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Interplay of Multiple Symmetries, Emerging Exotic States and Fields, and the New Quantum Complexity in Condensed Matter Physics

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Message from the Guest Editor

Dear Colleagues,

Symmetry is the strongest concept in condensed matter physics, which is the laboratory of ideas for other fields of physics as well. The breaking of specific symmetries allowed for classifying materials according to their corresponding quantum ordered states. Details of their structure and interactions have almost become irrelevant in the so-called low energy sector, so that just symmetry breaking matters. In the last decades, a novel form of quantum complexity has emerged. Exotic new kinds of quantum states have been discovered in real systems. They often appear in proximity to a potential quantum critical point, or competing frustrated interactions or a crossover between dimensionalities. In the complex phase, diagrams of the relevant systems these states sometimes define domes around expected quantum critical points. Sometimes, these kinds of states appear only at interfaces or other nanostructures...

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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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