



Special Issue

Quantum Walks and Related Issues

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*Deadline for manuscript
submissions:
31 October 2018*

Message from the Guest Editors

Dear Colleague,

Quantum walks have been systematically studied for over 20 years and display many distinct features that distinguish them from classical random walks. They have become of increasing interest over time due to their potential use in quantum information science, e.g., in implementation of quantum algorithms and in conducting quantum simulations of other systems. In particular, multi-particle quantum walks have been shown to be capable of universal quantum computation.

Quantum walks have been implemented in many types of physical systems, ranging from nuclear magnetic resonance and trapped atoms to linear optics. Recent research has explored walks in higher dimensions, in complex networks, and with multiple walkers, including entangled walkers. Beyond walks in position space, quantum walks in more exotic variables such as optical orbital angular momentum have been implemented.

As quantum walks grow to touch on more areas of research, a fresh perspective on the current state of the field and of research in related areas is timely. The goal of this Special Issue is to provide a guide to the field and a sampling of recent developments. This issue covers all aspects of quantum walks and their applications with special emphasis on recent work on photonic walks.

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