UNIVERSITY of STRATHCLYDE
ADVANCED NUCLEAR
RESEARCH CENTRE

University of Strathclyde Glasgow

Advanced Nuclear Research Centre (ANRC)

- 1950s to date;
- Research: *Non-Destructive Evaluation & Testing*
  Asset Management & Decision Support
  Decommissioning and Waste Disposal
  Structural Integrity
  Policy and Public Engagement
  Particle and Plasma Physics
- Research portfolio - £13M+ Nuclear Plant and £5M+ Physics
- Recent asset investments - £20M+






BrucePower Innovation at work
babcock
cavendish nuclear
eDF ENERGY
DOOSAN
KINECTRICS
KUKA
PEAK NDT
BTB JANSKY GMBH
NUCLEAR INNOVATION INSTITUTE
EPSRC Engineering and Physical Sciences Research Council
Cranfield University
The Alan Turing Institute
bam nuttall
WEHR
UKAEA UK Atomic Energy Authority
Sellafield Ltd
NATIONAL NUCLEAR LABORATORY
ansto
ROLLS ROYCE

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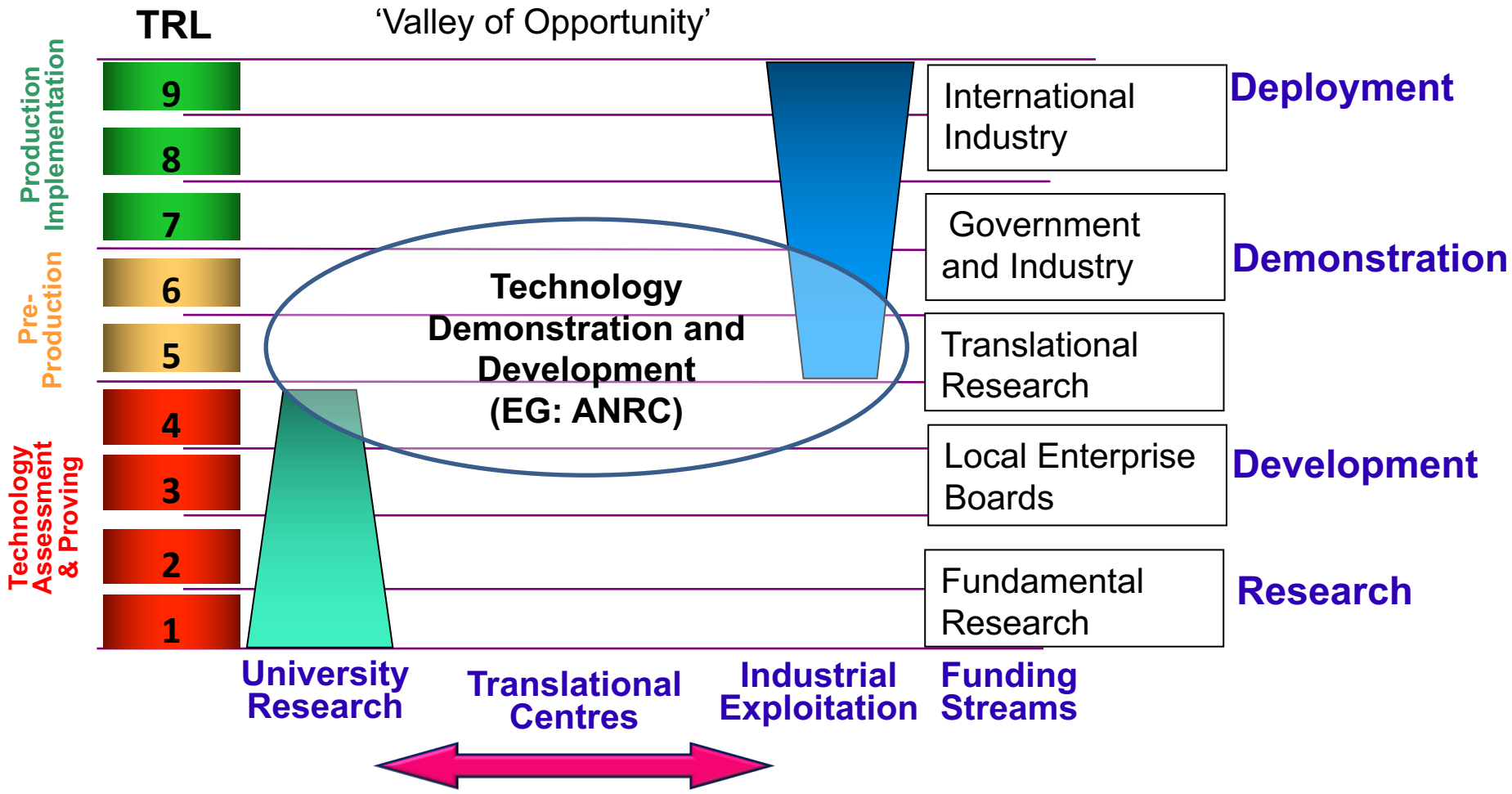
Innovation at Pace and Scale



