Minister's Approval for Early Career Industry Fellowships for Funding Commencing in 2023 Schedule

Approved Organisation, Leader of Approved Research Program	Approved Research Program	Estimated and Approved Expenditure ($)		Indicative Funding ($)	Total ($)	Industry Partner(s)
		2023-24	2024-25	2025-26*		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
Australian Capital Territory						
University of Canberra						
IE230100675 Mylek, Dr Melinda R	**Improving carer's quality of life and quality of care** This project will improve the ability of Carers Australia and the Department of Social Services to evaluate and enhance the success of services they implement to support Australia's 2.7 million unpaid carers. Currently little is known about which support and services most help improve quality of life for carers, and the quality of care they provide, despite strong evidence of a quality of life crisis amongst carers. By collecting cross sectional and longitudinal data to build on an existing data set, this project will enable evidence-based design and delivery of services that support carers socially, emotionally and financially while enabling them to provide high quality care. **National Interest Test Statement** Australia's 2.7 million carers provide services valued at $77.9 billion, but experience significant challenges, including high risk of financial stress, poor quality of life and difficulty accessing support. The Australian Government invests a significant amount providing support and services to assist them in their caring role, both directly and via organisations like Carers Australia. However, little is known about the outcomes of this investment in terms of its intended outcomes of improving carer quality of life and quality of care provided. This project will identify the effectiveness of different services using unique longitudinal analysis of carer outcomes, identifying priority areas for improving design and delivery to enable carers to provide high quality care while maintaining their own quality of life. This will allow the partner organisations to tailor their advocacy, support and services accordingly. This has potential to reduce low quality of life amongst carers and facilitate carers to provide high quality care, reducing burden on carers, the Australian community and the health support system.	146,802.00	146,802.00	149,882.00	443,486.00	CARERS AUSTRALIA, DEPARTMENT OF SOCIAL SERVICES
	University of Canberra	146,802.00	146,802.00	149,882.00	443,486.00	
	Australian Capital Territory	146,802.00	146,802.00	149,882.00	443,486.00	

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
New South Wales						
Macquarie University						
IE230100103 Padovan, Dr Amanda S	**Improving efficacy of biopesticides through understanding mode of action** Insecticides are used extensively to control agricultural pests, but options are increasingly limited owing to environmental and human health concerns. A biopesticide, Bt, provides a valuable 'soft' option for control of caterpillars that are amongst the world's most damaging insect pests. However, little is known about how ingested Bt kills insects and this knowledge gap constrains options to improve efficacy and to counter resistance. This project connects industry end users (Cotton RDC; Bayer CropScience) with research training (Macquarie University) and applied research (CSIRO) to model how Bt interacts with the insect gut. This model will make valuable contributions to ensuring sustained and improved efficacy of Bt biopesticides. **National Interest Test Statement** Australian farmers are heavily reliant on pesticides as an effective way to control insect pests across the landscape. Many of the unwanted impacts of pesticide use are due to the ways they are delivered into the environment, so there are now plants that produce the pesticides as they grow – Bt cotton in Australia. The value of Bt cotton led to the development of stringent industry wide management requirements by the industry representatives and by the supplier, Bayer CropScience, involving continually monitoring of insect populations by the supplier. But exactly how these pesticides work inside the insects is not well understood. This project aims to reveal how a particularly effective type of Bt works in two very damaging insect pests. By understanding how the Bt works inside the insect, we can predict new ways in which the insect might evade the Bt. The outcomes of this work will help us to control insects more efficiently and may contribute to identifying new pesticides.	174,890.00	142,327.00	159,616.00	476,833.00	BAYER CROPSCIENCE PTY LTD
	Macquarie University	174,890.00	142,327.00	159,616.00	476,833.00	
The University of New England						
IE230100594 Dewo, Dr Teka F	**Advancing chicken helminthology for sustainable worm control** Worm infections are a serious disease problem in free-range chicken production systems which now dominate egg production in Australia. This project aims to improve the control of worm infections of chickens by developing new tools for poultry researchers, advisors and farmers to use for this purpose. The project expects to develop novel methods for laboratory-based anthelmintic drug resistance testing, maintenance of defined worm strains and diagnosis of infection. It will also determine the effectiveness of mass treatment in the field and the prevalence of anthelmintic resistance. Use of these tools and information will improve worm control and thus the productivity and welfare of free-range chickens in Australia and worldwide. **National Interest Test Statement** Australia's fast-growing chicken meat and egg industries are key sources of cheap high-quality protein and have a gross value of production of $4.2 billion annually. Consumer concerns about welfare have driven a major move to free-range production which is now the main production system for eggs. Paradoxically this increases the risk of parasitic worm infections which are re-emerging as a problem requiring frequent chemical treatment that threatens sustainable control and the "clean, green, welfare friendly" perception of free-range production. To overcome significant limitations in the methods available for researching and managing avian worm infections this project will develop novel tools for laboratory-based resistance testing, strain maintenance and diagnosis while also conducting field investigations. Adoption of these tools and information in partnership with industry will benefit Australian producers and consumers to support sustainable worm control and improved hen welfare. The underlying science will also have applications internationally and in other species.	147,274.00	152,696.00	147,944.00	447,914.00	AUSTRALIAN EGGS LIMITED, INVETUS PTY LTD
	The University of New England	147,274.00	152,696.00	147,944.00	447,914.00	

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The University of New South Wales						
IE230100215 Zhuo, Dr Yuting	**Design and optimisation of metal hydride hydrogen storage tanks** This project aims to tackle the bottlenecks of the current metal hydride hydrogen storage tank developed by the key industry partner LAVO, i.e., limited storage capacity and non-efficient structure design. Through advanced numerical modelling and machine learning methods, the metal hydride hydrogen storage tank will be optimised by redesigning advanced heat management systems and optimised hydride materials, enabling it to store and deliver hydrogen in a more controllable way with high performance. Expected outcomes of the project include the numerical platform to improve the material and design iteration and a prototype of the next-generation metal hydride hydrogen storage system. This opens a new market for Australian-H2 storage tanks.	146,442.00	146,942.00	147,542.00	440,926.00	LAVO HYDROGEN STORAGE TECHNOLOGY PTY LTD
	National Interest Test Statement 'Metal hydrides' are important energy storage materials, enabling hydrogen to be conveniently stored and readily transported to drive the 'green hydrogen' economy. However, the development of more efficient hydrogen storage devices with increased capacity is hindered by the need for improved tank structure design and selection of hydride materials. This project aims to use advanced mathematical modelling and experimental research approaches to develop cutting-edge prototype design strategies incorporating selection of high-performance hydride materials. Through licensing of IP and close collaboration with established industry partners, these research outputs will enable enhanced storage device production, ultimately increasing hydrogen storage capacity and promoting widespread adoption across the Australian green energy sector. These advances will effectively bridge the gap between upstream hydrogen production and downstream hydrogen applications, helping to transition the Australian energy system towards a low carbon-emission future.					
IE230100467 Chu, Dr Guoyu	**A More Sustainable High-speed Drive System for Air Conditioning Systems** The project aims to develop an environmentally & strategically sustainable high-speed drive system for the heating, ventilation, and air conditioning (HVAC) systems. A novel rare-earth-less high-speed electric motor (70k rpm) will be designed and experimentally validated. The outcomes will help to mitigate the potential rare earth crisis faced by the HVAC and other industries by significantly reducing the rare earth permanent magnets used in their drive systems. The design will also enable Conry Tech's HVAC products to use greener refrigerants with extremely low impact on global warming and improve its system efficiency. This project's success will help revive advanced manufacturing of premium HVAC and electric motor products in Australia.	117,079.00	170,854.00	189,304.00	477,237.00	CONRY TECH DEVELOPMENT PTY LTD
	National Interest Test Statement Today 90% of the global rare earth elements (REEs) are produced in China. Also, due to the rapid growth of electric vehicle, air conditioning, and REE magnet motor industries, the global demand for REE magnets is expected to increase five-fold by 2030 and its price will rise significantly. Therefore, there is an urgent need for the sustainability and national independence of REE supply chains, especially in the heating, ventilation, and air conditioning (HVAC) industry. To help mitigate this issue, this project aims to develop a novel high-speed motor with significantly reduced REEs for the HVAC industry. It will help to increase the resilience of Australian HVAC and other related industries against the potential REE crisis using premium motor designs with high efficiency, significantly reduced REEs, and sustained sovereign production capacity. This motor design will also allow Australian HVAC products to reduce carbon emissions and the impact on global warming significantly. In combination, this project will position Australian HVAC products to compete strongly internationally and grow Australia's exports.					
	The University of New South Wales	263,521.00	317,796.00	336,846.00	918,163.00	

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The University of Newcastle						
IE230100410	**Bridging the gap between rockfall theory and engineering practice**	156,910.00	153,279.00	141,896.00	452,085.00	ROCK SLOPE ENGINEERING PTY LTD, ROCSCIENCE INC.
Guccione, Dr Davide E	Fragmentation is often observed post rockfall events and it is recognised as a critical aspect of adequate rockfall risk management. Yet, rockfall fragmentation is a complex phenomenon still poorly understood and not properly considered in engineering practice. This project aims at developing a theoretical and stochastic fragmentation framework, based on high-quality and comprehensive experimental data, in collaboration with leading international industry partners that provide advanced geotechnical design tools to practitioners around the world. The outcomes of the project will bridge the gap between rockfall theory and engineering practice. It will allow for more cost-effective and safer design of rockfall protection structures.					
	National Interest Test Statement					
	Unstable rock surfaces can lead to rockfalls which are characterised by an extremely rapid rate of movement and have been responsible for at least 26 known fatalities in Australia since 2000; 4 of which occurred in 2022. In NSW alone, remediation works to protect against rockfall hazards have cost over $60M in the last two decades and a further $20M annual expenditure is required for slope risk management. This project aims to develop a design tool to predict the complex phenomenon of rock fragmentation caused by collisions during rockfall events. This research will bridge the gap between rockfall theory and engineering practice to confidently assess rockfall hazards and protect infrastructure and people. It will allow for a more cost-effective and safer design of rockfall protection structures. The annual national financial benefit is estimated to be hundreds of millions of dollars, across both civil and resources sectors. Widespread adoption and translation of this new numerical tool for geotechnical engineers will occur through workshops and training courses.					
	The University of Newcastle	156,910.00	153,279.00	141,896.00	452,085.00	
The University of Sydney						
IE230100098	**Hunting high and low: mapping ancient topography to find copper**	139,000.00	139,000.00	139,000.00	417,000.00	BHP GROUP LIMITED
Wright, Dr Nicky M	Transitioning to a decarbonised society requires significant amounts of copper; however, preventing a systems-based exploration approach for copper is the lack of a first-order dataset of the Earth's surface evolution, known as palaeogeography. This project aims to unearth potential areas of porphyry copper through deep time by developing innovative global palaeogeography reconstructions. Expected outcomes of this project include new quantitative palaeogeography reconstructions, as well as the first well-constrained reconstructions of copper preservation potential. This should provide benefits such as an improved understanding of the porphyry copper lifecycle, with significant impacts for resource exploration and decarbonisation efforts.					
	National Interest Test Statement					
	Copper is essential for the functioning of modern society; however, the global supply of copper is projected to fall short of the increasing demand driven by decarbonisation technologies. Finding new copper sources is urgently required yet hindering a systems-based exploration approach to find more copper is our understanding of Earth's surface evolution, known as palaeogeography. This research will develop new reconstructions of palaeogeography and associated probabilistic uncertainties through deep time using machine learning. By combining these innovative palaeogeography reconstructions with surface evolution models, this project will uncover new regions favourable for both copper formation and preservation. This will ultimately allow Australia to expand its capacity in copper exploration, with hugely beneficial impacts for resource industries and the economy. It will also allow for resource industries to incorporate a systems-based and targeted approach in copper exploration, with the goal of increasing copper supply as governments around the world seek to achieve ambitious decarbonisation targets.					

