

Minister's Approval for Linkage Projects for Funding Commencing in Jan 2024 Round 1 Schedule

Approved Organisation, Leader of Approved Research Program	Approved Research Program	Estimated and Approved Expenditure (\$)		Indicative Funding (\$)				Total (\$)	Partner Organisation(s)
		2023-24 (Column 4)	2024-25* (Column 5)	2025-26* (Column 6)	2026-27* (Column 7)	2027-28* (Column 8)	2028-29* (Column 9)	(Column 10)	(Column 11)
	low intensity interventions work. Expected outcomes include enhanced capacity of NGOs to deliver effective interventions to refugees living in LMICs, and to tailor their services to those who are at greatest risk of not responding. Benefits include improved functioning of refugees living in LMICs, and enhanced capacity of Australia to meet its international refugee obligations.								
	National Interest Test Statement								
	Australia has made an international commitment to protect and support refugees, however the number of refugees worldwide far exceeds Australia's resettlement capacity. This has led the Australian government to develop alternative strategies to meet these commitments by supporting partner countries in improving refugee functioning in displacement contexts. In this project, we propose to partner with Australian and Indonesian-based non-government organizations to investigate the psychological processes by which best-practice low-intensity interventions improve psychosocial functioning in refugees. By determining how and for whom these interventions are effective, this project will (1) improve Australia's capacity to meet its international commitments to refugees, (2) provide NGOs with strategies to operate more effectively, (3) enhance strategic relationships in the Asia-Pacific region, and (4) enhance social cohesion amongst resettled refugees, thus improving regional stability.								
	The University of New South Wales	430,109.50	866,894.50	839,228.50	526,910.50	176,902.50	52,435.50	2,892,481.00	
	The University of Newcastle								
LP230100156	Pioneering reproductive biotechnology innovations for equine breeding	71,180.00	145,030.50	150,367.50	76,517.00	0.00	0.00	443,095.00	EQUIBREED UK, MEMPHASYS LIMITED
Swegen, Dr Aleona	This project aims to develop the world's first commercially viable system of in vitro fertilisation (IVF) for horses. The equine industry is seeking reproductive technologies that allow rapid genetic gain to improve the health, welfare and quality of progeny. This project will exploit recent breakthroughs in molecular and cell biology, veterinary practice and biotechnology, by assembling these research findings into practical systems and products optimised for successful production of foals in vitro. These technologies will boost the productivity and international competitiveness of Australia's equestrian sporting disciplines, and position the Australian biotechnology sector as global leaders in animal reproductive technologies.								
	National Interest Test Statement								
	This project will bring together recent innovations in cell biology and biotechnology to pioneer in vitro fertilisation (IVF) for the horse breeding industry. Horses are an economically important species in Australia but the industry has fallen behind other livestock species, because methods to improve the genetics and quality of stock are not available. IVF can produce multiple embryos, reduce risk of genetic abnormalities, and make import and export of high quality animals easier. By making IVF possible for the equine species, this project will put Australian biotech at the global forefront (driving economic and commercial benefits through globally marketable technologies), enhance the productivity of the breeding industry, improve the genetic quality (and therefore value) of exportable bloodstock, and boost the international competitiveness of our equestrian athletes (e.g., Olympic disciplines, polo, endurance, cutting). Equestrian sports yield mental and physical health benefits and contribute to Australia's tourism sector; thus improving the efficiency and sustainability of horse breeding in Australia will have significant social, cultural and economic benefits. Scientists, veterinary clinicians, breeders and the biotech sector will work together closely to develop IVF technology and apply it directly to breeding practice, so research outcomes will be immediately usable by the industry upon project completion.								
	The University of Newcastle	71,180.00	145,030.50	150,367.50	76,517.00	0.00	0.00	443,095.00	
	The University of Sydney								
LP230100108	Portable biosensor for rapid detection of viral contamination in food	73,140.50	154,905.00	171,921.00	90,156.50	0.00	0.00	490,123.00	HA TECH PTY LTD
Dehghani, Prof	The objective of this project is to create a miniaturised and cost-effective								

