Minister's Approval for Linkage Infrastructure, Equipment and Facilities for Funding Commencing in 2025 Schedule

Approved Organisation, Leader of Approved Research Program	Approved Research Program	Estimated and Approved Expenditure ($)	Indicative Funding ($)					Total ($)	Partner Organisation(s)
		2024-25	2025-26	2026-27	2027-28	2028-29	2029-30		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)	(Column 9)	(Column 10)	(Column 11)

Australian Capital Territory

The Australian National University

LE250100042	**A recoil imaging detector module for directional particle physics**	447,000.00	0.00	0.00	0.00	0.00	0.00	447,000.00	UNIVERSITY OF NEW MEXICO, KOBE UNIVERSITY, THE UNIVERSITY OF SHEFFIELD, UK, UNIVERSITY OF HAWAII AT MANOA, USA, STAWELL UNDERGROUND PHYSICS LABORATORY LTD
Bignell, Dr Lindsey J	This proposal seeks to build a highly advanced detector, called CYGNET, capable of imaging low-energy particle tracks, that will form the basis of a future major underground experiment in Australia's Stawell Underground Physics Laboratory. CYGNET will settle the remaining technical questions to pave the way for the future large detector, which in turn will open new frontiers in the hunt for dark matter and address long-outstanding issues in neutrino physics. CYGNET's neutron detection ability will support innovations for defence and agriculture by opening measurement possibilities inaccessible to conventional instruments. This work will train a highly-skilled workforce and position Australia as an international leader in particle detection.								

National Interest Test Statement

The discovery of particle dark matter, whose nature is currently unknown, would have a huge impact, similar in scale to discovery of the Higgs boson or gravitational waves. This proposal will build an advanced particle detector (CYGNET), that will form the basis of a future world-leading underground dark matter experiment. The decadal vision is for an international network of large detectors, with a major node in the Stawell Underground Physics Laboratory in regional Victoria. CYGNET will be uniquely sensitive to the direction of incoming particles, which creates translational opportunities that can benefit Australia, particularly in the field of neutron detection. There is an established need in defence for fissile material localisation using neutrons, and cosmic-ray neutrons are the only means to measure soil moisture at the hectare scale; directional detection of neutrons with CYGNET will benefit both of these areas. The CIs will make use of their existing networks, especially through the Centre of Excellence for Dark Matter Particle Physics, to engage with industrial stakeholders and promote key milestones in the media. Students working on this project will build connections at leading international institutions, receive hands-on training in instrumentation and data science, and develop advanced nuclear and particle physics skills. These skills are valuable to the mining, medical physics, space and defence sectors, especially the nascent nuclear-powered submarine program.

LE250100148	**Comprehensive testbed for optical quantum technology**	1,037,647.00	0.00	0.00	0.00	0.00	0.00	1,037,647.00	
Ahlefeldt, Dr Rose L	This project aims to furnish Australia with a multi-functional optical quantum measurement facility for developing high-performance and network-ready optical quantum devices. The project expects to identify novel quantum optical materials and expedite the development of hybrid quantum technologies that leverage multiple physical platforms for next-generation performance. The facility will serve as the keystone of a national optical quantum test facility, allowing quantum devices to be deployed on a real-world, dark-fibre network. Expected outcomes include bolstering cross-disciplinary research collaborations, improved training for the quantum workforce, and opening a new direction for Australia's academic and commercial quantum ecosystems.								

National Interest Test Statement

Quantum technology is predicted to revolutionise the technology landscape over this century and drive Australia's future economic growth. Quantum computers, for instance, could provide the computing power to solve the world's most challenging problems, while quantum sensors could offer increased sensitivity to better monitor our changing continent. However, it is now clear that to reap many of the benefits of quantum technology, these devices must be integrated into optical quantum networks to increase their size and performance. Australia has long been a leader in both quantum hardware and quantum networks, making it uniquely positioned to take a pioneering role in the emerging field of optically integrated quantum technology. This facility provides the key infrastructure to support this future growth direction: it reaches the ultra-low temperatures required for most quantum devices to reach high performance and provides flexible access to a range of optical resources, including Australia-first single photon detection facilities in the technologically crucial telecom band. This facility will foster collaborations as researchers from across the quantum community work together to build hybrid devices. It will allow more quantum devices to be deployed on quantum networks, becoming remotely accessible to more Australians, and provide a new avenue along which to grow the commercial quantum ecosystem in Australia.

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	The Australian National University	1,484,647.00	0.00	0.00	0.00	0.00	0.00	1,484,647.00	
	Australian Capital Territory	1,484,647.00	0.00	0.00	0.00	0.00	0.00	1,484,647.00	

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)	(Column 9)	(Column 10)	(Column 11)
New South Wales									
The University of New South Wales									
LE250100086	**Dynamic Nuclear Polarization NMR for Accelerating Materials Science**	1,490,304.00	0.00	0.00	0.00	0.00	0.00	1,490,304.00	WEIZMANN INSTITUTE OF SCIENCE
Stenzel, Prof Martina	Solid state Nuclear Magnetic Resonance (ssNMR) spectroscopy is a versatile tool used for studying the molecular structure of complex materials in chemical, biological, environmental and engineering sciences. While NMR provides exceptional resolution to discriminate between chemical structures, many potential NMR measurements are hamstrung due to the inherently low sensitivity of the NMR technique, small volumes of material available and low natural abundance of NMR active isotopes. Dynamic Nuclear Polarization (DNP) coupled to ssNMR (the DNP-NMR technique) enhances the sensitivity of the NMR experiment by nearly two orders of magnitude, thereby enabling deep structural characterization of challenging and complex materials.								
	National Interest Test Statement								
	The proposed infrastructure will promote research excellence in the fields of drug delivery, environmental science,catalysis and energy storage. Many of the projects supported by the infrastructure will develop more efficient ways to store renewable energy, develop novel capabilities to remediate environmental hazards and waste, and accelerate cutting edge development of various anti-cancer therapies. Thus, the projects supported by the requested infrastructure have a high applicability to addressing key societal issues, such as energy security, environmental impacts and health. As such there is potential for providing job opportunities for highly skilled workers and tremendous commercial benefit to the Australian economy by opening possibilities for the development of high value products.								
LE250100164	**Closing the Gap in High-Efficiency Solar Cell Research in Australia**	1,315,125.00	0.00	0.00	0.00	0.00	0.00	1,315,125.00	SUNDRIVE SOLAR PTY LTD
Hoex, Prof Bram	All commercial and high-efficiency silicon solar cells employ a thin-film on the front surface to improve light collection and electrical performance. A flexible Plasma Enhanced Chemical Vapour Deposition (PECVD) system will regain this critical capability at UNSW and also be the first in Australia capable of fabricating all advanced cell structures in an industrially compatible but research-scale tool. The significance lies in ensuring Australian research on silicon and next-generation tandem solar cells remains competitive internationally. Expected outcomes are a national capability for fabricating silicon solar cells with efficiencies exceeding 25% with direct benefit to domestic industry, academic research groups and graduate training.								
	National Interest Test Statement								
	Photovoltaic (PV) solar power has the potential to provide Australia and the world with clean energy and divert a future catastrophic climate. For decades UNSW has been a world leader in PV research and making PV devices. Now, industry is rapidly adopting and accelerating novel cell architectures. Plasma Enhanced Chemical Vapor Deposition (PECVD) layers are crucial for all existing and future cell types and are particularly critical and rapidly changing in high efficiency cell structures. This is bringing manufacturing and reliability challenges. Unsolved, the latter can result in significant yield losses when these technologies are applied at scale in Australia to meet our Net-Zero ambitions. All four PECVD tools for solar research at UNSW are now obsolete. A new PECVD tool for advanced nitride and varying dopant and crystallinity silicon layers for high-efficiency solar cells will not just regain critical capability but more importantly add new capabilities for Australia, enabling leading-edge research and collaboration with rapid translation to industry. As a result, Australia will benefit from retained leadership in solar research with benefits to the whole value chain down to PV field operation, a unique researcher training program fabricating full single junction and tandem PV devices, improved opportunities for collaborations, manufacturing know-how development and technology transfer, and ultimately more efficient and more reliable solar power for a cleaner future.								
	The University of New South Wales	2,805,429.00	0.00	0.00	0.00	0.00	0.00	2,805,429.00	
The University of Newcastle									

