



# NNUF update: September 2016

## Chris Grovenor and Malcolm Joyce

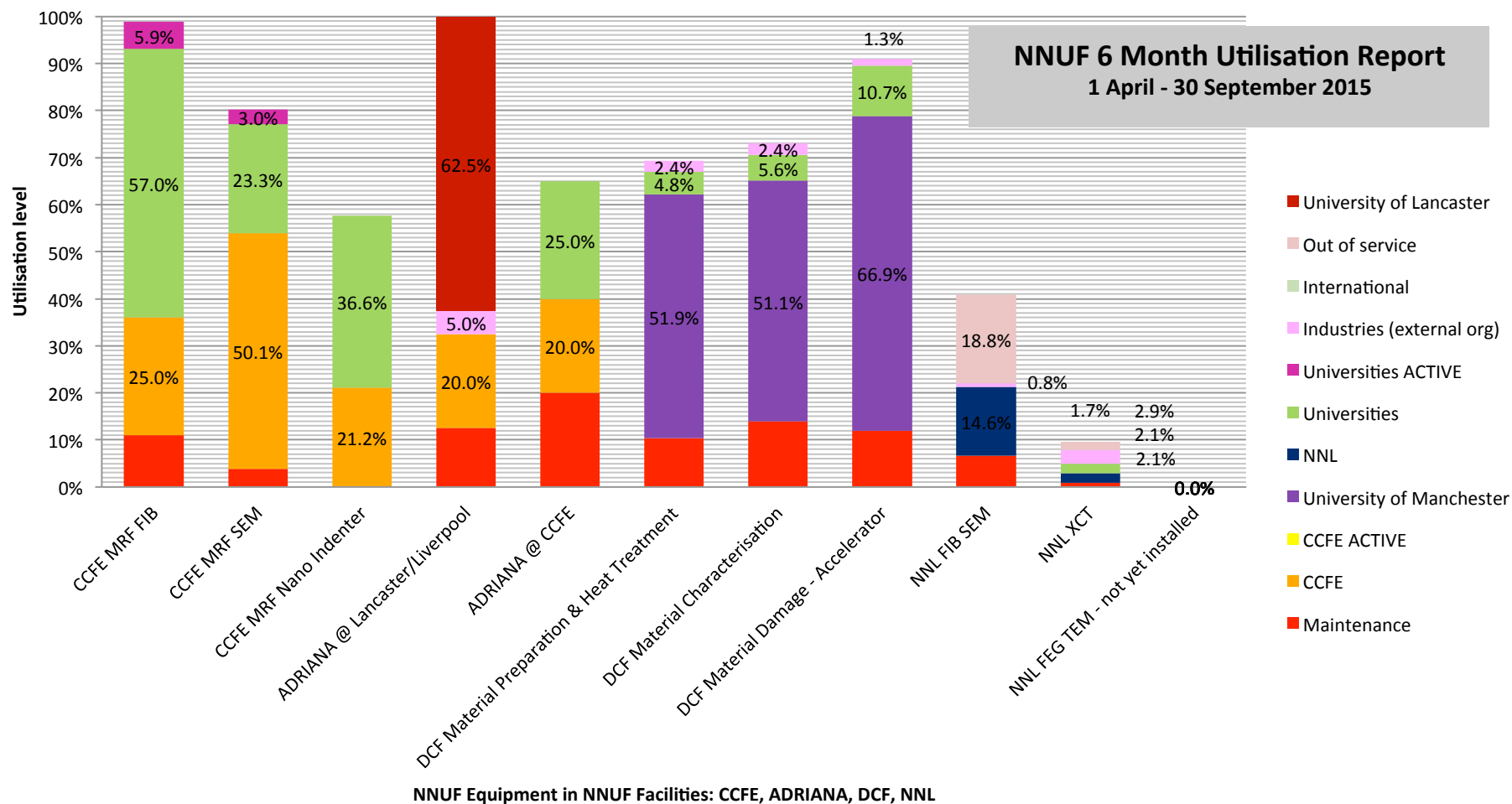




## £16M NNUF initial capital spend (2013/14)

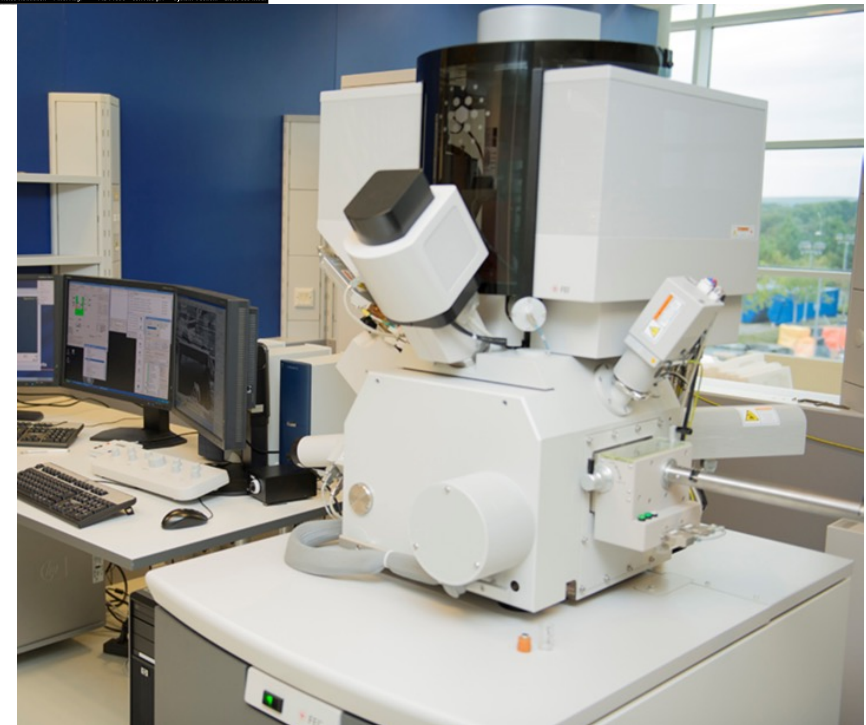
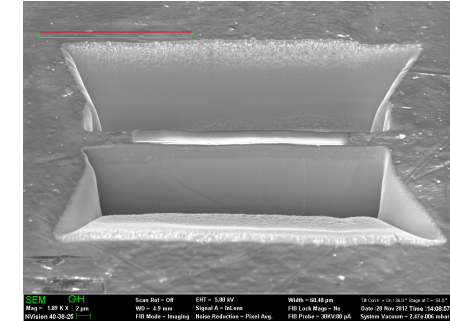
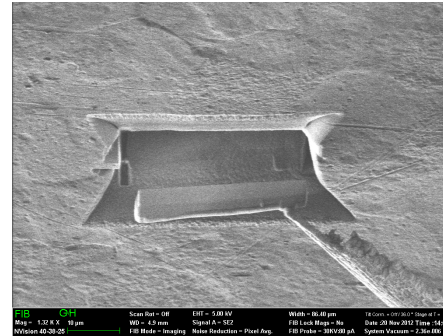
- DCF: Expanded ion beam irradiation facilities, SPS, XRD etc.
- CCFE: MRF facility for medium activity; SEM, FIB, Nanoindenter, TDS etc
