



symmetry

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Quantum Phenomena in Magnetic Materials

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Message from the Guest Editor

Dear colleagues,

Although mankind has known about magnetite for more than 2500 years, our knowledge of magnetic materials is still fast-growing and magnetic materials play a vast role in modern technology throughout all aspects and fields. Their applications range from permanent magnets, though to computer storage, superconductors, sensors, and actuators, to very special applications in optics, electronics, nuclear spin resonance imaging, and calorimetrics.

Magnetic materials also have a vast number of quantum phenomena ranging from the existence of magnetic “monopoles”, a surprising role of magnetism in the existence of novel superconducting phases to topological protected large objects. These skyrmions were first observed in non-centrosymmetric cubic magnetic materials with emergent topological spin structure. Furthermore, parity-time (PT) symmetry-breaking phase transition also could be seen in quantum spin systems. Amongst others, all these phenomena are of special importance for applications in future quantum computing...



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Special Issue



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Message from the Editor-in-Chief

Symmetry is ultimately the most important concept in natural sciences. It is not surprising then that very basic and fundamental research achievements are related to symmetry. For instance, the Nobel Prize in Physics 1979 (Glashow, Salam, Weinberg) was received for a unified symmetry description of electromagnetic and weak interactions, while the Nobel Prize in Physics 2008 (Nambu, Kobayashi, Maskawa) was received for the discovery of the mechanism of spontaneous breaking of symmetry, including CP symmetry. Our journal is named *Symmetry* and it manifests its fundamental role in nature.

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