Special Issue

Nonlinear Optics and Optical Parametric Oscillators: From Fundamentals to Cutting-Edge Research

Message from the Guest Editor

Nonlinear optics explores intense light-matter interactions, producing phenomena like second-harmonic generation (SHG), sum-frequency generation (SFG), and parametric processes. Optical parametric oscillators (OPOs) leverage nonlinear crystals to convert pump laser energy into signal and idler waves, enabling applications in spectroscopy, quantum optics, and laser wavelength extension. Recent advances highlight Lithium Niobate-on-Insulator (LNOI) platforms for integrated nonlinear optics, including OPOs, supercontinuum generation, frequency combs, and quantum optics. Cutting-edge research also investigates topological photonics and non-Hermitian physics to control photon dynamics, paving the way for next-generation photonic devices. This Special Issue invites high-quality contributions on theoretical models, experimental techniques, and material/device advancements in nonlinear optics. Topics include (but are not limited to):

- Optical parametric oscillators
- Ultrafast & integrated photonics
- Nonlinear topological photonics
- Quantum optics & nanophotonics
- Photonic crystals, metamaterials, & biophotonics

We aim to foster innovation and novel applications in this evolving field.

Guest Editor

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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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