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LE250100161	**A multifunctional platform for advanced materials characterization**	570,000.00	0.00	0.00	0.00	0.00	0.00	570,000.00	
Yi, Prof Jiabao	The proposed facility provides unique capabilities for the understanding of mechanisms, dynamics and kinetics in catalysis, carbon capture, energy storage and conversion and investigating interactions between semiconductor devices under external stimuli of electric field, magnetic and optical light at various temperatures in functional materials. The platform offers both in-situ spectrum functions to assess the electrochemical reaction of different materials and the measurement of property by external stimuli under extreme environment. It will facilitate multidisciplinary research collaborations between academics and industries to advance clean energy, energy storage and conversion, carbon neutral and next-generation semiconductor devices,								
	National Interest Test Statement								
	The proposed facilities integrate the capabilities of materials and devices with in-situ spectrum function under the well-controlled environment, such as humidity, pressure, vaccum and various external stimuli including electric field, magnetic field and optical light in the big Sydney basin. The proposal offers a general platform capable of investigating the physical and chemical properties of various functional materials for the applications of catalysis, carbon capture and conversion, energy storage and semiconductor devices. It will support the Science and Research Priority “Advanced Manufacturing”, and the research outcomes will facilitate the development of catalysis, energy and electronic technologies. The global semiconductor sector's revenue was $573B in 2022, while the clean energy market will reach $1977 B by 2030. It will build capacity in Australia for research in clean energy, advanced materials and functional devices. This unique platform will also fill a major gap in the currently available facilities in Australia, enhancing Australia's global position as a leader in renewable energy, carbon neutral and net zero emission, energy storage and conversion as well as next-generation semiconductor devices.								
	The University of Newcastle	570,000.00	0.00	0.00	0.00	0.00	0.00	570,000.00	
The University of Sydney									
LE250100091	**Ultrafast dynamic tomography and x-ray based rheography facility**	1,443,332.00	0.00	0.00	0.00	0.00	0.00	1,443,332.00	
Saadatfar, A/Prof Mohammad	This project aims to enhance our understanding of materials science through advanced imaging technology. Central to this is acquiring a TESCAN DynaTOM, a unique MicroCT system for fast, detailed 2D/3D/4D imaging without moving the sample. This approach lets researchers observe materials' structural changes in real-time, offering insights into deformation, mass transport, and chemical reactions. Expected benefits include deeper knowledge of material behaviours essential for geosciences and manufacturing. Moreover, the project will support educational and research opportunities at the University of Sydney, partner universities, and nationwide, providing access to an advanced imaging platform.								
	National Interest Test Statement								
	Australia and the global community urgently require advanced technologies to deepen our understanding of materials critical for environmental sustainability, mineral processing, and energy security. The acquisition of TESCAN DynaTOM, an advanced x-ray imaging facility, addresses this need by providing unprecedented insights into materials essential across everyday life and key industries. This facility's unique imaging capabilities enable us to explore opaque materials and physicochemical processes with an unprecedented level of detail, introducing capabilities not currently available in Australia. This technological advancement strengthens Australia’s leadership in precision measurement and material characterisation, fostering a collaborative network of researchers excelling in materials and environmental sciences. The facility's ability to enhance our understanding of energy storage and resource management processes aligns with our nation's strengths in research commercialisation, opening up economic and social opportunities by leveraging the global demand for advanced technologies. To maximise the research impact beyond academia, we will engage industry partners and the public, disseminating findings through open-access publications and workshops with key stakeholders. This strategy aims to translate our research into practical applications, ensuring Australian innovation delivers tangible, global benefits with widespread societal impact.								
LE250100114	**Single Cell Proteomics Platform**	1,534,196.00	0.00	0.00	0.00	0.00	0.00	1,534,196.00	
Larance, A/Prof Mark	This proposal will establish a state-of-the-art platform to characterise protein function								

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L	at the single-cell level across a range of biological samples including yeast, plants, animals and humans. It will provide new insights into the differentiation of cellular functions across many different cell types in multicellular organisms, which cannot be achieved by bulk analysis of whole tissues. Expected outcomes include identification of new biological pathways and associated complex and high-value protein molecules. Such new fundamental knowledge of biological processes will enable future efforts in the National Reconstruction Fund Priority for medical science and agriculture and boost Australia's competitiveness in these global industries.								
	National Interest Test Statement								
	The tissues of animals and plants contain cells that have diverse functions, without which life cannot form. Yet this diversity is far from understood. The state-of-the-art infrastructure and collaborative platform established here will advance our molecular understanding of cells across the tree of life from humans to rice plants. This first-in-country platform will fill a large gap in our capability that is obstructing further advances to understand cell function and their role in basic processes such as ageing, development, and metabolism. The platform established here will enable discoveries that pave the way for future commercialisation of treatments for animal, human, or plant disease, and thus falls within the "Health" Science and Research Priority. In the future, the platform established here can be used to understand the function of drugs at the single cell level and will benefit the National Reconstruction Fund Priorities for medical science and agriculture. Thus, both economic and social benefits will arise for Australians from the capability of this platform. The single cell proteomics platform established here will provide Australia with a world-leading capability and will also benefit the Australian community by facilitating international collaboration on single cell analysis, while training young researchers in the latest analytical techniques. We will promote these outcomes through media engagement, community outreach and commercialisation through industry.								
LE250100147 Quack, A/Prof Niels	**Hybrid Integration: Advancing Semiconductors, Quantum and Photonics** This project aims to establish an advanced on-demand precision micro-solder ball jetting to accelerate innovation in engineering of microelectronics, semiconductors, photonics and quantum systems. Expected outcomes include enhanced sovereign capability for Australia in advanced microelectronics and photonics subsystems assembly for critical imaging, sensing and communication applications. It will improve thermal imaging systems, increase digital fibre-optical telecommunications efficiency, enhance autonomous navigation capabilities and secure quantum and space communications, which will benefit multiple National Reconstruction Funds priority areas including medical science, defence capability, renewables, and enabling capabilities.	680,000.00	0.00	0.00	0.00	0.00	0.00	680,000.00	ADVANCED NAVIGATION PTY. LTD.
	National Interest Test Statement								
	Australia has the objective of establishing and growing a prosperous, sustainable, sovereign semiconductor industry capability. This project aims to establish an advanced on-demand micro-solder ball jetting to address the current capability gap in key semiconductor technologies. It will allow us to address emerging research and engineering challenges in electronic, photonic, and quantum integrated circuits. This capability will allow assembly of subsystems for a variety of applications, and will strengthen Australia's sovereign capability and global leadership in photonics, microelectronics and quantum engineering. These are multi-billion dollar markets, and this new capability will offer considerable economic benefit to Australian industry. The research outcomes will find application in secure and low-power telecommunications, in sensors for observation in agriculture, autonomous navigation in space, or thermal imaging in defence applications. For example, novel photonic integrated circuits in datacentres will make them more energy efficient and support Australia's efforts towards net zero. The strengthened advanced manufacturing capability will shorten development cycles, and the technology will help to more efficiently harness semiconductor and photonics value chains, so that innovation can more rapidly find uptake by Australian industries.								
	The University of Sydney	3,657,528.00	0.00	0.00	0.00	0.00	0.00	3,657,528.00	
University of Technology Sydney									
LE250100063 Jin, Prof Dayong	**National Live Cell Analytics Facility for Organelles' Interactome Discovery** The LIEF project aims to establish a state-of-the-art National Live Cell Analytics Facility for Organelles' Interactome Discovery. It will incorporate various cutting-edge equipment, including spinning disk super-resolution confocal microscope, polarization	999,950.00	0.00	0.00	0.00	0.00	0.00	999,950.00	

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	structure illumination microscope, an extended excitation unit operating in the near-infrared spectrum, and a high-throughput screening workstation. The facility will provide unparalleled capabilities for visualizing interactions among subcellular organelles and mapping out networks between cells. Australian data science, biology, materials, and engineering researchers will collaborate to spearhead international advancements in cell biology methodologies through this advanced platform. **National Interest Test Statement** Organelles are independent subcellular structures within cells that play important functional roles. Traditional methods for studying their functions involve using specific probes to label organelles of interest and observing them under a microscope. However, due to spectral overlap between markers, the ability to simultaneously image the dynamic changes of all organelles is unattainable. This LIEF application aims to establish a national live cell imaging facility for high-throughput chemistry and biology discoveries. One of the benefits of this facility is to provide the entire biology community with a novel approach to studying organelle interactions. Through this method, significant advancements will be made in our understanding of various cell disorders at the subcellular level of organelle interactions. The system holds promise for catalyzing innovation and fostering job growth within the technology sectors. As ongoing research and development in this domain progress, the system is poised to unveil fresh applications and utilities, consequently spurring the development of novel products and services. This cycle of innovation is anticipated to fuel economic expansion, generate employment opportunities, and invigorate the broader economy. In addition, the utilization of social media and collaboration with industries will promote research outcomes on organelle interactions beyond academia, enhancing public understanding and application awareness in the field.								
LE250100112 Liu, Prof Hao	**Operando Monitor of Gas Evolution in Renewable Energy Systems** The gas evolution reactions are critically important in renewable energy systems. However, the gas evolution mechanisms in many energy systems have not been well investigated due to the fast reaction dynamics and trace of gaseous byproducts. In this project, we will combine the technology of differential electrochemical mass spectrometry with in-situ Raman/FTIR investigation to collect information on adsorbed species, reaction products, and intermediates on a short timescale. By characterising the changes in product distribution in various systems, the reaction mechanism can be revealed, and relevant information for specific reactions can be obtained. This will provide guidelines for fundamental knowledge in renewable energy systems. **National Interest Test Statement** This project establishes an Australian first analytical technique to accurately detect and measure gases that develop after electrochemical reactions, particularly in renewable energy and storage systems. The signal detected using traditional techniques is often compromised by residual gases and other interfering factors and our proposed method allows for real-time tracking of gas distribution and yield while detecting changes in reaction conditions. As an integrated facility consisting of Mass, Raman and Infrared spectrometers, it can simultaneously collect the gaseous consumption/generation along with the bonding evolution of electrodes, thereby providing the opportunity to reveal the reaction mechanism and solve the practical challenge in many energy storage and conversion systems. This information can also serve as a critical experimental and theoretical basis for guiding the design and optimisation of reaction conditions, improving the development and manufacturing of renewable energy storage and conversion products and equipment. The outcomes of the cross-field investigations will not only create a number of high impact academic publications, but also has the potential to generate patentable technologies which might bring benefits to Australia and attract collaborations from industry to meet the practical demands. This directly aligns with Australia's aim to become a leader in renewable energy and meet its emission targets.	461,000.00	0.00	0.00	0.00	0.00	0.00	461,000.00	
	University of Technology Sydney	1,460,950.00	0.00	0.00	0.00	0.00	0.00	1,460,950.00	
University of Wollongong									
LE250100038 Deutscher, A/Prof Nicholas M	**Regional and Urban Greenhouse Gas Emission Detection (RUGGED)** The facility proposed here will establish a network of sun-sensing spectrometers for detection of changes in atmospheric composition. The instruments can be deployed to regions or facilities of interest to capture the total change of greenhouse gases in the atmosphere due to these regions or facilities, for example at urban scales, or areas of intense natural or anthropogenic emissions or uptake. The greenhouse gas	770,891.00	0.00	0.00	0.00	0.00	0.00	770,891.00	