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
IE230100160 Chen, Dr Yi-Sheng	**Characterise high-performance, green steels for the hydrogen economy** This project aims to develop the knowledge around microstructures and hydrogen interactions of a range of advanced steels that can be produced with low carbon emissions by the industry partner. These steels can lead to solutions for the hydrogen pipes and vessels without concern of hydrogen embrittlement, which play a crucial role in enabling a safe hydrogen economy in Australia. This partnership will allow the industry partner to access the advanced characterisation tools and will also expose the Fellow with the opportunity to develop and manufacture new steels in industry. This will also de-risk the KIP's investment in Australia for a new steel mill dedicating to the new green steels for supporting Australia's hydrogen infrastructure.	159,079.00	159,079.00	159,079.00	477,237.00	GIFLO STEELS AUSTRALIA PTY LTD, CITIC METAL
	National Interest Test Statement Australia has committed to achieving a carbon-free economy by 2050 to preserve our climate for future generations. Replacing fossil fuels with clean hydrogen fuel is key to this transition but presents a challenge in terms of infrastructure, as conventional steels fracture easily when they come into contact with hydrogen. This project aims to develop new steel that is safe to use in high-pressure hydrogen pipes, in collaboration with Giflo Steels Australia and CITIC Metal. It will result in a better understanding of the interaction between steel microstructure and hydrogen, which is the key information required for the design of hydrogen-compatible steels. This research will ultimately enable the production of the gas infrastructure necessary for a future hydrogen economy, using new cost-effective, low carbon footprint steels. Enabling an Australian hydrogen industry will bring economic benefits, and clean, safe hydrogen energy will mean a healthier environment for all Australians to enjoy.					
IE230100282 Zhang, Dr Jianping	**Delivering breeding-oriented genetic tools for cereal disease resistance** This project will focus specifically on delivering the genetic tools to the industry partner to assist its wheat and barley breeders to increase the accuracy and efficiency of incorporating the durable wheat stripe rust disease and barley leaf rust disease resistance into their core germplasm collections, respectively. The expected outcomes will also contribute to filling our knowledge gap in understanding the cereal rust innate immune system and benefit other cereal fungal pathosystems. The wide application of the expected outcomes from the proposed project will reduce the utilisation of fungicides and subsequently will subsequently contribute to the resilience of cereal crops and sustainable global food security.	157,741.00	157,741.00	159,699.00	475,181.00	AUSTRALIAN GRAIN TECHNOLOGIES PTY LTD
	National Interest Test Statement Wheat and barley are critical to Australia, both for domestic consumption and as major exports. Wheat stripe rust and barley leaf rust are among the most common and damaging diseases affecting these cereals, robbing Australian farmers of millions of dollars in lost crops and adding to the cost of production every year. The most economical and environmentally friendly way to reduce the impact of these diseases is to develop commercial wheat and barley varieties that are genetically resistant, however this is a lengthy process that has had mixed results. This research will make Australian crops more resilient by improving our understanding of the cereal immune system. Working with Australia's largest plant breeding company, we will develop genetic tools that wheat and barley breeders can use to introduce long-lasting genetic resistance into their core seed and plant collections. Increasing the precision and effectiveness of this process will reduce losses and the use of fungicides, contributing to a sustainable cereal industry in Australia and the security of our domestic food supply and exports.					
IE230100365 Tang, Dr Rui	**Solar-driven catalytic production of high-value product from waste glycerol** Sustainable bio-refining requires an efficient and economical way of utilising the surplus amount of glycerol generated as a by-product in biodiesel industries. This project aims to construct an industry-scale solar-driven catalytic system to generate high-value-added chemicals and green hydrogen fuel from biomass wastes simultaneously. The structure-reactivity relationship of working catalysts will be established to fit the up-scale applications. The gained cutting-edge knowledge and technology will significantly contribute to biomass waste utilisation and sustainable fabrication, further bringing significant economic and social benefits by creating a new competitive business for Australian chemical and fuel areas.	154,079.00	154,079.00	154,079.00	462,237.00	SUN BIOTECHNOLOGY PTY LTD

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
	National Interest Test Statement As we work towards our goal of net zero emissions by 2050, renewable biodiesel is increasingly used to power vehicles in Australia. Manufacturing biodiesel generates significant amounts of glycerol (a crude alcohol) which is not currently used. This project aims to develop a solar-driven system that converts waste glycerol into a refined sugar called dihydroxyacetone and hydrogen gas, valuable resources that are in high demand in the food industry and global energy market. Working with Australian manufacturer Sun Biotechnology, the research will investigate the reaction process and optimise the system for large-scale glycerol conversion. The resulting innovations will be shared with biodiesel and other relevant manufacturers, bringing economic benefits to Australia's food and renewable energy industries. By enabling Australian industries to adopt cost-effective and sustainable manufacturing practices and promoting sustainable fuel production, this research will ultimately help create a healthier climate for all Australians.					
	The University of Sydney	609,899.00	609,899.00	611,857.00	1,831,655.00	
University of Technology Sydney						
IE230100323 Thalakotuna, Dr Dushmantha N	**Multiband multibeam antennas for cryogenic cooled satellite ground stations** The project aims to develop a compact multiband antenna array for multi-satellite communication, particularly an antenna system that operates in both S (2GHz-4GHz) and X (8GHz-12GHz) bands in a shared aperture. This project will overcome the limitations of single satellite connectivity in legacy Ground Stations by providing simultaneous downlinks to multiple satellites using multiple beams. The research will directly apply to the next-generation satellite Ground Station product of Quasar Satellite Technologies, an Australian startup providing satellite Ground Station as a Service (GSaaS). This will have enormous benefits to society as it enables fast, affordable satellite data access for services to communities and emergency services.	139,439.00	139,439.00	139,439.00	418,317.00	QUASAR SATELLITE TECHNOLOGIES PTY LTD
	National Interest Test Statement There are over five thousand satellites around the globe collecting terabytes of data every day from various missions such as disaster monitoring, space observations, emergency services, weather observations, etc. All this data can't be stored on satellites due to limited onboard storage capacity and needs to be downloaded to earth. Satellites send this data to Ground Stations, typically large satellite dishes located on earth. The traditional satellite dishes cannot connect to multiple satellites at once thereby becoming the bottleneck to downloading data from satellites in space. This project develops a novel antenna technology that will allow a Ground Station to connect to multiple satellites at once, performing the duties of multiple traditional large satellite dishes from just one antenna. This will revolutionise the way in which satellite data is accessed to provide faster, reliable satellite data to emergency services, businesses and communities around the world. This groundbreaking antenna technology will be used in Australian Startup: Quasar Satellite Technologies next-generation product.					
IE230100437 Ansari, Dr Ashley J	**Nanobubbles for effective and energy efficient water treatment** This project aims to produce new knowledge for developing ozone nanobubbles as a technological option for the water industry where commercially suitable technologies are unavailable. Australian water utilities have identified two key challenges: destruction of micropollutants and natural organic matter in recycled and reservoir water, respectively. New knowledge from the project will allow these water utilities to utilise the extraordinary properties of nanobubbles and the strong oxidation capability of ozone for effective and energy efficient water treatment. Tech-transfer to the industry is guaranteed through a scientifically designed pilot plant for benchmarking against the current state of the art ozonation process and reverse osmosis.	139,079.00	139,079.00	139,079.00	417,237.00	SYDNEY WATER CORPORATION, WATER RESEARCH AUSTRALIA LIMITED, NANOBUBBLE SYSTEMS, INFINITE WATER HOLDINGS LTD
	National Interest Test Statement By increasing the amount of purified recycled water recovered from waste water, water utilities will be able to better meet supply shortfalls due to droughts and population growth. This project aims to use nano bubbles (extremely small gas bubbles that remain dispersed in water) that are used to create a unique energy-efficient treatment technology to eliminate ozone loss from waste water to the atmosphere and remove chemical and microbial contaminants that have been a major limitation to water recycling. Initiated by Australian water utilities, the project will future-proof the country's water resources, by enhancing climate resilient drinking water supplies. Knowledge from the project can also address other water industry needs, including energy efficient biological aeration and removing natural organic matter in reservoir water to avoid disinfection by-products. The project will provide essential insights to support pilot trials and full-scale adaption of nanobubble technology. The project outcomes will improve efficiency, reduce costs, and lower energy consumption, allowing Australian water utilities to achieve net zero emissions. Equipment manufacturing partners of the project will support scale-up and full-scale implementation, creating additional jobs in Australia and export opportunities for these SMEs.					
	University of Technology Sydney	278,518.00	278,518.00	278,518.00	835,554.00	

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	New South Wales	1,631,012.00	1,654,515.00	1,676,677.00	4,962,204.00	

