Contribution ID: **349** Type: **Oral Presentation**

Using a synthesised wavelength to non-locally probe the depth of objects

Thursday 10 July 2025 12:10 (15 minutes)

Quantum ghost imaging (QGI) makes use of a pair of quantum entangled photons whereby one interacts with an object while spatial projective measurements are performed on the other. Using the correlated detections of the entangled photons, the transverse spatial profile of the object can be retrieved. QGI has recently been used to retrieve phase information of a field, however the depth profile of objects with heights which are orders of magnitude larger than the wavelength of the photons could not be achieved. In this presentation we will be learning how to probe an object with two diCerent wavelengths to obtain its depth profile using QGI, the depth profile of the object is not resolvable with either of the wavelengths individually.

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Session Classification: Photonics

Track Classification: Track C - Photonics