Special Issue

Emerging Trends in Diffractive Optics and Metasurfaces

Message from the Guest Editor

Rapid advances in nanofabrication and inverse design algorithms are redefining diffractive optics and metasurfaces, offering sub wavelength control over amplitude, phase, and polarization. This Special Issue highlights the latest breakthroughs that move the field beyond traditional diffractive elements and toward system level photonic solutions.

Key themes include, but are not limited to, the following:
1. Broadband dispersion engineered meta achromats.
2. Actively reconfigurable platforms.
3. Nonlinear and quantum metastructures.
4. Large area wafer scale fabrication (nano imprint lithography, deep UV stepper patterning, and roll to roll processing).
5. Data driven topology optimized design frameworks.
6. Lab on chip biosensing metasurfaces

Collectively, these developments are catalyzing disruptive applications in AR/VR head up displays, LiDAR, free space optical links, point of care diagnostics, and spaceborne instrumentation. By mapping both the scientific frontiers and emerging industrial pipelines, this Special Issue seeks to guide researchers toward the next wave of compact, energy efficient, and mass manufacturable photonic technologies.

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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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