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Queensland						
Griffith University						
IE230100593 Zhou, Dr Ming	**Membrane-based real-time ammonia monitoring system for sewage treatment** This project aims to develop a real-time, calibration-free, low-maintenance ammoniacal nitrogen monitoring system to assist in optimised wastewater treatment control. This project expects to generate new knowledge in the area of sensing technology using a self-developed membrane-based analytical principle, which overcomes the challenge of directly and accurately determining ammonia in a harsh wastewater environment. Expected outcomes include new theories in membrane-based sensing techniques and a market-ready field-based ammonia analytical system. This should provide significant benefits, such as a new technology for optimising wastewater treatment and reducing emissions and a valuable analytical tool to safeguard effluent quality.	166,379.00	149,429.00	149,429.00	465,237.00	AQUARIUS TECHNOLOGIES PTY LTD
	National Interest Test Statement The ammonia level in treated sewage is a key indicator of how well sewage treatment plants are working. Current sewage treatment techniques are energy intensive, inefficient, and costly and cannot reliably monitor ammonia levels. This project aims to develop a reliable sensing system capable of accurately and continuously monitoring ammonia concentrations in sewage in real-time. Access to this system will enable plant operators to monitor ammonia levels in real-time and take corrective action to maintain ammonia at acceptable levels. This will create significant economic and environmental benefits for Australia by saving more than 30% of plant electricity costs, providing better control over the nitrogen removal process to reduce greenhouse gas emissions, and reduce the use of harmful reagents, thus minimising potential risks to public health and local environments. Working with our Australian industry partner, these sensors will be trialled by Queensland water utilities and further developed into a viable commercial product ready for use by sewage treatment plant operators.					
	Griffith University	166,379.00	149,429.00	149,429.00	465,237.00	
James Cook University						
IE230100648 Guppy, Mr Jarrod L	**Novel reproductive approaches to de-risk and transform barramundi breeding** Demand for Australian seafood outstrips supply. Farming of the iconic Australian barramundi is poised to play a major role addressing this shortfall; but innovative methods are needed to de-risk breeding processes and to provide precise control of maturation, spawning and genetic contribution of broodstock. This project, in partnership with the world's largest barramundi breeding company, will develop, test and apply novel breeding methods to obtain tight control over barramundi reproductive development and spawning. By combining cutting-edge genetic and applied breeding techniques, selective breeding programs will be more efficient and the genetic gains from breeding programs will be maximised.	182,152.00	151,867.00	138,008.00	472,027.00	MAINSTREAM AQUACULTURE GROUP PTY LTD
	National Interest Test Statement This project will provide the critical knowledge and the innovative tools to precisely control the breeding and reproductive development of Australian farmed barramundi. Currently, an inability to tightly regulate barramundi breeding processes in hatcheries limits the efficiency of selective breeding programs. The successful outcomes from this project will; de-risk the operation of advanced selective breeding programs, maximise the rate of genetic gains in improvement and thus increase productivity and economic viability of the industry. These outcomes will foster continued expansion of the industry, and translate to increased employment and economic development throughout the regionally focused aquaculture sector. Increased production of Australian barramundi will enhance domestic consumer's access to highly nutritious seafood and service the strong international demand for high-quality Australian seafood.					
	James Cook University	182,152.00	151,867.00	138,008.00	472,027.00	

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Queensland University of Technology						
IE230100441	**Sounds of change: using ecological knowledge to advance acoustic monitoring**	184,156.00	170,208.00	120,079.00	474,443.00	BUSH HERITAGE AUSTRALIA
Teixeira, Dr Daniella	To recover biodiversity, conservation actions must be informed by robust ecological data. In partnership with Bush Heritage Australia, this project aims to transform ecological monitoring with eco-acoustic technologies by developing new acoustic metrics to measure biodiversity at various levels, from individual species through to whole communities. This project will combine advanced computer methods with theories of animal sounds and communities to generate metrics that are informed by animal ecology and directly address monitoring needs of conservation organisations. By experimentally testing the metrics on long-duration real-world sound data, this project will provide new tools to measure conservation impact and prioritise actions.					
	National Interest Test Statement					
	Biodiversity is declining rapidly, driven by habitat loss, climate change, invasive species, pollution, and the unsustainable use of natural resources. We urgently need to reverse this trend and, to do this, we need high-quality ecological data to inform the best conservation actions. This project will develop new ways to monitor biodiversity through sound. Healthy ecosystems have diverse soundscapes and, by recording and analysing ecological sounds, we can measure how species and ecosystems are changing. This project will integrate animal ecology and machine learning to create tools to track how species and ecosystems respond to threats and conservation actions. Partnering with Bush Heritage Australia, this exciting collaboration will ensure the methods are useful and shared with other conservation and government agencies, critical to inform and facilitate real-world conservation decisions. This research will benefit Australia more broadly by providing an efficient way to collect and report on data in line with national and international targets for improving biodiversity over the coming decade and beyond.					
IE230100578	**Next generation soil carbon satellite-based measurement for carbon markets**	195,429.00	159,779.00	0.00	355,208.00	AGRIMIX PTY LTD
Nguyen, Dr Trung H	Soil carbon sequestration is a federal government priority to offset greenhouse gas emissions. Efforts to advance this opportunity are hindered by the high technical costs of soil carbon quantification. This project will develop an innovative and potentially commercialisable technology that integrates ground data, unmanned aerial vehicles (UAVs), satellites, Eddy covariance CO2 flux towers, soil carbon (C) models, and artificial intelligence (AI) to improve the accuracy of satellite-based soil C modelling. The project will provide an accurate and cost-effective solution to quantification of soil C changes to unlock a large potential of carbon offsets in rangelands in Australia and worldwide.					
	National Interest Test Statement					
	Australia’s carbon crediting scheme aims to combat the effects of global warming by encouraging farmers to increase beneficial carbon storage in soils. Currently, the adoption and commitment of Australian graziers to this scheme is restricted due to the prohibitive costs of measuring soil carbon. This project will deliver a technology to cost-effectively integrate remote sensing, real-time carbon sensors, and artificial intelligence to significantly reduce the measurement costs by over 90%. The successful commercialisation of this innovative technology will allow thousands of graziers to participate in Australia’s carbon crediting scheme, saving Australia $57.3B in soil carbon measurement costs and generating an additional income of $61.6B from carbon credits over 25 years. The outcomes of this project will be integrated directly into Agrimix Pty Ltd’s commercial IT platform to provide a complete and cost-effective solution for quantification of soil carbon in grasslands in Australian and worldwide.					
	Queensland University of Technology	379,585.00	329,987.00	120,079.00	829,651.00	

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		2023-24	2024-25	2025-26*		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
The University of Queensland						
IE230100179 Zhao, Dr Dongxue	**Drought tolerance in sorghum: the roots of the solution** This project aims to develop an efficient, cost-effective sensing platform for visualising sorghum root systems in the field. Through innovative use of above and below ground sensing technologies, this project expects to generate new knowledge on the association between root structure and improved yield stability under drought stress. Expected outcomes include improved capacity for sorghum breeders and new digital agriculture products and services to support the industry more broadly. Given that sorghum is the main summer cereal grown in Australia, this should provide significant benefits, such as improved productivity and profitability for the Australian agriculture sector. **National Interest Test Statement** Food production and the nutritional security of millions of people are interwoven with the health of our planet. The increasing demand for food is adding unsustainable pressures to our land and water resources. With Australia's agricultural value expected to reach $100B by 2030, this is a pressing issue of national importance. The most viable option is to utilise science and technology to produce more food using less land and less water. This project will deliver the required tools to help plant breeders and farmers design crops that have more efficient root systems, so the crops can thrive under hotter and drier future climates. Project outcomes and commercial deployment through a digital agriculture service provider and a plant breeding company will deliver improved crops to farmers and more sustainable foods for the planet. Deploying new digital agriculture products and services that mitigate the impacts of droughts and create efficiency gains will deliver substantial economic benefits to farmers and significant environmental benefits to Australian society and the planet.	166,776.00	160,321.00	130,809.00	457,906.00	GENTECH SEEDS PTY LTD, AIRBORN INSIGHT PTY LTD
IE230100245 Zheng, Dr Min	**Transforming wastewater services in regional Australia** Wastewater treatment in regional Australia faces challenges of odour control, poor pollutant and pathogen removal, and greenhouse gas emissions. This project aims to innovatively use iron salts to realise highly efficient wastewater treatment in regional areas. With Partner, Western Australia Water Corporation, this project expects to leverage a recent breakthrough discovery on iron chemistry to co-develop and field test a solar system that doses wastewater with iron, to overcome four challenges and a supply chain issue simultaneously. Expected outcomes include industry capacity to adopt and commercialise a novel technology with important global relevance. Outcomes should reduce the inequity of wastewater services in regional Australia. **National Interest Test Statement** Australia has approximately 600 small treatment facilities - ponds - to treat wastewater in rural and remote areas. However, most ponds operate with odour emissions, greenhouse gas emissions, and limited pollutant removal efficiencies and pathogenic organism reductions. This fellowship will innovatively use iron salts to realise highly efficient wastewater pond treatment in regional Australia. This project will further develop a new manufacturing process that enables regional Australia to have cost-effective access to iron salts required. Working closely with Western Australia Water Corporation, who service 109 ponds state-wide, this project will promote technology development and translation. It will develop a smart pond process and deliver a technology enabling water utilities to produce iron salt, locally to meet demand. These will improve access to functional wastewater treatment in remote areas, providing significant social benefits to Australian Indigenous communities.	154,079.00	154,079.00	152,079.00	460,237.00	WATER CORPORATION
IE230100263 Nguyen, Dr Loan T	**Improve genomic testing tools for fertility traits in beef cattle** Fertility is a key driver of productivity and profitability for beef industry; however, a substantial industry challenge is poor fertility and the difficulty and expense of measuring fertility in remote Australia. By integrating multiple omics datasets and fifty thousand fertility phenotypes recorded on beef cattle, the project will identify sequence variation, including structural variants, that underpin genetic variation in cattle fertility. Our industry partner, which genotypes hundreds of thousands of cattle a year, will produce new genotype arrays and novel low-cost sequencing approaches including these variants, enabling selection that could potentially increase herd reproductive rate by 4%, returning $40M per annum to the farmers.	165,679.00	172,249.00	139,109.00	477,037.00	NEOGEN AUSTRALASIA PTY LIMITED

