



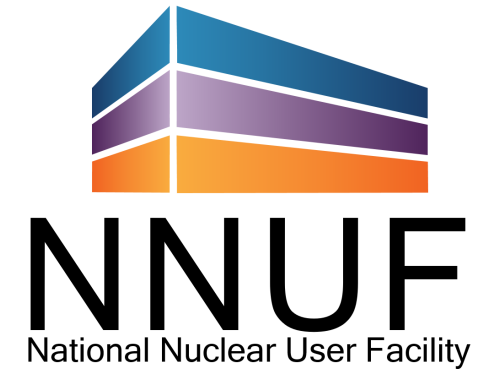
National Nuclear User Facility

www.nnuf.ac.uk





National Nuclear User Facility (Phase 1)









- NNUF was established to support the Government Nuclear Industrial Strategy launched in March 2013
- NNUF Phase 1 (2014), funded new facilities on 5 sites:
 - **NNL** (National Nuclear Laboratory)
 - **MRF** (Materials Research Facility – UKAEA/Culham Centre for Fusion Energy)
 - **DCF** (University of Manchester’s Dalton Cumbrian Facility)
 - Advanced Digital Radiometric Instrumentation for Applied Nuclear Activities (**ADRIANA**) – Lancaster, Liverpool, UKAEA
- Facilities funded separately but affiliated with NNUF Phase 1:
 - **High Temperature Facility** (Jacobs)
 - **Pyrochemical Research Laboratory** (University of Edinburgh)
 - **MIDAS** Waste Disposal Laboratory (University of Sheffield)
 - **“UTGARD I” SIMFUEL facility** (University of Lancaster)

National Nuclear User Facility (Phase 2)






- Funded by BEIS in 2019, delivery partner is EPSRC
- £81m in total: project currently running until 2023
- £60m capital, £12m support, £6.5m to fund UK HEI researchers to use NNUF facilities
- 15 facility projects funded in round 1 (2019)
- 10 facility projects recently funded in round 2 (“Call 2a”: 2021)
- Management Group:
 - **PI** [Prof Chris Grovenor](#) (Oxford), **Co-I** [Prof Malcolm Joyce](#) (Lancaster), **Co-I** [Prof Francis Livens](#) (Manchester)
 - **NNUF Administrators:** [Francesca McGowan](#) (Oxford), [Mary English](#) (Lancaster)





NNUF Phase 1 projects open for user access

Project	Institution	Project lead	Open for user access?
Ion beam accelerators (5MV tandem Pelletron and a 2.5MV Pelletron) Gamma Irradiators	Dalton Cumbrian Facility	Prof Fred Currell	
Materials Research Facility	UKAEA/CCFE	Dr Steven Van Boxel/Dr Andrew London	
ADRIANA (4 high resolution gamma spectrometry systems with digital signal processing and analysis software)	UKAEA/CCFE Lancaster University University of Liverpool	Prof Malcolm Joyce (Lancaster); Dr Chantal Nobs and Dr Lee Packer (UKAEA)	
Focussed Ion Beam X-Ray Microtomography (S)TEM with EELS capability	National Nuclear Laboratory – Central Laboratory	Prof Jonathan Hyde	
High Temperature Mechanical Testing Facility	Jacobs	Dr John Stairmand; Dr Andrew Wisbey	
Pyrochemical Research Laboratory	University of Edinburgh	Prof Andrew Mount	



Projects funded under NNUF Phase 2

Project	Institution	PI	Information	Open for user access?
Active Nano Mapping Facility - ANM	University of Bristol	Dr Neil Fox	High-speed Atomic Force Microscope in an active lab	 Open
Centre for Radiochemistry Research (CRR)	University of Manchester	Prof Steve Liddle	'One-stop-shop' for making and studying actinide compounds	Opening date TBC
Diamond Active Materials Laboratory	Diamond Light Source	Prof Fred Mosselmans	Sample preparation facilities for active materials on beamlines	Open for DLS applications
EXACT (Next Generation Accelerated Characterisation Technologies)	University of Southampton	Prof Phil Warwick	<i>In-situ</i> , on-site characterisation and remediation methods for complex waste streams	 Open
HADES: User Facility for High Activity Decommissioning Engineering Science	University of Sheffield	Prof Neil Hyatt	Thermal treatment technologies for radioactive waste (incorporates MIDAS from NNUF Phase 1)	 Open

Projects funded under NNUF Phase 2

Project	Institution	PI	Information	Open for user access?
High-Flux Accelerator-Driven Neutron Facility	University of Birmingham	Prof Martin Freer	High brightness accelerator-driven neutron source	 (existing MC40 Cyclotron Facility open; neutron facility due to open spring 2022)
Hot Robotics Facility	University of Bristol; UKAEA; University of Manchester; NNL	Prof Tom Scott Dr Rob Buckingham	Remotely operated and autonomous robots for active sites	
LAMS-UK	Lancaster University	Prof Malcolm Joyce	Accelerator Mass Spectrometry Facility for nuclear fission research	Estimated opening: January 2022
Molten Salts in Nuclear Technology Laboratory	Manchester Edinburgh DCF	Dr Clint Sharrad	Fluoride salts in nuclear systems	
Nuclear Materials Atom Probe (NuMAP) Facility	University of Oxford	Prof Michael Moody	An Atom Probe Tomography instrument for active materials	

