

Room A (Grand Ballroom 1), 2F

Chair: Michela Svaluto Moreolo
(Centre Tecnològic de Telecomunicacions de Catalunya)

Tu3A

June 30 (Tue), 2026

Optical Security & Distributed Computing

13:15-14:45

Tu3A-1

13:15-13:30

Securing Physical Layer of Access Networks with Optical Key Distribution

Mateusz Kucharczyk^{1,2}, Jarosław P. Turkiewicz³, Karol Kowalik⁴, Artur Stabrawa¹, Patryk Urban^{1,5}, Konrad Banaszek^{1,2}

¹Quantum Optical Technologies sp. z o.o., ²University of Warsaw, ³Warsaw University of Technology, ⁴Fiberhost S.A., ⁵West Pomeranian University of Technology

Point-to-multipoint IM/DD distribution of cryptographic keys is presented as a security measure for passive optical networks. A proof-of-principle demonstration in a model 64- user configuration achieved key rates exceeding 100 Mb/s.

Tu3A-2

13:30-13:45

Two-Layer Chaotic Encryption for Alamouti-Coded Simplified Coherent Systems

Xiaoqian Liu, Jifan Yin, Chun-Kit Chan
The Chinese University of Hong Kong

We propose a two-layer chaotic encryption scheme for Alamouti-coded simplified coherent systems by integrating chaotic mapping and coding. 25-Gbaud secure transmission over 100-km fiber is simulated without performance penalty, achieving a 2^{159} key space.

Tu3A-3

13:45-14:00

Optical-Switching-Based Memory Sharing for High-Bandwidth Distributed Computing

Qishen Liang¹, Bin Zhang^{1,2}, Zichao Zhao¹, Lingzhi Yuan¹, Baojie Hou¹, Haoran Ma¹, Yongdi Zhang¹, Bangmin Gong¹, Huihui Zhu¹, Yuehai Wang¹, Jianyi Yang^{1,3}

¹Zhejiang University, ²Zhejiang Lab, ³Jinhua Institute of Zhejiang University

We propose an optical-switching-based memory sharing scheme for distributed computing. Experimental FPGA-based validation using silicon-integrated HSS switches demonstrates a 66% latency reduction in matrix multiplication, offering a scalable high-performance architecture.

Tu3A-4

14:00-14:15

Deployment of AI Workflows over Multi-Cluster Distributed Computing Infrastructures

Salvatore Spadaro, Albert Pagès, Enric Guasch, Fernando Agraz
Universitat Politècnica de Catalunya

Supporting data-intensive AI workflows across multicluster computing infrastructures requires high performance networking. This work develops a Machine Learning agent to accurately estimate network end-to-end latency, assuring network solutions match the rigorous AI workflows requirements.

Tu3A-5 Invited

14:15-14:45

Metro/Access Converged Network Technology

Shin Kaneko, Jun-ichi Kani, Tatsuya Shimada
NTT, inc.

This invited talk addresses driving forces for metro/access convergence, and reviews progress in research regarding extending dense-wavelength-divisionmultiplexing-based metro networks to access areas from the perspectives of end-to-end client-signal optical transmission and remote-control-and-management of optical-path endpoints.