Special Issue

Advances in Quantum Technologies Based on Trapped Charged Particles

Message from the Guest Editor

This Special Issue will present the latest advances in the domain of ion traps and the associated quantum technologies (QTs) based on ultracold ions and molecules. Since their advent, ion traps have proven to be an invaluable instrument for modern spectroscopy, opening new pathways towards investigating atomic properties and testing quantum physics laws with unbeatable accuracy. The first quantum logic gate was achieved using trapped ions as natural qubits. Moreover, trapped ions exhibit the longest coherence times with respect to any other type of qubit, while quantum control techniques for ions are the outcome of intensive research in the area of atomic clock engineering. Optical waveguides that are integrated into a new micromachined ion-trap architecture enable the accurate control of ion qubits, excluding the need for free-space optics. Under these circumstances, the relevance of this *Photonics* Special Issue is clear; it will approach both fundamental and experimental aspects of the latest progress in ion traps and their applications.

Guest Editor

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Deadline for manuscript submissions

closed (20 July 2024)

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Photonics

an Open Access Journal by MDPI

Impact Factor 1.9
CiteScore 3.5

mdpi.com/si/178853

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Message from the Editor-in-Chief

You are invited to contribute a research article or a comprehensive review for consideration and publication in *Photonics* (ISSN 2304-6732). *Photonics* is an online open access journal covering both the fundamental and applications of optics and photonics. *Photonics* strives to provide an avenue to allow authors to disseminate their scientific findings—both theoretical/ simulations and experimental works—in highly accessible peer-reviewed journal publications. The manuscript in *Photonics* will be handled with quick turnaround production processing time. We welcome authors to submit their manuscripts for publications in *Photonics*. Our goal in *Photonics* is to enable fast dissemination of high impact works to the scientific community.

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