

Leveraging great science to deliver big outcomes

ANSTO leverages great science to deliver big outcomes. We partner with scientists and engineers and apply new technologies to provide real-world benefits.

Our work improves human health, saves lives, builds our industries and protects the environment.

ANSTO is the home of Australia's most significant landmark and national infrastructure for research with thousands of scientists from industry and academia, benefiting from gaining access to state-of-the-art instruments every year.



Science

World-class research and user facilities

ANSTO uses nuclear research techniques to address many of the important issues of our time relating to our environment, human health and industry.

We do this using our country's most sophisticated research infrastructure, including the Open Pool Australian Light-water (OPAL) multi-purpose reactor, the Australian Centre for Neutron Scattering (ACNS), the Australian Synchrotron (pictured right), the Centre for Accelerator Science (CAS) and the National Deuterium Facility (NDF).

Every year, ANSTO researchers as well as over 5000 visiting national and international scientists use our facilities.



Research themes



Improving human health



Sustainable energy



Support to industry



Protecting the environment

Ingenuity

Food provenance

ANSTO, together with the University of New South Wales (NSW) and Macquarie University, is undertaking food authenticity research that will assist fisheries and aquaculture industries tackle food fraud.

The research will provide certainty to industry and consumers that the seafood they distribute or consume does in fact come from the place identified on its packaging.

ANSTO's nuclear research techniques, including stable isotope analysis, X-ray fluorescence using Itrax, and neutron activation analysis, provide great precision in determining geographical locations and production methods such as whether the seafood is farmed or wild-caught.

ANSTO's research aims to develop a quick, cost-effective analytical tool that will best serve the needs of the seafood producers, and import and export industry bodies.

Although seafood is the initial area of focus, the provenance research can be applied to other types of food.



Supporting international scientific projects

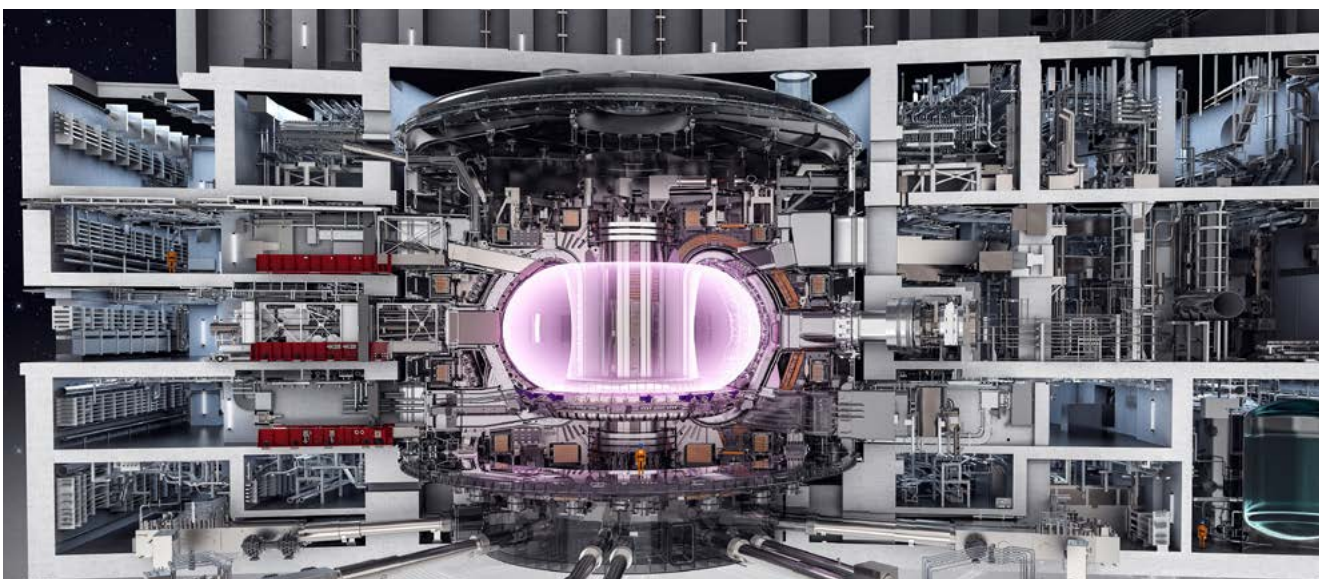
ANSTO is supporting two of the world's most significant scientific and engineering projects, the ITER global fusion energy project and the Generation IV International Forum (GIF).

ANSTO, the Australian National University and other Australian universities are providing ITER with access to Australia's unique expertise in fusion plasma physics and nuclear material engineering. Fusion technology holds the potential to deliver a large-scale and carbon-free source of energy, with very low levels of radioactive waste. ITER will be the first fusion device to produce more energy than it consumes.

