

Special Issue

Next-Generation Free-Space Optical Communication: Systems, Networks, and Signal Processing

Message from the Guest Editors

Free-space optical (FSO) communication has emerged as a transformative solution bridging the gap between high-capacity fiber systems and flexible wireless networks. Leveraging the vast unlicensed optical spectrum, FSO enables ultra-high-speed, low-latency, and secure data transmission across diverse environments—from terrestrial and aerial links to underwater and inter-satellite connections. Recent advances in micro/nano-photonics, adaptive optics, and intelligent signal processing have accelerated the evolution of next-generation FSO systems, addressing long-standing challenges such as turbulence-induced fading, misalignment, and dynamic link variability.

This Special Issue aims to highlight the latest breakthroughs, methodologies, and architectures that redefine the potential of optical wireless communications. We welcome original research articles and comprehensive reviews from academia and industry that explore novel system designs, hybrid FSO–RF networks, intelligent modulation and detection strategies, and advanced photonic integration for robust, scalable, and energy-efficient FSO links.

Guest Editors

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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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