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Fariba	electrochemical biosensor device that can detect multiple pathogens, simultaneously, even at very low level of concentrations. This device will be crucial for rapidly detect pathogen contamination in food and water to monitor their safety and quality, particularly beneficial in an outbreak or natural disaster for testing these resources. In addition to food and water, the successful development of this versatile cost-effective sensor will benefit a wide range of companies such as pharmaceuticals, medical device manufacturing and farms for controlling product quality where detection of life threatening pathogens is pivotal to prevent risk for consumers.								
	<p>National Interest Test Statement</p> <p>This project aims to develop a diagnostic device for detection of multiple pathogens in a product such as a food or water to reduce the risk of food borne diseases for consumers. This device will be portable and sense very low level of viral contaminations at low cost rapidly that will be superior to existing technologies that rely on specialised, laborious and time-consuming techniques. This sensor will empower Australian Med-tech and agribusiness to capitalise on the rapidly expanding global demand for increasing product safety and quality for consumers in supply chain. This device will be ideal for detection of life-threatening pathogens in food, potable water and other products such as pharmaceuticals and in the long-term will lead to greater socio-economic, environmental and health benefits by reducing the risk of releasing and consuming contaminated products that is a major issue threatening millions of lives and causing massive socio-economic disruption. This work will maximise translation and adoption of the research in the future and will provide for Australian small-to-medium agrifood and medical device enterprises with a rapid and cost-effective portable sensor for pathogenic contamination detection, build a globally competitive Australian med-tech and agriculture industry in the short-term and lay the foundation for an advanced diagnostic devices manufacturing industry in the longer-term.</p>								
LP230100262	Assessing fish connectivity across highly-modified seascapes	127,021.00	230,424.50	215,877.50	112,474.00	0.00	0.00	685,797.00	DEPARTMENT OF PRIMARY INDUSTRIES
Figueira, A/Prof Will F	This project aims to quantify the effects of large-scale infrastructure on fish connectivity and populations by advancing our understanding of critical ecological processes within these modified coastal seascapes. The project expects to generate new knowledge in the area of fish seascape ecology and management using an innovative approach which considers all life history stages within a metapopulation modelling context. Expected outcomes of this project include the development of an integrated modelling approaches to better predict the effects of habitat modifications. This should provide significant benefits by allowing assessment of development and management actions before they take place, supporting long-term planning.								
	<p>National Interest Test Statement</p> <p>Healthy fish populations are a fundamental element of thriving coastal ecosystems and indeed an integral part of Australian life. There is an expectation that these ecosystems will be biodiverse and productive into the future, serving to underpin a huge variety of cultural, social, recreational and economic activities that depend upon them. Yet the ecosystem services that we derive from fish are threatened by development pressures which alter their habitat. Understanding the large-scale impacts this coastal development has on fishes is an urgent and critical knowledge gap. This project will for the first time determine the effects of coastal modification on the full life cycle (larvae to adult) of fishes and will provide an understanding of the ways the impacts of such development can be minimised. The project team has direct links with relevant management agencies to ensure the translation of outcomes and their extension to other settings and situations.</p>								
LP230100294	High Quality-of-Experience Real-time Video for Smart Online Shopping	62,064.50	127,722.50	135,422.50	69,764.50	0.00	0.00	394,974.00	LINK GROUP PTY LTD
Bao, Dr Wei	This project aims to develop high quality-of-experience real-time video systems for smart shopping applications by devising new deep-neural-network-enhanced video delivery schemes. It will generate new knowledge of combined AI and network solutions to achieve high-quality and low-latency real-time video delivery, addressing unsatisfactory user experience intrinsically caused by network delay and bandwidth. Fundamental principles and an all-in-one platform will be developed to address research problems and the industrial partner's practical problems. It will significantly benefit all								

