Professor Michael James
Acting Director, Australian Synchrotron

Michael was appointed to the role of *Acting Director of the Australian Synchrotron* in Melbourne in January 2023 and now leads this international user facility which hosts more than 5,500 researcher visits and generates more than 600 scientific research articles per year. In his previous role, Michael led the *Science Team* at the Australian Synchrotron with responsibilities to operate and develop the original suite of 10 synchrotron beamlines, and to deliver the next generation of 8 synchrotron beamlines as part of the $100M *BRIGHT Program*.

Prior to moving to Melbourne and the Australian Synchrotron in 2013, Michael has held various roles at ANSTO in Sydney:

- *Senior Principal Research Scientist* at the *Australian Centre for Neutron Scattering*;
- *Leader of the Chemical Deuteration Laboratory*, in the *National Deuteration Facility*; and
- *Instrument Scientist* for the *PLATYPUS* Time-of-Flight neutron reflectometer that he designed and built at Australia's 20 MW OPAL research reactor.

With a research background in chemistry, nanomaterials and magnetism, his research interests include numerous areas of neutron and X-ray scattering; predominantly relating to instrument and technique development, and the study atomic and molecular structures of technologically advanced materials. He has published more than 150 scientific peer-reviewed publications.

Nuclear Science & Technology Research in Australian - Why Stop at One Source of Brilliant Light

Professor Michael James – Acting Director, Australian Synchrotron.

The *Australian Nuclear Science & Technology Organisation* (ANSTO) operates, maintains, and develops a wide range of research infrastructure (worth ~$1 billion) for the benefit of all Australians and the international research community. This includes some of the largest research facilities in the country.

The Lucas Heights campus in Sydney is home to the *20 MW OPAL Research Reactor* with irradiation facilities for the production of medical and industrial isotopes and radiation damage studies; the *Australian Centre for Neutron Scattering*, where neutrons from the OPAL reactor are used in 15 distinct instruments to study a wide variety of condensed and soft matter systems under extreme or biomimetic environments; the *Centre for Accelerator Science* that hosts 17 beamlines across four mega-volt ion accelerators to undertake ion beam analysis and accelerator mass spectrometry studies; and the *National Deuteration Facility* that supports the chemical and biological production of isotopically labelled molecules for use in research activities, particularly where hydrogen can be selectively exchanged for deuterium.

The Clayton campus in Melbourne is home to the *Australian Synchrotron*, a 3 GeV electron accelerator that is used to generate brilliant beams of infrared and X-ray light for use in a vary array of scientific research – studies in radiotherapy, biomedical imaging and 3-D computed tomography; macromolecular crystallography for the study of the biomolecular basis of disease and the development of new medicines; agricultural, environmental and climate change research; studies in advanced electronics and advanced energy materials; planetary sciences; engineering; advanced manufacturing; and cultural heritage studies. The Australian Synchrotron currently hosts over 1000 experiments per annum across its 14 operational beamlines and is currently in the middle of the ~$100 million *BRIGHT Program* to design, build and commission 8 next-generation beamlines at the facility.

This presentation will showcase a range of impactful research outcomes in the fields of health, advanced and energy materials, environmental and climate change research, engineering materials and cultural heritage studies. In many instances, it is the combination of the capabilities that are available at ANSTO's national research facilities that enables these complex and vitally important research problems to be solved.