- NNL: Active FIB, TEM, X-ray microtomography in Central Laboratories
- ADRIANA: 32-detector neutron calorimeter, low-background  $\gamma$  systems etc
- **6 monthly reporting to stakeholders on NNUF usage**

## 6 monthly reporting to stakeholders

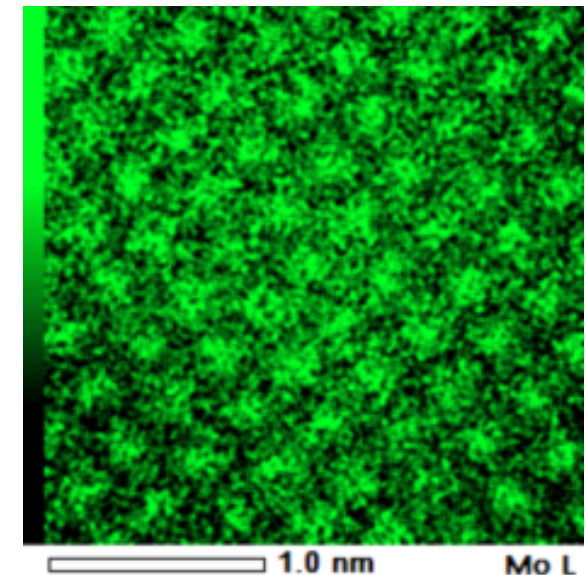
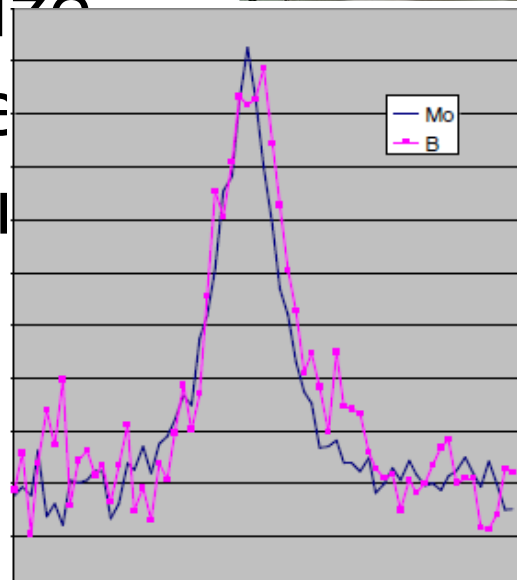
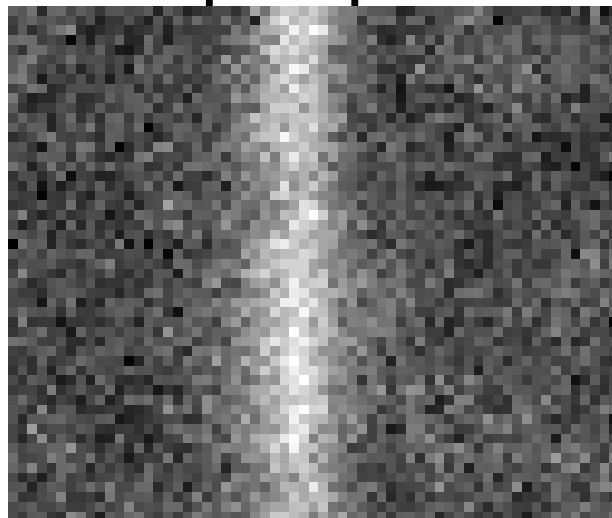