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		2023-24	2024-25	2025-26*		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
	National Interest Test Statement The beef industry in Australia contributes a significant amount of money, about 14.7 billion dollars, to the country's economy every year. However, there's room for improvement, especially in the northern part of the country where only 40% of cows are successfully weaning calves. This project plans to use data from multiple sources, including genetics and fertility traits from tens of thousands of tropical beef cattle, to identify genetic differences that affect fertility. This information will be used to develop a cheaper and more accurate way to select cattle with superior genetics for fertility at an early age, which will increase profitability for farmers. By improving fertility in cattle, this research may also have positive implications for addressing climate change in agriculture as more fertile cows dilute their emissions over a greater number of kg of beef produced. Therefore, the proposal presents an option to mitigate greenhouse gases by 30% by 2030. Overall, the project aims to make cattle farming more efficient and profitable while also having potential benefits for the environment.					
IE230100268 Potia, Dr Azhar Hussain I	**Supporting successful educational pathways of First Nations students** The aim of this study is to develop strategies to prevent the steep drop in school attendance rates of First Nation students as they transition from primary to secondary school. The project expects to generate effective culturally embedded support strategies. In partnership with communities, industry partners and schools we propose to consult, codesign and assess the effectiveness of peer-mentoring of primary school students by those from the same community who have successfully reached senior grades. The outcome is the evaluation of students' experiences and ongoing attendance and attainments. Significant benefits are for students' ongoing school engagement and academic success. Cultural and economic benefits are for all Australians.	164,845.00	142,123.00	169,085.00	476,053.00	FORMER ORIGIN GREATS, DEPARTMENT OF EDUCATION
	National Interest Test Statement The Closing the Gap report (2020) identifies improvements in uptake of early education and year 12 completion, yet many First Nations students disengage from formal education with a significant drop in attendance seen at transition from primary to secondary school. In response, this project focuses on the primary-secondary transition as a critical place to sustain educational engagement. In partnership with Former Origin Greats and co-designed with First Nations communities, the study trials a peer mentorship program building relationships between First Nations secondary and primary students. Translation pathways focus on program evaluation and scaling. The intended benefits are 1) for students- sustained educational engagement and attendant improved lifetime trajectories of health, achievement and social inclusion 2) for schools- opportunities to establish a culturally-embedded sustainable mentoring model 3) for Australian society, aligning with the Mparntwe declaration, asserting each child's right to be the best they can be, improved cultural pride, social well-being, productivity, and economic growth.					
IE230100385 Ward, Dr Andrew J	**"Circular Economy", via renewable energy and resource recovery** In a circular economy context, wastewater utilities are well placed to exploit the commercial potential of microalgae. Sewage treatment plants have an abundance of key nutrients required for algae growth, existing dewatering infrastructure that is suitable for harvesting algae and in some cases, existing anaerobic digestion infrastructure suitable for the conversion of microalgae to renewable energy in the form of biogas. This project aims to upscale wastewater-based algae production that will enable increased renewable energy production via anaerobic digestion, for onsite thermal, electrical energy and upgraded liquefied natural gas.	149,079.00	153,079.00	151,079.00	453,237.00	CENTRAL SEQ DISTRIBUTOR-RETAILER AUTHORITY
	National Interest Test Statement The use of natural resources and renewable energy together with sustainable practices has become a critical driver for wastewater utilities and industries. This project aims to use the power of microalgae which are invisible to the naked eye, and sunlight to harvest nutrients in wastewater, whilst removing carbon dioxide from the atmosphere. Traditional wastewater practices involve energy and carbon intensive nutrient removal technologies. The use of microalgae will allow innovative, cost-effective, environmentally sustainable wastewater treatment, producing renewable energy and quality organic fertilisers from the algae. Using carbon from algae to create sustainable products will help Australia reduce energy and carbon emissions from wastewater treatment, and also support the country's transition towards a circular economy with no carbon emissions. This brings direct benefits to Australian society, including a cleaner environment and a more sustainable economy. This project has broad industry support from treatment utilities, which will drive adoption of the technology in wastewater treatment plants.					

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
IE230100422 Duan, Dr Haoran	**Feasible quantification of greenhouse gas emitted from wastewater treatment** This project aims to develop an accurate and practical approach to quantify greenhouse gas (GHG) emissions from wastewater treatment. Australian water utilities have pledged to net-zero emissions. However, most utilities do not know its actual emissions due to lack of feasible quantification method. This project will apply an interdisciplinary approach via mechanism investigations, mathematical modelling, and field works to develop and validate a new feasible quantification method. This project will also advance knowledge on GHG emissions to guide quantification design. The outcomes will be translated into industry protocols and disseminated into industry. The outcomes provide timely support to water sector on its pathway to net-zero.	140,129.00	131,279.00	115,229.00	386,637.00	COUNCIL OF THE CITY OF GOLD COAST, WATER CORPORATION, CENTRAL SEQ DISTRIBUTOR-RETAILER AUTHORITY, WATER RESEARCH AUSTRALIA LIMITED
	National Interest Test Statement Most Australian water utilities, serving 18 million Australian population, have pledged to reach net-zero Greenhouse Gas (GHG) emissions by as early as 2030. However, most wastewater treatment plants still do not know its actual GHG emissions due to lack of feasible quantification method. This project will develop an accurate and feasible approach to quantify greenhouse gas emissions from wastewater treatment, and advance fundamental knowledge to guide the implementation. An industry protocol will be developed to translate the outcome and facilitate implementations in water industry. This project will support Australian water sector to achieve net-zero emission goals. The project directly aligns with the National Science and Research Priority area of Environmental Change, to build Australia's capacity in responding to environmental change by integration of research outcomes from urban wastewater systems, which will lead to more resilient urban, rural and regional infrastructure. The outcome will support Australia in making substantial contributions toward global net-zero emission targets by 2050.					
IE230100571 Sufian, Dr Adnan	**Safeguarding dams and levees from internal erosion failure** This project aims to improve the reliability and robustness of quantifying the risk of internal erosion failure in dams and levees. Existing industry approaches are reliant on judgement and experience. Using an innovative approach that integrates a variety of data sources, this project expects to objectively quantify risk based on the underlying internal erosion mechanisms. Expected outcomes include the translation of new knowledge to update current empirical understanding, the development of models to directly assess risk, and additional data to obtain the probability of failure. This should provide significant benefits by reducing subjectivity in assessing risk and improving industry confidence in identifying susceptible assets.	137,958.00	137,958.00	137,958.00	413,874.00	SMEC AUSTRALIA PTY. LIMITED
	National Interest Test Statement Australia is experiencing a resurgence in proposals for new and upgraded dams and levees as highlighted by the recent highly publicised Warragamba Dam upgrade for flood mitigation, and the Pioneer-Burdekin Dam to support pumped hydro energy storage. There are limited resources to manage these publicly funded assets and risk assessments play a vital role in identifying susceptible assets. While internal erosion is a major cause of dam failure, the current risk framework is highly dependent on user judgement and experience. This project will develop tools that engineering consultancies can use to quantify risk based on an improved understanding of internal erosion. These tools will be employed within existing risk frameworks, thereby providing a tangible pathway to translate new knowledge to better inform technical, regulatory, and governmental decision-makers. A more robust risk framework will improve the resilience of dams and levees, which benefits Australia through improved water security, facilitate the shift to renewable energy, and support the economy through energy generation and irrigation.					
IE230100647 Brownbill, Dr Aimee L	**Improving the accountability of dark advertising on digital platforms** This project aims to improve accountability of dark alcohol advertising on digital platforms. Digital marketing practices are largely opaque, posing a critical challenge for regulation which traditionally relies on advertising being observable as a foundation for public accountability. This project will develop and translate cutting-edge approaches for monitoring dark advertising, building tools and expertise to observe digital advertising and ensure consumer protection and fair market practices in the digital era. The project benefits researchers, civil society, government and the public by providing new methods to examine and monitor harmful digital marketing practices and informing regulatory solutions to mitigate harms.	162,995.00	195,180.00	0.00	358,175.00	FOUNDATION FOR ALCOHOL RESEARCH AND EDUCATION LIMITED

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		2023-24	2024-25	2025-26*		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
	National Interest Test Statement Digital platforms have become integral to people's ability to participate in society, yet there are certain harmful aspects of the online environment. For example, digital marketing systems are currently designed in a way that amplifies harm to individuals and communities when used to advertise unhealthy and addictive products like alcohol and gambling. This advertising is largely untraceable, making it difficult to observe and regulate. This project aims to develop and translate cutting-edge technology to capture and observe digital advertising. This technology would provide researchers, civil society, and governments with a novel tool for monitoring digital marketing practices. It would bring significant benefits to Australian society by enabling policy development for online protection of communities and individual consumers. Moreover, implementing safer online practices enabled by our technology would bring about economic benefits through a healthier society and higher security of online practices.					
	The University of Queensland	1,241,540.00	1,246,268.00	995,348.00	3,483,156.00	
University of Southern Queensland						
IE230100435 Wang, Dr Qingxia (Jenny)	**Customising weather index insurance for agribusiness using machine learning** This project aims to customise weather index insurance (WII) by utilising machine learning techniques. WII is used as a type of risk management tool in the agriculture sector to transfer risk due to extreme weather events. Significantly this project expects to establish an accurate correlation between insurance payouts and actual losses and thus improve the WII uptake rate. This will effectively support farmers and agribusinesses in Australia to mitigate and adapt to climate change, help reduce the impact of climate change and ensure crop production and food security.	143,000.00	144,000.00	144,000.00	431,000.00	CELSIUS PRO (AUSTRALIA) PTY LTD
	National Interest Test Statement This project harnesses historic forecast and crop yield data and applies advanced machine learning techniques to develop bespoke weather index insurance (WII) products. WII is an innovative financial product, used by farmers and agribusinesses to mitigate risks arising from extreme weather events. However, an inherent problem with WII is the mismatch between insurance payouts and actual losses. The development of a tailored product based on the weather index of individual farms will result in a more accurate correlation between weather parameters and crop yield. By closing the gap between payout and losses, farmers and agribusiness benefit from payouts that more accurately reflect their losses caused by extreme weather. The WII customisation proposed in this project will enable farmers and agribusiness to better mitigate and adapt to the risks associated with climate change, as well as significantly improve uptake across the agricultural sector. This will ensure more consistent crop production and food security, ultimately benefiting the Australian society and strengthening our economy.					
	University of Southern Queensland	143,000.00	144,000.00	144,000.00	431,000.00	
	Queensland	2,112,656.00	2,021,551.00	1,546,864.00	5,681,071.00	

