
Ray-wave coupling structured light and its applications

Tsinghua University, China

Xing Fu

Email: fuxing@tsinghua.edu.cn

Structured light with customized topological patterns inspires diverse classical and quantum investigations. In recent years, a class of exotic structured optical fields termed ray-wave coupling structured light has attracted much attention, whereby crafted spatial modes appear to be both wave-like and ray-like. The ray-wave duality, which arises from the coupling of the geometric ray trajectory with the wave function, has unveiled several new controllable degrees of freedom (DoFs) such as sub-beam optical angular momentum (OAM), coherent-state phase, and astigmatic degree. In this talk, I will introduce our research progress on ray-wave coupling structured light, including the efficient tailoring, detection, and manipulation methods, as well as its applications of information multiplexing and quantum-classical analogy.



Short Bio:

Xing Fu received his PhD degree in Optical Engineering from Tsinghua University, China. He is a tenured Associate Professor of Tsinghua University, and his research interests include optical field manipulation, single-photon detection, and solid-state laser. He has undertaken more than 10 national-level projects, and has published over 100 papers in peer-reviewed journals including *Light: Science & Applications*, *Nature Communications*, and *Photonix*, with several papers selected as ESI hot paper, and outstanding scientific paper of China Association for Science and Technology. He is the recipient of Dimitris N. Chorafas Prize and Wangdaheng Optics Award. He serves as the deputy director of State Key Laboratory of Precision Space-time Information Sensing Technology, and Key Laboratory of Photonic Control Technology, Ministry of Education, as well as special committee member of Chinese Optical Society and Chinese Society for Optical Engineering.