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	quantification system will provide valuable independent estimates of emissions, to enable verification of bottom-up greenhouse gas inventories and satellite-based estimates of emissions.. **National Interest Test Statement** Application of the equipment in this project will enable targeted, independent, estimates of greenhouse gas emissions and verify Australia's progress towards NetZero and meeting obligations under the Paris agreement. The quasi-continuous measurements provided by the proposed network will enable detailed temporal information about emissions to be quantified, and reduce uncertainties associated with current estimates. A 20% error in Australia's GHG inventory has a spot price value of approximately $3.5 billion. Through the research enabled by this infrastructure, targets for emissions reductions can be identified. Reducing uncertainties and emissions has a direct economic benefit. In applying the network of instruments, we will be undertaking training of next generation scientists, industry and government professionals in state-of-the-science work to estimate emissions, and develop a method for applying this to multiple locations. In this growing area, which is now a billion dollar industry, there are currently an inadequate number of people able to undertake the work necessary in the near future.								
LE250100055 Hyland, A/Prof Christopher J	**A Self-Driving Automated Molecular Synthesis and Formulation Platform** This LIEF will build a NSW-wide machine-learning powered, self-driving, automated chemical synthesis platform. These robotic systems will put us at the forefront of the revolutionary transformation of chemical synthesis and formulation into data rich disciplines. Based on technological advances in chemistry robots and machine learning, these specialised systems will carryout reaction and formulation optimisation with a range of chemical classes across scales. They will conduct online analysis of reaction outcomes and using machine learning algorithms operate in a self-driving mode to decide upon the next round of experiments. They will accelerate the optimisation of processes for advanced applications in medicines, mining and agriculture. **National Interest Test Statement** New molecules, prepared in a sustainable manner, are required to solve challenges in healthcare, materials, and energy. However, the synthesis of new molecules and the optimisation of novel chemical reactions to produce them is a laborious and time-consuming task that hinders novel applications occurring in a timely fashion. This equipment will use advanced chemical handling robots and machine-learning algorithms to rapidly speed up the discovery of efficient methods to prepare new molecules for these applications. Infrastructure for automated chemical synthesis is not well developed in Australia, so this equipment will fill this critical capability gap. The equipment will have broad benefit as it will enhance multiple research programs that have downstream impact on the preparation of enhanced materials, agrochemicals and medicines. It will also identify more efficient conditions for manufacturing high-value chemicals and therefore it will have both commercial and environmental benefits for Australians. The research team is broad ranging in terms of areas, which intrinsically maximises the possible pathways to translation and adoption. Commercial impact will be explored through the CIs' existing network of commercial collaborators. This network includes local pharmaceutical companies and international links through a key partner investigator in the Netherlands.	1,987,000.00	0.00	0.00	0.00	0.00	0.00	1,987,000.00	EINDHOVEN UNIVERSITY OF TECHNOLOGY
LE250100150 Ellis, A/Prof Shane R	**Mass Spectrometer for Label-Free Molecular Imaging at Ultra-High Resolution** This project will establish next-generation mass spectrometry capabilities for imaging and identification of molecules in complex systems such as tissue, cells, plants and marine organisms. The project expects to generate new knowledge in the biological, chemical and environmental sciences and realise high spatial resolution (1 µm) capabilities 5-fold higher than currently available in Australia. Expected outcomes include new technologies for multidisciplinary research and a critical mass of expertise to position Australia at the forefront of spatial-omics. This should provide significant benefits, such as new capabilities for studying spatially-defined systems that benefits areas such as biotechnology, pharmaceutical and materials science. **National Interest Test Statement** New molecular imaging will be deployed for comprehensive mapping and structural analysis of molecules within complex systems (e.g. tissues, cells, plants and marine organisms). This can lead to an improved understanding of agricultural and marine systems that can reduce fertiliser inputs and help preserve the Great Barrier Reef. Fundamental molecular knowledge gathered can help develop new disease classification tools that complement	1,281,990.00	0.00	0.00	0.00	0.00	0.00	1,281,990.00	

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	conventional histopathology and benefit the health of the Australian population. The project will position Australia at the forefront of the emerging mass spectrometry imaging and spatial-omics fields attracting significant industry interest (e.g., instrument vendors and pharmaceutical companies). It will provide early access to cutting-edge new technologies that are currently only available in one other laboratory globally, providing a significant competitive edge to Australian research. Developments made may lead to new Australian intellectual property and industrial collaboration, with carry-over benefits to the economy. The research program will also train young researchers in developing and applying state-of-the-art technologies that position them well to contribute to Australia's knowledge economy.								
	University of Wollongong	4,039,881.00	0.00	0.00	0.00	0.00	0.00	4,039,881.00	
	New South Wales	12,533,788.00	0.00	0.00	0.00	0.00	0.00	12,533,788.00	

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Queensland									
Queensland University of Technology									
LE250100024 Candusso, Prof Damian J	**Mobile 3D Artefact Digitisation Lab** The Mobile 3D Artefact Digitisation Lab is an integrated research facility providing mobile, robot-automated, multi-camera photogrammetry and 3D sound capture that will enable researchers to investigate efficient, end-to-end digitisation solutions from 3D scanning to immersive experiences with broad impact on the cultural preservation field. The facility will make inexpensive 3D sound and image digitisation available in any location in Australia and cut the time it takes to digitise artefacts 10 times or more. It will be applied on projects with partner organisations, including museum artefacts for exhibition, historical sites, and immersive educational and research projects, and provided on a cost recovery basis to the broader sector.	261,250.00	0.00	0.00	0.00	0.00	0.00	261,250.00	QUEENSLAND MUSEUM, AUSTRALIAN MUSEUM
	National Interest Test Statement The proposed research equipment will address critical challenges in the preservation and dissemination of Australia's cultural heritage by augmenting Australia’s capacity in 3D digitisation. This aligns closely with the national interest in safeguarding and promoting our rich cultural identity and historical legacy. The project will develop a mobile, robotic, multi-camera photogrammetry and 3D sound capture integrated research facility that is the first of its kind and will support collaborative, interdisciplinary research endeavours, education, and cultural heritage preservation. The facility will make 3D image digitisation ten times faster than is currently achievable, and will result in accessible virtual, augmented and extended reality experiences for education and research at the cutting edge of current technology. The project's focus on advancing 3D digitisation techniques, particularly in the realms of 3D image digitisation, 3D sound, and immersive cultural heritage experiences directly contributes to the national imperative of preserving and sharing Australia's diverse cultural assets for current and future generations.								
	Queensland University of Technology	261,250.00	0.00	0.00	0.00	0.00	0.00	261,250.00	
The University of Queensland									
LE250100050 Schembri, Prof Mark A	**A Facility for Accelerated Microbial Phenotyping in Southeast Queensland** This facility for Accelerated Microbial Phenotyping aims to establish the most advanced cell sorter and microbioreactor platforms in Australia. It will enable high-throughput sorting of complex microbial populations and physiological characterisation of sorted samples at unprecedented levels of detail and efficiency. It will elevate the capacity and remove bottlenecks of interdisciplinary ARC and industry projects that rely on deconstructing hundreds of poly-microbial environmental samples and refining highly complex bioengineered populations. Expected outcomes include new knowledge on the massively diverse Australian microbiota, and future commercial products benefiting the environment, agriculture, food, health, and biotechnology.	937,500.00	0.00	0.00	0.00	0.00	0.00	937,500.00	
	National Interest Test Statement Microbes perform countless life-supporting functions from recycling of essential elements to biocontrol of pests, and are now being re-engineered to pioneer sustainable manufacturing of high-value chemicals and biological products. The most important and valuable microbial functions are best performed by biodiverse communities of microbes. However, to understand and leverage these complex systems, we must first be able to efficiently characterise in detail the role each constituent microbe has within these communities. This facility will elevate capacity for rapid dissection of complex microbial communities and subsequent physiological characterisation of individual isolates. This level of precision and efficiency is essential for achieving global competitiveness, yet it is currently unreachable in Southeast Queensland. This facility will provide cornerstone technology for hundreds of researchers in the metropolitan and regional areas of Southeast Queensland, essential for deciphering the genetic codes of environmental microbes and development of next-generation products using engineered microbes. This new capacity will provide a competitive edge for high-impact outcomes and enhance training capacity. It will also support economic benefits for Australia, such as the development of new commercial products for the agriculture,								

