

# Call for Papers

## ONDM 2025

### 29th International Conference on Optical Network Design and Modelling

May 6-9, 2025 (Scuola Superiore Sant'Anna, Pisa, Italy)

<https://ondm2025.santannapisa.it/>

Following the path of previous editions, ONDM 2025 calls for contributions for cutting-edge research advances in optical network engineering spanning the user, control and/or management planes through the access, metro and core segments. The conference scope also includes the design and modelling of networks based on advanced photonic, packet transport and wireless technologies integrated with optical networks.

ONDM 2025's edition motto is: **“Gazing at future optical networks”**.

Communications networks and computing are expected to massively interact in the envisioned edge cloud continuum, unlocking the full potential of AI. In this scenario, optical networks will play a crucial role for enabling a low latency and high-capacity transport network. They will also benefit from the exploitation of computational resources to implement disaggregated network functions that could be easily upgraded and deployed and AI-based network management. However, the main challenge that shall be faced is how to get the best from both worlds.

This challenge calls for the development of novel optical network architectures and designs, based on optical network disaggregation models, exploiting and integrating new multidimensional photonic technologies, as well as adopting open and highly programmable hardware and software platforms that need to deal with ~~the~~ new spatial/band/modulation dimensions in a scalable way. The objective is to meet this challenge with improved efficiency, flexibility, availability, autonomy, security, resiliency and intelligence, while featuring real seamless integration of IP and optical layers.

The scope of the conference includes, but is not limited to, the following topics:

- Multiple vs-single optical planes in hyperscaler networks
- Multi-core/mode/fiber optical spatial division multiplexed (SDM) networks
- Multi-band optical transmission, switching and grooming
- Benchmarking the scalability of network designs
- Zero-touch network and service management at scale
- Digital twin-based management and design
- Advances in optical network modelling and optimization
- ML/AI applications in optical networks
- Routing, spectrum and spatial assignment in multi-granular (wavelength, waveband, core/mode/fibre) optical networks
- Optical network availability, resilience, survivability, security and privacy

- IP over Optical transport networks (IPoWDM)
- Designing and optimizing large QKD networks
- Quantum Networks on the road to the Quantum Internet
- Optical networks exploiting photonic integrated circuits
- Visible light communications and networks
- Photonics-based Non-terrestrial networks
- Free Space Optical communications
- Optical and wireless network convergence, including radio-over-fibre access networks and non-terrestrial networks
- Optical networks in 6G: backhaul, midhaul and fronthaul networking
- Novel optical node designs including disaggregation and open optical line systems
- Intra-/inter-data centre connectivity for cloud/edge computing
- Optical network control, management and orchestration including SDN and NFV solutions
- Transport slicing, service chaining, virtualization and multi-tenancy techniques
- Novel network telemetry and real-time monitoring technologies for optical networks
- Energy efficient management and sustainable optical networks
- Impact of the hollow-core fibre revolution in network design
- Optical networking in support of vertical industries
- Field trials and interoperability demonstrations
- Network function acceleration on Smart NICs
- In-network computing

### **Submission Instructions:**

Authors are encouraged to submit either abstract / short papers (3 pages) or full papers (up to 6 pages) in standard IEEE conference style

(<https://www.ieee.org/conferences/publishing/templates.html>),

describing original, unpublished research results, not currently under review by another conference or journal, addressing forefront research and development in the area of optical network design and modelling. IEEE ComSoc, IEEE Photonics Society, and IFIP Technical co-sponsorship in process.

Authors of 3-page papers must ensure their papers are formatted correctly (i.e., they are exactly 3 completely filled pages). Only PDF files with all fonts embedded are accepted. Authors must submit their papers electronically through the submission system (updates will follow).

### **Important Dates**

Submission deadline: January 17, 2025

Acceptance notification: March 13, 2025

Camera ready submission: April 11, 2025

Conference date: May 6-9, 2025

### **Journal Special Issue**

Selected ONDM2024 papers will be considered for publication in an archival journal. The selection criteria include the conference paper's score, novelty and impact. The extensibility of the paper with significant new material is also a key requirement for inclusion in this Special Issue. Updates will follow.

### **General Chair**

*Luca Valcarengi, Scuola Superiore Sant'Anna, Pisa, Italy*

### **TPC Co-Chairs**

*Carmen Mas-Machuca, University of the Bundeswehr Munich (UniBw), Munich, Germany.*

*Raul Munoz, CTTC, Spain*

*Andrea Sgambelluri, Scuola Superiore Sant'Anna, Pisa, Italy*