# Special Issue

# Lasers and Complex System Dynamics

### Message from the Guest Editors

The field of photonics has long regarded lasers as exemplary systems for exploring nonlinear dynamics, instabilities, and coherence phenomena. However, beyond their well-known behaviors, modern laser systems increasingly exhibit features typical of complex systems: multi-scale interactions, self-organization, emergent behaviors, and sensitivity to initial or boundary conditions. These characteristics are especially prominent in high-gain systems, laser networks, coupled resonators, and light–matter interactions in structured environments. This Special Issue is dedicated to exploring the intersection between laser physics and the science of complex dynamical systems. We welcome contributions that take both theoretical and experimental perspectives, covering topics such as chaos, pattern formation, bifurcation theory, synchronization, cavity solitons, and topological photonics. By framing lasers within the broader landscape of complexity science, this issue aims to foster a multidisciplinary dialogue across nonlinear optics, applied physics, control theory, and systems engineering.

### Guest Editors

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### Deadline for manuscript submissions

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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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