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
South Australia						
Flinders University						
IE230100464 Wood, Dr Georgina	**A genomic toolkit to future-proof the seaweed industry** This project will combine genomics, artificial intelligence and experimental ecology to develop guidelines and technologies that maximise the growth and resilience of key seaweed species for aquaculture. Industrial seaweed production is growing rapidly and is expected to supply 1000s of jobs to regional Australia and 10% to the nation's emissions reduction target by 2040. Expected outcomes of this project include a genomics-based regulatory framework and hatchery tools that support rapid industry growth and minimise biosecurity and climate change risks. This will benefit government, aquaculture, and ecosystem management by improving design, assessment and implementation options for sustainable and productive use of Australian seaweeds.	209,905.00	145,593.00	112,079.00	467,577.00	DEPT OF PRIMARY INDUSTRIES, DEPARTMENT OF PRIMARY INDUSTRIES AND REGIONS
	National Interest Test Statement Industrial seaweed production is growing rapidly in Australia, for food, materials, agricultural feed, and restoration. At the same time, southern Australian waters are warming three times faster than the global average, causing the loss of seaweeds and ecosystem services valued at ~$1M per km of coastline per year. This project will provide government and the aquaculture industry with the first genomics-based regulatory framework to guide productive and climate-resilient seaweed farms. This framework will translate genomic research and statistical modelling into an interactive, easy-to-use guide, co-developed with end users. It will enable users to include genomic data in the design, assessment and implementation of seaweed projects, encouraging the sustainable and productive use of Australian seaweeds and accelerating success in this rapidly growing industry. These tools will also provide scalable, sustainable restoration solutions to bolster natural marine ecosystems and securing ecosystem services provided by kelp forests experiencing widespread climate change impacts.					
	Flinders University	209,905.00	145,593.00	112,079.00	467,577.00	
The University of Adelaide						
IE230100119 Zhang, Dr Wei	**Towards Internet of Things Enabled Automated Mushroom Cultivation** This project aims to develop novel Internet-of-Things based learning techniques to inform the design and construction of a portable, automated system for the cultivation of mushrooms. The expected outcomes are a portable smart mushroom cultivation system that provides access to new agriculture techniques and local, fresh supplies in rural and remote areas; learning algorithms that detect mushroom ripeness and set the best environmental parameters; and a dataset of mushroom cultivation parameters. These products, and associated training opportunities through a strong focus on public and industry engagement, will benefit the industry partners and horticultural producers to improve resource efficiency, waste reduction, and overall yield.	116,379.00	172,379.00	138,353.00	427,111.00	CLEVER AGRICULTURE PTY LTD, CLEVER TOWNSVILLE MUSHROOMS PTY LTD
	National Interest Test Statement The fresh mushroom industry suffers high waste losses (up to 30%) as handling, storage, and transportation can all adversely affect product quality. Using the key industry partner's existing semi-intelligent, large-scale greenhouse, this project will develop a small-scale, fully automated smart mushroom cultivation system that will transform the current mushroom industry to local growing and harvesting. This will significantly reduce waste. At the same time, the system can maintain an ideal growth environment for optimum yield. Cultivation data collected from the systems will be visualized and summarized in a data platform. Outcomes will benefit the Australian mushroom-growing industry and, in the future, other horticultural crop growers. Further benefits will come from better access to agricultural techniques and fresh produce between rural and urban areas. This project will position Australia as a leading pioneer in smart crop production systems.					

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
IE230100380	**Enhancing comprehension of forensic science in the justice system**	128,028.00	133,528.00	129,018.00	390,574.00	FORENSIC SCIENCE SA
Searston, Dr Rachel A	Failures to effectively communicate the accuracy and reliability of forensic evidence to courts can lead to unreliable convictions and miscarriages of justice. This project aims to understand how best to distil complex information about error and uncertainty in forensic expert opinion evidence for enhanced comprehension of forensic science in the justice system. Outcomes include evidence-based strategies for communicating error and uncertainty in forensic science and an accessible online dashboard for visualising known error rates in forensic disciplines. The knowledge gained from the project will help forensic experts to calibrate how they present their conclusions to courts for improved comprehension and evaluation of forensic evidence.					
	National Interest Test Statement					
	Effective communication of forensic evidence in courts is vital to carry out justice. Misunderstandings about complex scientific techniques used to analyse evidence such as fingerprints and DNA can lead to miscarriages of justice, including wrongful convictions. This project aims to provide better communication strategies to improve how forensic science is explained in courts. These strategies will be developed in partnership with forensic scientists using interviews, surveys, experimental testing, and cognitive research into how forensic evidence is understood by people who are not scientists. These strategies will then be implemented through online platforms, with communication guidelines that will be available to all Australian forensic agencies. This will ensure that there are high and consistent standards of practice to assist forensic scientists when they have to give evidence in court. The outcomes of this project will not only reduce the incidences of misunderstanding when forensic science is presented in court, but they will also result in a fairer, more reliable justice system for all Australians.					
IE230100545	**Developing a deployment-ready robust controller for wave energy converters**	154,829.00	158,529.00	135,529.00	448,887.00	CARNEGIE CLEAN ENERGY LIMITED
Sergiienko, Dr Nataliia	This project aims to improve the economic viability of wave energy converters that convert the power of ocean waves into electricity. It will develop deployment-ready control systems which will effectively predict, model and respond to wave activity, maximising energy production and resulting in an overall reduction in the cost of renewable energy. The fundamental knowledge gained will increase the technology readiness of wave energy and drive the next generation of wave energy converters by improving their commercial viability. This project is an opportunity for Australia to become a world leader in the global transformation towards clean and affordable low-carbon technologies for domestic and global markets.					
	National Interest Test Statement					
	Australia's transition to net zero emissions by 2050 requires new clean energy sources and storage technologies that are efficient, cost-effective and reliable. The movement of ocean waves can be converted into electricity, with the potential to contribute up to 11% of the national energy demand. However, the biggest challenge for the currently available technology is the significant cost. This project will develop new prediction and modelling techniques to more efficiently convert the energy associated with waves into electricity. The outcome will be a system that can better predict, model and respond to wave activity, maximising energy production and reducing the overall cost. The system will be deployed and validated in the open sea environment with the industry partner, providing pathways to adoption. This will be a step change towards cheaper and more reliable power production. The project will also position the industry partner as a global leader in the field and will enhance Australian leadership in offshore energy innovations.					
	The University of Adelaide	399,236.00	464,436.00	402,900.00	1,266,572.00	
University of South Australia						
IE230100476	**Development of rapid-response thermal batteries for the global market**	155,079.00	155,079.00	155,079.00	465,237.00	ISOTHERMIX PTY LTD
LEE, Dr SEUNG HO	In collaboration with Isothermix, this project aims to develop and commercialize cost-effective, rapid-response thermal batteries to meet the air conditioning peak demand of buildings. This project expects to generate new knowledge about the phase change materials which can be used to store thermal energy across a range of temperatures and the highly thermal conductive materials which can be used as a heat exchanger. Expected outcomes include the development of rapid response thermal batteries which can cool buildings across a range of temperatures and site conditions. This should provide significant benefits by reducing primary heating and cooling plant capacity and thereby our reliance on fossil fuels.					

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
	National Interest Test Statement The demand for renewable energy is increasing, but solar and wind power can be unreliable since they don't generate electricity continuously, requiring battery storage. This project aims to develop a sustainable, cheap, and more compact thermal battery for use in building cooling systems. We will use safe materials primarily made of salt and water to store heat at the desired temperature and a novel form of heat exchange to quickly store and deliver heat. The use of this battery will improve the efficiency and reliability of the existing building cooling systems while minimizing their environmental impact. For successful adoption, regulatory support and industry willingness to embrace new technologies are needed. This project aligns with the Australian government's Low Emissions Technology Statement, which prioritizes battery storage as a means of reducing emissions. Our team is collaborating with industry partners, including Isothermix, which is already testing the first-generation thermal battery for air conditioners, to encourage the use of innovative batteries in addressing Australia's energy challenges.					
	University of South Australia	155,079.00	155,079.00	155,079.00	465,237.00	
	South Australia	764,220.00	765,108.00	670,058.00	2,199,386.00	

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Tasmania						
University of Tasmania						
IE230100443 Pearce, Dr Tamieka L	**Pyrethrum in half the time: genes and systems to annually crop a perennial** The capacity of the Australian pyrethrum industry, the global leader in the supply of the natural insecticide, is threatened by the profitability of the current 18-month crop cycle. The project aims to transform the crop to an annual production cycle by discovering genes that underpin flower timing and yield. The project will generate new knowledge on the genetic and physiological drivers of flowering and exploit these for the development of viable 10-month crops. Outcomes of the project include new protocols and germplasm for breeding and managing short cycle crops for optimum yield. This will provide significant benefits including an economically attractive crop option for growers and a more sustainable industry.	162,937.00	148,667.00	152,367.00	463,971.00	BOTANICAL RESOURCES AUSTRALIA-AGRICULTURAL SERVICES PTY LTD
	National Interest Test Statement There is growing demand from consumers worldwide for safe, effective, and natural insecticides to use at home and in industrial settings. Australia is the top producer of organic compounds called pyrethrins, which naturally occur and are extracted from seeds of the chrysanthemum plant called pyrethrum. Their potent insecticidal properties have been known and used for thousands of years. However, pyrethrum takes 18 months to flower, which increases production costs and has resulted in many farmers choosing to growing alternative crops. We aim to develop pyrethrum plants that flower in 10 months by studying the impact the environment has on the genetic and physical processes of plant growth and flowering. These earlier flowering plants and new growing guidelines will enable Australian farmers to produce more flowers for extraction of pyrethrins to meet the growing global demand, increase the market for pyrethrins, and increase farm profits. This research will benefit Australia's $15.2 billion horticultural sector, significantly boosting productivity and contributing to a more resilient and profitable industry.					
	University of Tasmania	162,937.00	148,667.00	152,367.00	463,971.00	
	Tasmania	162,937.00	148,667.00	152,367.00	463,971.00	

