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报告题目	Feature-domain phase retrieval for computational microscopy			
个人简介	Liangcai Cao received his BS/MS and PhD degrees from Harbin Institute of Technology and Tsinghua University, in 1999/2001 and 2005, respectively. Then he became an assistant professor at the Department of Precision Instruments, Tsinghua University. He is now tenured professor and director of the Institute of Opto-electronic Engineering, Tsinghua University. He was a visiting scholar at UC Santa Cruz and MIT in 2009 and 2014, respectively. His research interests are holographic imaging and holographic display. He is a Fellow of the Optica and the SPIE.			
报告摘要	Phase retrieval serves as a core technique in computational imaging, yet conventional idealized models often yield unsatisfactory reconstruction in practical applications. Critical image features, including edges, textures, and structural patterns, maintain remarkable stability across various image transformations and degradations. We developed Feature-Domain Phase Retrieval (FD-PR), an approach that formulates the wavefront reconstruction loss function based on these stable features rather than spatial pixels. The resolution and quality of the reconstruction are greatly improved in the experiments of coded ptychography, Fourier ptychography, in-line holography, and aberration-correction imaging. The framework can benefit a wide range of computational microscopy techniques, such as X-ray ptychography, diffraction tomography, and wavefront shaping. ( <i>Advanced Science</i> 2025, <i>Photonics Research</i> 2025)			