Special Issue

Alloy Materials Degradation and Microstructural Study

Message from the Guest Editors

The demand for high-performance materials in nuclear, aerospace, and energy industries highlights the challenges of material degradation in extreme environments. Materials must withstand high temperatures, aggressive chemical conditions, and mechanical stresses, requiring a deep understanding of their microstructure, crystallinity, and failure mechanisms to enhance durability and performance.

Metallic alloys play a critical role, with crystal structure and grain orientation determining key properties. Atomic arrangements in BCC, FCC, and HCP structures influence strength, oxidation resistance, and fatigue life; however, point defects and dislocations contribute to degradation mechanisms like creep, fatigue, and environmental-assisted cracking.
This Special Issue invites researchers to contribute studies addressing material challenges in extreme environments, including corrosion, irradiation effects, and novel material processing techniques across nuclear, CSP, WtE, biomass, and aerospace applications.

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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