

# Photon super-bunching from a generic tunnel junction

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Generating correlated photon pairs at the nanoscale is a prerequisite to creating highly integrated optoelectronic circuits that perform quantum computing tasks based on heralded single-photons. Here we demonstrate fulfilling this requirement with a generic tip-surface metal junction. When the junction is luminescing under DC bias, inelastic tunneling events of single electrons produce a stream of visible photons of plasmonic origin whose super-bunching index is 17 when measured with a 53 picosecond instrumental resolution limit. The effect is electrically rather than optically driven – absent are pulsed lasers, down-conversions, and four-wave mixing schemes. This discovery has immediate and profound implications for quantum optics and cryptography, notwithstanding its fundamental importance to basic science and its ushering in of heralded photon experiments on the nanometer scale.