

## Special Issue

# Magnetoelectric Materials and Their Application

### Message from the Guest Editor

Multiferroic magnetoelectric (ME) materials, characterized by the concurrent presence of multiple ferroic orders such as ferromagnetic, ferroelectric, and ferroelastic behaviors, play a pivotal role in a myriad of device applications. These applications span from energy harvesting systems to magnetic field sensors and extend to electrically tunable magnetic devices used in microwave communications. The synergistic interplay between ferromagnetism and ferroelectricity gives rise to a novel coupling phenomenon known as the ME effect, which intricately correlates magnetic fields, electric fields, and mechanical deformations. Engineered multiferroic ME composites, featuring diverse connectivities like 0–3, 1–3, 1–2, and 2–2 configurations between distinct ferroelectric and ferromagnetic phases, have garnered significant attention due to their ability to offer enhanced design flexibility along with notably large ME coupling coefficients. Various strategies have been explored to amplify the ME coupling in these composites, encompassing optimizations of constituent phases, tailored ME structures, and enhancements in interfacial layers, among others.

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### Guest Editor

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## Crystals

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## About the Journal

### 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.

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### Editor-in-Chief

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