

Spatiotemporal Hologram: from Concept to Experimental Realization and Applications

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The rapid advancement of spatiotemporal light field manipulation in recent years has garnered significant attention from researchers. This talk will introduce the concept of spatiotemporal hologram recently proposed by my group that enables precise joint control of the amplitude and phase of light fields in both space and time. By drawing an analogy with the computer generated holography in the spatial domain, we experimentally realize spatiotemporal hologram and generate a series of previously unimaginable spatiotemporal optical wave packets. The generation of several novel spatiotemporal optical wavepackets, including perfect spatiotemporal optical vortex, spatiotemporal Laguerre–Gaussian and Hermite–Gaussian modes, spatiotemporal tophat fields and spherical harmonic localized wavepackets will be shown to illustrate the power of this technique. Finally, future perspective of further developments and applications of this technology will be presented.

Short Bio:



Qiwen Zhan is Distinguished Chair Professor in Nanophotonics at the University of Shanghai for Science and Technology and founder of the Center for Complex Optical Fields and Meta-Optics Structures (COSMOS). He received B.S. in Physics (optoelectronic) from the University of Science and Technology of China (USTC) in 1996 and Ph.D. in Electrical Engineering from the University of Minnesota in 2002. From 2002 to 2020, he held tenured faculty position in the Department of Electro-Optics and Photonics at the University of Dayton, USA. He is Associate Editor for Science Bulletin, Associate Editor-in-Chief for PhotoniX, Associate Editor for Advanced Photonics, Deputy Editor for Optics Express, Senior Member of the IEEE, Fellow of Optica and Fellow of the SPIE.