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

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	shopping businesses and their customers in Australia, as well as all other video-related services (e.g., online education, video conferencing, etc.).								
	National Interest Test Statement								
	The project develops solutions to provide high quality-of-experience real-time video delivery, facilitating a great number of online shopping businesses in Australia. The research will address the gap between users' requirement for high quality-of-experience real-time video and the limited network bandwidth (yet expensive to expand). Our proposed solutions will contribute to intrinsic understanding on online and real-time video systems to provide drastically enhanced performance. A series of new research directions will be opened up for the convergence of AI and Internet video delivery. Theoretically innovative and accomplished analyses and algorithms are expected to break new ground, enhancing Australia's global research standing in information and computer sciences. Online shopping businesses share a significant portion of GDP and employment, and this project is essential if Australia is to maintain its momentum towards the post-pandemic economy. The expected research outcomes will not only significantly contribute to the academia, but will also be widely adopted in real-world shopping systems, and will be integrated in all types of video systems in different areas such as online education, video conferencing, and eHealth in Australia. We will further promote the project by introductory articles for the public, social events, and engagement with other industrial partners, to maximise understanding, translation, use, and adoption of the research outcome in the future.								
LP230100393	The Forgotten Children, Ten Years On	30,438.50	68,408.00	68,345.00	30,375.50	0.00	0.00	197,567.00	AUSTRALIAN HUMAN RIGHTS COMMISSION
Peterie, Dr Michelle	This project aims to investigate the rippling impacts of immigration detention in the lives of people who were detained as children. Utilising an innovative arts-based, person-centred design, and in partnership with Australia's national human rights institution and children themselves, the project aims to generate a foundational evidence-base that advances knowledge and provides the basis for improved policy and practice. Addressing the current dearth of evidence concerning the long-term impacts of childhood detention, the project will offer critical recommendations to improve services and reduce harm, while fostering increased public awareness through a high-impact radio documentary that tells the stories of Australia's forgotten children.								
	National Interest Test Statement								
	Immigration detention imposes serious harm on child detainees. Yet remarkably little is known about child detainees' wellbeing and trajectories after their release from detention. This project will set the international benchmark for research in this area by examining the multivarious and rippling impacts of childhood detention over time. Taking an arts-based, person-centred approach – and in close collaboration with Australia's national human rights institution and allied stakeholders – the project will allow child detainees' full stories to be heard for first time. The project will provide a critical evidence-based to inform both the delivery of services and supports, and sector advocacy concerning policy and legislative reform. The project will thus contribute to Australia's Science and Research Priority of 'Health', which seeks to improve outcomes for disadvantaged communities. It will also help Australia to meet its international obligations under the Convention on the Rights of the Child. Key outputs from the project will include a detailed public report, an easy-read child-friendly report, and a radio documentary that examines the legacies of Australia's (historical and present-day) child detention policies.								
	The University of Sydney	292,664.50	581,460.00	591,566.00	302,770.50	0.00	0.00	1,768,461.00	
	University of Technology Sydney								
LP230100199	Hybrid Pile-Drain System to Stabilise Railways Built on Soft Soils	71,825.50	147,303.50	152,100.50	76,622.50	0.00	0.00	447,852.00	SMEC AUSTRALIA PTY. LIMITED, JK GEOTECHNICS PTY LIMITED, MENARD OCEANIA PTY LTD, BESTECH AUSTRALIA PTY LTD
Indraratna, Prof Buddhima N	Australian coastal soils often pose significant challenges in the design and construction of railways. The project aims to develop a novel hybrid system of pipe piles & prefabricated vertical drains installed to prevent soft foundation soil (subgrade) from excessive yielding under prolonged cyclic loading by heavy-haul trains. Using large-scale physical model simulations and field trials supported by numerical analysis of soil-pile-drain interaction mechanisms, this innovative concept will be examined to establish a user-friendly design methodology. For rail operators, the outcomes will generate substantially reduced maintenance costs, while extending the longevity of								

