



From probing quantum materials to in vivo imaging of animals with Quantitative Phase Microscopy



Prof Renjie ZHOU

Associate Professor
Department of Biomedical Engineering
The Chinese University of Hong Kong (CUHK)

Date: 16 September 2026 (Wed)

Time: 10:00 – 11:00 am

Venue: Room 1122, William M.W. Mong Engineering Building, CUHK

Abstract

Quantitative phase microscopy (QPM) is a label-free imaging technique that has recently gained popularity in biomedical imaging and material metrology. At CUHK, Dr. Renjie Zhou and his research team focus on innovating QPM and addressing associated key technical challenges, including: (i) pushing measurement sensitivity to sub-angstrom levels and beyond to detect subtle electronic behaviors; (ii) achieving millimeter-scale imaging depth to enable in vivo imaging of thick tissues; and (iii) accelerating both imaging and processing speeds to enable the real-time analysis of millions of cells. In this talk, he will first present the recent developments in QPM and demonstrate their applications in many important fields, including atomic manufacturing, brain research, in vitro fertilization, in vivo imaging, etc. He will then outline our future research directions, where they will continue to advance measurement accuracy, imaging depth, and processing speed to meet user demands in material metrology and biomedical studies. Meanwhile, they will tackle several ambitious application areas, including whole-brain imaging and in situ metrology for integrated circuit fabrication, supported by InnoHK, RGC, NSFC, etc. Finally, he will share his experiences in technology transfer, education, and service.

Biography

Dr. Renjie Zhou received his PhD in Electrical and Computer Engineering from the University of Illinois at Urbana-Champaign in 2014, followed by postdoctoral training at the George R. Harrison Spectroscopy Lab at MIT, before joining CUHK in 2017. He is currently an Associate Professor in the Department of Biomedical Engineering which he co-founded. He directs the Laser Metrology and Biomedicine Lab that focuses on innovating Quantitative Phase Microscopy (QPM) and demonstrating its practical impact. At CUHK, he received the Croucher Innovation Awards, the Research Impact Fund and the Research Fellow Scheme from RGC, the Excellent Young Scientists Fund from NSFC, etc. As Principal Investigator/Co-leader, he has secured 18 competitive external grants, awards, and research contracts. He has demonstrated the impact of QPM by publishing over 90 journal and conference papers, filing more than 15 patents, and commercializing QPM technologies through his startup, Bay Jay Ray (BJR). BJR was named one of the Top 100 Investment-Worthy Startups by Forbes China (2025), won 2nd Prize at the HICOOL 2025 Global Entrepreneur Summit, and has deployed products at the BGI Group, the Chinese Academy of Sciences, etc. Dr. Zhou's contributions to CUHK and the broader academic community include organizing 18 conferences and symposiums as co-chair; delivering 47 invited/keynote conference talks, and 1 plenary talk; and serving on the editorial boards of Photonics Research and IEEE Photonics Technology Letters. Dr. Zhou is a Fellow of SPIE, a member of the Hong Kong Young Academy of Sciences, and the Chair of the IEEE Photonics Society Hong Kong Chapter (2026–2028). He served as Assistant Dean (Research) of the Faculty of Engineering (2023–2024).

**** ALL ARE WELCOME ****

Enquires: Ms. Kitty CHUNG 3943-8261