# Project Mol.Bioeng./POL

# Quantum Enhanced Deep Tissue Imaging

*(Also available as master thesis)*

## Motivation

*Background:*
While deep tissue imaging with near-infrared and infrared wavelengths is strongly desired in biological and medical applications, its realization is difficult due to ineffizient detectors in this area of the electromagnetic spectrum. Recent developments in quantum technolgies and in particular the use of entangled photons open a way to probe biological samples in the infrared range while detecting photons efficiently in the visible spectrum. However, the resulting imaging contrast resulting from absorption and phase changes needs to be interpreted with care.

Scope:
In this project, students will apply an existing quantum imaging microscope for deep tissue studies of well known samples. The gained information will be discussed with respect to resolution, contrast and biological applicability. Image correlation will be part of the software assisted analysis routine.



entangled photons

Sample

NIR/MIR light: only illumination

VIS light: only detection

CAM
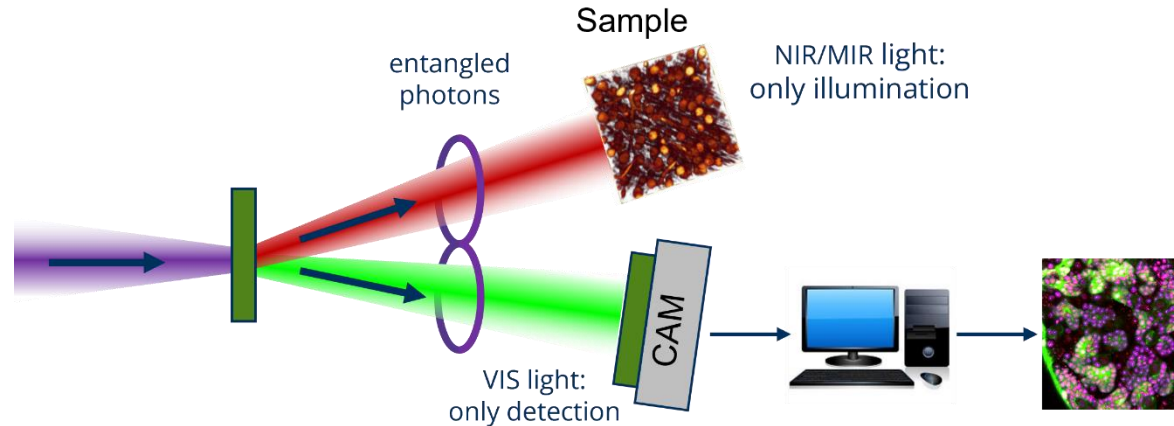
## Range of Tasks

- Adaptation of an existing quantum imaging setup for deep tissue applications

- Performing measurements on well known samples

- Image correlation, data analysis and discussion of the results

## Related Topics

Quantum Imaging, Infrared Fingerprints, Image Analysis

## Kontakt

• Stefan Krause, BAR E56I, Tel. 463-35282, E-Mail: stefan.krause1@tu-dresden.de

• Internet: http://tu-dresden.de/et/mst

**TECHNISCHE UNIVERSITÄT DRESDEN**

MST

**Professur für Mess- und Sensorsystemtechnik**