

*Announcing an IEEE/Optica Publishing Group
Journal of Lightwave Technology Special Issue on:*

Optical Switching for Artificial Intelligence Data Centers

As artificial intelligence (AI) data centers rapidly scale to meet the increasing demands of large-scale model training and inference, the underlying network infrastructure faces growing pressure in bandwidth, scalability, cost and energy efficiency. Optical switching technologies, benefiting from the ultra-high bandwidth and link reconfigurability, are emerging as a pivotal innovation to address the escalating interconnection and energy demands of AI data centers. In view of this, this JLT Special Issue covers topics in the field of optical switching for AI data centers, such as devices, networking, scheduling and management, and aims to provide researchers and students with the newest developments in these rapidly evolving fields. We welcome submissions that highlight recent advancements in optical switching devices and/or their application to networks and sub-networks for AI computing applications.

The scope of this special issue includes, but is not limited to, the following:

- Advanced optical switching devices and technologies
- Co-packaged optics and co-packaged optical switching
- Hybrid electro-optical switching and cooperative scheduling
- Intelligent control and management for optical data planes
- Hardware-software co-design for AI-centric applications
- Optical switching support for multicast and collective communications
- Application of optical switching in ultra-large-scale AI cluster interconnects
- Optical switching architecture design for AI workloads
- Reconfigurable data center networking based on optical switching
- Fault recovery and reliability assurance mechanisms for optical switching networks
- Low-latency and lossless optical switching networks
- Optical switching resource allocation and task scheduling algorithms
- Energy consumption modeling and optimization for optical switching networks
- Potential of novel fibers and hollow-core fibers in optical switching networks
- Advanced modulation formats and coherent technologies for optical switching
- Digital twins and AI-driven operations for optical switching systems
- The role of optical switching in interconnecting heterogeneous computing resources
- Security and quantum encryption integration in optical switching networks
- Cost, scalability, and commercialization path analysis for optical switching technologies
- Standardization, interoperability, and industry ecosystem for optical switching technologies

As Guest Editors and on behalf of the Editor-in-Chief, we encourage you to submit your work for inclusion in this special issue. Accepted papers will appear in the July 2026 hardcopy issue with accepted papers posted online in Early Access within one week of author final file upload. Mandatory page charges of \$260.00 per page are enforced for original contributions more than 7 pages and more than 10 pages for invited papers. Tutorial presenters will be invited to write articles that are up to 16 pages in length. The same mandatory fees apply to each tutorial paper more than 16 pages.

Submissions by website only: <https://iee.atyponrex.com/journal/ieee-jlt>

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Submission questions: Doug Hargis, *Journal of Lightwave Technology* d.hargis@ieee.org

Guest Editors: **Gangxiang Shen**, Soochow University, China; **Nicola Calabretta**, Eindhoven University of Technology, Netherlands; **Suresh Subramaniam**, George Washington University, USA; **Anna Tzanakaki**, National and Kapodistrian University of Athens, Greece; **Xuwei Xue**, Beijing University of Posts and Telecommunications, China

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