



# QUANTIC

The UK Quantum Technology Hub  
in Quantum Enhanced Imaging



## MAKING THE INVISIBLE, VISIBLE

Our mission is to connect world-leading scientists across UK universities with pioneering industry leaders to accelerate quantum innovation in imaging.

[www.quantum.ac.uk](http://www.quantum.ac.uk)

## OUR TECHNOLOGIES

QuantIC aims to commercialise world-leading imaging research to pioneer a family of cameras operating across a range of wavelengths, timescales and length-scales, creating a new industrial landscape for imaging systems and their applications.

We combine single photon sensing with nonlinear optics, computational methods, and a range of specialised detectors to advance imaging technology.

Find out more



## QUANTIC COMPONENTS

### QuantICam SPAD's

QuantIC has developed a range of world leading Complementary Metal-Oxide Semiconductor (CMOS) Single Photon Avalanche Diode (SPAD) image sensors. These sensors offer incredible light sensitivity and high precision timing.

### Ge on Si SPAD

Germanium on Silicon research at QuantIC extends sensitivity to the short-wave infrared whilst using the well-established Silicon supply chain, offering extremely low-cost, but highly advanced solutions. Ge on Si offers significantly enhanced performance and a wider spectral range than standard Silicon based SPADs in applications such as telecommunications and lidar.

### Superconducting single photon detectors

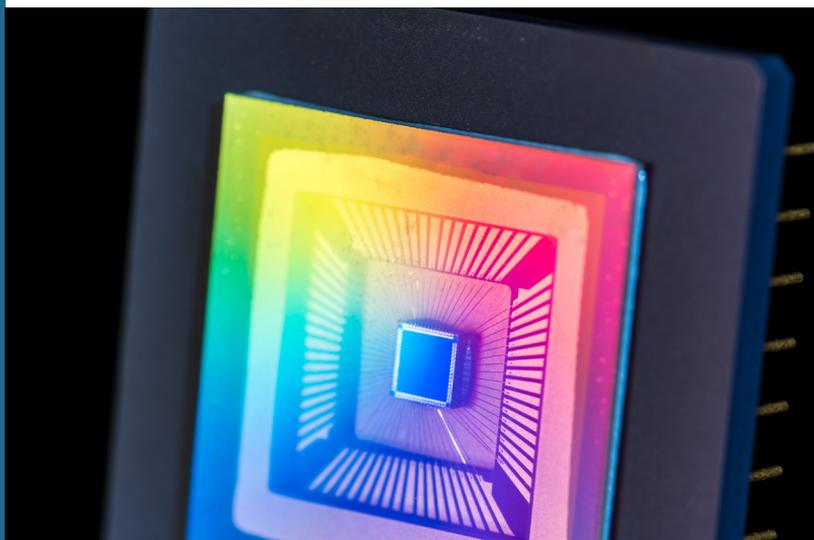
QuantIC has begun formulated superconducting detection for infrared applications that may prove pivotal in high value applications such as flagship satellite imaging, nuclear reactor monitoring, and scientific research. QuantIC's maturing of superconducting technology has opened prospects for scalability, as the size and cost of these system rapidly reduce.

### IndiPix

IndiPix™ is a mid-infrared imaging platform based on a new indium antimonide pixel technology that uses a monolithic construction. This allows IndiPix to reproduce highly expensive mid-infrared capabilities for a fraction of the cost and offers new applications in biological imaging, gas detection, security and sensing.

### Mosaic filters

Mosaic filters provide imaging systems with multi-colour outputs, enabling far greater capabilities to contrast, sort, and identify features of interest. The filters form a set of tiled patterns, where each tile set allows a specific wavelength to be captured by the camera. Mosaic filters may be used to enhance a number of low-light-level imaging applications such as lidar-based 3D imaging, low-light-level color passive imaging, or fluorescence lifetime imaging.



# IMAGING THE FUTURE

Working with industry partners QuantIC has developed a range of applications and active demonstrators which exhibit these next-generation technologies. We are partnered with industry, and government bodies across the following sectors:

## Healthcare and life science

QuantIC seeks to expand its contributions in biomedical imaging.

We are developing new optical cameras that could replace modern-day MRI and endoscopy equipment, and detect subtle differences in biological materials advancing tumor detection. More speculative work is combining single photon detection with machine learning to image through the body.

## Climate change

To tackle Climate Change, it is necessary for both industry and government organisations to have accurate, widespread access to monitoring solutions that can show the emissions, condition, and sustainability of our society.

QuantIC researchers have developed a range of quantum solutions that address major areas of climate impact. These include seeing gas emissions such as methane and hydrogen, structural health monitoring within challenging environments, and enabling better product longevity and recycling capabilities through new spectral imaging for material sorting and quality control.

## Transport

Quantum imaging offers intelligent, and dynamic approaches for improving the safety, efficiency, and security of our transport networks, whilst reducing its impact on the environment, and budgets.

QuantIC cameras can track objects around corners or through hard-to-see heavy rain, snow and fog. These technologies provide cities with improved traffic management, safer roads, more reliable public services, and usher a new era of autonomous vehicles. Quantum imaging research has simultaneously improved our capacity to manage the urban environment through crowd monitoring, remote scanning and emission level monitoring.

## Defence and security

QuantIC are developing a range of cameras and sensors that will advance surveillance, navigation, and threat detection across defence and security settings. Quantum effects allow us to surpass conventional limits to reduce image noise or enhance image resolution - enabling covert surveillance from greater distances keeping us ahead of threats.

Quantum imaging can also provide an alternative approach to navigation informing location without reference to satellites. This allows organisations using quantum technology systems to remain effective under restrictive environments, improving covert activities, data-security, and resilience to electronic and cyber-warfare attacks.

## Space communications

Satellites and low orbit technology are vital for a wide range of terrestrial applications, from communications and weather system tracking to navigation and earth observation.

QuantIC's researchers produce high value components in small packages, enabling quantum solutions to be deployed in nanosatellites. These technologies take advantage of next-generation low power consumption, minimal background interference, and high sensitivity.



## WORK WITH US

QuantIC's research programme is accessible to industry and new academic research groups through a £4M Partnership Resource Fund.

This collaborative fund offers an easy access, low-risk, mechanism for QuantIC to integrate with industrial products and processes, form new quantum technology based ventures, and address large-scale industrial challenges through novel quantum approaches.

To discuss how QuantIC research in imaging and sensing can have an impact on your company contact our Business Development Team today:

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