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(Columns 1 and 2)	(Column 3)	2024-25 (Column 4)	2025-26 (Column 5)	2026-27 (Column 6)	2027-28 (Column 7)	2028-29 (Column 8)	2029-30 (Column 9)	(Column 10)	(Column 11)
	food, mineral extraction, and biotech industries, together worth over $500B to the Australian economy, attracting new investment and creating new jobs.								
	The University of Queensland	937,500.00	0.00	0.00	0.00	0.00	0.00	937,500.00	
University of the Sunshine Coast									
LE250100077 Marshall, Prof Andrew R	**TruForest: Founding an Australian Rainforest LiDAR Monitoring Network** The TruForest project aims to establish a world-leading network for laser (LiDAR) scanning of Australian rainforests. LiDAR will advance the accuracy and efficiency of measuring forest structure, biomass and carbon, offering new potential for scientific research into large scale forest responses to logging, cyclones and climate change. The project will unite LiDAR expertise, tools and data across four universities and five rainforests, with an international partnership that will facilitate future LiDAR use and access for anyone. The network will help to understand and monitor Australia's forests, stimulating cutting-edge interdisciplinary science and helping to quantify and achieve national environmental and carbon sequestration targets.	1,757,147.00	0.00	0.00	0.00	0.00	0.00	1,757,147.00	AIRBORNE RESEARCH AUSTRALIA, ARBORMETA PTY LTD
	National Interest Test Statement Australia has one of the highest deforestation rates globally and its rainforests are undergoing unprecedented threats from land demand and environmental impacts. Australia’s research community lacks access to critical emerging technologies required to assess the large-scale consequences of these threats. The TruForest project will address this technological gap by establishing a network of cutting-edge equipment, expertise, and data to support laser (LiDAR) measurement of Australian rainforests. LiDAR uses lasers to rapidly generate 3-D environmental reconstructions allowing for regular mapping. TruForest will advance Australia’s capability in mapping of rainforest structural diversity, to lead the world in understanding and predicting the impacts of global threats to rainforest biomass, diversity and carbon stocks. The improved accuracy and efficiency of LiDAR survey will help end-users to assess the status and potential recovery of forests. Australian rainforests support >60% of Australian species on 2.7% of the land area and generate >$2.6 million in household income and >1,300 jobs in the Wet Tropics region alone. Improved rainforest restoration management would boost the economy by improving the health of our most valuable natural resource. Improved measurement and engagement with Government and the forest management community, will also inform policy and to monitor Australia's commitments to halt deforestation by 2030 and towards evidence-based restoration management.								
	University of the Sunshine Coast	1,757,147.00	0.00	0.00	0.00	0.00	0.00	1,757,147.00	
	Queensland	2,955,897.00	0.00	0.00	0.00	0.00	0.00	2,955,897.00	

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South Australia									
Flinders University									
LE250100119 Morley, A/Prof Mike W	**Australian Microarchaeology and Palaeosciences Facility (AusMAP)** The Australian Microarchaeology and Palaeosciences Facility (AusMAP) aims to revolutionise our understanding of the human and environmental past through the innovative application of micro-excavation and 3D recording techniques allied with state-of-the-art analytical instrumentation. The research undertaken at AusMAP will significantly advance the way we study artefacts, fossils and sediments, maximising their potential using a novel micro-analytical approach. Expected outcomes of AusMAP include facilitating interdisciplinary and international collaboration and streamlining research and cultural resource management processes. This will provide significant benefits to our deep time understanding of the environment and history of humankind.	394,173.00	0.00	0.00	0.00	0.00	0.00	394,173.00	LANTERN HERITAGE PTY LTD, UNIVERSITY OF TORONTO, SCARBOROUGH, SILPAKORN UNIVERSITY, NATIONAL UNIVERSITY OF MALAYSIA
	National Interest Test Statement The proposed AusMAP facility will be a state-of-the-art laboratory complex enabling analyses of cultural, fossil and environmental materials at a range of microscopic scales to tease out novel information about life on earth, the evolution of our species, and the environmental history of Australia. By uniquely combining cutting-edge micro-scale recording and excavation techniques with quantitative analytical instrumentation, the facility will be a first of its kind worldwide, allowing Australia to lead the field in micro-scale analyses of artefacts, fossils, ecofacts, rocks and minerals. The facility will benefit sectors from heritage conservation to natural resource management by streamlining the process of archaeological and environmental resource characterisation, employing AusMAP's seamless operational 'one-stop-shop' workflows. In the heritage sector this will afford a far greater level of detail to our understanding of how the Australian landscape has evolved and how Indigenous people have interacted with these unique environments over the past 65,000 years. To promote new high-profile findings, the AusMAP team will communicate discoveries through a range of non-traditional channels, including published commentary pieces, social media updates and public seminars. AusMAP will enhance our stewardship of cultural and ecological legacies, support informed decision-making in land use, and solidify Australia's reputation in global scientific leadership.								
	Flinders University	394,173.00	0.00	0.00	0.00	0.00	0.00	394,173.00	
The University of Adelaide									
LE250100010 Rowell, Prof Gavin P	**Australia's Engagement in the Cherenkov Telescope Array** The Cherenkov Telescope Array is a transformational multi-national facility in gamma-ray astronomy. It will be 10 times more sensitive than current instruments and provide a paradigm shift in understanding many challenges in high energy astrophysics and in the makeup of dark matter. The facility is now in its construction phase and full operations are expected from about 2029. This project will provide essential contributions to Australia's subscription to access the facility, recently approved enhancements to the facility, and provide hardware to kickstart new and expanded research programs using Australia's optical and radio astronomy telescopes critical to the Cherenkov Telescope Array's flagships Key Science Projects.	540,000.00	440,000.00	430,000.00	410,000.00	280,000.00	0.00	2,100,000.00	COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION, ARMAGH OBSERVATORY AND PLANETARIUM, MAX PLANCK INSTITUTE FOR NUCLEAR PHYSICS, NAGOYA UNIVERSITY, JAPAN
	National Interest Test Statement Australia is internationally-renowned for its leadership in astronomy. This project will ensure Australian scientists have access to the world's best facility for gamma-ray astronomy research, worth over 330 million Euro. The science								

