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Magnetocaloric Effect and Giant Negative Thermal Expansion

Guest Editors:

Prof. Dr. Jiantao Wang

Prof. Dr. Yu Jia

Dr. Jiazheng Hao

Deadline for manuscript submissions:
closed (10 August 2021)

Message from the Guest Editors

Dear Colleagues,

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, $Gd_5Si_2Ge_2$, FeRh, $La(Fe,Si)_{13}$, Eu_2In, and MnCoGe/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.

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Editor-in-Chief

Prof. Dr. Alessandra Toncelli
Department of Physics, University of Pisa, 56126 Pisa, PI, Italy

Message from the Editor-in-Chief

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Contact Us

Crystals Editorial Office
MDPI, St. Alban-Anlage 66
4052 Basel, Switzerland

Tel: +41 61 683 77 34
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