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
Victoria						
La Trobe University						
IE230100135 Patterson, Dr Brooke	**Developing strong, robust and high performing women football players** Women drop out of Australian football at a higher rate than men, often due to concerns about their physical capabilities and performance. Yet, coaches do not prioritise developing physical capacity (eg strength), due to perceived lack of relevance to football. In community Australian football players, this study will identify physical capacity elements relevant for football performance, assess the change across a typical season and the influence of gender and age. Combining sport science and engineering, smartphone videos and open-access software will be utilised to develop cost-effective methods to assess tackling skill. Findings will inform better training strategies for women, reducing injury, enhancing retention and physical activity. **National Interest Test Statement** Womens' retention in male-dominated contact sports such as Australian football is 35% lower than men. Concerns about the physical demands, injury, and performance quality feeds perceptions that womens' bodies are not made to play contact sport. Yet less than 10% of sports science research participants are women. In community Australian football players, this study will identify the physical skills most important for football performance, and changes across a typical season, and the influence of gender and age. Smartphone videos and free software will be used to develop cost-effective methods to assess gender differences in tackling technique. Findings will inform training strategies to best prepare women and be incorporated into sporting organisation coach and player education. The findings may motivate coaches to include underutilised training activities to develop strength and tackling skill. Building strong and robust players of the future will reduce drop-out and injuries, maximise the commercialisation of women's sport, and increase the visibility of professional, high performing women in society.	145,183.00	148,097.00	154,942.00	448,222.00	VICTORIAN AMATEUR FOOTBALL ASSOCIATION, VALD PERFORMANCE
	La Trobe University	145,183.00	148,097.00	154,942.00	448,222.00	
Monash University						
IE230100048 Gao, Dr Li	**Ammonium-selective membranes to shift water industry into circular economy** The project aims to develop ammonium-selective membranes which are urgently needed in Australian key industries for sustainable ammonia recovery. The project expects to construct the membranes to achieve desirable pore size and surface functionality for fast and selective ammonia transport. The developed membranes should make ammonia recovery from wastewater more effective and sustainable, leading to the healthy waterway and reduced energy for both ammonia production and removal. Recovered ammonia expects to produce valuable products, supporting agriculture industry and hydrogen economy. The developed membranes should enable water industry's shift into circular economy, providing significant economic and environmental benefits to Australia.	148,109.00	160,409.00	157,579.00	466,097.00	SOUTH EAST WATER CORPORATION, EPA VICTORIA, TOWNSVILLE CITY COUNCIL, WATER SERVICES ASSOCIATION OF AUSTRALIA LIMITED, WATER RESEARCH AUSTRALIA LIMITED, INTELLIGENT WATER NETWORKS, MELBOURNE WATER CORPORATION, ICON WATER LIMITED, TAS WATER, COLIBAN REGION WATER CORPORATION, BARWON REGION WATER CORPORATION, DUPONT MEMCOR (AUSTRALIA) PTY LTD, WINHARVEST PTY LTD

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		2023-24	2024-25	2025-26*		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
	National Interest Test Statement As the second most produced chemical in the world, the total ammonia demand for Australia is more than 1,700 kilo tons in 2020, driven by Australian key industries, such as agriculture, food, and chemical industries. It is estimated that 20% of the total ammonium-based fertiliser demand can be sufficiently met by recovering ammonium from wastewater. This can save Australia more than 7 billion kWh energy and reduce 5 million tons of carbon emission annually. However, current separation membranes have reached their intrinsic limits, they cannot effectively separate ammonium ions in wastewater. Excessive ammonium discharge can cause serious damages to the environment (soil acidification and toxic algae blooms) and human health. This project aims to address this urgent challenge by developing ammonium-selective membranes. This project expects to support Australian water industry's transformation into the circular economy by recovering and converting ammonium from wastewater into valuable products (e.g., fertilisers and hydrogen carriers), providing significant economic and environmental benefits to Australia.					
IE230100169 Al-Wassiti, Dr Hareth B	**Next-generation mRNA manufacturing and analysis technologies** Developing innovations in RNA manufacturing and technology. The project aims to develop cutting-edge manufacturing and analysis technologies by optimising Self-amplifying (SAM) RNA production towards low impurities, creating reliable purification technologies, and filling critical gaps in RNA analysis. The project expects to yield significantly cheaper, higher-quality RNA products and develop novel methods in RNA analysis. The outcomes are expected to revolutionise RNA manufacturing, develop cutting-edge commercialisable IP, scholarly know-how, and galvanise the Australian biomanufacturing sector towards sovereign capability, biosecurity and commercialisation of new animal, human and plant RNA products.	157,652.00	152,630.00	147,402.00	457,684.00	CSL LIMITED
	National Interest Test Statement Ribonucleic acid (RNA) is a complex compound found in all living cells. RNA has huge potential to help make crops better, and animals and people healthier. However, it is difficult to make high-quality RNA at low cost. A lack of standardised regulatory procedures also leads to unreliable RNA quality. This project aims to make new and better ways of producing and testing RNA by using cutting-edge technology for the next-generation RNA manufacturing in collaboration with CSL and other partners. It aligns with the Future Made in Australia policy to stimulate Australian manufacturing and biosecurity. The research will be translated into new technologies that can be incorporated into new commercial spin-offs or adopted by leading Australian biomanufacturing companies including CSL's current manufacturing pipeline. The research findings may also lead to new technologies that can be commercialised by other Australian RNA manufacturers. This project will grow the Australian RNA ecosystem, strengthening Australia's manufacturing and innovation capabilities and creating commercial benefits.					
IE230100200 Wang, Dr Zhouyou	**Advanced separation membrane for sustainable lithium mining and recycling** The project aims to develop and commercialise a novel membrane-based technology based on a newly invented lithium-selective ceramic-polymer membrane for low-cost and environmentally friendly lithium recovery and recycling from various sources. The project expects to generate deep knowledge in the design and scaling up of lithium ion separation membranes, and create a lithium extraction prototype for on-site lithium extraction testing. Expected outcomes of the project include full commercialisation of the lithium separation membrane and new intellectual property for establishing a new membrane manufacturing industry that is critically needed for transforming lithium mining and recycling industries.	122,109.00	136,304.00	128,644.00	387,057.00	ELECTRALITH PTY LTD, RIO TINTO LIMITED
	National Interest Test Statement Australia is one of the largest lithium exporters in the world and lithium-ion batteries play a key role in renewable energy and the transition to a low-carbon future. The current lithium mining process is costly and bad for the environment and recycling of used lithium-ion batteries is becoming a major challenge. This project aims to commercialise a new membrane-based technology for cheaper and environmentally friendly lithium recovery and recycling from various sources. Project partners consist of Australian lithium industry and mining companies who will help prototype and test the new technology, including at mining sites. The project will increase Australia's capability in the battery materials industry and contribute to the circular economy by providing effective processes for battery recycling. It will also enable larger vehicles to become electric, provide training of new engineers and scientists, and create new jobs.					

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
IE230100257	**Phase Change Materials for Renewable Energy Storage**	145,000.00	145,000.00	140,000.00	430,000.00	BORON MOLECULAR PTY LIMITED, ENERGY STORAGE PTY LTD
Matuszek, Dr Karolina B	This project aims to develop a new generation of phase change materials (PCMs) and their scaled-up, sustainable production processes to advance the technology of thermal energy storage. The significance of this proposal stems from its potential to boost renewable energy penetration and uptake by creating inexpensive and reliable energy storage technologies based on PCMs and thermal batteries. Working with partners Boron Molecular P/L and Energy Storage P/L the anticipated outcomes of this project will be practical and accessible energy storage devices that can be implemented at various distributed levels and integrated into existing supply networks, providing cheap energy in the form of heat and electricity from zero-carbon sources.					
	National Interest Test Statement					
	On average, more solar energy reaches the surface of Australia than any country on earth. However, renewable sources account for a tiny portion of Australia's energy production. A major reason for this is inadequate storage solutions. This project seeks to make it easier and cheaper to store energy from the sun and wind. It will develop advanced materials, made from sustainable sources, that can hold on to this energy and release it later when needed. The benefits to Australia include the ability to make greater use of energy from renewable sources, improving the economics of solar and wind farms and thereby contributing to Australia's transition to a low-carbon economy. It will also help create new jobs and make energy cheaper for consumers. Project partners include a local chemical producer and energy storage company that can help to commercialise the new energy storage materials into devices that can be integrated into existing energy supply networks.					
IE230100300	**Novel gestural technologies for musicians with physical disability**	148,340.00	152,016.00	130,556.00	430,912.00	YOUR DNA PTY. LTD.
Ilsar, Dr Alon A	This project aims to address the under-representation of people with disability in the Australian music industry by developing innovative, accessible gestural instruments. Teaming up with key industry partner, YourDNA Creative Arts, an accessibler arts organisation, this interdisciplinary project expects to generate new knowledge in instrument design, inclusive technology and creative artificial intelligence. Using mixed-methodologies, expected outcomes include music and performance which is socially inclusive, economic participation, and the health and well-being of musicians with disability. This should provide significant benefits to Australian society by breaking down barriers that hinder their effective participation in society.					
	National Interest Test Statement					
	By addressing barriers to creative opportunities for musicians with physical disability, this project aims to promote social engagement and connection, economic participation, and a sense of self-worth and empowerment through music-making and performing. Supporting the creative and professional practice of musicians with physical disability will lead to a greater visibility of their stories and experiences in Australian culture, which can help break down attitudinal barriers that hinder the effective participation in society of people with disability. It will also lead to new employment opportunities in the Australian music industry as it rebuilds from the effects of COVID-19. It aligns with Australia’s National Disability Strategy, promoting social inclusion, economic participation, health and well-being, and enjoyment of life.					
IE230100449	**High-performance ammonia electrosynthesis devices**	163,000.00	145,000.00	145,000.00	453,000.00	JUPITER IONICS PTY LTD
Du, Dr Hoang-Long	The project aims to develop a robust process for electrosynthesis of ammonia using devices manufactured by Melbourne company Jupiter Ionics P/L and innovative electrolyte components. Towards this aim, tailored ion-shuttling compounds need to be designed and investigated to enable continuous generation of ammonia in scaled-up flow devices. This is expected to generate new knowledge in practical electrochemistry, catalysis and sustainable synthesis. Key project outcome is a technology for production of ammonia from renewables that is pollution-free and highly scalable in contrast to the current process. Resulting benefit to Australian agriculture businesses is a method for distributed fertiliser generation without the use of fossil fuels.					

