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NUS and NRF launch National Synchrotron Programme and International Synchrotron Access initiative to foster collaboration in scientific research

Singapore, 18 Oct 2022 — The National University of Singapore (NUS) and the National Research Foundation, Singapore (NRF) have launched the **National Synchrotron Programme (NSP)** today to promote and anchor synchrotron research in the country. As part of the launch, NUS and the **Australian Nuclear Science and Technology Organisation (ANSTO)** have signed an agreement giving Singapore researchers preferred access to the **Australian Synchrotron.**

Hosted by NUS, the S$16 million NSP brings together all Singapore-based research institutions, agencies, and industry into a vibrant ecosystem of synchrotron-related research. This will advance knowledge, create unique tools and techniques, and develop the talent to light-up Singapore's synchrotron efforts globally.

The NSP will coordinate resources for synchrotron research locally at the Singapore Synchrotron Light Source (SSLS), which is based at NUS' Kent Ridge campus, and overseas through the **International Synchrotron Access (ISA)** initiative that complements the capabilities of the current facility.

Under the ISA initiative, a five-year collaboration agreement was signed between NUS and ANSTO that allows Singapore researchers to use ANSTO's synchrotron facilities in Melbourne.

The launch ceremony took place during **Singapore Prime Minister Lee Hsien Loong's official visit to Australia for the 7th Singapore-Australia Leaders' Meeting on 17 October 2022**. It was witnessed by **Singapore Minister for Trade and Industry, Mr Gan Kim Yong**, and **Australian Minister for Industry and Science, the Hon Ed Husic MP**.

Professor Chen Tsuhan, NUS Deputy President (Research and Technology), said, "Synchrotron facilities are crucial to many disciplines such as the life sciences, materials science, environmental analysis, and micro/nano fabrication. Advancements in synchrotron research have enabled scientists to probe a wide range of materials and conduct scientific experiments that eventually lead to important discoveries. NUS is excited to host the National Synchrotron Programme and its International Synchrotron Access initiative, which will broaden our scientists' access to such premier research facilities, and in turn, accelerate the pace of innovation to bring about game-changing solutions that benefit society."

"We are delighted to partner ANSTO as our first collaborator under the International Synchrotron Access initiative. This will further strengthen and deepen the research linkages between scientists in Singapore and Australia, and bring new opportunities of joint research in areas of common interests," Prof Chen added.

Director of the Australian Synchrotron, Professor Andrew Peele welcomed the announcement of a collaborative partnership between ANSTO and the National University of Singapore.

“ANSTO’s Australian Synchrotron is one of the largest and most significant standalone pieces of scientific infrastructure in the southern hemisphere, making groundbreaking contributions to Australia’s scientific research endeavours,” Professor Peele said.

“This new partnership will enable greater access to the specialised tools and techniques required to carry out important research and deliver strong outcomes for both nations’ scientific research capabilities.”

Greater access to synchrotron capabilities locally and overseas

A synchrotron is a machine that accelerates charged particles, such as electrons at extremely high energies to produce an electron beam that travels at almost the speed of light. The resulting light emitted in synchrotrons has many useful properties – it can be filtered and adjusted to travel into experimental workstations where light hits samples to illuminate the innermost secrets of materials, from human tissue to plants to metals and more.

Synchrotrons cater to users from various domains such as biosciences, medical research, environmental sciences, agriculture, and advanced materials. For example, plant biologists have used synchrotron light sources to produce ‘metal maps’ of rice grains that accurately tracks the diffusion of key nutrients such as iron and zinc at sub-micron resolutions, leading to breakthroughs in better biofortification of rice.

The SSLS, designated as a National Research Infrastructure located at NUS, has been in operation for over two decades, catering to a wide range of local and international, academic, agencies and industry users from different domains. With the evolution and broadening of research fields in Singapore, the number of users and demand for higher energy and more sophisticated light sources have increased over the years. On top of tapping on the SSLS, Singapore scientists have been collaborating with international synchrotrons worldwide.

The Australian Synchrotron operated by ANSTO in Australia is popular with Singapore researchers as its wider energy range and advanced capabilities such as macromolecular crystallography, phase contrast imaging, X-ray scattering, and absorption ideally complement the SSLS.

