

Infrared microscope

Contact: Val Zwiller, zwiller@kth.se, Quantum Nanophotonics, Albanova, KTH

In this project you will develop a new optical microscope to collect light from single dopants and single defects that emit light in the infrared. By studying new materials in the infrared such as high bandgap materials (SiC, GaN) and 2D materials (hBN), precious information on material quality and on emission characteristics can be obtained. You will design and start assembling a new microscope optimized for single photon studies able to record 3D maps of single photon sources including their emission lifetimes.

You will be able to work on optical design, coding, assembly of the system or on optical measurements on new semiconductor materials.



Figure 1. A commercial optical microscope for the infrared. The system you will design will also include a single photon detector to count the number of photons and measure the precise lifetime of the dopants and defects to identify and characterize new materials.