Special Issue

Quantum Sensing and Symmetry

Message from the Guest Editor

Nanoscale nuclear magnetic resonance is a flourishing area with both fundamental and applied implications. Among them, we have the possibility of exploring central interactions that appear, e.g., between the spin components of electrons and nuclei, and the enhancement in the resolution of the images obtained by magnetic resonant imaging. The underlying physical mechanism that habilitates all these applications is the interaction between a quantum sensor, typically a controllable pseudo-electron-spin, and specific targets. This interaction can be modulated by judiciously applying tailored radiation patterns in a procedure known as quantum sensing or quantum detection. In this context, the concept of symmetry emerges naturally in different aspects of the theory. In addition, symmetric constructions of microwave radiation patterns certify robustness against environmental and control errors. The latter have been widely studied in the frame of dynamical decoupling techniques. Finally, the hyperfine vectors that define each sample are intrinsically symmetric and this is reflected in the resonance spectrum of the samples.

Guest Editor

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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.

Editor-in-Chief

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