Dr Jasbir Singh, Director (National Research Infrastructure) at NRF, said, “Synchrotron techniques hold immense potential for advancing fundamental knowledge across various scientific fields. The National Synchrotron Programme will accelerate Singapore researchers into international developments. Furthermore, its International Synchrotron Access initiative with Australia will also expand our current synchrotron capabilities.

“We are confident that the Programme will strengthen Singapore’s synchrotron research capabilities and nurture a pipeline of manpower and expertise to address national needs in the future.”

International Synchrotron Access initiative

The ISA initiative complements the existing SSLS to facilitate greater scope, engagement, and access by Singapore researchers to advanced synchrotrons around the world. For the first phase, the ISA will partner with ANSTO’s Australian Synchrotron in Melbourne, with the eventual aim of broadening the scheme to include other leading international sites.

Three calls will be put out each year for Singapore researchers who are keen to use the synchrotrons to submit proposals to the NSP for review by its technical committee. Approved experiments will be scheduled to be carried out at either local or overseas sites.

National Synchrotron Programme

Besides overseeing the SSLS and the newly launched ISA initiative, the NSP will offer outreach activities and expertise to evaluate and analyse research problems that can spark the use of synchrotron techniques to further advance the science. With the evolving global landscape on synchrotron developments, the NSP will be at the forefront of synchrotron developments and help to actively train fresh talent for the development of manpower in synchrotron-related activities.

More details on the NSP and its ISA initiative can be found at http://synchrotron-sg.org.

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About National University of Singapore (NUS)

The National University of Singapore (NUS) is Singapore's flagship university, which offers a global approach to education, research and entrepreneurship, with a focus on Asian perspectives and expertise. We have 16 colleges, faculties and schools across three campuses in Singapore, with more than 40,000 students from 100 countries enriching our vibrant and diverse campus community. We have also established our NUS Overseas Colleges programme in more than 15 cities around the world.

Our multidisciplinary and real-world approach to education, research and entrepreneurship enables us to work closely with industry, governments and academia to address crucial and complex issues relevant to Asia and the world. Researchers in our faculties, research centres of excellence, corporate labs and more than 30 university-level research institutes focus on themes that include energy; environmental and urban sustainability; treatment and prevention of diseases; active ageing; advanced materials; risk management and resilience of financial systems; Asian studies; and Smart Nation capabilities such as artificial intelligence, data science, operations research and cybersecurity.

For more information on NUS, please visit www.nus.edu.sg.

About the National Research Foundation (NRF)

The National Research Foundation is a department within the Prime Minister's Office. The NRF sets the national direction for research and development (R&D) by developing policies, plans and strategies for research, innovation and enterprise. It also funds strategic initiatives and builds up R&D capabilities by nurturing research talent. The NRF aims to transform Singapore into a vibrant R&D hub that contributes towards a knowledge-intensive, innovative and entrepreneurial economy; and make Singapore a magnet for excellence in science and innovation

For more information, please visit www.nrf.gov.sg

About the Singapore Synchrotron Light Source (SSLS)

The Singapore Synchrotron Light Source (SSLS) is a compact synchrotron accelerator facility serving researchers from all Singaporean Research Institutions and a range of Industries. SSLS is a University-level Research Institute at the National University of Singapore (NUS), under the office of the Deputy President (Research & Technology). In 2016, SSLS was designated as a National Research Infrastructure (NRI).

Further details can be found at https://ssls.nus.edu.sg/.

About the Australian Nuclear Science and Technology Organisation's (ANSTO) Australian Synchrotron facility

ANSTO is Australia's centre of nuclear expertise, and is the home of Australia's most significant landmark and national infrastructure for research. As the national synchrotron facility of Australia, ANSTO's Melbourne facility operates ten independent beamlines and caters to a wide range of international academic and industry users from different domains and industries. An additional eight new state-of-the art beamlines are currently being built which will be ready by 2024.

Further details can be found at https://www.ansto.gov.au/research/facilities/australian-synchrotron/overview.