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	of this facility (the Cherenkov Telescope Array) is fundamentally linked to Australia's key investments in radio and optical astronomy such as the Square Kilometre Array, and the fully robotic 2.3 metre telescope run by the Australian National University. Parts of this project's funds will equip the 2.3 metre telescope with a new optical astronomy instrument to support the Cherenkov Telescope Array's Key Science Projects that study mysterious transient sources in the sky. Australian industry will also directly supply critical hardware for the Cherenkov Telescope Array, providing economic benefits to advanced manufacturing industries. The project expects to unveil Nature's extreme phenomena in space through collaboration of world-leaders in astrophysics, nuclear and particle physics, and machine learning. The potential social benefits include supporting Australia's security needs through developing a workforce of researchers experienced in high-speed electronics, optics, nuclear physics and machine learning techniques. Results will be shared with the public through mainstream media, social media and outreach events to encourage translation and to inspire future young scientists into scientific and technology careers.								
LE250100049 Boes, Dr Andreas	**National Atomic Layer Etching Facility** This project aims to create Australia's first and only facility for Atomic Layer Etching, which allows layer-by-layer removal of semiconductor materials with excellent etch depth control and uniformity, while the etched surface exhibits ultra-low surface damage and roughness. The etch and surface quality is crucial for advanced nanoscale electronic and photonic devices, as the surface is a significant fraction of nanoscale devices, severely affecting their properties. The diverse variety of applications supported by this facility will make it a nexus point between multiple disciplines, enabling research in quantum technology, broadband networks, sensing, materials science, and beyond, accelerating its adoption by Australian manufacturing.	989,620.00	0.00	0.00	0.00	0.00	0.00	989,620.00	
	National Interest Test Statement With growing domestic and global security threats, Australia's intelligence sectors need sophisticated security and communication technologies to identify threats early and keep Australians safe. To do this, Australia's intelligence agencies need fully integrated devices the size of a fingernail that can use advanced materials to power new technologies like quantum computing, super-fast electronics, and high-tech sensors. However, Australia currently lacks the manufacturing capability to process these materials with the precision and quality that is required for such fully integrated devices. This project brings a world-class facility to Australia that allows precise layer-by-layer removal of semiconductor materials needed for devices, while retaining material quality. The National Atomic Layer Etching Facility will operate as a shared and open-access research facility available to Australian and international companies. It will benefit Australians commercially, by enabling cutting-edge research as part of a new Australian industry capability. Additional social benefits will be realised by increasing Australia's competitiveness in energy, information, and communication sectors. Project outcomes will be communicated to the public through media releases, social media and proactive engagement of the media. Overall, this facility will benefit national security by giving our defence and intelligence agencies the tools they need to keep Australia secure in the future.								
LE250100052 Luiten, Prof Andre N	**All-Optical Upgrade to the Adelaide Atom Trap Trace Analysis Facility** This LIEF will upgrade the University of Adelaide Atom Trap Trace Analysis facility with a state-of-the-art analysis system that incorporates new all-optical methods. The system will provide ultrasensitive measurement of trace argon and krypton gas for groundwater dating. The project addresses a global demand for measurements by increasing the capacity at the Adelaide facility and enables new applications through analysis of smaller sample volumes. It will benefit the Australian environmental and earth sciences by providing unique datasets, generating new knowledge into the flow and transport mechanisms of groundwater systems. It will address national water security and sustainability goals, and support growth of population and industry.	824,046.00	0.00	0.00	0.00	0.00	0.00	824,046.00	ANSTO
	National Interest Test Statement Water security is a major issue. Globally, water crises continue to pose a real threat to the well-being of people. In Australia, many communities and industries rely on groundwater. Yet, the impact of extraction and contamination of groundwater resources and its quality are still poorly understood. This LIEF project will upgrade the Adelaide facility for Atom Trap Trace Analysis, addressing a global measurement bottleneck, and enabling Australian groundwater research. The facility measures naturally occurring noble gas tracers via quantum technology for better understanding and managing our groundwater resources. It will provide data to quantify natural groundwater flow paths and flow rates for resource sustainability estimates, mapping of contaminant migration, and to accelerate the discovery of hidden water resources. This research provides social, environmental, and commercial benefits as Australia adapts to a changing climate. It will support development of new government policy, improve sustainable use of water resources that support quality of life and the sustainable development of the critical minerals, hydrogen								

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(Columns 1 and 2)	(Column 3)	2024-25 (Column 4)	2025-26 (Column 5)	2026-27 (Column 6)	2027-28 (Column 7)	2028-29 (Column 8)	2029-30 (Column 9)	(Column 10)	(Column 11)
	production and food production industries. Research outcomes will be shared with policy makers, industry stakeholders and community stakeholders through direct engagement. Project highlights will be communicated with the public through various media channels, including social media, press releases, and public seminars.								
LE250100094 Jackson, Prof Paul D	**Enabling the future of the Australian collider physics program** The project aims to fund the continuation of Australia's very successful experimental particle physics program to explore how the universe works at its fundamental level. We interrogate subatomic matter at the energy frontier at CERN's Large Hadron Collider and the intensity frontier at Japan's SuperKEKB collider. The basic contributions required for Australian membership of these two key programs will enable scientists to continue capitalising on decades of hard work and accumulated expertise, significant project outcomes and benefits include: access for Australia to advanced instruments and international research facilities; training of the next generation of researchers in detector construction and operation; and a rich science program.	300,000.00	300,000.00	300,000.00	0.00	0.00	0.00	900,000.00	EUROPEAN ORGANISATION FOR NUCLEAR RESEARCH, FRENCH NATIONAL CENTER FOR SCIENTIFIC RESEARCH
	National Interest Test Statement Through collaboration with the world-leading European Laboratory of Particle Physics at CERN (Conseil Européen pour la Recherche Nucléaire) and the KEK Laboratory in Japan, this project will provide continued access to both the high energy and high precision frontiers of high energy physics represented by the ATLAS, LHCb and Belle II experiments that is otherwise unavailable to Australian researchers. Usage of these facilities will maintain Australia's international collider particle physics program, enabling current and future generations of students to learn from these hubs of advanced technology and grow throughout the country. New hardware, software, and analysis methodologies will be developed to fill a research gap in measuring how these particles interact. The team will inspire and train a new generation of Australian graduates, enhancing Australia's technology and data science industry. The outcomes will yield applications in detection devices and telecommunications, financial services, data analytics, and help protect Australia, securing national assets potentially improving privacy and securing data of individuals. An additional cultural benefit is positioning Australian science at the forefront of the international quest for Nobel-worthy physics discoveries. The team will promote and disseminate our research outcomes to Australian technology and data science industries through our collaborative networks to maximise future benefits of particle physics developments.								
LE250100097 Spooner, Prof Nigel A	**Micro-photoluminescence (μ-PL) Facility for unique materials identification** There is demand for robust, field-deployable material characterisation technologies in multiple industries, e.g., mining & mineral processing, advanced materials (laser & telecom glasses), Defence (CBRNe), Safety (asbestos sensing, toxic chemicals), pathogen detection & Food and Agriculture. Our unique Micro-photoluminescence facility enables spatially resolved analysis of samples using both conventional and multi-photon Upconversion Fluorescence (Novel Fluorescence, NF) excited by any wavelengths from UV to mid-IR. Machine learning analysis of the NF signals will train a library for rapid identification of unknown materials, delivering a new sensing capability, and enabling future low-cost devices to be developed to target these signals.	589,412.00	0.00	0.00	0.00	0.00	0.00	589,412.00	DEFENCE SCIENCE AND TECHNOLOGY GROUP, LOUGHAN TECHNOLOGY GROUP PTY LIMITED
	National Interest Test Statement The detection and identification of tiny quantities of unknown materials in real time out in the field is an unmet need for many industries. The proposed micro-photoluminescence facility is a critical step towards developing new devices to satisfy this need in a robust, practical, and cost-effective way. This facility will obtain information about a material just by "looking at it" using sophisticated light-based analysis. It will be capable of generating light in a range of colours to illuminate samples, then capturing the emitted light – i.e. photoluminescence - and analysing properties such as the colour or timing of the light with a range of detectors and machine learning methods. This facility will enable wide economic and environmental benefits across multiple industries because results will be translated into the development of customised portable sensors to address diverse needs in areas such as environmental monitoring, Defence and National Security, and health and medical industries. For example, this facility could identify different minerals to enable improved processing methods, measure the performance of new laser glasses under development for defence and telecommunications applications, and optimise optical sterilisation techniques for treating antibiotic resistant pathogens. Outcomes will be promoted to potential end-users through engagement with professional societies, exhibiting at trade-shows, and beyond academia by social and mainstream media outreach.								

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	The University of Adelaide	3,243,078.00	740,000.00	730,000.00	410,000.00	280,000.00	0.00	5,403,078.00	
University of South Australia									
LE250100089	**2D electromagnetic Hopkinson apparatus for multi-axial dynamic testing**	420,000.00	0.00	0.00	0.00	0.00	0.00	420,000.00	
Zhuge, Prof Yan	This project aims to establish an innovative biaxial electromagnetic Hopkinson apparatus to study the dynamic property of materials. Current Hopkinson bars struggle with reliably delivering impulse loads due to various factors, resulting in inaccurate findings. The proposed equipment utilises electromagnetic force for precise control, surpassing the limitations of traditional method. Ensuring resilience against multiple hazards is crucial for structures in Australia, including aerospace structures. This apparatus, yet to be introduced in Australia, offers significantly higher accuracy in dynamic property assessments. It boasts versatile applications, including analysing new composites materials, green building materials and soil properties.								
	National Interest Test Statement Australia urgently needs resilient structural design methods to cope with its decaying infrastructure. By introducing a new-generation biaxial electromagnetic Hopkinson bar, a technology not yet present in Australia, the project aims to fill this critical research gap. This innovative equipment applies pressure in two directions using electromagnets to investigate how materials respond to extreme conditions. It overcomes the inaccuracies of current Hopkinson bars and promises precise evaluation of dynamic material properties, essential for creating sturdy structures and systems to protect against increasing natural and man-made disasters. The research's outcomes offer diverse benefits for Australians. Economically, it could mitigate the projected $39 billion cost of natural disasters by 2050 by reducing infrastructure damage. Socially, it may enhance human life and safety, strengthening communities against evolving threats. Environmentally, it could minimise disaster impact by boosting infrastructure durability and sustainability. Culturally, it may foster confidence in the nation's resilience, promoting solidarity. To disseminate the research effectively, collaboration with government, industry, and community stakeholders is crucial. Integrating the new technology into practical solutions through industry partnerships facilitates its adoption. Leveraging digital platforms and media amplifies awareness and gathers support, ensuring the research's impactful implementation.								
	University of South Australia	420,000.00	0.00	0.00	0.00	0.00	0.00	420,000.00	
	South Australia	4,057,251.00	740,000.00	730,000.00	410,000.00	280,000.00	0.00	6,217,251.00	