Working with Industry to understand their challenges
Working with Industry, Academic Partners and Funding Bodies in Partnership to support Industry at pace and scale

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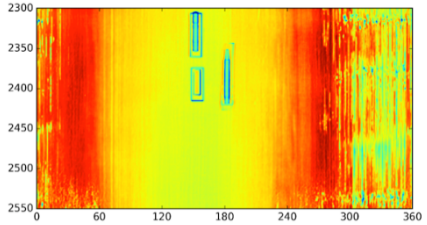
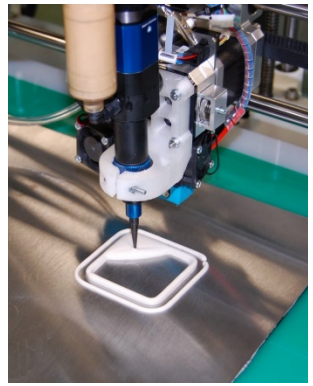
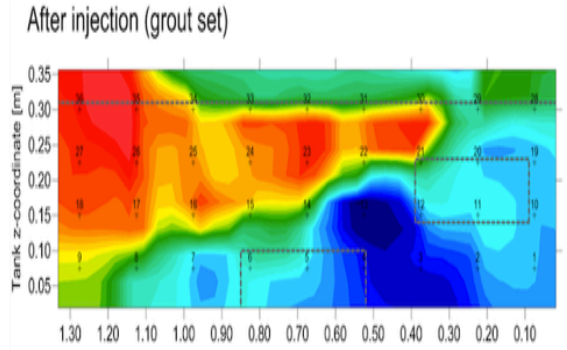
Technical Programmes

University of Strathclyde Glasgow

- **Industrial Informatics for operational management and decision support**
  - Data Analytics for Operational Support and Lifetime Extension for PWR, AGR and CANDUs
  - Decision Support Tools to Minimise Outage Time eg: automating inspection decision support for AGR and CANDU reactors
- **Advanced through life inspection solutions**
  - Advanced Image Processing Techniques for in reactor core inspection eg AGR Graphite
  - Automated Sizing & Classification of component defects, eg: CANDU Pressure Tubes
  - Smart materials for monitoring of concrete infrastructure
- **Decommissioning & radioactive waste management**
  - Immobilisation & Containment of Radioactive Waste using Colloidal Silica-Based Grout eg ANSTO
  - Novel Treatments for Carbon-based Radioactive Waste eg graphite treatment
- **Manufacturing**
  - SMR and small reactor manufacturing eg Rosyth component manufacturing







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EPSRC Prosperity Partnership
Delivering Enhanced Through-Life Nuclear Asset Management

University of Strathclyde Glasgow

Theme 1: Advanced Through-Life Inspection Solutions

- Automation Solutions for Next Generation Nuclear Inspection
- Ultrasonic In-Process Monitoring for Challenging Industrial Applications

Cranfield University

Theme 2: Biotechnology for Treatment and Repair of Concrete Nuclear Infrastructure

- Biotechnology-based concrete repair
- Concrete bio-treatment for nuclear decommissioning

NPL National Physical Laboratory

Theme 3: Operational Intelligence: Novel Data Science and Distributed Intelligence

- Translational advances in machine learning
- Human-Learner Interaction and Active Learning
- Flexible Decision Support Architectures

