

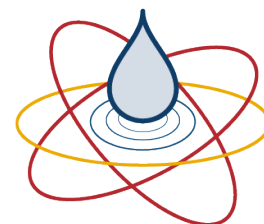


PRIFYSGOL
BANGOR
UNIVERSITY



NUCLEAR**FUTURES**
Bangor

Nuclear Academics Meeting
10th-11th September 2019



BWR Hub
Boiling Water Reactor
Research Network



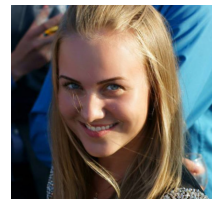
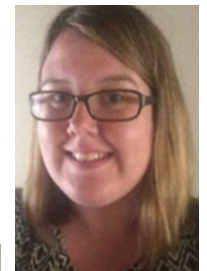
Vision

**To become a world-leading team in nuclear technology
to benefit Wales and the UK**

Path to success:

- **Build a materials science and engineering capability** working with aligned companies, communities and institutes through:
 - Materials for Energy Research: Laboratory for INnovation, **MERLIN**
 - Materials Analysis Laboratory In Bangor University, **MALIBU**
- **Fuse materials modelling and experimental research.** Combine our group member's expertise to efficiently make advances in industrially relevant problems.
- **Research and training/education focus in nuclear systems and materials.** Grow North Wales' pedigree in nuclear and low carbon energy technologies – a force for change in the United Kingdom.

People



- **Bill Lee FEng**, Ser Cymru Professor 50% PT position, and 50% with Institute for Security Science and Technology at Imperial.
- Appointed **Michael Rushton** (from Imperial) and **Simon Middleburgh** (from industry) as Senior Lecturers and **Federico Di Rocco** (mathematical modelling) as a lecturer. *Soon advertising academic position in thermal hydraulics area.*
- **Laurence Williams OBE FEng** to help with regulatory aspects.
- Support from **Debbie Jones** and **Annwen Hughes**. Key to melding nuclear community.
- 2 PDRA's appointed (**Iuliia Ipatova** – experimental, **Lee Evitts** - modelling). Advertising PDRA in structural integrity.
- 5 PhD students (2 Westinghouse, Wood, NNL, self-funded.), 5 summer intern students.

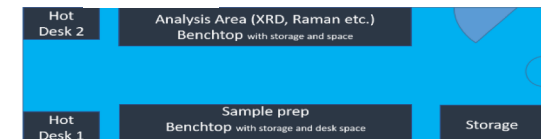
Since late 2017

Space and facilities

- Office, meeting rooms and laboratory space provided by Bangor University in Dean Street.
- **MERLIN** laboratory in School of Electronic Engineering at Dean Street.
- Plans for **MALIBU** – Materials Analysis Laboratory In Bangor University – incl. electron microscopy a prominent site making them accessible and visible in the university and local community.



MERLIN



Nuclear Futures Bangor Office Space



MERLIN

- Built to work with uranium compounds, including powders for fuel research.

Two areas: **Materials Manufacture**



MERLIN

- Built to work with uranium compounds, including powders for fuel research.

Two areas: **Materials Characterisation**





Money



wood.



Ysgoloriaethau Sgiliau Economi Gwybodaeth
Knowledge Economy Skills Scholarships

NATIONAL NUCLEAR
LABORATORY



Westinghouse



LeadCold



NUCLEAR AMRC



Initial Focus Areas

- Fuel performance and reactor control
- Monitoring and control
- Material manufacture and design
- Waste forms, dry storage and useful isotopes
- Thermal hydraulic – neutronics

Partnering for Performance

Partnering for Prosperity

Partnering for Change



Next steps

- Academics:
 - Thermal Hydraulics and Reactor Design
 - Structural Integrity and Materials Processing (NAMRC, RR)
 - Medical Isotopes and Nuclear Medicine
 - Control and Instrumentation.
- PDRAs:
 - Thermal hydraulics and reactor design
 - Structural Integrity (finite element modelling)
 - Medical Isotopes and Nuclear Medicine
 - Control and instrumentation
 - Policy, Safeguards and Regulation
 - Nuclear Co-generation (Royal Society report)
- Technicians:
 - Lab based
 - Computer based
 - Senior experimental officer

Built for Collaboration



SUPERCOMPUTING WALES
UWCHGYFRIFIADURA CYMRU



The Open
University



Lancaster
University



NUCLEAR AMRC

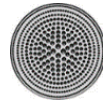
wood.



Westinghouse



NATIONAL NUCLEAR
LABORATORY



LeadCold

EPRI



The
University
Of
Sheffield.

HITACHI
Inspire the Next



University of
BRISTOL

Imperial College
London



Australian Government



ANSTO



Los Alamos
NATIONAL LABORATORY
EST. 1943

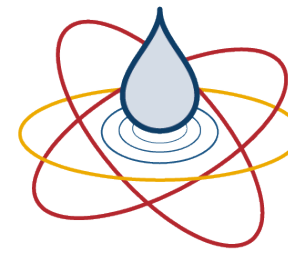


Canadian Nuclear
Laboratories

HORIZON
NUCLEAR POWER

MANCHESTER
1824

The University of Manchester



BWR Hub
Boiling Water Reactor
Research Network

“The purpose of the BWR Research Hub and Network is to enable the academic and industrial communities of Wales and the wider UK deepen and enhance their understanding of BWR technology, and participate in research and development relating to this and future generations of BWRs.”

