

## Special Issue

# Magnetocaloric Effect and Giant Negative Thermal Expansion

### Message from the Guest Editors

The magnetocaloric effect (MCE) is among the most intriguing topics in materials science due to its most straightforward application in magnetic refrigeration. The discovery of giant MCE materials, such as NiMn-based Heusler alloys,  $\text{Gd}_5\text{Si}_2\text{Ge}_2$ ,  $\text{FeRh}$ ,  $\text{La}(\text{Fe,Si})_{13}$ ,  $\text{Eu}_2\text{In}$ , and  $\text{MnCoGe}/\text{MnNiGe}$ -based compounds has promoted the developing of the solid-state magnetic refrigeration technique. A common feature of these materials is the strong spin-lattice coupling with the magnetostructural or magnetoelastic first-order magnetic transitions. The giant MCE materials can show negative thermal expansion (NTE) or positive thermal expansion (PTE), depending entirely on the characteristics of the magnetostructural/magnetoelastic transition. Meanwhile, common side effects related to hysteresis and irreversibility can be controlled and tuned by compositional adjustments, chemical/external pressure, or magnetic field. The purpose of the present Special Issue is to exhibit the recent development on different magnetocaloric materials and pave the way for further studies in this very active research field. Both reviews and original research articles are welcome.

---

### Guest Editors

Prof. Dr. Jiantao Wang

Prof. Dr. Yu Jia

Dr. Jiazheng Hao

---

### Deadline for manuscript submissions

closed (10 August 2021)



## Crystals

---

an Open Access Journal  
by MDPI

---

Impact Factor 2.4  
CiteScore 5.0



[mdpi.com/si/77382](https://mdpi.com/si/77382)

*Crystals*  
Editorial Office  
MDPI, Grosspeteranlage 5  
4052 Basel, Switzerland  
Tel: +41 61 683 77 34  
[crystals@mdpi.com](mailto:crystals@mdpi.com)

[mdpi.com/journal/  
crystals](https://mdpi.com/journal/crystals)





# Crystals

---

an Open Access Journal  
by MDPI

---

Impact Factor 2.4  
CiteScore 5.0



[mdpi.com/journal/  
crystals](https://mdpi.com/journal/crystals)



## 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.

---

### Editor-in-Chief

Prof. Dr. Alessandra Toncelli

Department of Physics, University of Pisa, 56126 Pisa, PI, Italy

---

### Author Benefits

#### Open Access:

free for readers, with article processing charges (APC) paid by authors or their institutions.

#### High Visibility:

indexed within Scopus, SCIE (Web of Science), Inspec, Ei Compendex, CAPus / SciFinder, and other databases.

#### Journal Rank:

JCR - Q2 (Crystallography) / CiteScore - Q2 (Condensed Matter Physics)