novel surface modification or coating strategies.

By gathering original research articles, reviews, and perspectives, this Special Issue seeks to highlight the state of the art in aluminum alloy science, promote cross-disciplinary collaboration, and provide a reference point for future directions in alloy development.

Guest Editors

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Message from the Editor-in-Chief

Welcome to *Crystals*, the journal dedicated to the fascinating world of crystallographic research! Crystals are more than mere decorative elements; they hold the key to understanding the fundamental structure of matter. Our mission is to explore the crucial significance of this research across various fields. From medicine to technology, chemistry to geology, crystals play a vital role. Their structure provides insights into new advanced materials, innovative drugs, and groundbreaking technologies. Through *Crystals*, we delve into the microscopic world to discover solutions that will shape the future. Join us on a journey through the *Crystals*, where science merges with beauty and innovation.

Editor-in-Chief

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