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	track infrastructure to ensure faster and heavier trains of the future.								
	National Interest Test Statement								
	Australia continues to experience an ever-growing demand for more efficient heavy-haul rail operations to sustain improved productivity especially in our mining, dairy and agriculture sectors. In this regard, optimising the supply chain economics necessitates strategic expansion of our rail networks between the manufacturing sources and the transport hubs (ports & airports). To ensure reliability and safety, the recent track maintenance costs have exceeded \$120 million/year in NSW alone. The losses in productivity have been nearly threefold due to prolonged repairs, apart from commuter inconvenience. For robust heavy-haul operations, alleviating track instability is vital by improving drainage, minimising deformation, and increasing the load capacity of the underlying soil foundation. The proposed design that combines deep soil drainage with the dynamic load capacity of pipe piles offers a novel solution that is more cost-effective than traditional piling. When packaged with industry practice guides, this hybrid pile-drain method will generate considerable commercial interest and opportunities for the Australian ground engineering sector to rejuvenate future design and minimise the frequency of track maintenance and service disruptions. Professional development seminars & workshops will be held to disseminate the salient outcomes for adoption through proactive dialogue with industry (e.g. Sydney Trains), embracing the government strategy for enhanced rail freight efficiency.								
LP230100235 Wang, Prof Qilin	Achieving Nitrite Shunt For Mainstream Sewage Treatment Using Human Waste This project aims to develop a novel technology to achieve mainstream nitrogen removal from domestic sewage via nitrite shunt. Nitrite shunt can reduce energy consumption and promote energy recovery compared with the conventional nitrogen removal process. However, it is difficult to inactivate nitrite-oxidising bacteria, which is a key barrier for achieving nitrite shunt. By advancing the underpinning science and introducing a novel technology that innovatively harnesses a human waste, the project expects to remove the barrier. Expected outcomes will support the transformation of sewage treatment plants into net-zero energy generators. This should provide economic, environmental and energy benefits for Australia's water and energy sectors.	48,338.00	95,676.00	91,151.00	43,813.00	0.00	0.00	278,978.00	SOUTH EAST WATER CORPORATION, WATER RESEARCH AUSTRALIA LIMITED, BEYOND H2 PTY LTD
	National Interest Test Statement								
	Nitrogen removal from sewage is essential; however, conventional processes require a lot of energy and an organic carbon source, such as fats, oils, and foods. Australian water treatment services are struggling to reduce their carbon footprint, and operating costs are increasing. This project aims to develop a new technology that utilises human waste, urine, to achieve an elegant nitrogen removal process, which reduces the amount of organic carbon and energy to remove nitrogen effectively. The benefits are better nitrogen removal and freeing up organic carbon that can be used to generate energy. With over two billion cubic meters of sewage rich in organic carbon, it is a promising renewable energy source. The energy can be used by sewage treatment plants or fed back into the electricity grid, reducing carbon emissions. It supports the country's water industry to shift from energy consumers to energy producers and achieve net-zero emissions. It will also reduce costs. This technology will also benefit the Australian public by providing cleaner and cheaper water. The project partners from three Australian states and the project team are well-connected within the water industry. This will ensure that the technology developed in this project can be adapted and deployed by wastewater operators around Australia. Standard operating procedures and training workshops for this industry will ensure that the technology can be commercialised, and outcomes achieved beyond academia.								
LP230100288 Li, A/Prof Wengui	Novel Hydrophobic Concrete for Durable and Resilient Mining Infrastructure The mining field is harsh with various corrosive media that cause rapid deterioration and ageing of concrete. This project aims to develop a novel hydrophobic concrete with integrated water-proofing and self-healing capacities and optimise its efficacy and cost-effectiveness for durable and resilient mining infrastructure using hybrid water-repellent nanoparticles and raw crystalline admixtures. The new hydrophobic concrete is expected to significantly improve structural safety, durability, and service life of mining infrastructure while simultaneously reducing protection costs, repair needs, and reconstruction. The outcomes will offer desirable benefits for Australia's mining industry, with significant reductions in maintenance costs.	65,438.00	139,152.00	164,017.00	90,303.00	0.00	0.00	458,910.00	YAT ENGINEERING AND CONSTRUCTION, CHEM CONCRETE PTY LTD

