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Symmetry and Its Application in Magnetism and Magnetic Materials

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Message from the Guest Editor

Dear Colleagues,

Most of our surrounding physical world is guided by symmetry, which seems to be one of the omnipresent laws of the universe. Using symmetry, complex multidimensional systems can be easily explained and understood from both classical and quantum perspectives. Simplification relies on the fact that the system can be described by viewing one of its two identical aspects, even though the perspective views are different. On the other hand, theoretical local spontaneous symmetry breaking is responsible for the existence of crystals (breaking of transitional invariance) and magnetism (breaking of rotational invariance), as well as the superconductivity (where the phase of the charged particle is broken). Properties of magnetic materials, bulk or thin films can be understood by taking into account their geometrical crystal symmetry (for crystalline structures) and/or their spin symmetry structure. Generally, one can include here ferromagnetic materials (e.g., 3d-transition metals and alloys), and antiferromagnetic materials (metallic alloys or oxides), as well as ferrimagnetic structures (3d-RE alloys, ferrites and garnets)...

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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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