Supporting the Reactor Chemistry and Materials Research (RCMR) Working Group

- Organising core member meetings
- Facilitating workshops
- Helping develop a roadmap into Resource-renewable Boiling Water Reactors (RBWR)

Funded 5 summer student placements this year at Bangor University



Imperial College
London

HITACHI



Llywodraeth Cymru
Welsh Government

The North West Nuclear Arc

2 Innovation Partnerships:
Cumbria
North West Wales

Aim it to foster innovation
in the nuclear industry
across the North West
Nuclear Arc.



North Wales Growth Deal

- Includes funding for
 - Low Carbon Centre of Excellence based at Menai Science Park
 - New microscopy facilities in the MALIBU (Materials Analysis Laboratory in Bangor University)
 - Funding for Trawsfynydd development to prepare the site for possible S/AMR use
- Strength in Places proposal to support these key developments and building on a wide range of Low Carbon research capability at the University from Nuclear to tidal/marine to solar energy and including work on grid infrastructure

M-SParc

Already working with:

Wood Group

NAMRC

Frazer Nash

Tecnatom

UKAEA

BU; Ser Cymru and the Nuclear Future
Institute

North West Nuclear Arc



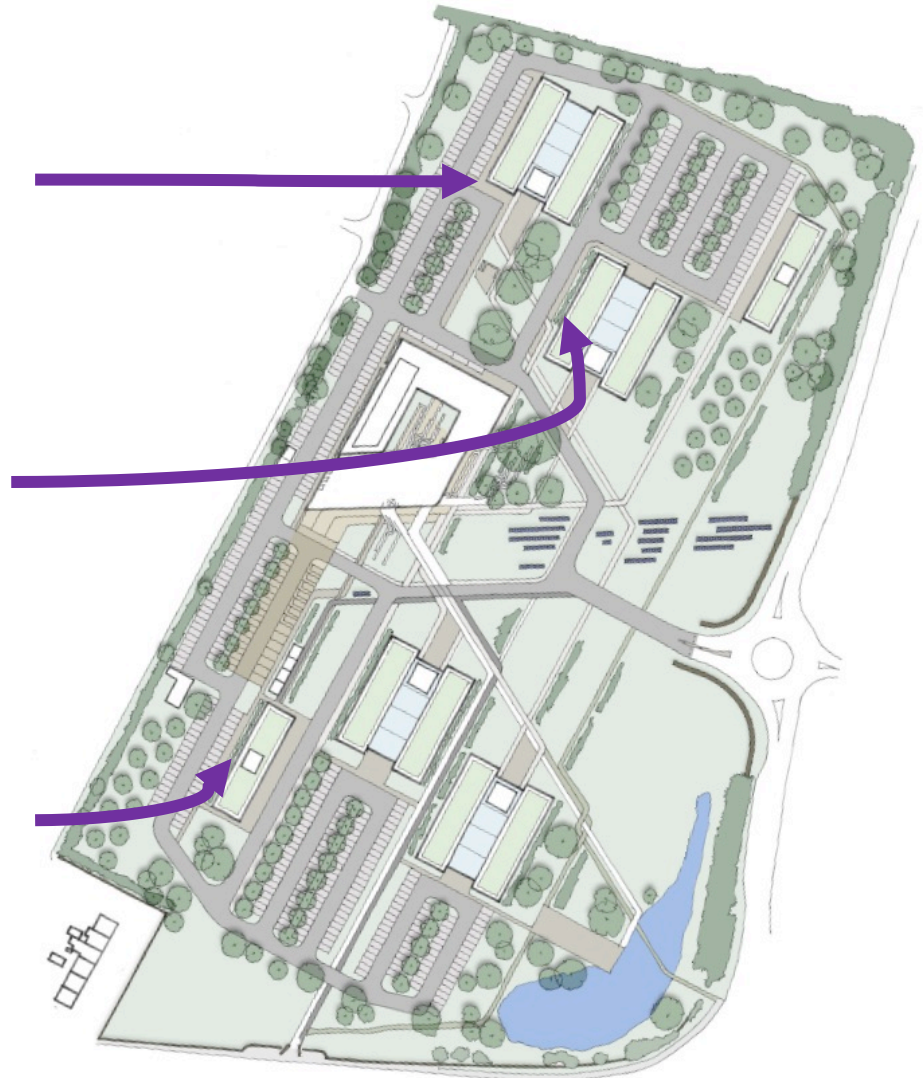
Overview of Opportunities



National Thermal Hydraulic Facility
(UKAEA) £40m

North Wales Growth Deal; Low Carbon
Centre of Excellence circa £3m

BU BioComposites; Bio Fuels,
Materials & Economy £1.5m+



Vision for N Wales Low C Energy Triangle



- Bangor – University, Coleg Menai with apprentice, UG and PG training and links to local industry and community.
- Anglesey – Reactor at Wylfa, Thermal Hydraulics facility and Low C Energy Centre of Excellence at M-SParc including central research labs and facilities and innovation hub.
- Trawsfynydd – Small Modular Reactor/Advanced Modular Reactor and satellite Low C Energy Centre of Excellence linked to reactor type and regional hydro electric power and water storage capability.

Welcome to Bangor



Diolch!
Thank you!