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		2024-25	2025-26	2026-27	2027-28	2028-29	2029-30		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)	(Column 9)	(Column 10)	(Column 11)
Victoria									
Monash University									
LE250100012	**A platform for in situ structural biology**	2,078,333.00	0.00	0.00	0.00	0.00	0.00	2,078,333.00	THE WALTER AND ELIZA HALL INSTITUTE OF MEDICAL RESEARCH
Ramm, A/Prof Georg	This project aims to establish an Australian facility for in situ structural biology. The Arctis cryo-plasma focused ion beam will enable cryo-electron microscopy on a large range of samples from bacteria, plants, animal cells, tissues and organs to soft materials. This project expects to reveal new structural information in situ generating knowledge in the fields of microbiology, cell and developmental biology and in bioengineering and materials science. Expected outcomes are fundamental discoveries, training opportunities, international collaborations, and high impact publications. This project should provide significant benefits through underpinning innovation in renewal energy generation and storage, drug delivery, and nanotechnology.								
	National Interest Test Statement								
	Previously, structure determination has required analysing targets, such as proteins, in isolation. This means our study of these proteins has been missing a lot of important information – such as their location, compositional diversity as well as the context of their environments. This project will address this gap in our knowledge by establishing a highly advanced “high throughput cryogenic plasma focus ion beam” microscope, to allow the visual study of molecular structures in their real environment inside bacteria, plants, animals, and humans. This microscope will be one of the first of its kind in the world, and will be made open access. Engineers can use it to characterise new materials including solar cells, biomaterials, batteries and building materials, leading to important outcomes such as longer lasting batteries and cheaper manufacturing, making renewable energy more accessible for more Australians. Researchers in the pharmaceutical industry can use it to directly visualise a drug acting on its target inside the cell, facilitating the development of AI-guided drug design and delivery and leading to more targeted medicines with less side effects. This technology will put Australia at the forefront of high-resolution imaging, and the advancements in sustainable energy and drug development stemming from this work will also lead to environmental, health, and economic benefits for all Australians.								
LE250100032	**Victorian Facility for Atom-Scale Quantum Microscopy and Manufacturing**	904,800.00	0.00	0.00	0.00	0.00	0.00	904,800.00	
Edmonds, Dr Mark T	This proposal aims to establish a readily accessible facility that will enable atomic-scale measurements of quantum phenomena in materials that are currently unavailable in Victoria. This project expects to generate new knowledge in the area of quantum and functional materials, utilising innovative techniques in microscopy and electronic measurements. Expected outcomes of this project include building capacity for and supporting world-leading research collaborations into novel topological materials, atomically thin materials, quantum matter, and magnetic materials. This should provide significant benefits, such as materials for faster and more efficient generation, storage, transmission and processing of energy and information.								
	National Interest Test Statement								
	The proposed project will establish a facility unique to Victoria that will enable a wide variety of new quantum materials to be fabricated and studied with microscopy and electronic measurements at extreme temperatures and magnetic fields. This world-class facility will bridge a research gap in the development of quantum materials, with applications in more efficient and faster information technology, quantum computing and sensing, magnetic data storage, and energy harvesting. The research facility will offer tangible benefit to the Australian people by generating valuable new knowledge in quantum and functional materials, as well as intellectual property which will serve as a foundation for Australian industry in next-generation quantum technologies. Long-term outcomes will likely include multiple economic and societal benefits, including more efficient generation and use of energy, sustainable classical and quantum computation to meet the demand for artificial intelligence, and improved quantum sensing and cryptography for better security. The facility will further be used for training the next generation of physicists and material scientists in the skills they need to grow and support the Advanced Manufacturing, Energy, and Quantum sectors. Research outcomes of the facility will be promoted via public science websites aimed at a broad audience, along with workshops that involve industry in order to forge new partnerships to develop these new quantum technologies.								

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	Monash University	2,983,133.00	0.00	0.00	0.00	0.00	0.00	2,983,133.00	
RMIT University									
LE250100014 Walia, Prof Sumeet	**Laser Chemical Vapor Deposition facility for Ultra-Thin Materials Writing** This project aims to establish a Laser direct writing facility for large-area reproducible synthesis of both amorphous and crystalline atomically-thin materials and their hybrids. Over a decade of research in atomically-thin materials has revealed unique value propositions. Expected outcomes of this facility include and ability to realise reproducible large-scale growth of a range of material systems on-demand on arbitrary substrates thereby addressing a key fabrication bottleneck hampering real-world benefit. This should provide significant benefits in creating a nexus point between disciplines, enabling research in electronics, optics, chemistry, nanomaterials characterisation, precision metrology and sensing.	1,013,942.00	0.00	0.00	0.00	0.00	0.00	1,013,942.00	
	National Interest Test Statement The laser direct writing facility for atomically-thin materials will be a first of its kind in Australia, enabling rapid research into novel materials and interface driven technologies and systems that can use these platforms. The dedicated nature of this facility will ensure accessibility, reliability and its compatibility with scale-up mass manufacture at semiconductor foundries. This will enable breakthrough fundamental science and provide a clear pathway for commercial translation. Direct areas of application include high speed electronics, optics, sensing, energy, precision measurement and quantum computing. In addition to basic fundamental research, our approach will enable researchers to rapidly deliver prototypes, giving Australian industries the confidence to partner in developing these technologies for their applications. This facility breaks a deadlock in atomically thin materials research by addressing a critical gap in large scale synthesis of amorphous and crystalline atomically thin materials. This will ensure their relevance to real-world applications in next-generation semiconductors, electronics solutions, remote sensing and medical imaging, new energy generation and storage, smart sensors, high-speed electronics and sensor fabrication for defence and space applications. The facility is expected to support major funded initiatives of fundamental and translational research across sectors as highlighted by the breadth of the projects outlined in the proposal.							
LE250100078 Jia, Prof Baohua	**Intelligent 3D Laser Nanoprinting Facility with In-situ Characterisation** This project aims to establish Australia’s first and only facility of intelligent femtosecond laser nanoprinting platform with in-situ spectroscopic dynamic characterisation capability. This facility possesses unprecedented capabilities of both nanofabrication and in situ ultrafast temporal-spatial resolved spectroscopic characterisation. This project expects to enable Australian researchers to gain novel insight into unexplored light-matter interaction. Expected outcomes include significantly accelerated research of new materials and advanced manufacturing, facilitating the research of renewable energy, biotechnology, advanced materials, and quantum science, providing significant benefits for Australian’s economy and society development.	856,200.00	0.00	0.00	0.00	0.00	0.00	856,200.00	
	National Interest Test Statement This project seeks to establish a groundbreaking facility in Australia, integrating two forefront technologies: intelligent femtosecond laser nanoprinting and temporal-spatial resolved spectroscopic characterisation. This integration will create Australia's premier platform capable of in-situ spectroscopic analysis during nanofabrication, marking a significant leap in research capabilities. The proposed facility will possess the previously achieved capability of real-time nanofabrication-characterisation in nanoscale with timescales of femtoseconds to hours, under flexibly controllable conditions, such as ambiance of vacuum or nitrogen, cryogenic temperatures and bias of light or electric field. The facility will significantly increase the research capability and enable Australia researchers highly efficient nanofabrication and acquire an in-depth understanding of light-matter interaction. The facility will be a world-class research infrastructure in Australia, serving the discovery of new functional materials, and exploring new physics and innovative technologies. This will ensure the Australian technology industry is globally competitive in next-generation energy, information and communication, sensing, quantum technology and biomedical engineering. This presents an excellent potential for scientific breakthroughs, training, and emerging/disruptive technology development, that will significantly enhance Australia’s capability in National Priority Manufacturing areas.							
LE250100137	**In-situ high-energy X-ray synchrotron platform for engineering materials**	1,474,839.00	0.00	0.00	0.00	0.00	0.00	1,474,839.00	

