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IAPME Seminar

Meta-Optics Empowered Terahertz Devices

4 December 2025

Prof. Quan XU
Tianjin University
Venue: N23-4018
Time: 10:00 - 11:00
Hosted by: Prof. Hongchao LIU

Abstract

Terahertz waves, situated between infrared and microwave regions in the electromagnetic spectrum, exhibit significant application value in security screening, radar systems, and particularly next-generation wireless communications (6G). Consequently, research on terahertz science and technology has flourished since the early 21st century. During the same period, meta-optics—an approach leveraging subwavelength artificial microstructures to tailor electromagnetic responses—has undergone rapid development. The convergence of these fields provides an unprecedented platform for designing terahertz functional devices. This presentation will introduce terahertz functional devices based on meta-optics, focusing on two key aspects: 1）Free-space terahertz wave manipulation devices, including waveplates, lenses, gratings, and holographic plates; 2) On-chip devices bridging free-space terahertz waves to on-chip integrated optoelectronic systems. These devices, characterized by compact structures and on-demand multifunctional integration, hold significant potential to propel 6G communications development from the bottom up.

Biography

Prof. XU is currently an Associate Professor at the School of Precision Instruments and Optoelectronics Engineering, Tianjin University. He obtained his Ph.D. degree from Tianjin University in 2019, during which he conducted research visits to King Abdullah University of Science and Technology in Saudi Arabia and the University of Birmingham in the UK. His research focuses on terahertz photonics and terahertz meta-devices. Currently, he serves as a Youth Editorial Board Member for Research and Infrared and Laser Engineering.

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