



New and advanced applications of nuclear science and technology towards a sustainable environment

IAEA Collaborating Centre at ANSTO

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Science. Ingenuity. Sustainability.

ANSTO

A leader in nuclear science
and technology

Operating safely
for over 60 years

Managing over \$1.5 billion
in scientific infrastructure

About 1350
skilled employees



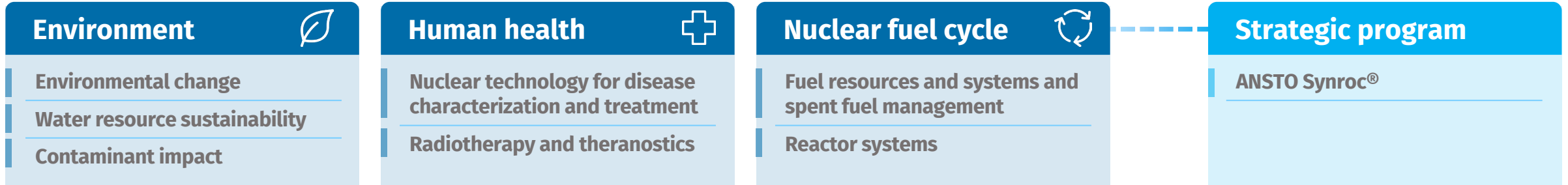
Lucas Heights
campus

Australian
Synchrotron

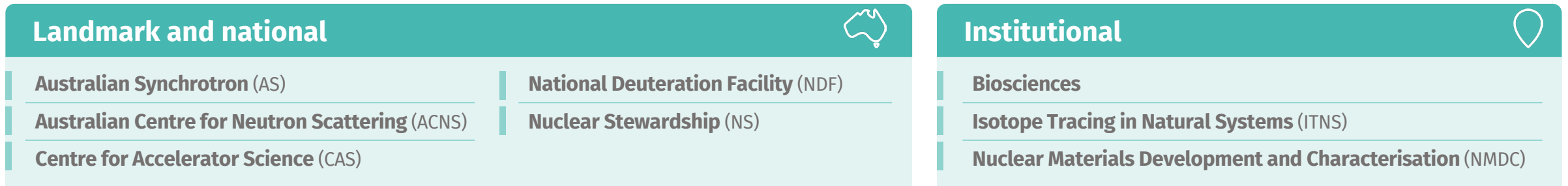
ANSTO's Lucas Heights campus.

ANSTO Research and Infrastructure

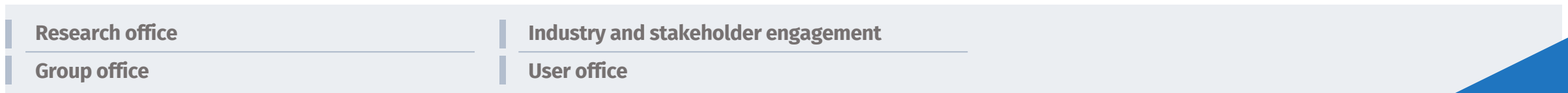
Research themes



Research infrastructure



Research enablers



Environmental Research at ANSTO



How can we inform sustainable environmental management strategies and add to our capacity to respond to modern environmental challenges?

1

Environmental change

Scale and speed of environmental change

2

Water

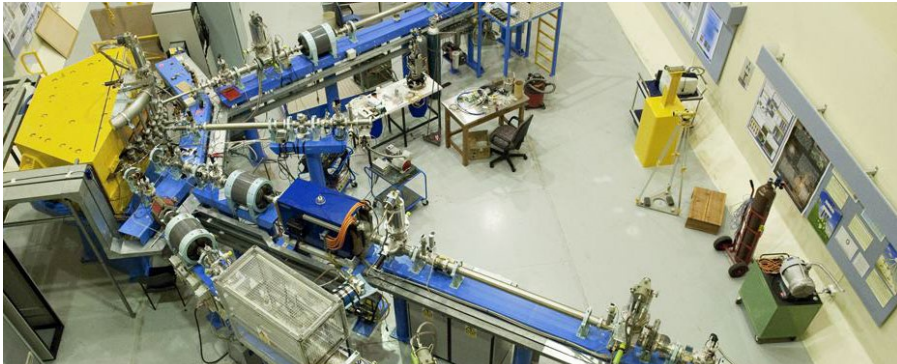
Sustainability and quality of key water resources and aquatic ecosystems