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		2023-24	2024-25	2025-26*		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
	National Interest Test Statement The global chemical and fertiliser industry is heavily reliant on fossil fuels, which contribute to greenhouse gas emissions and climate change. This project aims to develop a sustainable and efficient way to produce ammonia, a vital chemical for farming, using abundant renewable energy sources such as wind and solar. It will develop new functional materials that will increase the efficiency and productivity of an Australian-invented electrolytic technology, making it more cost-effective and scalable. This will help reduce pollution and create a cheaper way for farmers to get the fertilizers they need. The project is aligned with Australia's Hydrogen and Ammonia for Power policy and climate change strategies. The new technology will be commercialised by the key industry partner, an Australian start-up company, and propel it into a world-leading position for green ammonia technology. It will also provide solutions for long-term storage and export of Australian renewable energy, boosting the economy and creating new jobs.					
IE230100468 Nguyen, Dr Tam D	**Scalable high-performance electrolytic hydrogen generator** The project aims to demonstrate energy-efficient generation of compressed hydrogen by water electrolysis in a high pressure electrolyser test-rig produced by Melbourne company Energys Australia P/L, using high-performance membrane-electrode assemblies. Innovative electrode architectures, membranes, and method for their high through-put lamination will be developed. New knowledge in catalysis, device fabrication and materials science is expected to be generated. The major project outcome is sustainable method for generation of compressed hydrogen at significantly reduced cost as compared to the existing technologies. Benefits include industry-ready processes for electrolyser and hydrogen production that support Australian energy industries.	150,000.00	150,000.00	150,000.00	450,000.00	ENERGYS AUSTRALIA PTY LTD
	National Interest Test Statement Australia aims to be a global hydrogen leader by 2030, both in green hydrogen exports and for the decarbonization of Australian industries. Advancement and application of technologies for green hydrogen generation from renewables is of key strategic importance to Australia's future energy security and economic growth. This project will assist Australia in attaining this goal by developing a sustainable method for generating compressed hydrogen at significantly lower cost than is currently possible with existing technologies. The key industry partner, an Australian energy company, will become a leader in the production and supply of green hydrogen technology. The company will use its advanced hydrogen technology test-rig to demonstrate energy-efficient generation of compressed hydrogen by water electrolysis. Project benefits include industry-ready processes for electrolyser and hydrogen production that support Australian energy industries and hydrogen sector export growth.					
IE230100564 Rudd, Dr David A	**On-Site, Reponsive and Less Invasive Drug Testing In Corrective Services** This project aims to develop a new drug screening system using nanomaterials interfaced with advanced mass spectrometry to improve testing speed, cost, and accuracy, and minimise the distress associated with current drug testing programs within corrective services. Currently, testing programs are costly, with confirmation taking multiple weeks, preventing appropriate responses to drug use and support service recommendations. Additionally, vulnerable people in custody or on corrective orders find conventional urine testing distressing, especially when previously exposed to sexual violence. New accurate, rapid saliva testing on-site will revolutionise drug monitoring and provide an Australian designed solution for correctional jurisdictions.	244,179.00	109,079.00	0.00	353,258.00	DEPARTMENT OF COMMUNITIES AND JUSTICE CORRECTIVE SERVICES NSW
	National Interest Test Statement The project aims to replace conventional urine testing in corrective services with a nanomaterial-assisted drug testing technology that detects drugs in saliva with a high degree of confidence, on-site. The technology still employs the gold-standard detection process (mass spectrometry), however, the liquid phase conventionally used in a laboratory settings is replaced with a dry nanomaterial substrate, thus allowing a drug testing platform that can operate in a corrective centre. This new technology addresses a significant problem with corrective drug testing time-frames and costs, by allowing instant results to be obtained from a saliva sample on-site for situationally responsive action. The outcomes of this new technology will benefit the social and financial management of drug use in the prisoner/corrective orders population, improve the safety of corrective staff and establish a technology that could work globally in similar settings. To date, the drug testing technology has been effective on prisoner samples provided Corrective Services NSW, but is yet to be piloted in an operational environment.					
	Monash University	1,278,389.00	1,150,438.00	999,181.00	3,428,008.00	

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
RMIT University						
IE230100420 Kirk, Dr Holly L	**Spatial planning for urban biodiversity conservation** This project will reduce the complexity of planning for biodiversity during urban development by enabling industry and government to visualise and measure the potential performance of different urban designs. This project expects to create a new open-access online tool to allow spatial planning of urban biodiversity conservation actions. Expected outcomes of this project include enhanced capacity for developers, environmental consultants and local governments to measure potential urban biodiversity outcomes at a range of scales. This should provide significant benefits to human well-being by increasing the efficiency of urban nature conservation and restoration in cities. **National Interest Test Statement** Urban development is one of the greatest threats to nature in Australia, creating cities that expose residents to climate extremes and limit access to the wellbeing benefits that nature provides. Solutions exist, but local governments, urban designers and housing developers need accessible tools to measure the impact of planning decisions on urban nature. This project will produce an online software tool allowing industry and government to identify the best places and actions to benefit urban nature. The tool will be developed in close collaboration with a diverse group of users, creating opportunities for immediate adoption. The freely available tool will be provided with the support of training materials and sample applications. Urban developers and city planners can use the tool to identify where nature restoration will support other urban wellbeing goals, such as safer communities, improved mental health and stormwater control. Industry partners will further promote the tool via training workshops and publications through their commercial and government networks, ensuring wide availability and uptake.	113,055.00	177,716.00	184,398.00	475,169.00	LENDLEASE CORPORATION LIMITED, WSP AUSTRALIA PTY LIMITED, KNOX CITY COUNCIL
IE230100678 Khorasani, Dr Mahyar	**A Digital Twin-Driven Model for Mapping Part Quality in Multi-Jet Fusion** This project aims to develop a digital simulation model to address the irregular mechanical properties of Multi-Jet Fusion in 3D printing of automotive components. This model expects to solve a significant challenge when using Multi-Jet Fusion which is the dependence of quality on the build position. The expected outcome of this project is the development of a novel tool for quality assessment in mass customisation and production. This project will provide significant benefits by creating an independent digital simulation model for quality mapping in Multi-Jet Fusion that reduces production costs and enhances automotive part quality. **National Interest Test Statement** 3D printing has gained popularity, however it is not used for mass production due to low production rates. In this project, virtual copies of automotive parts produced by 3D Printing will be developed. The outcome of this fellowship will be a tool for quality assessment in the mass production of 3D-printed automotive parts. The tool will enable industry to simulate the properties of 3D printed parts before actual printing, leading to improvement of the manufacturing quality and reduction in risk associated with 3D printing. Also, this project increases the potential to establish national manufacturing capability, especially in regional areas, by reducing the risk and cost associated with 3D printing. This project directly translates robust scientific insights toward commercialisation and Ford will use the developed tool for the design and optimisation of the mechanical response of commercial components for automobile safety.	140,573.00	149,574.00	148,425.00	438,572.00	FORD MOTOR COMPANY OF AUSTRALIA PTY LTD
	RMIT University	253,628.00	327,290.00	332,823.00	913,741.00	

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
The University of Melbourne						
IE230100140 Hradsky, Dr Bronwyn A	**Supporting Australia's conservation agencies to control foxes & feral cats** This project aims to empower land managers to better protect Australia's native wildlife. Introduced predators (foxes and feral cats) are a key driver of wildlife loss in Australia, and millions of dollars are invested in management annually. The project expects to advance the efficacy of introduced predator management by building robust datasets on predator densities, conducting continental-scale syntheses on predator ecology, developing advanced simulation models to predict the effects and cost of management and monitoring, and making these accessible via free decision-support tools. The project will enhance the capacity of land managers to conduct best-practice management and substantially advance understanding of predator ecology.	145,601.00	189,830.00	141,806.00	477,237.00	PARKS VICTORIA, ZOOS VICTORIA, DEPARTMENT OF ENVIRONMENT LAND WATER AND PLANNING, DEPARTMENT FOR ENVIRONMENT AND WATER, KANGAROO ISLAND LANDSCAPE BOARD, NORTHERN AND YORKE LANDSCAPE BOARD, CONSERVATION ECOLOGY CENTRE PTY LTD
	National Interest Test Statement Australia has the unenviable position of being a world leader in species extinction rates. Introduced foxes and feral cats have played a major role in the loss and decline of our native fauna, and best-practice management of these predators is a key target in the national 'Threatened Species Action Plan 2022-32'. This project will develop interactive decision-support tools to empower Australia's land managers to better suppress, eradicate and monitor invasive predators for biodiversity conservation. The innovative tools will be informed by cutting-edge simulation models, new field data and continental-scale predictive models. Involvement of the primary government conservation agencies across Victoria and South Australia will ensure immediate translational value and ready uptake. Adoption of these tools will lead to more effective and efficient management of introduced predators, increasing the resilience of Australia's native species to other threatening processes and freeing resources for other conservation priorities. The tools will also have immediate relevance to pest management in agriculture.					
IE230100561 Aitken, Dr Zoe Lisa A	**Solving the disability data puzzle to ensure progress towards equity** In South Korea, the average age of death for people with disability is 16 years younger than people without disability. In Australia, we do not have the data infrastructure to generate life expectancy statistics for people with disability. This fellowship aims to solve this disability data challenge, identified as a critical problem by the Australian Government. It will develop a validated methodology for producing disability statistics from linked data; generate a whole population disability data resource to build capacity in disability research; and for the first time, produce life expectancy statistics for people with disability - the ultimate policy tool to monitor progress towards equity and improve the lives of disabled Australians.	117,158.00	167,158.00	168,620.00	452,936.00	AUSTRALIAN BUREAU OF STATISTICS, AUSTRALIAN INSTITUTE OF HEALTH AND WELFARE
	National Interest Test Statement Life expectancy statistics for people with disability represent the ultimate policy tool to monitor progress towards equity and improve the lives of disabled people. However, we currently do not have the data infrastructure to generate these statistics for Australians with disability. This program will solve that problem by developing a validated methodology for generating a whole population disability data resource. Data on disability are confined to disability services, payments and benefits, and education datasets and are not routinely collected in mainstream services (primary care, hospitals, allied health). Combining information from these different data sources to derive a set of disability indicators is a complex challenge that can be solved only by working with our industry partners, Australian Bureau of Statistics (ABS) and the Australian Institute of Health and Welfare (AIHW). The resulting disability data resource will be valuable in reporting against Australia's Disability Strategy and the government's commitments under the United Nations Convention on the Rights of Persons with Disabilities.					
	The University of Melbourne	262,759.00	356,988.00	310,426.00	930,173.00	