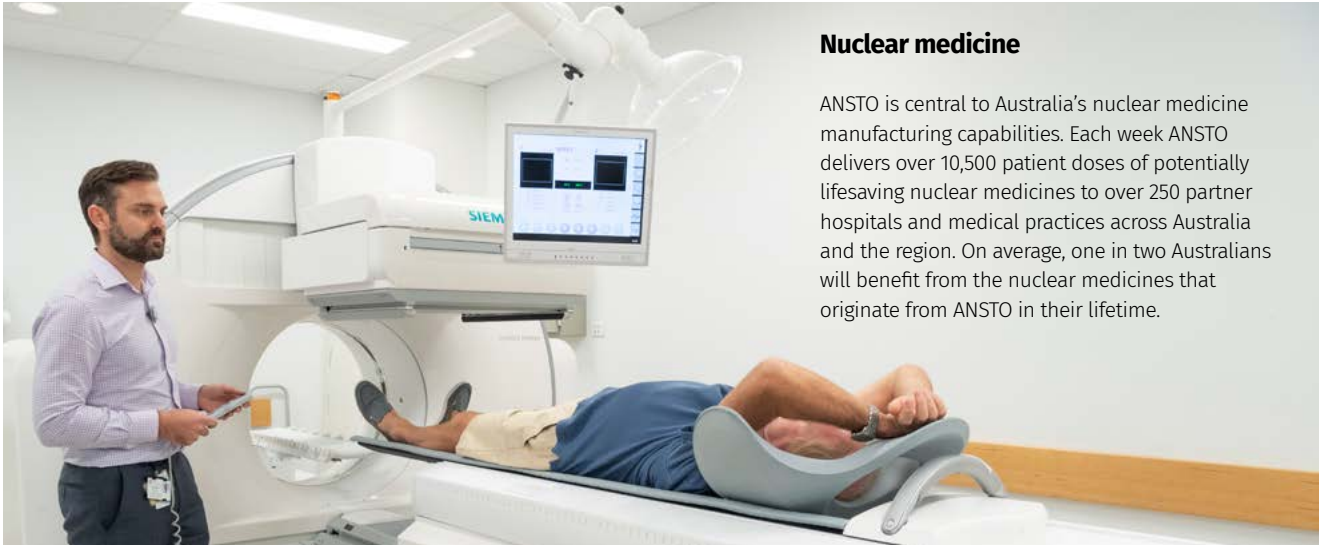
ANSTO's nuclear materials engineering capabilities and expertise also led to Australia's membership of GIF, a consortium of countries committed to working together on long-term research into advanced nuclear technologies. Generation IV power reactors represent the next step in nuclear technology. Generation IV power reactors are being developed to use fuel more efficiently with less radioactive waste production, enabling them to be economically competitive while meeting stringent standards of safety and proliferation resistance.

Diagram of the Tokamak fusion test reactor.

Image credit- ITER.



Sustainability



Nuclear medicine

ANSTO is central to Australia's nuclear medicine manufacturing capabilities. Each week ANSTO delivers over 10,500 patient doses of potentially lifesaving nuclear medicines to over 250 partner hospitals and medical practices across Australia and the region. On average, one in two Australians will benefit from the nuclear medicines that originate from ANSTO in their lifetime.

Water resource management

Research by ANSTO and the University of NSW on Rottneest Island, off the coast of Western Australia, has provided invaluable information about groundwater systems that is relevant for the sustainability of many other islands around the globe.

Rottneest Island has a freshwater lens under it that sits atop seawater. These lenses are formed from rainwater seeping down through soil. The seawater stays below the freshwater because it is denser. A decline in rainfall is causing a change in the equilibrium of the lens and reducing the volume of freshwater.

Any change in equilibrium in the system will also change the environment of the microorganisms that live in the soil zone. In addition, the freshwater lens also feeds natural springs on the island, which are used by the island's fauna such as quokkas and reptiles.

There is a threat of not only losing an important resource but potential harm to the ecosystem that relies on the groundwater.

The phenomenon of a freshwater lens becoming salty is expected to become a world-wide problem as climate change impacts island settings. This is especially important when groundwater is recharged predominantly by rainfall, which is the case on Rottneest Island.

Rottneest Island, Western Australia.



Dr Karina Meredith groundwater sampling on Rottneest Island.



Globally connected

ANSTO's many strategic international collaborations, with the world's leading research institutes and universities, ensure Australian scientists are well placed to drive innovation for Australia.

These important partnerships give Australian scientists access to some of the world's most sophisticated research techniques, enabling discoveries that benefit Australia and the world.

As part of enabling a strong national collaborative network, ANSTO is connected with Australian and New Zealand universities through the Australian Institute of Nuclear Science and Engineering (AINSE), providing researchers with access to Australia's nuclear science, technology and engineering expertise and landmark infrastructure which, in turn, facilitates greater national science collaboration.



ANSTO collaborates with many science based institutions, organisations and universities as well as companies and corporations around the world.

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