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IEEE Photonics Society ITALY CHAPTER

PIX Europe Advanced Photonic Integrated Circuits

Photonic technologies for AI infrastructures and optical wireless communications

February 18th, 11:00 – 12:30

Aula Beta (Ed. 24), Politecnico di Milano (Campus Leonardo)

(link for online attendance)

Chair: **Francesco Morichetti,** Politecnico di Milano

11:00-11:45 High Speed Optical Interconnects for AI infrastructure
Prof. Oskars Ozoliņš, Riga Technical University

Abstract: The increasing computational demands of AI systems require optical interconnects that provide higher bandwidth density, lower energy per bit, and scalable manufacturability. This talk will review recent advances in high-speed optical I/O technologies, with particular focus on next-generation modulator platforms that underpin these interconnects. Silicon photonics highlight their respective advantages for AI-driven performance targets. Emphasis will be placed on system-level experiments, electro-optic optimization, the role of wafer-level characterization, and the integration challenges that must be overcome to support the future scale of AI interconnect architectures.

Tenured Full Professor **Oskars Ozoliņš**, Riga Technical University (RTU) received the Dr.sc.ing degree in optical communications from RTU, Latvia in 2013 (have spent 3 months during 2012 in DTU under Prof. Christophe Peucheret supervision) and habilitation degree (Docent) from KTH Royal Institute of Technology, Sweden in 2021. O. Ozoliņš is a full member (Academician) of the Latvian Academy of Sciences. O. Ozoliņš is coholder of eleven world records reported at top conference post-deadline sessions. He is the author of around 300 international journal publications (including two Nature Communications articles), conference contributions, invited talks (70+), patents (10+), and book chapters. O. Ozoliņš was a TPC member of the ECOC 2022, 2024-2026 and OFC 2023 – 2025. He is senior member of OPTICA and IEEE.

11:45-12:30 Free-Space Optical Beamforming for Fi-Wi-Fi Scenarios and Commodity QKD
Dr. Bernhard Schrenk, AIT Austrian Institute of Technology

Abstract: Optical wireless communication is touted as one important contributor to establish a seamless communication-computing continuum within 6G networks – our future communication infrastructure that expands towards a highly heterogeneous landscape that will eventually fuse communication, sensing and quantum technologies. Towards that, key enablers such as optical beamforming will be addressed, with the aim to establish Fi-Wi-Fi bridges for extending the fiber-grade connectivity in fiber-scarce environments, as well as to serve as optical hotspots for solarblind quantum key exchange for handheld smartphone-like applications in the commodity segment.

Bernhard Schrenk is senior scientist at the AIT Austrian Institute of Technology. Prior to his PhD study at UPC Barcelona, he was at the Institute of Experimental Physics of Nobel laureate Prof. A. Zeilinger, where he was involved in the realization of a first commercial prototype for a quantum cryptography system. After a post-doc year at NTUA in Athens, he established his own research group on photonic communications at AIT. He has (co-)authored ~260 publications and has served as TPC member for the OFC and ECOC conferences. His excellent work is recognized by being awarded with ERC Starting and Proof-of-Concept Grants.