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Understanding Iron Superconductors and Isostructural Materials

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Message from the Guest Editor

Studies of iron-based superconductors, stimulated by an enormous public interest and supported by the experience collected from the preceding work on the unconventional superconductivity. It is possible to synthesize numerous related yet different materials of the iron family. An assortment of spontaneous orders, related to the breaking of all possible symmetries of the many-electron wave function, has been detected in these materials. We have accumulated a good bulk of evidence suggesting that such proximity of different electronic phases is connected to the very origin of unconventional superconductivity. Nevertheless, the precise formulation of what actually underlies efficient electron pairing has not yet been achieved. Recently, compounds of the same crystalline symmetries, but with iron substituted by the other *d* elements, have caught the attention of the research community.

This Special Issue will collect new experimental and theoretical results, as well as overviews, generalizations, and analyses of the known facts, facilitating the understanding of iron-based superconductors from a wide perspective.

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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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