

Speaker Karlsruhe Days of Optics & Photonics 2023



Abstract: Cryogenic Hybrid Photonics for Optical Communications, Sensing and Quantum Applications

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This talk explores the growing demand for low-noise readout of weak microwave signals in diverse applications such as cryogenic environments, high-field magnetic resonance, and precision timing distribution in large accelerator facilities. To address these challenges, highly efficient electro-optic (EO) modulators are being investigated. The Silicon-Organic Hybrid (SOH) platform emerges as a promising candidate, capitalizing on well-established silicon

integrated photonics through standard CMOS fabrication processes, while harnessing the electro-optically active properties of organic materials that can be locally applied to silicon photonic (SiP) devices. This presentation highlights recent advancements in SOH modulator technology and delves into their potential applications, particularly focusing on cryogenic electro-optic readout of microwaves.

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Biography:

He received the B.Sc. and M.S. degrees in applied physics and mathematics from the Moscow Institute of Physics and Technology (MIPT) in 2005 and 2007, and the Ph.D. degree in physics from the Kotelnikov Institute of Radio-engineering and Electronics (IRE), Moscow, in 2011. From 2013 he is with the Karlsruhe Institute of Technology His research interests included the development of sensitive superconducting transition-edge sensors (TES) and hot-electron-bolometer mixers for terahertz applications, ultrafast THz detectors from high-temperature superconductors to study coherent synchrotron radiation, superconducting nanowire single-photon detectors (SNSPD) for the optical and infrared range and application of superconducting resonators. In 2023 he joined Institute of Microstructure Technology and Institute of Photonics and Quantum Electronics. His current research interests are cryogenic photonics and electro-optic devices.