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Studying the lower limit of human vision with a single-photon source REBECCA HOLMES, BRADLEY CHRISTENSEN, WHITNEY STREET, RANXIAO WANG, PAUL KWIAT, University of Illinois — Humans can detect a visual stimulus of just a few photons. Exactly how few is not known—psychological and physiological research have suggested that the detection threshold may be as low as one photon, but the question has never been directly tested. Using a source of heralded single photons based on spontaneous parametric downconversion, we can directly characterize the lower limit of vision. This system can also be used to study temporal and spatial integration in the visual system, and to study visual attention with EEG. We may eventually even be able to investigate how human observers perceive quantum effects such as superposition and entanglement. Our progress and some preliminary results will be discussed.

Rebecca Holmes
University of Illinois

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