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National Interest Test Statement										
The mining sector is a cornerstone of Australia's economy, accounting for around 10% of total GDP. However, due to the harsh condition and corrosive media in the mining field, concrete infrastructure deteriorates and ages quickly over time. As traditional protection methods are ineffective, it is necessary to provide new measures to reduce maintenance costs and extend service life. This project aims to develop a new integral hydrophobic concrete with integrated waterproofing and self-healing capacities to improve mining infrastructure's safety, efficiency, and service life in response to this durability challenge. The new knowledge of this innovative integral hydrophobic concrete will significantly reduce the costs of protection and maintenance by up to 50% for the mining industry and provide better durability and resilience. Therefore, the safety and serviceability of mining infrastructure will be improved by adopting this hydrophobic product, thus lowering costs, frequent repairs, and reconstruction. Importantly, this new admixture product will provide significant economic and safety benefits for the construction industry and government organisations to introduce the new product to the market, which will create significant opportunities for use by the Australian mining and construction sectors, promoting more durable and resilient infrastructure across the country.										
LP230100396 Wang, Prof Guoxiu	Silicon-based Anode Materials for Next Generation Lithium-ion Batteries This project aims to develop low-cost high-performance silicon-based anode materials for next generation high-energy lithium-ion batteries. A cutting-edge in situ reduction and encapsulation technique will be developed to synthesise sub-nanometer silicon nanoparticles homogeneously embedded in graphite matrix. The newly developed silicon-based anode material is expected to deliver high specific capacity and long cycle life. The novel silicon-based anode materials will boost the energy density of next generation lithium-ion batteries, which will be used to power electric vehicles and renewable energy storage. This project will benefit the industry partner to launch commercial production of silicon-based anode materials for global market.	124,000.00	248,500.00	244,500.00	120,000.00	0.00	0.00	737,000.00	KINALTEK PTY. LTD.	
National Interest Test Statement										
This project aims to develop silicon-based anode materials for next generation lithium-ion batteries. The proposed research will fill the gap on developing high-capacity anode materials as the supply chain for global battery industry. The project is expected to achieve breakthrough materials technologies for next generation batteries to reduce our reliance on fossil fuels. Such new-generation batteries will have significantly boosted energy density and service life, with potential to power electric vehicles, and off-grid electrical energy storage for the fast-growing renewable energy industry in Australia. The new battery material technology will support the Australian government's Long Term Emission Reduction Plan to achieve net zero emissions by 2050. The industry partner Kinaltek Pty. Ltd. has planned to commercialise the research outcomes and produce our newly developed silicon-based anode materials for global battery industry. The project will create jobs for Western Sydney community where manufacturing will be based, and therefore bring economic and social benefits for Australia. The outcomes of this project will be promoted to the public through the news broadcasts and science websites, and relevant government agencies such as the Australian Renewable Energy Agency (ARENA) and the NSW Chief Scientist Office via direct communication. The intellectual property generated from this project will be patented and adopted for commercialisation by industry partners.										
LP230100456 Ji, A/Prof JC	Dynamic model assisted fault diagnostics of wind turbine gearbox This project aims to develop novel condition monitoring methodologies for the gearbox of large horizontal-axis wind turbines which are widely installed in wind farms for generating renewable energy. This project expects to generate a new diagnostic framework by integrating dynamic model assisted simulations and digital twin-based approaches. Expected outcomes of this project include new vibration-based methods for fault diagnostics and predictions of the remaining useful life of turbine gearboxes. This should provide significant benefits to the Australian Wind Industry by ensuring reliable operation of wind turbines, reducing turbine downtime and reducing operation and maintenance costs; ultimately lowering the cost of energy from wind.	60,492.50	123,296.00	125,257.00	62,453.50	0.00	0.00	371,499.00	AUSTRALIAN RENEWABLE ENERGY LABORATORY	
National Interest Test Statement										
Wind energy is one of the fastest growing renewable energy sources in the world, with wind farms being built worldwide in large open (usually remote) areas for generating renewable energy. While wind turbines have low operation and maintenance costs, one of the biggest technical challenges for the industry is premature turbine component failures. This project will address this challenge by developing an innovative dynamic model-based framework to										

