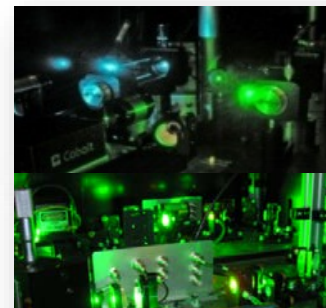
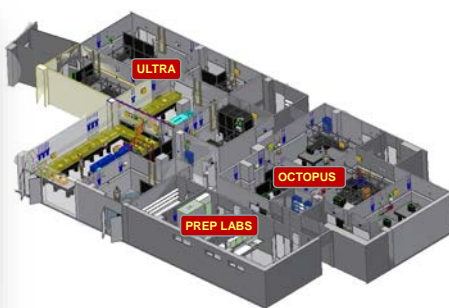




Central Laser Facility

Octopus and Ultra Facilities



The Central Laser Facility (CLF) supports users from academia and industry in the areas of imaging (the *Octopus* facility, p2) and ultrafast spectroscopy (the *Ultra* facility, p3).

- Two calls for access per year
- Access typically 1 – 4 weeks
- 100 weeks / year (*Octopus*), 60 weeks / year (*Ultra*)
- Applications peer reviewed by academic access panel
- Successful applications are free at the point of access and supported with travel, accommodation and subsistence

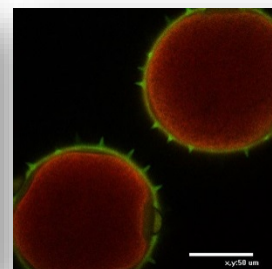
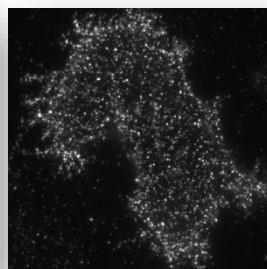
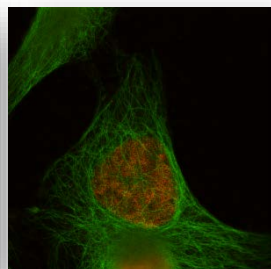
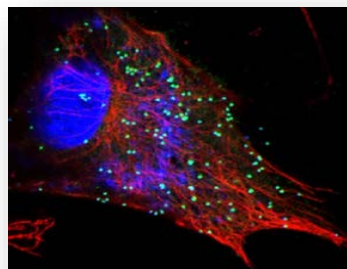
Details on applying for access can be found here:

<https://www.clf.stfc.ac.uk/Pages/Access-to-Octopus-and-Ultra.aspx>

Octopus and *Ultra* are housed in the Research Complex at Harwell (RCaH).

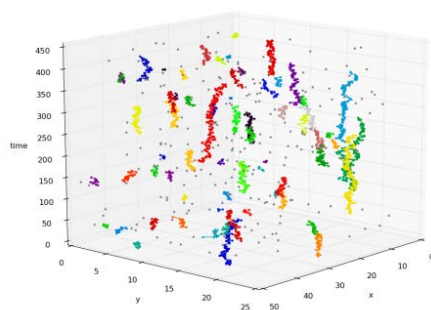
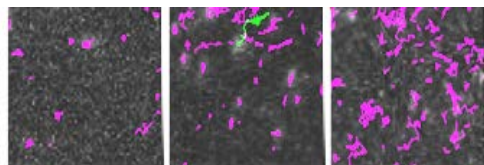
The CLF is an STFC funded organisation that supports UK academic science and industry with specialised lasers and instrumentation. The CLF is co-located with UK's international synchrotron radiation and neutron facilities, Diamond Light Source and ISIS, at the Rutherford Appleton Laboratory (RAL) on the Harwell Campus.





Octopus is a national user facility specialising in supporting UK science and industry with bio-imaging techniques

The Octopus facility supports and develops the latest microscopy techniques to enable successful applicants to perform complex studies in the areas of biological, chemical, environmental and materials science.



Super Resolution Microscopy

STORM/PALM 20 nm max xy resolution	Brüker Vutara SR-350. Max 0.5 Hz. Simultaneous two-colour 3D (bipolar) imaging	405, 488, 561, 642, 750 nm
	Zeiss Elyra PS1. Low speed. Sequential three-colour 3D (phase ramp) imaging	
Cryo-STORM 20 nm max xy resolution	FEI CorrSight & custom built microscope with cryo stage	405, 488, 561, 642 nm
Structured illumination 100 nm max xy resolution	Zeiss Elyra PS1. Any dye, low phototoxicity. Sequential three-colour imaging. z-stacks	
STED 50 nm max xy resolution	Leica SP8, 592/775 nm depletion, FLIM, FCS	470-680 nm

