

Quantum Technology Lecture Series

## Entangled imaging

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### Abstract

Ghost imaging was first demonstrated in the 1990s by Shih and co-workers using entangled photon pairs created by parametric down-conversion to obtain an image using photons that have never interacted with the object.

In a typical ghost-imaging configuration, the down-converted photons are directed into two separate optical arms. The object is placed in one arm and a single-pixel “heralding” detector detects the photons transmitted through this object. The signal from this detector triggers a camera positioned in the other arm, which then detects the spatial position of the correlated photon. The image can only be recovered from the coincidence detection of the two photons.

Such techniques, combined with standard image processing algorithms enable images to be obtained from fewer than one recorded photon per pixel.



### Short biography

**Miles Padgett** holds the Kelvin Chair of Natural Philosophy at the University of Glasgow. He is fascinated by light, both classical and quantum - specifically light's momentum.

In 2001 he was elected to Fellowship of the Royal Society of Edinburgh and in 2014 the Royal Society, the UK's National Academy.

In 2009, with Les Allen, he won the IoP Young Medal, in 2014 the RSE Kelvin Medal in 2015 the Science of Light Prize from the EPS and in 2017 the Max Born Award of the OSA.

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