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	improve the diagnosis of faults and premature failures in wind turbine gearboxes. The diagnostic methodologies which will be validated by field measured data should be directly applicable to the currently installed wind turbines in wind farms. The developed framework will enable the Australian Wind Industry to reduce the operating costs of wind farms, reduce turbine downtime and lower energy costs from wind sources. The direct adoption of research results by the Industry Partner will help to propagate academic research and connect academics with industry. Effective communication with the Australian Wind Industry through knowledge sharing workshops, seminars and industry publications will further promote and translate the research results into practical applications. As the wind industry continues to evolve, there will be an increasing demand from the industry to improve long-term health management of assets by conducting the fault diagnosis and predicting the remaining life of turbine gearboxes using the developed methodologies.								
	University of Technology Sydney	370,094.00	753,927.50	777,025.50	393,192.00	0.00	0.00	2,294,239.00	
University of Wollongong									
LP230100083 Susilo, Prof Willy	Robust Defences against Adversarial Machine Learning for UAV Systems This project aims to investigate robust defences for Unmanned Aerial Vehicle (UAV) systems to protect them against adversarial Machine Learning (ML) attacks. This project expects to generate new knowledge in the area of cybersecurity using innovative approaches to safeguard UAV systems from attacks that exploit vulnerabilities in ML models. The expected outcomes of this project include improve techniques for understanding and developing robust ML models and enhanced capacity to design secure UAV systems. This should provide significant benefits, such as improving the security of UAV technology and increasing the reliable use of UAVs for transport and logistics services to support urban and regional communities in Australia.	68,636.50	143,299.50	153,868.00	79,205.00	0.00	0.00	445,009.00	SKY SHINE INNOVATION PTY. LTD., HOVER UAV PTY LTD
	National Interest Test Statement As part of critical technologies in the national interest, Unmanned Aerial Vehicle (UAV)-related technologies offer significant economic, environmental and social benefits to Australia, in logistics, environmental monitoring, smart farming, bushfire and disaster management and so on. However, Machine Learning (ML) models on UAV systems are vulnerable to adversarial attacks. This impedes the large-scale adoption of UAVs by industry. This project aims to develop robust defences for UAV systems to protect them against adversarial ML attacks. To enhance the security of navigation and decision-making processes in UAV systems, this project will investigate various adversarial attacks on UAVs and develop effective countermeasures against them. The improved security of UAV systems resulting from this research will facilitate the reliable adoption of UAVs to support urban and regional communities. Deloitte Access Economics estimates that the Australian UAV industry will create 5,500 new jobs annually, increase Australia's Gross Domestic Product (GDP) by \$14.5 billion and delivery cost savings of \$9.3 billion across all sectors by 2040. This project will integrate research outcomes in real-world UAV systems and promote the research by engaging with industry and the community through research showcases and social media. Hence, this project aligns with the Australian Government's strategy of promoting and protecting critical and emerging technologies to strengthen Australia's future.								
	University of Wollongong	68,636.50	143,299.50	153,868.00	79,205.00	0.00	0.00	445,009.00	
Western Sydney University									
LP230100042 Umbers, Dr Kate	Snails to the rescue! Conservation of Australia's island invertebrates This project aims to deliver an exemplar industry network model for conservation on Australia's islands which are hotspots both of biodiversity and of extinctions. Protecting species on islands is therefore key to securing Australia's biodiversity. We will secure Norfolk Island's 60 species of land snails via in situ and ex situ conservation with six key industry partners. The project expects to unite conservation actions across research, governments, and industry. Expected outcomes of this project include Norfolk Island emerging as a leader in global conservation. This should provide significant benefits such as a model for conservation that is applicable to thousands of	36,979.00	128,749.00	186,609.00	94,839.00	0.00	0.00	447,176.00	AUSTRALIAN MUSEUM, TARONGA CONSERVATION SOCIETY AUSTRALIA, PARKS AUSTRALIA, SENVERSA PTY LTD, DEPARTMENT OF INFRASTRUCTURE, TRANSPORT, REGIONAL DEVELOPMENT, COMMUNICATIONS AND

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isolated, range-restricted invertebrate species across Australia.