3

Contaminant impacts

Pathways and impacts of contaminants in biota and the environment

ANSTO Collaborating Centre: Infrastructure and expertise



Centre for Accelerator Science



Australian Centre for Neutron Scattering



Australian Synchrotron



Environmental Radioactivity Measurement Centre

ANSTO Collaborating Centre

- Collaboration topic:

New and advanced techniques and applications of nuclear science and technology towards a sustainable environment

- Department of NA,
Divisions of NAPC & NAEL

- 1.4 - Nuclear Science
- 2.3 Water Resources
- 2.4 – Environment

- Region: Asia and the Pacific

- Duration: 4 years



Objective

- To provide support to the IAEA Member States in the field of new and advanced techniques and applications of nuclear science and technology towards a sustainable environment.

Benefits

- Very ambitious, comprehensive but coherent programme with benefits and impact on
 - ✓ Networking
 - ✓ New scientific results
 - ✓ Training
 - ✓ Novel methodologies and techniques
 - ✓ New stakeholders
 - ✓ Improved utilization of nuclear techniques
 - ✓ Strengthen Partnership

→ Both to the IAEA and ANSTO

2 ZERO HUNGER



3 GOOD HEALTH AND WELL-BEING



6 CLEAN WATER AND SANITATION



13 CLIMATE ACTION



14 LIFE BELOW WATER



15 LIFE ON LAND



17 PARTNERSHIPS FOR THE GOALS



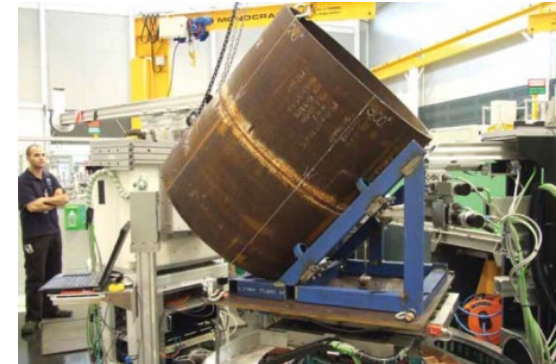
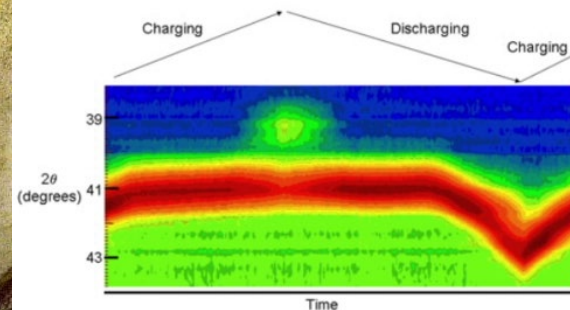
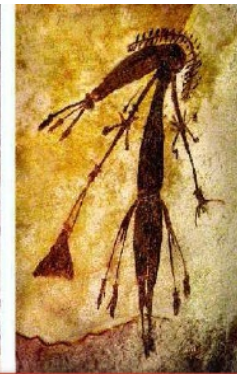
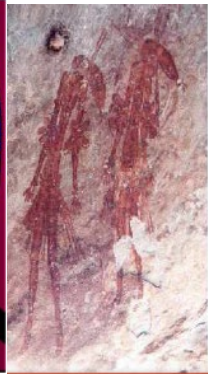
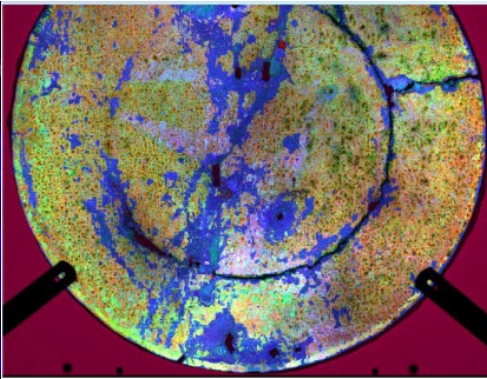
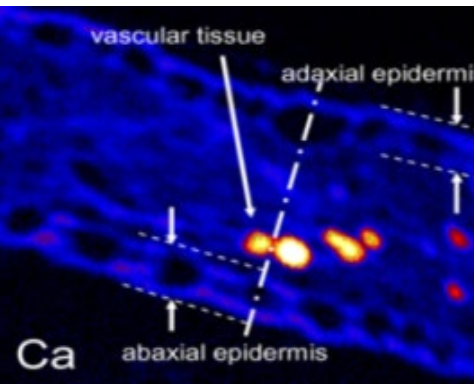
Focus areas for the Collaborating Centre

