

Spatial Imaging and Sensing with Correlated Biphotons

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Spatially entangled photon pairs offer direct access to the structure and evolution of high-dimensional quantum states. In this talk, I will discuss recent advances in the measurement and exploitation of biphoton spatial correlations, including quantum phase imaging, imaging through scattering media, and the observation of propagation-induced distortions arising from birefringence and free-space diffraction. These results demonstrate how the spatial degrees of freedom of entangled photons can be used both to probe fundamental aspects of quantum propagation and to develop new imaging and sensing techniques beyond the reach of conventional optical methods. The combination of entanglement, spatially resolved coincidence detection, and modern single-photon cameras is opening new opportunities for quantum-enhanced microscopy, wavefront sensing, and imaging in complex environments.

References

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