Special Issue

Exploring the Optical Solitons in Fiber Optics: Fundamental Concepts, Computational Approaches, and Broad Applications

Message from the Guest Editors

This Special Issue aims to present cutting-edge research on soliton dynamics in various nonlinear systems, with a strong focus on fiber optics. Solitons, known for their localized and stable wave structures, play a crucial role in optical communications, nonlinear optics, and quantum field theory. This Special Issue explores the mathematical frameworks governing soliton formation, propagation, and interactions, with an emphasis on nonlinear partial differential equations (PDEs), fractional PDEs, and integro-differential equations. Topics of interest include the derivation and classification of soliton solutions, stability analysis, modulation effects, and applications in optical communication systems. By bringing together innovative studies on soliton dynamics, this Special Issue aims to advance our understanding of nonlinear wave phenomena and foster new theoretical and practical breakthroughs in fiber optics and related fields. Researchers from diverse backgrounds, including applied mathematics, physics, and engineering, are encouraged to contribute their findings and insights.

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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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