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Quantum Imaging Technologies Using Single Photon Detectors

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Technology at the quantum limit promises significant advances in computing, communication, sensing and metrology, and imaging. The UK and many other countries around the world have recently provided significant investment in the development and realisation of such technologies. In this talk, I will discuss the UK's quantum technology landscape and highlight my group's activities in applied and fundamental quantum science, specifically focussing on advances in communication, imaging, and metrology. Much of our work relies on the detection of single photons via single-photon detectors, either in single-point or array formats. Such detectors enable unprecedented sensitivity to light and allow precise detection of arrival times, down to picosecond timescales. This is the key enabling feature that allows us to see around corners, detect objects through scattering media, and generate entanglement between photons that have never interacted. Our work highlights the progress in single-photon detection technologies and showcases a range of applied and fundamental applications of the science.

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