A Miniaturized 4 K Platform for Superconducting Infrared Photon Counting Detectors

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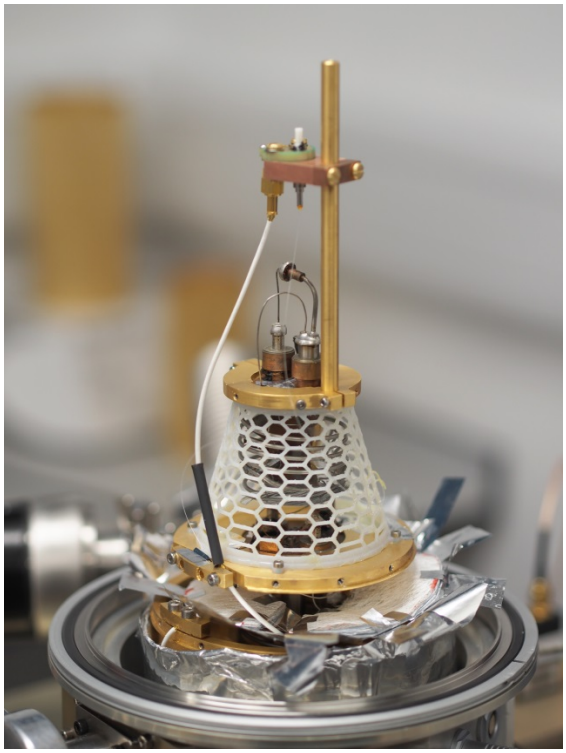
October 11, 2017 (HP127, STH611). Detecting single quanta of light - single photons – is extremely challenging, requiring detectors with exquisite sensitivity. Single-photon detectors based on superconducting nanowires have emerged as the gold standard for infrared photon counting, enabling ground-breaking studies in quantum optics, space-to-ground communication and long range remote sensing. These sought after devices operate just a few degrees above absolute zero; such low temperatures are challenging to achieve outside of the research laboratory. Researchers at the University of Glasgow and Rutherford Appleton Laboratory UK have adapted a miniaturized cooler first developed for the European Space Agency Planck mission to house a fibre-optic coupled superconducting detector, provided by the Dutch start-up Single Quantum BV. They have used this compact platform to carry out a range of compelling infrared photon counting demonstrations, including time-of-flight ranging and dose monitoring for laser cancer treatment. These results are reported in a Letter to the Journal *Superconductor Science and Technology*. Editor-in-Chief Dr Cathy Foley of CSIRO Australia explains 'This is a very exciting report and a genuine breakthrough. This work shows that advances in cryogenic engineering will enable superconducting quantum technologies to have decisive impact in a host of real-world applications.'

Superconductor Science and Technology Letter

http://iopscience.iop.org/article/10.1088/1361-6668/aa8ac7/meta



Pictured: *A superconducting single photon detector mounted in the miniaturized cooler.*