Advances in Quantum Computing

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Message from the Guest Editors

The field of quantum information science has seen tremendous progress over the last several years, with advances in both hardware development and novel algorithms. The future viability of quantum computers now appears to rely on demonstrating two key features: (1) that they are fundamentally distinct and more capable than classical devices, and (2) that they are practically scalable in the number of qubits.

This Special Issue focuses on the recent advances, and challenges, in developing large-scale, fault-tolerant quantum computers capable of solving tomorrow's growing computational needs. Original unpublished papers and review articles are invited on the following topics: (1) advances in quantum computing hardware, (2) novel quantum and hybrid algorithms, (3) applications to real-world problems using noisy, intermediate-scale quantum devices, (4) quantum networks and distributed quantum computing, (5) classical challenges to demonstrations of quantum advantage, and (6) investigations into the scalability of different quantum hardware architectures.

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Special Issue

Editor-in-Chief

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Message from the Editor-in-Chief

The concept of entropy is traditionally a quantity in physics that has to do with temperature. However, it is now clear that entropy is deeply related to information theory and the process of inference. As such, entropic techniques have found broad application in the sciences.

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