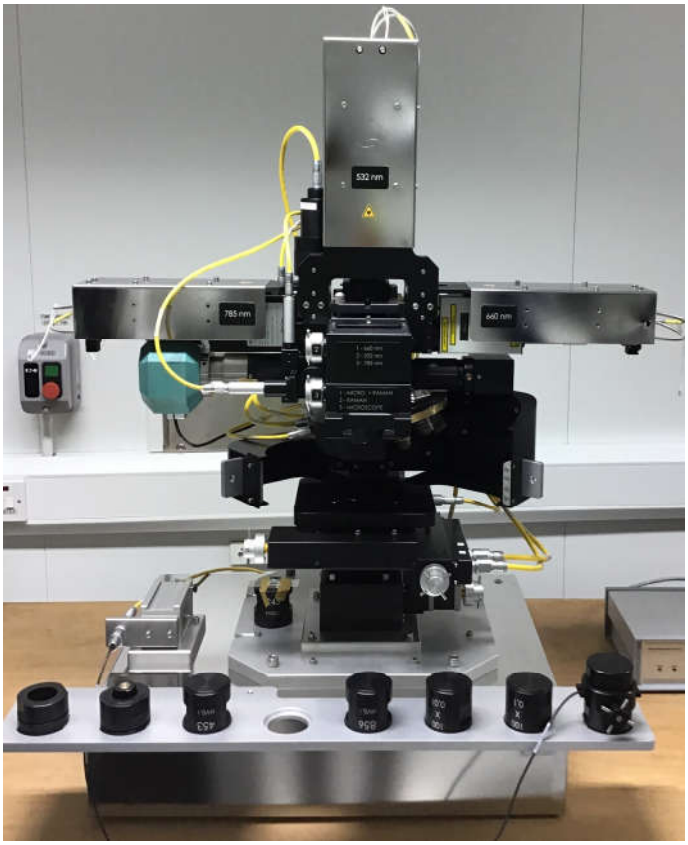
Hot Cell Optical Microscope with Triple Raman Spectroscopy and Micro-mechanical Test Capability Open Day



Date: 19th February 2020

Venue: National Nuclear Laboratory, Workington

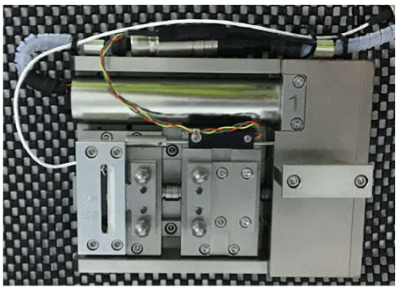
Time: 8:15 – 16:00 (split into 3 sessions)

NNL are holding an open day on the **19th February 2020** at the non-active Workington facility to showcase the capabilities of the **Henry Royce Institute** funded nuclearized optical microscope with three Raman lasers, a microhardness HV tester (Vickers) and in-situ mechanical testing stage.

This piece of equipment will be available for use in the non-radioactive setting of the NNL Workington Facility until its installation in the Active Handling Facility at NNL Windscale Laboratory in April 2020.

The multiple capabilities of this microscope allow complete characterisation of highly active samples, including but not limited to, irradiated fuels, cladding, graphite and waste forms, available in the Windscale Laboratory, at request.

The optical microscope is complemented by the three Raman lasers allowing features of interest to be visually identified, together with the chemical composition determined. Further mechanical property information can be inferred by the microhardness tester and the in-situ tensile compression and horizontal bending stage.



Instrument Specification

Optical Microscopy:

- Olympus LOM imaging – BF, DF, POL
- Resolution of >2 µm
- Six optical objectives (for imaging and positioning) at 1.25x, 2.5x, 5x, 10x, 50x, 100x
- Integrated image analysis software

Raman Spectroscopy:

- Horiba confocal system with 3 lasers:
  - 532 nm/100mW air cooled laser (spatial resolution 4 µm)
  - 660 nm/100mW air cooled laser (spatial resolution 4 µm)
  - 785 nm/90mW air cooled laser (spatial resolution 8 µm)
- Multichannel cooled CCD detector
- HORIBA LabSpec 6 software

Microhardness Testing:

- Vickers microhardness tester with load range of 0.1N to 4N

Supporting equipment: Deben in-situ tensile compression and horizontal bending stage with 2 kN and 5 kN load cells, operating at cell temperatures (20 to 30°C).

Standard sample sizes: Flexibility is dependent upon specific requirements

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