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Chen, Dr Yunhui	This project aims to establish an in-situ advanced materials characterisation platform based at the Australian Synchrotron. This project expects to generate ground truth knowledge in the processing of engineering materials, especially additive manufacturing and materials circularity, and materials used in extreme applications. Expected outcomes of this project include a national network of scientists and engineers using direct observation of the processing and performance of materials at nanometre and microsecond scales. This should provide significant benefits, such as the development of world class Australian manufacturing and advanced capability supporting defence, aerospace, materials circularity, energy and geo-science. **National Interest Test Statement** Australia has the opportunity to bring the world's most advanced analytical capabilities to advanced manufacturing and materials research, networked into advances in Europe and the United States. The project will enable direct observation of phenomena observed in highly relevant technologies and applications such as additive manufacturing, materials for the circular economy and materials performance under extreme environments. This project fits into five of the Australian government's six priority areas: defense, medical products, Mining/Resources and Agriculture and Space, all of which are being transformed by the development and processing of advanced engineering materials and benefit Australians economically, environmentally, and commercially. Areas of initial impact will be the rapidly growing additive manufacturing sector, the mining sector, aerospace and space technology, the energy sector and the materials circularity in the building industry. Further possible applications are in battery technology and geoscience. The team assembled will be the basis for a national network on the use of synchrotron radiation in the processing and performance of engineering materials, which will expand as the techniques and data flows are established. The strong industry networks of the CIs and the partners involved will enable a seamless transition of the knowledge to Australian industry.								
	RMIT University	3,344,981.00	0.00	0.00	0.00	0.00	0.00	3,344,981.00	
Swinburne University of Technology									
LE250100051 Swalwell, Prof Melanie L	**The Australian Emulation Network Phase 2 - Extending the Reach** This project aims to extend the reach of the Australian Emulation Network, conserving born digital artefacts and making them accessible for research purposes. High value collections from university archives and the GLAM sector requiring legacy computer environments will be targeted. The project expects to generate new knowledge across media arts, design, and architecture. Expected outcomes include stabilising and providing researchers with emulated access to born digital cultural artefacts, sharing legacy computer environments across the network, and expanding the Australian software preservation Community of Practice, building skills in preserving and emulating digital cultural artefacts across an expanded set of domains and institutions. **National Interest Test Statement** The project aims to extend national emulation infrastructure, more than doubling the size of the existing Australian Emulation Network by adding 22 new institutional nodes. This addresses the national challenge of preserving and accessing Australia’s born digital heritage. Born digital heritage faces several forms of obsolescence. Consequently, much born digital material has not been collected, is inaccessible because of its reliance on legacy computing	346,205.00	198,742.00	0.00	0.00	0.00	0.00	544,947.00	NATIONAL MUSEUM OF AUSTRALIA, NATIONAL AND STATE LIBRARIES AUSTRALASIA, NATIONAL FILM AND SOUND ARCHIVE OF AUSTRALIA, NATIONAL ARCHIVES OF AUSTRALIA, TWEED REGIONAL MUSEUM, QUEENSLAND STATE ARCHIVES, AUSTRALIAN MUSEUMS AND GALLERIES ASSOCIATION VICTORIA

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(Columns 1 and 2)	(Column 3)	2024-25 (Column 4)	2025-26 (Column 5)	2026-27 (Column 6)	2027-28 (Column 7)	2028-29 (Column 8)	2029-30 (Column 9)	(Column 10)	(Column 11)
	environments, and at risk of loss. The project will provide the tools and skillsets required so that professionals in the university and Galleries, Libraries, Archives and Museum (GLAM) sectors have confidence in collecting, preserving and emulating complex digital artefacts. Securing digital heritage materials and making these available to the researchers who need access to them promises to deliver new knowledge in the inter-related fields of digital art, design, and creative practice, delivering research with social and cultural benefits. Making emulation infrastructure available to more national and state institutions will improve access to digital collections in keeping with the national cultural policy, and ensure that the benefits extend well beyond academia to the wider public. This investment will ensure a sustainable, resilient network that can address the needs of diverse collections across the nation, including in regional areas.								
	Swinburne University of Technology	346,205.00	198,742.00	0.00	0.00	0.00	0.00	544,947.00	
The University of Melbourne									
LE250100008 Scott, A/Prof Nichollas E	**Near Single Molecule Sensitivity Mass Spectrometry for Multi-Omic Research** This proposal aims to enable multi-omic analysis of recalcitrant plant/microbes and model systems by coupling robust liquid chromatography (LC) systems to near single molecule sensitivity mass spectrometry (MS). These capacities will consist of two Evosep LCs located at La Trobe (LTU-PMP) & Uni. Melbourne (Bio21MMSPF) in addition to (i) a Thermo Scientific Orbitrap 240 MS & Vanquish Neo LC for rapid study optimisation and workflow validation, located at LTU-PMP; & (ii) a Thermo Scientific Orbitrap Astral MS for ultra-deep & reproducible quantitative omic analysis, located at Bio21MMSPF. This infrastructure will enable the characterisation of atypical biomolecules from challenging biological samples incompatible with traditional LC-MS.	1,977,382.00	0.00	0.00	0.00	0.00	0.00	1,977,382.00	
	National Interest Test Statement Ultra-sensitive Mass Spectrometry (MS) is an indispensable analytical technique for the comprehensive and reproducible analysis of biological samples. However, not all teams working on diverse, and in many cases challenging samples derived from microbes and plants are able to access next-generation MS instrumentation due to the incompatibility of these samples with standard Liquid Chromatography (LC) instrumentation that is used to deliver samples into MS instruments. We will couple innovative LCs (designed for robustness) to MS instruments with near single molecule sensitivity, transforming analytical capacities. This will make the platform more accessible to teams and disciplines with non-traditional samples that cannot be handled by standard MS. These capacities will provide researchers, including early career and students, from across Australian research institutions and industry with a competitive edge in basic and strategic research disciplines focused on agri-biosciences (e.g., assessing nutritional quality of grains, livestock muscle development), microbiology (e.g., vaccine production, study of decomposition processes, antibiotic development), as well as veterinary sciences (breeding biomarker identification, diagnostics). The findings from the use of these capacities will be published in open-access journals as well as shared beyond academia through outreach to community and stakeholder groups, as well as by engaging with traditional and social media.								
LE250100018 Barberio, Prof Elisabetta	**Construction of the SABRE South full-scale dark matter detector** This project completes the construction and underground installation of the SABRE South dark matter detector for operation in 2025. The nature of dark matter, a mysterious substance making up the majority of the of the universe's matter, is one of science greatest mysteries. Its discovery would be groundbreaking. SABRE South is located in the Southern Hemisphere's pioneering Stawell Underground Physics Laboratory (SUPL). With its world-best ultra-high purity crystal target and strategic location, it is uniquely positioned to test the most persistent and enigmatic signal in the worldwide hunt for dark matter, with discovery potential across a range of dark matter models. Aspects of this project will benefit future research projects in SUPL.	800,000.00	0.00	0.00	0.00	0.00	0.00	800,000.00	NATIONAL INSTITUTE FOR NUCLEAR PHYSICS GRAN SASSO NATIONAL LABORATORY (INFN LABORATORI NAZIONALI DEL GRAN SASSO), KEK TSUKUBA-SHI
	National Interest Test Statement The completion of the SABRE South dark matter detector in the unique Stawell Underground Physics Laboratory will position Australia as a leader in dark matter research. Its successful operation has the potential to deliver groundbreaking discoveries on par with the Higgs boson and gravitational waves, paving the way for future transformative experiments. The benefits of the project extend beyond scientific research to advanced manufacturing, by offering unique skills and opportunities for industries by developing new techniques that enhance instrument sensitivity for radiation traces. For example, by being able to detect very small amounts of radioactive elements in food,								

