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Noisy Intermediate-Scale Quantum Technologies (NISQ)

Guest Editor:

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Message from the Guest Editor

Today we are entering the realm of so-called noisy intermediate-scale quantum (NISQ) technologies, where post-classical advantages can be realised by exploiting the small yet significant amounts of coherence and entanglement in a many-body quantum system. These machines are precursors to the coveted fully scalable and fault-tolerant quantum computer, composed of 50–300 physical qubits and to date are mostly solving sampling related problems. We expect NISQ machines to have a significant impact in areas such as quantum machine learning, artificial intelligence and most importantly the development of scalable and fault-tolerant quantum computers.

This Special Issue will bring together researchers presenting original and recent developments on NISQ technologies. In particular, authors should address challenges, which once overcome, will allow NISQ machines to serve our computational needs beyond proof-of-principle demonstrations of post-classical problems. Both algorithmic and architectural issues should be explored, in particular, the notion of specific algorithms running on compatible—perhaps even bespoke—physical hardware.



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Special Issue



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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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