THE ARTS, NORFOLK ISLAND REGIONAL COUNCIL

National Interest Test Statement

This project aims to create and test a new multi-agency network model for the conservation of Australia's island invertebrates—starting with a highly diverse group of 60 species of land-snails, found only on Norfolk Island. Island invertebrates represent a large proportion of Australia's biodiversity per land area, yet we are naïve to their conservation status in most cases. This project will deliver an exemplar conservation framework that is adaptable to thousands of species, the majority of invertebrates on islands plus thousands of invertebrates with restricted 'island-like' distributions on the mainland. We will develop the approach with six key industry partners focused on highly diverse and most imperiled island inhabitants worldwide, the the land snails. On islands, snails are often the key decomposers that make nutrients available to the plants that create the forests. By securing the snails, we secure the forests. Our project will benefit Australia by increasing the security of biodiversity of Norfolk Island, and involving and empowering the Norfolk Island community to create a deeper understanding of the conservation value and needs of Norfolk Island's biodiversity, ensuring its protection into the future. We will work with the Norfolk Island community through our on-island partners and by giving public presentations, and we will engage the broader Australian public through university teaching, zoo, and museum displays.

Western Sydney University	36,979.00	128,749.00	186,609.00	94,839.00	0.00	0.00	447,176.00
New South Wales	1,481,977.00	2,981,042.50	3,010,934.50	1,711,336.00	251,902.50	52,435.50	9,489,628.00

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Northern Territory

Charles Darwin University

LP230100171 Banks, Prof Sam C	The Macroderma initiative: conserving ghost bats and informing development This project aims to improve methods for capturing biological information required for environmental assessments of highly mobile species and enable strategic environmental planning in Northern Australia. Using Australia's iconic ghost bat as a focus, the project will test and apply emerging technologies to obtain key information on a species' population status and its critical resources to inform assessments of ecological impacts of industry development. Important benefits of the project include information and tools for streamlining development approvals and accurately assessing risks to threatened species to improve outcomes for both our economy and our natural environment.	109,572.50	205,620.00	172,463.50	76,416.00	0.00	0.00	564,072.00	DEPARTMENT OF ENVIRONMENT, PARKS AND WATER SECURITY, DEPARTMENT OF BIODIVERSITY CONSERVATION AND ATTRACTIONS, DEPARTMENT OF ENVIRONMENT AND SCIENCE, PARKS AUSTRALIA, COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION, UNIVERSITY COLLEGE DUBLIN, THE UNIVERSITY OF MARYLAND, AUSTRALASIAN BAT SOCIETY INC, AUSTRALIAN SPELEOLOGICAL FEDERATION INCORPORATED, AGNICO EAGLE
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National Interest Test Statement

The Australian agriculture and mining industries are worth half a trillion dollars to our economy. This project is about showing how development of these industries, often perceived to conflict with biodiversity conservation, can support conservation outcomes through better information and tools for regional environmental planning. A substantial number of projects are delayed or abandoned while awaiting project approval as there is insufficient data requested to accurately assess the negative risks to threatened species; or in some cases, development proposals require information on the biodiversity of threatened species that take years to gather. The information gained by this project will contribute to an assessment guide provided to industry leading to more accurate and efficient regulatory decisions. The benefits include increased developments while simultaneously improving the conservation outlook for iconic, endemic, and mobile species. We will disseminate our findings directly to key industry bodies such as the Minerals Council and the National Farmers Federation to ensure industry stakeholders are made aware of the project outcomes. Additionally, a significant portion of this project relates to capacity building for Indigenous Rangers, facilitating travel to Country developing skills in cutting edge non-invasive environmental research methodologies to be employed on future ecological research.