Projects funded under NNUF Phase 2

Project	Institution	PI	Information	Open for user access?
PANAMA (Plasma Accelerators for Nuclear Applications and Materials Analysis)	University of Strathclyde	Dr Joanna Renshaw	Imaging and spectroscopy facility	Estimated opening: early 2022
RADER (Radioactive Waste Disposal and Environmental Remediation)	University of Manchester	Prof Katherine Morris	Radiometrics, environmental characterisation of solids and solutions	
SIMFUEL and Alpha-Active Material Manufacturing and Characterisation Capability	University of Manchester	Prof Tim Abram	FIB/SEM and S/TEM characterisation of fuels	Estimated opening: early 2022
UK Irradiated Materials Archive Options Study	University of Bristol CCFE/UKAEA	Prof Peter Flewitt Martin O'Brien	Stage one: Planning for an archive of neutron-irradiated materials	n/a
UTGARD I and II: Simfuel Fabrication and Characterisation Facility	Lancaster University	Prof Colin Boxall	Simulated nuclear fuel (incorporates UTGARD I from NNUF Phase 1)	

Projects funded under NNUF Phase 2a

Project	Institution	PI	Information	Open for user access?
PLEIADES (Platform for Long-term Experimental Investigation of Alteration in Disposal Environments and Storage)	University of Sheffield	Dr Claire Corkhill	Infrastructure to underpin safety cases for decommissioning, interim storage and disposal for waste	Funded from 1 st Oct 2021
Development of an <i>in-situ</i> characterisation facility for both proton and neutron irradiation	University of Birmingham	Dr Yu Lung Chiu	Facilities for in situ mechanical property and corrosion testing under irradiation	Funded from 1 st Oct 2021
EMITS (Enhancing Materials Irradiations through Thoughtful Shielding)	University of Manchester	Prof Frederick Currell	Improving facilities for ion beam irradiation	Funded from 1 st Oct 2021
A National Focused Ion Beam Facility for Active Materials	University of Bristol/ University of Oxford/ UKAEA	Prof Tom Scott Prof Michael Moody Dr Slava Kuksenko	Enhanced FIB facilities for active materials	Funded from 1 st Oct 2021
NUFRETH (NUclear Fission REactor Thermal-Hydraulics)	University of Manchester/UKAEA	Dr Andrea Cioncolini Chris Harrington	Thermal-hydraulic facilities for light-water nuclear reactor technology	Funded from 1 st Oct 2021

Projects funded under NNUF Phase 2a

Project	Institution	PI	Information	Open for user access?
RadIAEM (Analytical Electron Microscope with <i>in situ</i> capability for beta, gamma active materials)	University of Manchester/ UKAEA	Prof Grace Burke Dr Joven Lim	TEM facilities for active materials	Funded from 1 st Oct 2021
MUFFIN (MULTIphase Fluid Flow In Nuclear systems)	University of Leeds	Prof Bruce Hanson	Pilot scale, multiphase fluid flow facilities	Funded from 1 st Oct 2021
BUFFF (Bangor University Fuel Fabrication Facility)	Bangor University	Dr Simon Middleburgh	Processing of nuclear fuels and other nuclear relevant ceramics	Funded from 1 st Oct 2021
FaRMS (Facility for Radioactive Materials Surfaces)	University of Bristol	Dr Ross Springell	Deposition and surface properties of actinide materials	Funded from 1 st Oct 2021
FaSCiNATe (Facility for the Structural Characterisation of materials for Nuclear Applications operating at high Temperatures)	UKAEA	Dr Steven Van Boxel	Enhancement of facilities in the Materials Research Facility	Funded from 1 st Oct 2021

NNUF funded user access scheme:

nnuf.ac.uk/how-gain-access



- Access to NNUF facilities by UK university researchers and their international collaborators (plus employees of other organizations eligible to apply for UKRI funding)
- **Free at the point of access:** covers **facility** and **equipment** costs, **T&S**, **sample transport etc.**
- £6.5m to be spent (funding currently guaranteed till 31st March 2023)
- External users can attend facilities in person, or have experiments conducted on their behalf by facility staff scientists
- Scheme has been running for a year; 40 access applications granted (and many completed).
- High success rate in terms of applications being granted.

Continuous quarterly application process

- Discuss feasibility with facility, then complete simple application form at nnuf.ac.uk
- Can apply for **up to 6 months access** (can then apply to another call to continue research if needed)
- Applications reviewed by NNUF Management Group on basis of quality, impact and scope
- **6th call** opening soon; **closing November 2021**. Will primarily cover **access commencing in Jan – March 2022**.

(Applications for modest amounts of funding can be submitted at any time and will be evaluated swiftly.)

Access for industry

- Most NNUF facilities are available to industrial users (both UK and international). Contact facilities directly to discuss access and rates (contacts listed at nnuf.ac.uk/facilities)
- Facilities will support industrial users to create a research plan and timetable
- Many facilities offer a range of access options, including facility scientists performing experiments on behalf of, or under the (remote) direction of, external users
- N.B. the [NNUF-funded user access scheme](https://nnuf.ac.uk/access-facilities) (nnuf.ac.uk/access-facilities) is only available to applicants from universities (and employees of other organizations eligible to apply for UKRI funding).

Further information about NNUF



- For enquiries about individual facilities, contact the facility directly using the details provided on each page: nnuf.ac.uk/facilities
- For queries about NNUF as a whole, please contact Francesca McGowan, NNUF Administrator, on francesca.mcgowan@materials.ox.ac.uk in the first instance
- Reminder of the NNUF Management Group members:
 - **PI Prof Chris Grovenor** (Oxford), **Co-I Prof Malcolm Joyce** (Lancaster), **Co-I Prof Francis Livens** (Manchester)
 - **NNUF Administrators:** [Francesca McGowan](#) (Oxford), [Mary English](#) (Lancaster)