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Interplay between NISQ Devices and Symmetry

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Deadline for manuscript submissions:
closed (31 December 2024)

Message from the Guest Editors

Dear Colleagues,

We live in exciting moments where one can control quantum devices on the fly over the cloud. However, packaging in more and more such devices, potential decoherence is imminent. To attain a functional, scalable, practical quantum computer, one needs to understand and manipulate such fragile quantum devices in the presence of noise or counter it by doing some manipulations. We hope that the symmetry present in the quantum system might help design or create robust quantum devices that are protective against certain types of noise. The interplay between noisy-intermediate scale quantum (NISQ) devices and their symmetries may also help surpass challenges. In this Special Issue, we intend to gather a series of articles related to the interplay between symmetry and NISQ devices, including but not exclusively dedicated to quantum error mitigation, dynamical phase transitions and decoherence, and numerical methods in open quantum systems. We welcome theory papers with relevant implications in quantum platforms, such as trapped ions and superconducting circuits.

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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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