The Alan Turing Institute

Industry Partners

BrucePower Innovation at work
EDF ENERGY
babcock
bam nuttall
WEIR
KINECTRICS

EPSRC Engineering and Physical Sciences Research Council

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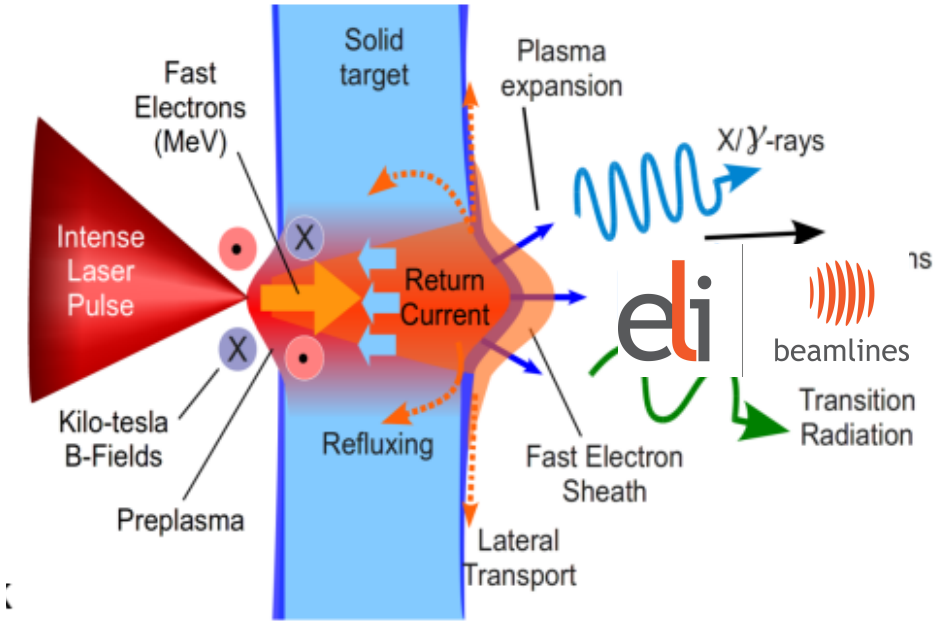
SCAPA: Scottish Centre for the Application of Plasma Accelerators

University of Strathclyde Glasgow

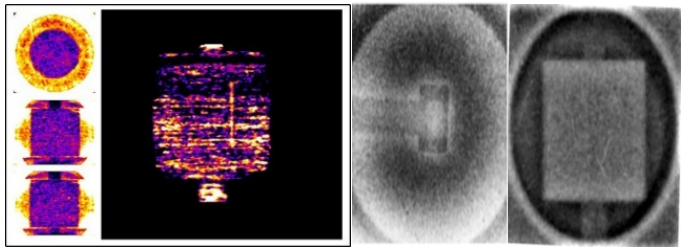
- £12M strategic investment by Strathclyde, SUPA, EPSRC & STFC-CI
- Focussed on the development and exploitation of laser-driven accelerators and radiation sources.



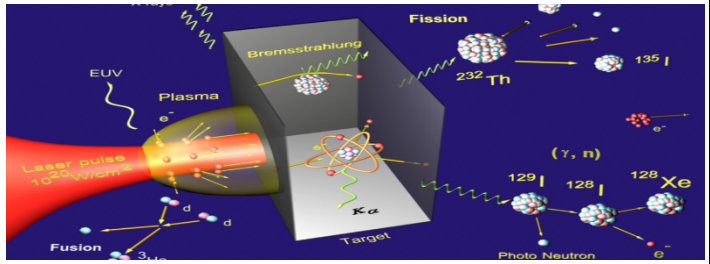
Radiation & particle beams:
X-rays, γ-rays, THz radiation
Electrons, light particles & neutrons

- 350 TW, 40TW, Sub TW pulsed lasers
- 3 large shielded concrete bunkers
- 8 beam lines

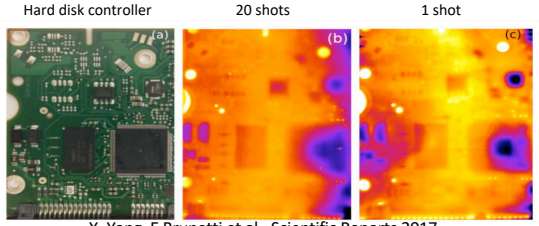
Nuclear Waste barrel imaging (X-rays)



Nuclear Activation and Isotope production



Imaging electronic components (electrons)



X. Yang, E Brunetti et al., Scientific Reports 2017