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		2024-25	2025-26	2026-27	2027-28	2028-29	2029-30		
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	it is possible to determine its provenance. Analysis of trace elements in soil and water can improve our understanding of past climates. Australian PhD students will receive training in radiation monitoring, detector design, and precision measurement techniques relevant to Australian defense and industries. For instance, these skills are being applied to defense applications through our partnership with the DST Group. The SABRE South experiment will both advance knowledge and benefit society as a whole. By contributing expertise and a skilled workforce to our defense capabilities and industries, it will enhance our global competitiveness. The pursuit of dark matter has ignited the imagination of the Australian public, inspiring our youth to pursue meaningful careers in science and technology.								
LE250100062 Thai, Prof Huu-Tai	**Modular electric furnace for structural fire testing** This proposal aims to establish a novel fire testing facility capable of testing a wide range of large-scale structural systems under various fire scenarios and loading conditions at an affordable cost. By using electric furnaces assembled from modular units, the proposed facility is not only flexible for any setup, but also safer and more environmentally friendly than conventional gas-powered furnace testing facilities. This unique facility will enable the developments of novel fire-resistant building materials and products as well as possible fire safety regulations to ensure the fire safety of the built environment. This can help mitigate the risk of fire incidents (e.g. cladding fires) to benefit the Australian community.	341,000.00	0.00	0.00	0.00	0.00	0.00	341,000.00	
	National Interest Test Statement Fire is an extreme hazard in Australia causing significant damage to buildings and infrastructure as well as loss of life. During fires, structural systems and construction materials in the built environment can lose structural integrity and trigger blazes that spread rapidly. Fire-testing facilities provide valuable insights into how various structures and materials respond to fire. Yet Australia has few facilities capable of testing full-scale specimens and most use expensive gas-powered furnaces with limited fire conditions. To date, these facilities have constrained fire research in Australia. This project will establish a modern fire testing facility using modular electric furnaces with a flexible setup for testing various mechanical loading systems. It will be cheaper, safer, and environmentally friendly. We will use this facility to foster strong collaborations with government agencies and industry partners by developing fire-resistant construction materials and building products. Results will be conveyed to the manufacturing, building, and construction industries through seminars and demonstrations. The benefits to Australia are financial, commercial, and environmental. Fire-related incidents are projected to cost Australia $1.2 billion per year over the next 25 years. Advanced research into structural fire engineering will enhance fire resilience in the built environment while reducing costs and mitigating risk in future catastrophic fires.								
LE250100109 Hutchins, Prof Nicholas	**Laser-based 4D imaging for enhanced analysis of complex fluid flows** An ability to design for complex turbulent flows, often with heat transfer and suspended particles, is critical to a lower emissions future. These flows dictate the fuel use of ships and aircraft and the efficiency of heat exchangers and solar collectors. This project aims to establish a 4D velocity, phase and temperature measurement system that will permit these flows to be studied in unprecedented detail. This measurement capability will provide breakthrough fundamental knowledge in fluid mechanics and enhance industry and inter-institutional collaboration. It will equip the next generation of researchers in Australia to innovate more efficient engineering solutions, based on an unrivalled understanding of these complex flows.	1,766,306.00	0.00	0.00	0.00	0.00	0.00	1,766,306.00	
	National Interest Test Statement Australia’s transition towards net-zero will require the re-engineering of our current technologies in the energy and transport sector. This development will require better understandings of complex fluid flows involving droplets, suspended particles, and heat transfer. Mastery of fluid flows will improve performance in heat pumps and exchangers, solar collectors, and batteries, which are critical to a lower emission future, as well as in the turbulent flows that lead to drag and energy expenditure for ships and aircraft. Despite a concerted push within Australia to develop new experimental facilities capable of generating these flows of interest, none can measure flows at the required fidelity. This flow measurement facility will provide unique 4D velocity and temperature measuring capabilities to Australian researchers. As well as facilitating pace-setting research, it will help provide the fundamental insights required to understand, predict, and control these fluid flows across a broad range of activities. It will permit research groups in Australia to retain global competitiveness, enhance collaboration, and provide industry with solutions. Extensive links between the assembled team and industry will be used to demonstrate results and ensure rapid pathways to translation and impact. This facility will support the decarbonisation of Australia’s economy providing economic, commercial, social, and environmental benefits to all Australians.								

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	The University of Melbourne	4,884,688.00	0.00	0.00	0.00	0.00	0.00	4,884,688.00	
Victoria University									
LE250100022 Foley, Prof Gary E	**Aboriginal History Archive 2.0** The Aboriginal History Archive 2.0 builds on its success in filling the gaps in Australia's knowledge estate by adding never-before-seen data on Aboriginal political movements. It expands the infrastructure by incorporating significant collections curated by Prof Gary Foley from individuals, families and community organisations. The current IT framework is limited to scholarly reference and needs to be upgraded to meet new researcher expectations and accessibility for growing demand by researchers, educators, creative industry professionals, Aboriginal community members and the general public. These advances expect to accelerate uptake in AHA's collection and contribute to enhanced research and community understanding.	437,235.00	550,939.00	0.00	0.00	0.00	0.00	988,174.00	NATIONAL ARCHIVES OF AUSTRALIA, NATIONAL LIBRARY OF AUSTRALIA, STATE LIBRARY OF SOUTH AUSTRALIA, AUSTRALIAN CENTRE FOR THE MOVING IMAGE, MUSEUM OF AUSTRALIAN DEMOCRACY
	National Interest Test Statement Australia's historical record suffers through a lack of Indigenous voice and context leading to an incomplete and imbalanced understanding of our shared history. The Aboriginal History Archive (AHA) has developed a framework for capturing, contextualising and sharing previously unavailable materials and creative, proven approaches to research impact that contribute to a more accurate record based on the founding 'Foley Collection.' However, there is still much to be uncovered and disseminated through adding until-now privately held collections, to significantly expand the archive. The rapid development of digital technologies as well as online and remote work due to the COVID pandemic has led to a concomitant decline in the capacity for current AHA digital infrastructure to meet contemporary user expectations and demand. This threatens accessibility, uptake and growth of the AHA. This project aims to rectify this threat by updating AHA's IT framework and optimising its website for audiences beyond academia. This project will expand historical data available to the research community, enabling researchers to reveal Aboriginal perspectives, produce more accurate narratives and advance Australia's truth-telling endeavour. Building on AHA's recognition amongst researchers nationally and internationally, and the reputation it has earned with Aboriginal people and organizations as a trustworthy repository, this project scales up AHA's use, translation and understanding.								
	Victoria University	437,235.00	550,939.00	0.00	0.00	0.00	0.00	988,174.00	
	Victoria	11,996,242.00	749,681.00	0.00	0.00	0.00	0.00	12,745,923.00	

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Western Australia									
The University of Western Australia									
LE250100054 Hirvonen, Dr Liisa M	**WA lightsheet microscopy facility for fast and gentle volumetric imaging** Lightsheet is a fluorescence microscopy technique that is ideal for volumetric imaging of microscopically large 3-dimensional samples in a fast, gentle and nondestructive way. It allows the observation of living specimens, such as developing embryos, zebrafish, plant roots or engineered tissues, over an extended time frame (hours or days) with subcellular resolution. Over the past 10 years, this technique has become a standard tool in many fields of research, but it is not yet available anywhere in Western Australia (WA). This project will install WA's first lightsheet microscope in an openly accessible core facility, where it will benefit WA based researchers from many fields, including agriculture, engineering, and biological sciences.	754,063.00	0.00	0.00	0.00	0.00	0.00	754,063.00	PERRON INSTITUTE FOR NEUROLOGICAL AND TRANSLATIONAL SCIENCE LIMITED, TELETHON KIDS INSTITUTE
	National Interest Test Statement Lightsheet is a special microscopy technique that is ideal for long term observation of living and developing samples, such as embryos, organelles, zebrafish and plant roots, as well as microscopically large fixed samples such as whole mouse brains. Lightsheet microscopes are now a standard tool in many fields of research and widely available, but this technology is not yet available anywhere in Western Australia. Due to interstate quarantine limitations, costs and issues with transporting living samples, instruments located on Australia's East Coast are out of reach for many researchers in WA. This project will bring lightsheet technology to WA, and make it openly accessible to all publicly funded researchers. WA researchers in the fields of agriculture, engineering, materials science and biology will utilise this infrastructure, for example in improving the yield and stress tolerance of commercial crops; developing bioengineered heart valves; and studying the evolution of vertebrate skeleton and healthy ageing of brain. It will help recruit and retain high-quality researchers and train PhD candidates of international quality, increase the standard of research training, and provide world-class research environments to sustain leadership and innovation in many Australian priority sectors including Agriculture, Cell Biology, Synthetic Biology, Biological Sciences, Crop and Pasture, Ecology, Mechanical Engineering, Neurosciences, Plant Biology, Soil Science, and Zoology.								
LE250100123 Sun, Prof Hongqi	**An operando characterisation platform for clean energy transition in WA** This project aims to investigate the transitional properties of energy materials in clean energy generation, storage, conversion, and utilisation under real synthesis and catalysis conditions by establishing an in situ and operando analysis platform. The project expects to generate new knowledge in materials chemistry and reaction kinetics with varying temperature, gases, light, and/or electrolytes. Expected outcomes include innovative catalyst design strategies and insights into clean energy transition and decarbonisation, as well as enhanced interdisciplinary collaborations. This research will provide significant benefits, such as the development of new knowledge and technology, contributing to Australia's transition towards clean energy.	1,514,327.00	0.00	0.00	0.00	0.00	0.00	1,514,327.00	
	National Interest Test Statement This project aims to establish an operando analysis platform that enables in situ and operando characterisations for the synthesis and optimisation of novel energy catalyst materials as well as their applications in clean energy transition and decarbonisation. The research integrates and advances the in situ/operando functions of dilatometry, atomic force microscopy (AFM), ultraviolet-visible (UV-Vis), electron paramagnetic resonance (EPR), and integrated Fourier-transform infrared and Raman spectroscopies. The proposed facility will enable the study of materials in real synthetic or catalytic conditions, including high temperature, gas reactants, light or electrolyte employed. This configuration bridges the research gaps between catalyst design principles and the understanding of reaction mechanisms. By engaging with clean hydrogen production, carbon dioxide reduction, fuel cells, batteries, and solar energy conversion, this research can bring significant benefits to Australia. For instance, economic and commercial benefits can be derived from the novel catalysts materials as the products, cost-effective clean energy, and renewable energy conversion. Clean energy transition and decarbonisation will benefit the environment and promote future sustainability, leading to social and cultural benefits. The proposed facility will be showcased								

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	in conferences, public lectures and government policy consultation processes.								
	The University of Western Australia	2,268,390.00	0.00	0.00	0.00	0.00	0.00	2,268,390.00	
	Western Australia	2,268,390.00	0.00	0.00	0.00	0.00	0.00	2,268,390.00	
		35,296,215.00	**1,489,681.00**	**730,000.00**	**410,000.00**	**280,000.00**	**0.00**	**38,205,896.00**	