Special Issue

Recent Advances in Optical Metamaterials: Numerical Methods, Modeling, and Al Techniques

Message from the Guest Editor

The field of optical metamaterials has matured beyond the initial demonstration of exotic properties, such as negative refraction and electromagnetic cloaking, into a phase focused on practical application and scalable fabrication. This evolution has been critically enabled by parallel advancements in computational electromagnetics and, more recently, the emergence of sophisticated artificial intelligence (AI) and machine learning (ML) techniques. This Special Issue aims to capture the state-of-the-art at this intersection of disciplines. We seek to highlight pioneering research that leverages advanced numerical methods, multiphysics and multi-scale modeling, and data-driven Al approaches to overcome the longstanding challenges in the design, analysis, and optimization of optical metamaterials and metasurfaces. By bringing together contributions from computational physics, photonics, and computer science, this issue will serve as a foundational reference for researchers developing the next generation of metamaterial-based devices for applications in imaging, sensing, communications, and quantum photonics.

Guest Editor

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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 peerreviewed 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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