1. Nuclear (Accelerator, Research Reactor and Isotopic) Techniques in Provenance and authentication of products of illicit trade
2. Applications of Isotope Hydrology – Sustainable water resources
3. Nuclear and Isotopic Techniques in Art, Archaeology and Cultural - Heritage
4. Nuclear techniques in Environmental Change and Radioecology – Climate change, Marine Environment, Atmospheric pollution and NORM/Legacy sites

History of collaboration

- IAEA ANSTO CC projects:

- 1) 2007-13: Neutron scattering applications in materials research and various industries
- 2) 2016-2020: Multi-analytical techniques for materials research, environmental studies and industrial applications
- 3) Proposed: 2020-2024: Nuclear and Isotopic Techniques for the Environment





IAEA

International Atomic Energy Agency

Atoms for Peace and Development

History of collaboration

ANSTO's membership in IAEA Networks

ALMERA Regional Leadership



GNIP, NWAL, IDN, RANET, ANENT,
WATEC, TWGRR, LABONET,
DISPONET, IPN, ENVIRONET,
INLEX, SAGNA

ANSTO's membership in IAEA CRPs

12 CRPs: F11020, F11022, F22026,
F31006, G42008, J02013, K41015,
K41016, K41017, K41019, T14003, T22002

ANSTO's membership in IAEA TC Projects

12 TC Projects: RLA 7023, RAS5081,
RAS7028, RAS7029, RAS7030, RAS7031,
RAS6097, RAS7035, RAS7037, RAS9092,
RAS0086

What's been achieved so far

Next-generation batteries

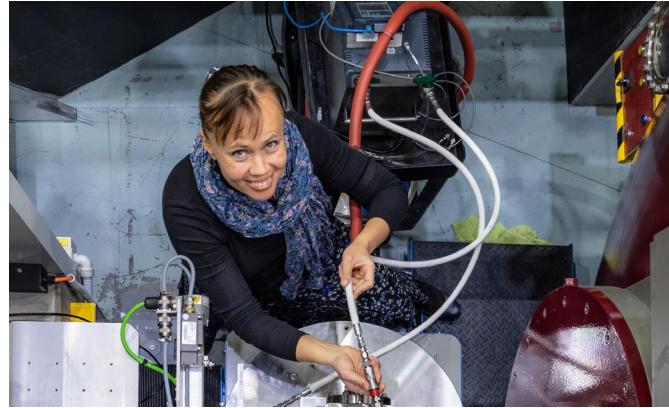


Budj Bim

UNESCO World Heritage site



Particle based emulsifier
towards functional food



New method for radiocarbon
age of rock art



Neutron tomography of fossils



Cultural Heritage

- Cutting-edge nuclear research techniques have been combined with historical artefacts to provide never-before-seen images
- Collaboration between ANSTO and the Museum of Applied Arts and Sciences
- Using ANSTO's world-class nuclear scientific capabilities including the Australian Synchrotron, particle accelerators and the neutron imaging instrument '*DINGO*' we have examined historical artefacts at an atomic level to reveal their inner workings or hidden secrets from the past



THANK YOU