QUANTIC

The UK Quantum Technology Hub
in Quantum Enhanced Imaging

# Ultra sensitive infrared microscopy

QUANTIC

The UK Quantum Technology Hub in Quantum Enhanced Imaging

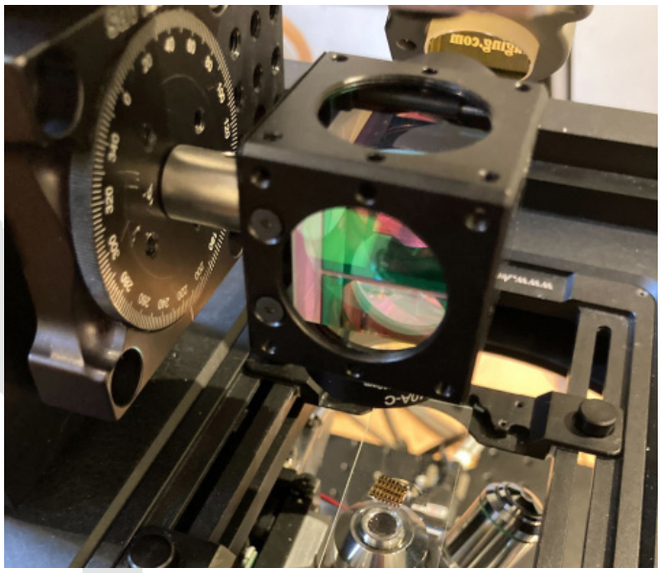
# Ultra-sensitive infrared microscopy

Microscopes rely upon digital cameras to record images. In the short-wave infrared these cameras are noisy, meaning the light source needs to be bright to record high quality image. However, the brightness of the lights source may damage the sample.

QuantIC has used homodyne techniques to improve the sensitive of the microscope by 100 times, requiring only one photon per pixel per frame to record an image. This homodyne technique is like that used in a radio receiver where the weak transmitted signal can be made detectable by mixing it with a more powerful oscillator. Homodyne techniques are used in optical sensing and here we are applying it to imaging where each small group of pixels is acting as a separate receiver.

Short-wave infrared (SWIR) microscopy has several applications in both material instrumentation and life sciences. For example, silicon-based components are opaque in visible light but transparent in the SWIR can therefore be inspected without having to disassemble them.

In biological sciences at SWIR microscope can be used for imaging SWIR emitting markers or assessing the water content of tissue samples. Techniques are used in optical sensing and here we are applying it to imaging where each small group of pixels is acting as a separate receiver.



For more info please contact:

**Christopher.Payne-Dwyer@glasgow.ac.uk**
Business Development Manager

**Miles.Padgett@glasgow.ac.uk**
Project Research Lead

Funded by

UKRI Engineering and Physical Sciences Research Council

University of Glasgow