# NNUF facilities in NNL

- X Ray CT
- FIB SEM
- FEG TEM



- JEOL ARM200CF
  - Highest resolution analytical S/TEM
  - Atomic resolution composition mapping
  - 80pm probe size



# User Access Team

- New User Access Team to manage student access in NNL facilities, primarily Central Laboratory but also other sites including the Academic Hubs.
- Research Study Agreement or Third Party Users
- **Faster and simpler process** - though Central Laboratory access will never be easy



## Options

- Fully trained (many months and variable because of security clearances)
- Visiting (hands in pockets 2 weeks max per year on site, NNUF access). 2 weeks lead time
- >10 different Nationalities 'in the process'
- **Currently almost 50 students and PDRAs 'in the process' (2014, 1 student)**

One email request to:  
[CentralLaboratory.UserAccessTeam@nnl.co.uk](mailto:CentralLaboratory.UserAccessTeam@nnl.co.uk) and the dedicated access team will now guide you through the process

# Dalton Cumbrian Facility news

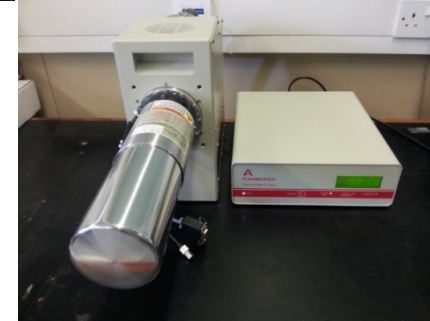
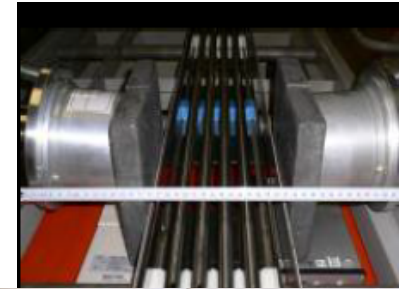
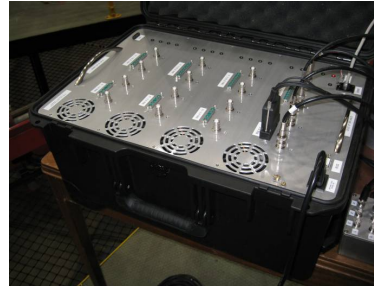
- **The second accelerator** (a 2.5 MV single ended machine) is now installed and commissioned. Full dual beam capability (combining the 5MV tandem and new 2.5MV accelerator) will be established through development of a new end station.
- **Beamline hot cell end station** (developed by Aquila) now installed and commissioned. This will allow higher penetration (higher energy ions) and higher damage rate (higher flux) experiments. Next stage is to work with CCFE/MRF and NNL CL to facilitate the transfer, onward processing, PIE of activated samples produced at DCF.
- **15 different universities and 14 different industry partners** have so far accessed DCF equipment to support their research.





New hot cell and  
accelerator





## ADRIANA (Lancaster and Liverpool)

- NEUP bid with Texas A&M and Georgia Tech
- Interview for InnovateUK bid on tomography research
- NNUF Calorimeter will be taken to Oak Ridge for experiments in December
- Papers:

Active fast neutron singles assay of  $^{235}\text{U}$  enrichment in small samples of triuranium octoxide', H. M. O. Parker et al., Progress in Nuclear Energy 93 pp. 59-66 (2016)

Fast neutron tomography with real-time pulse-shape discrimination in organic scintillation detectors', M. J. Joyce et al., Nucl. Inst. Meth. A834 pp. 36-45 (2016)

# NNUF Phase 2?

- Expressions of interest: December 2015
  - > 40 bids from 11 institutions
  - > £110M in total
- Consideration and refining of bids: January/February 2016
- Case for support written (and rewritten): March-Sept.
  - £60 M of capital and £20 M of recurrent 'operational' cost
- Watch this space.....