

Special Issue

Mathematical Approaches to Optical Network Design and Optimization

Message from the Guest Editor

The demand for network traffic is driven by bandwidth-intensive applications like cloud computing and conferencing. The expansion of 5G/6G and IoT devices—such as sensors and autonomous vehicles—accelerates this growth. Optical fiber networks serve as the backbone infrastructure. Effective network planning and optimization are crucial for managing optical networks. This Special Issue explores mathematical and AI-based techniques to address challenges, including:

- ILP and MILP models for network planning and optimization.
- Bio-inspired and machine learning techniques for network design and performance.
- Optimization of optical access, wireless optical, and backbone networks.
- AI-driven methods for performance evaluation and modeling.
- Strategies for device placement and operation.
- Advanced algorithms for routing, spectrum allocation, and sustainability.

We welcome research that advances methodologies for improving optical network efficiency, reliability, and sustainability. Researchers are encouraged to submit their latest findings.

Guest Editor

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About the Journal

Message from the Editor-in-Chief

The journal *Mathematics* publishes high-quality, refereed papers that treat both pure and applied mathematics. The journal highlights articles devoted to the mathematical treatment of questions arising in physics, chemistry, biology, statistics, finance, computer science, engineering and sociology, particularly those that stress analytical/algebraic aspects and novel problems and their solutions. One of the missions of the journal is to serve mathematicians and scientists through the prompt publication of significant advances in any branch of science and technology, and to provide a forum for the discussion of new scientific developments.

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