



复旦大学物理系 物质科学报告

Time: 2:00pm, Tuesday, 2019.12.10

Location: Room C108, Jiangwan Physics Building

Title: **Nanoscale manipulation of optical orbital angular momentum**

Speaker: **Min Gu**

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Abstract: Research in photonics has transformed the society in every sector of our life due to the capability of the nanoscale manipulation of light in multiple physical dimensions. Optical multiplexing — a technique in which multiple individual optical signals encoded in physical dimensions of light, including time, space, wavelength, polarization and angular momentum, are processed in parallel — has played an indispensable role in information optics. The possibility of manipulation of optical angular momentum at the nanoscale is of crucial importance for both fundamental research and many emerging applications. However, it is still fundamentally challenging to achieve on-chip angular momentum multiplexing due to the extrinsic nature of orbital angular momentum associated with a helical wavefront. Here we present an entirely new concept of nanophotonic multiplexing of orbital angular momentum through the nonresonant angular momentum mode-sorting sensitivity by nanoring slit waveguides on tightly-confined plasmonic angular momentum modes, leading to on-chip angular momentum multiplexing of ultra-broadband light. Multiplexing of orbital angular momentum provides a horizon for high-capacity nanoscale information optics in telecommunications, quantum information processing, chemical sensing, display, metrology and holography.



Professor Gu is Executive Chancellor of the University Council and Distinguished Professor of University of Shanghai for Science and Technology. He was Distinguished Professor and Associate Deputy Vice-Chancellor at RMIT University and a Laureate Fellow of the Australian Research Council. He is an author of four standard reference books and has over 500 publications in nano/biophotonics. He is an elected Fellow of the Australian Academy of Science and the Australian Academy of Technological Sciences and Engineering as well as Foreign Fellow of the Chinese Academy of Engineering. He is also an elected fellow of the AIP, the OSA, the SPIE, the InstP, and the IEEE. He was President of the International Society of Optics within Life Sciences, Vice President of the Board of the International Commission for Optics (ICO) and a Director of the Board of the Optical Society of America.