Light Sheet Microscopy

Light sheet microscopy Up to 100 frames/s x,y diffraction limited; z up to 0.86 µm	Leica TCS SP8 DLS; fast 3D reconstruction of µm-mm translucent samples; in-situ fluorescence imaging; sequential multi-colour detection	470-670 nm
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TIRF/Single Molecule Techniques

TIRF	Single molecule tracking Stoichiometry	Single pair FRET Single molecule polarisation	Nanometre separation	405, 488, 532, 561, 642 nm
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Optical Trapping

Optical Tweezers	Force Measurement Raman Spectroscopy Mie Scattering Spectroscopy	Wavelengths for trapping and Raman 488 nm, 514 nm 532 nm 700 – 900 nm 1064 nm, 1090 nm
Aerosol Trapping	Confocal Microscopy FLIM/PLIM TIRF Multi-colour	

Lifetime Imaging

Confocal	Fluorescence FLIM 25 ps-50 ns Phosphorescence PLIM 100 ns-ms	Wavelengths 405nm, 488 nm, 543, 561 nm Fianium, NKT 550 – 980 nm 76MHz, 200fs
Multiphoton	Multi-colour 2-16 channels Multi-wavelength excitation	
Widefield		

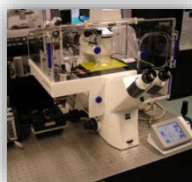
Successful applications are given full support from a team of experienced professional scientists whose sole aim is to deliver high quality and high impact results on every project

A comprehensive range of laser-based imaging techniques and sample handling are supported

Suite of cutting edge, complimentary bio-imaging techniques

Animal cell culture facilities

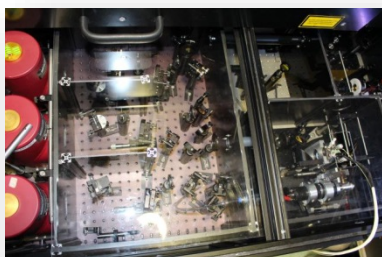
Advanced, bespoke image analysis



Chemistry and biological prep labs

Interdisciplinary operations team

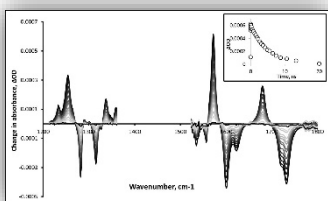
Access to simulation /modelling expertise for interpretation



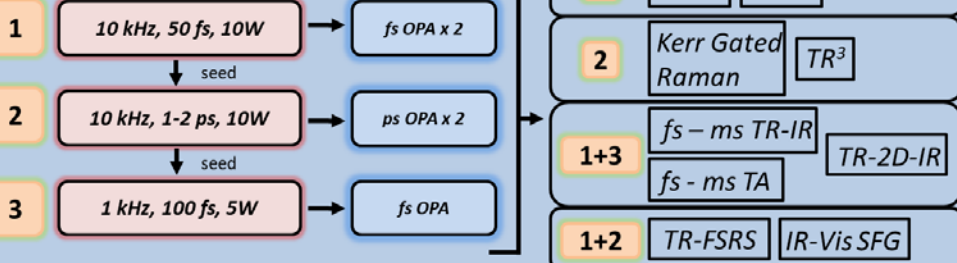
Ultra is a national user facility specialising in supporting UK science and industry with ultrafast laser spectroscopy



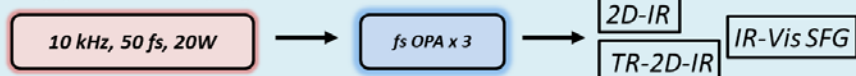
The Ultra facility hosts three unique laser systems, supporting a variety of complementary ultrafast measurements



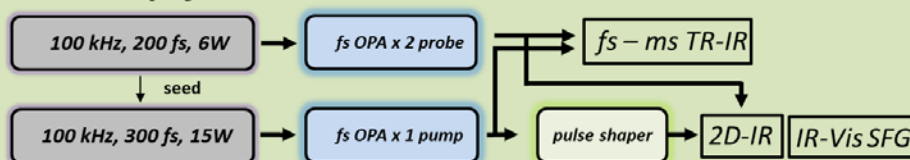
Ti: Sapphire Amplifiers



Ti: Sapphire Amplifier



Yb:KGW Amplifiers



A comprehensive range of spectrometers, detectors and sample handling are supported

Multiple probe colours

Multiple probe pulses spanning fs-s delay range in a single measurement

Interferometry

Infrared pulse shaping

Simultaneous TR-IR and TA

Broad bandwidth probing (500 cm^{-1})

256 MCT element probe detection + referencing @ 1 – 100 kHz

High sensitivity CCD spectroscopy cameras

In-house data acquisition and processing software

Spectroscopy on liquids solids and gases

Full temperature control, 10 - 600 K

Sample cells for continuous liquid flow, rapid mixing and low volumes

Chemistry labs and support for sample preparation