Special Issue

Modern Semiconductor Lasers: From VCSELs to QCLs

Message from the Guest Editors

This Special Issue invites contributions on the latest breakthroughs in semiconductor laser technology, emphasizing advances in Vertical-Cavity Surface-Emitting Lasers (VCSELs) and Quantum Cascade Lasers (QCLs). VCSELs continue to evolve, with improvements in high-power emission, high-speed modulation, and thermal stability, broadening their applications in 3D sensing, optical communications, and LiDAR systems. Meanwhile, QCLs have emerged as leading sources across the mid-infrared and terahertz spectra, with recent work overcoming barriers in power efficiency and system integration, opening new possibilities in portable sensing, environmental detection, and biomedical imaging. This Issue also seeks studies on emerging areas such as nanoscale lasers, innovative resonator architectures, and hybrid photonic integration aimed at next-generation computing and sensing. We welcome original research and reviews that present fundamental insights and practical solutions toward high-performance, application-ready laser systems.

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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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