ICFO

INSIGHT SEMINAR: The future of optical communications is massively parallel (and non-quantum)

PETER J. WINZER

September 27, 2024
12:00 to 13:00
Seminar Room

BIO:

Peter J. Winzer received his Ph.D. in electrical engineering from the Technical University of Vienna, Austria, and from 2000 through 2019 worked at Bell Labs in NJ, where he performed research on fiber-optic communication systems and networks, set multiple high-speed optical transmission records, and substantially contributed to optical communications products used in all commercial optical fiber networks today. Following his work on classical Shannon and quantum Gordon-Holevo capacities for optical fiber channels, he pioneered space-division multiplexing (SDM) to scale optical transport systems. In 2020 he founded the VC-funded start-up Nubis Communications, where he currently acts as CTO. Dr. Winzer has widely published and patented and is actively involved with the IEEE and with Optica. He

served as Editor-in-Chief of the Journal of Lightwave Technology (2013 to 2018), was Program Chair of ECOC 2009, and Program/General Chair of OFC 2015/2017. A Highly Cited Researcher, Bell Labs Fellow, Fellow of the IEEE, Optica, and the US National Academy of Inventors, and an elected member of the US National Academy of Engineering, he received multiple recognitions for his work, including the John Tyndall Award and an Honorary Doctorate from the Technical University of Eindhoven.

ABSTRACT:

Over the past decade, high-speed communications technologies have reached severe scalability limits, from short-reach electrical chip-to-chip interconnects to ultra-long-haul subsea optical fiber cables. While these scalability limits have different origins ranging from saturating high-speed electronics bit rates, to systems approaching fiber Shannon capacities, to energy density/distribution limits, there seems to be only a single long-term viable solution that is common to economically overcome all these limits: massively integrated spatial parallelism using advanced (and inherently classical) electrical and optical communications. In reviewing the communications systems solution space, we will also discuss why quantu technologies are not part of practical communications applications, neither for capacity or for security.

Hosted by: Prof. Dr. Juan P. Torres