Special Issue

Microstructures and Properties of Martensitic Materials

Message from the Guest Editor

Martensite was evidenced in steels at the end of the 19th century. It is a particular complex microstructure made of isolated or intricate laths or plates built by the collective displacements of atoms during a diffusionless phase transformation. It can be observed in many materials, such as cobalt, titanium, zirconium, shape memory alloys, in some gold alloys, brasses and other copper alloys, and in some ceramics and polymers. Their extraordinary mechanical and physical properties, used in many industrial domains, explain why these materials have been extensively studied for the last century. The phenomenological theory, developed in the 1950s, filled a gap in our understanding regarding their crystallography, morphologies and mechanical properties, but many questions remain unsolved or prone to controversies. The way that atoms move, the correlation with phonon softening, the effect of chemical composition, the link with other types of microstructures (for example, Widmanstätten ferrite, bainite, or massive phases), and the role of the dislocations/disclinations, all these issues are still open to discussions and debates.

Guest Editor

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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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