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
Victoria University						
IE230100635 Pinto Sampaio Gomes, Dr Douglas	**Developing broken power line localisation devices with added grid sensing** This project aims to develop improved devices for detecting and locating power line breakages and investigate their use to support renewable sources in regional grids. The project expects to generate novel power protection technology and support the commercialisation of devices resulting from a previous feasibility project with Victoria's largest power distributor. The expected outcome is the delineation of commercial-grade, programmable devices to be deployed to regional networks for enhanced monitoring. This should provide significant benefits, such as mitigating fire-ignition risk and subsequent emissions, faster power recovery times, and insights for increasing the presence of renewable generation in regional networks. **National Interest Test Statement** Australia has an unfortunate history of bushfires creating devastating economic and life damages. Aware of this issue, The Department of Environment, Land, Water and Planning, in collaboration with local power companies and Victoria University, funded the development of a device capable of detecting power line breakages in regional grids before they touch the ground. With attested feasibility, this project aims to continue the development of such technology, supporting its path towards commercialisation, expanding its capabilities to locate line breakages and studying its use to assist distributed energy resources. The developments will result in reduced bushfire risk, faster power recovery times, and potential support for higher penetration of renewables in regional areas. Therefore, it has the potential to avoid environmental damage and emissions from fires, improve power security, and support clean energy expansion for regional customers.	158,915.00	151,991.00	153,138.00	464,044.00	POWERCOR AUSTRALIA LTD
	Victoria University	158,915.00	151,991.00	153,138.00	464,044.00	
	Victoria	2,098,874.00	2,134,804.00	1,950,510.00	6,184,188.00	

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
Western Australia						
Edith Cowan University						
IE230100040 Hooper, Dr Cornelia M	**Unravelling the genetics of Kangaroo paws for climate-resilient gardens** The project will produce the first DNA-anchored plant lineage map of Kangaroo paws and gain novel insights into their resilient growth characteristics. Using novel genome and data-driven strategies, this project addresses the knowledge gap around the genetic heirloom of more than 200 iconic Kangaroo paw varieties to speed up the breeding of new varieties with enticing leaf patterns and flower colour combinations. While unravelling the inheritability and breeding barriers, immediate industry adoption will boost horticultural breeding programs long-term. This project uses cutting-edge science to enhance industry capacity for providing new Kangaroo paws for climate-resilient urban green spaces on the national and international market.	139,026.00	151,772.00	156,329.00	447,127.00	DEPARTMENT OF BIODIVERSITY CONSERVATION AND ATTRACTIONS, ZANTHORREA PTY LTD, NEW WORLD PLANTS PTY. LTD
	National Interest Test Statement The project aims to decipher the relationship and genetic diversity of Kangaroo paw varieties contributing to visual and growth characteristics, including a rare variety with mottled leaves. Cutting-edge genome sequencing and data-driven approaches are used to decode the ancestry of >200 variants from 12 distinct Kangaroo paw species unique to Western Australia. The project will produce the first plant lineage map of horticultural Kangaroo paw breeds anchored by DNA and gain novel insights into their resilient growth characteristics. Closing the knowledge gap around the genetic heirloom will assist horticultural breeding programs with the selection of breeding partners and circumvent breeding barriers. Predictability of breeding outcomes will accelerate the development of new Kangaroo paws with enticing leaf and flower colour combinations for climate-resilient urban green spaces. This will benefit urban life quality, mental health as well as assist the conservation and increase national and international market value of this unique Australian resource through established Kangaroo Paw marketing pipelines.					
	Edith Cowan University	139,026.00	151,772.00	156,329.00	447,127.00	
The University of Western Australia						
IE230100042 Chen, Dr Kai	**Developing a multimodal imaging pipeline for antisense technology** Antisense molecules represent a revolutionary drug discovery platform for life science, but to understand their distributions in cells and tissues is challenging. By integrating nanobiotechnology approaches, this project expects to develop and apply innovative imaging workflow to track antisense molecules in cells and tissues with nanoscale precision. Expected outcomes include new knowledge of the trafficking of these molecules across cells and tissues and refined imaging methods. This project should provide more strategic delivery of antisense molecules to specific cells and tissue, which will have significant downstream economic and social benefits to the Australian community.	156,618.00	155,014.00	151,214.00	462,846.00	PYC THERAPEUTICS LIMITED, CARL ZEISS PTY. LIMITED
	National Interest Test Statement The development of new drugs is a challenge for the entire pharmaceutical industry. Recently there have been advances in RNA technology that could help develop new drugs. RNA is a molecule in our cells that can control which genes are turned on or off. These advances can use small pieces of RNA to bind to the existing RNA in our cells, switching off genes that lead to disease development. However, there is a gap in our understanding of how these RNA segments behave once inside our body. This project will develop new imaging technology that will allow us to visualise these RNA segments moving through cells. This new technology will have major benefits for the Australian pharmaceutical industry and reinforce Australia's world-leading position in the field of RNA technology. Development of this technology, here in Australia, will result in economic benefits for Australia, as well as eventual health benefits for Australians. We will work with our industry partners to ensure the technology is adopted and used effectively.					

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
IE230100498 van Rooijen, Dr Arie A	**Optimising bioengineered structures for resilient shorelines and habitats** Nature-based solutions for shoreline protection through ecosystem restoration are increasingly being considered by foreshore managers. However, habitat restoration efforts are greatly hampered by the time it takes to fully revegetate an area. This project aims to develop a comprehensive understanding of wave interaction with bioengineered structures that provide shelter from wave impacts and promote revegetation and contribute to shoreline flood and erosion mitigation. Expected outcomes of this project include quantitative design guidelines and predictive tools that will help foreshore managers to develop more robust and cost-effective nature-based shoreline protection strategies.	189,152.00	142,949.00	138,449.00	470,550.00	DEPARTMENT OF BIODIVERSITY CONSERVATION AND ATTRACTIONS, SYRINX ENVIRONMENTAL PTY LTD, TRANEN REVEGETATION SYSTEMS, DAMARA WA PTY LTD, REEF DESIGN LAB INTERNATIONAL PTY LTD, THE NATURE CONSERVANCY, DJOONA
	National Interest Test Statement Shoreline flooding and erosion are major threats to human safety, property and infrastructure in Australia. With sea level rise and increased storms more than $220 billion in homes, businesses, roads, railways and other infrastructure will be at risk from flooding by 2100. Native foreshore vegetation can provide important protection, but has often been degraded or removed entirely, especially in Australia's metropolitan areas. Restoration efforts have shown great potential but are hampered by the time it takes for plants to be full-grown and be able to withstand storm waves. This project aims to provide design guidelines for bioengineered structures that are used to create calm environments for replanted vegetation to reach its full potential. It is expected to boost the uptake of nature-inspired solutions for shoreline protection by allowing for more resilient, efficient and cost-effective approaches. While many countries are increasingly battling with rising sea levels, this project can help Australia develop more robust and sustainable protection strategies and become a leader in their implementation.					
IE230100672 Howard, Dr Zachary L	**Measuring real-time mental workload to improve our Defence capability** This project aims to develop a novel platform for measuring real-time variation in the cognitive workload of humans working with advanced Defence technologies. The project expects to combine innovative statistical techniques with cutting-edge psychological and neuroscience developments to measure and process workload-related brain activity in real-time. Expected outcomes of the project include an enhanced capacity to measure and respond to cognitive workload in the field. This should provide significant benefits such as enhanced performance and safety outcomes, which will provide a strategic advantage to the Australian Defence Force by facilitating the development of advanced technologies that respond to the capabilities of the human user.	149,049.00	160,644.00	160,644.00	470,337.00	DEFENCE SCIENCE AND TECHNOLOGY GROUP, AGILI8
	National Interest Test Statement Technology can provide opportunities to enhance our lives, but can also present unique risks. For example, our cars are becoming safer through warnings and alerts to dangers, but these alerts and displays may overwhelm us and lead to distraction or accidents. By being able to measure and respond to the demands placed on a human user we could avoid these negative outcomes. This research will use state-of-the-art science to monitor activity in the brain and understand when a technology user is being pushed too far. It will identify and openly publish the signs of these risks, providing strategic, economic and health benefits to Australia by informing creation of safer technologies that adapt to the demands experienced by the user. The Defence Forces (partners in this project) will be the first to use this research, where effective use of technology could be the difference between life and death. However, the results will also be relevant to emergency services, mining and heavy machinery and other industries.					
IE230100697 Cuttler, Dr Michael V	**Quantifying eco-geomorphic linkages to enhance marine park management** This project aims to develop a novel framework for predicting the future resilience of reef-fronted coastal habitats within marine parks. Through innovative observations of reef-fronted coastal dynamics, it will quantify the relationships between coastline evolution, physical drivers, reef geomorphology, sediment supply and reef ecology. Expected outcomes include new practical tools and transferable knowledge that can identify coastal regions that are sensitive to changing environmental conditions and/or reef ecology. These tools will enable marine managers to identify areas that are most vulnerable or resilient to change, allowing prioritisation of resources, conservation efforts, restoration activities, and management interventions.	172,000.00	152,000.00	118,000.00	442,000.00	DEPARTMENT OF BIODIVERSITY CONSERVATION AND ATTRACTIONS

* Note - Indicative funding for approved projects will be made available through a funding variation under section 54 of the ARC Act

Minister's Approval for Early Career Industry Fellowships for Funding Commencing in 2023 Schedule

Approved Organisation, Leader of Approved Research Program	Approved Research Program	Estimated and Approved Expenditure ($)		Indicative Funding ($)	Total ($)	Industry Partner(s)
		2023-24	2024-25	2025-26*		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
	National Interest Test Statement Australia is renowned for its coastal ecosystems, including world heritage sites such as Ningaloo Reef and the Great Barrier Reef. Management of these ecosystems often overlooks the complex processes that create and sustain beaches, which provide habitat for iconic species and are vital for recreation and tourism. Despite the value of the coastal zone, we still have limited knowledge of the best coastal management and conservation strategies in these ecosystems. Together with project partner WA Department of Biodiversity, Conservation, and Attractions, this project will deliver innovative approaches and practical tools to help management agencies to better understand and predict coastal dynamics. The project outcomes will identify areas most resilient or sensitive to physical and ecological change and will guide conservation strategies and management interventions to safeguard Australia's iconic coastal ecosystems. These results will have environmental and social benefits for Australia by preserving our coastal environmental and recreational areas for people and wildlife.					
	The University of Western Australia	666,819.00	610,607.00	568,307.00	1,845,733.00	
	Western Australia	805,845.00	762,379.00	724,636.00	2,292,860.00	
		7,722,346.00	**7,633,826.00**	**6,870,994.00**	**22,227,166.00**	

* Note - Indicative funding for approved projects will be made available through a funding variation under section 54 of the ARC Act