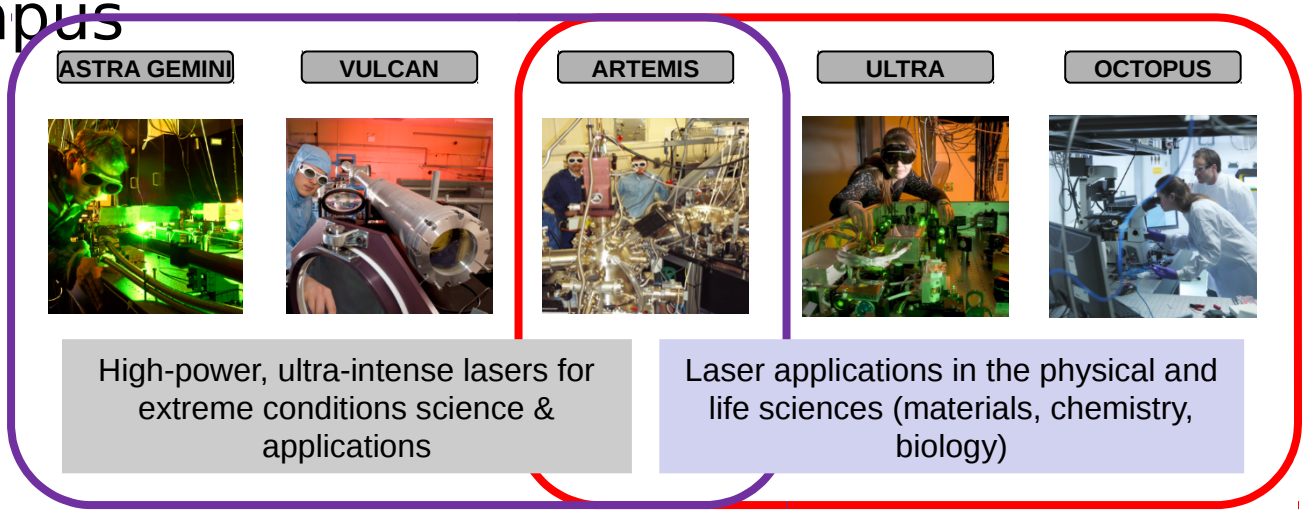
Octopus – site report

ICAT F2F October 2016

Brian Ritchie
Dan Rolfe
STFC Rutherford Appleton Laboratory

OCTOPUS

- Part of STFC Central Laser Facility at Harwell Campus

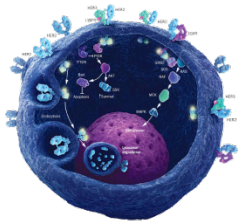


- National imaging facility with peer-reviewed, funded access
- Located in Research Complex at Harwell
- Cluster of microscopes and lasers and expert end-to-end multidisciplinary support

Science & Technology Facilities Council

OCTOPUS

Nanoscopy
>20 nm resolution



VUTARA
Fast STORM
3D system

MRC-funded

3D super-resolution SIM with PALM/STORM

20nm 3D super-resolution (under development)

2D super-resolution PALM/STORM

BBSRC-funded

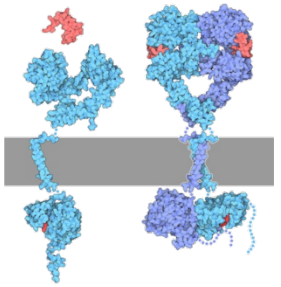
G-STED/FLIM system

OCTOPUS
Imaging Village

Single Particle Imaging
>5 nm resolution

Single molecule confocal ALEX

2-colour single molecule FRET & polarisation



3-colour single molecule tracking

3-colour single molecule FRET & polarisation & ALEX

BBSRC-funded

5-colour single molecule tracking

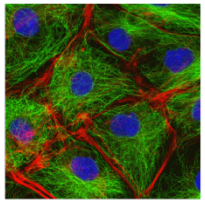
Single photon confocal FLIM/FRET

Multiphoton confocal FLIM/FRET

3-colour confocal

TIRF Tweezers

STFC-funded



Cellular Imaging
>200 nm resolution

Science & Technology Facilities Council

Octopus challenges

- Large and growing variety of imaging and analysis modalities and tools
- Changing variety and combinations of
  - studies, samples, instrumental and analysis techniques, platforms, licensing models, dataset types, computing architectures, algorithms
- Challenging image analysis – often very manual
- User expertise (or lack of it) in numerical/computational work

- Motivation for the IJP

Science & Technology Facilities Council

Deployment history 1

- Development system on Octopus hardware
  - Server running ICAT, IDS and IJP
  - Two worker nodes
  - Torque; puppet
- Production system being set up on SCD RIG VMs
  - Server running ICAT, IDS and TopCAT (with IJP GUI)
  - Separate server for IJP and batch connector
    - Hit problems with migration from Ubuntu to RedHat

Deployment History 2

- Octopus server suffered fatal hardware failure
- Created new development system from SCD resources
- Initial system used SCD Cloud VMs
  - ICAT / IDS / TopCat server
  - IJP server + Torque batch connector
  - Single worker node
- Worker node too underpowered
  - Added two larger VMs from a different pool
  - Later removed original worker

Current status

- Octopus using development system to develop and test ingest process and jobscripts
- Worker node performance is still an issue
- Production configuration still under discussion