



## Exploring the Horizon of Practical Utility in Near-Term Quantum Computing

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### Message from the Guest Editors

Over the past few decades, the field of quantum computing and quantum information processing has witnessed significant strides in fundamental theory and hardware development. These advancements have not only facilitated groundbreaking showcases of quantum computational advantages in scientific experiments like boson sampling and cross-entropy benchmarks but have also spurred the exploration of quantum applications poised to provide practical value in near-term quantum devices.

This Special Issue focuses on the roadmap, as well as the boundary, of the pursuit of applications with practical advantages on near-term quantum computers. Papers and review articles are invited to address the following topics:

- Algorithms/applications that are suitable for near-term devices include variational algorithms and quantum machine learning;
- Error mitigation techniques;
- Optimization techniques for variational quantum algorithms;
- Classical simulation of quantum algorithms;
- Hardware-inspired design of algorithm/applications;
- Limitations of quantum algorithms for solving classical problems;
- Limitations of near-term quantum devices.





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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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