Charles Darwin University	109,572.50	205,620.00	172,463.50	76,416.00	0.00	0.00	564,072.00
Northern Territory	109,572.50	205,620.00	172,463.50	76,416.00	0.00	0.00	564,072.00

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Approved Organisation, Leader of Approved Research Program (Columns 1 and 2) (Column 3)	Approved Research Program (Column 3)	Estimated and Approved Expenditure (\$)		Indicative Funding (\$)					Total (\$)	Partner Organisation(s)
		2023-24 (Column 4)	2024-25* (Column 5)	2025-26* (Column 6)	2026-27* (Column 7)	2027-28* (Column 8)	2028-29* (Column 9)	(Column 10)	(Column 11)	

Queensland

The University of Queensland

LP230100071	Leveraging lived experience to prevent burnout among healthcare workers	37,181.50	87,016.50	91,462.00	41,627.00	0.00	0.00	257,287.00	FLOURISH AUSTRALIA SERVICES, NETWORK OF ALCOHOL & OTHER DRUGS AGENCIES INC, THE QUEENSLAND NETWORK OF ALCOHOL AND OTHER DRUGS AGENCIES LTD
von Hippel, A/Prof Courtney D	Providing treatment for people with mental health problems or misuse of alcohol and drugs can be emotionally taxing, making staff particularly susceptible to client-related burnout. This proposal aims to examine whether staff who have lived-experience of the issues faced by their clients are buffered from this form of burnout. The proposal further examines whether this buffering effect is brought about by changes in empathy, attributions, and recovery knowledge from lived-experience. The outcomes of this research will provide the knowledge base to enable future research to develop interventions to reduce burnout, thereby boosting resilience, engagement, and longevity among healthcare staff – ultimately improving client outcomes.								

National Interest Test Statement

The economic costs of treatment for problems with mental health and alcohol and other drug issues in Australia is over \$60 billion annually. The two most pressing issues for treatment – poor client recovery rates and high staff turnover – have been treated as unrelated problems, but we propose that poor client recovery rates are a major cause of staff turnover. We also propose a possible solution to this joint problem. People who struggle with their mental health or problematic use of alcohol and drugs typically experience high levels of relapse and an uneven road to recovery. Staff who have experienced these problems first-hand, i.e., who have struggled with their own mental health problems or use of alcohol and other drugs, know recovery does not necessarily follow a linear path. Furthermore, their own lived experience shows them that success can emerge suddenly or unexpectedly at the end of long periods of hopelessness. Our proposed research will provide longitudinal evidence that lived experience buffers staff from burnout when their clients are not improving, while simultaneously testing three possible reasons why lived experience breaks the link between poor client recovery rates and staff burnout. All three of these potential mechanisms are conducive to training, and hence the proposed research has the potential to dramatically alter the treatment landscape.

LP230100160	Enhancing outcomes for young people in out-of-home care who self-place	79,991.50	167,712.00	150,728.50	63,008.00	0.00	0.00	461,440.00	COMMUNITY LIVING ASSOCIATION INC, CREATE FOUNDATION LIMITED, DEPARTMENT OF CHILDREN, YOUTH JUSTICE AND MULTICULTURAL AFFAIRS, QUEENSLAND ABORIGINAL & TORRES STRAIT ISLANDER CHILD PROTECTION PEAK LIMITED, THE UNITING CHURCH IN AUSTRALIA PROPERTY TRUST (Q.)
Venables, Dr Jemma L	This project aims to enhance the safety and well-being of young people in out-of-home care who leave formal placements to stay in unapproved locations. The significance lies in the development of new knowledge with this group of young people about their needs and of factors shaping effective responses to them. Expected outcomes include the generation of policies and practices to reduce the drivers of young people leaving approved placements and to address the support and protective needs of young people when staying in unapproved locations. The benefits include improved social and economic inclusion of young people in out-of-home care and reduced socio-economic burdens on health and justice systems associated with placement breakdown.								

National Interest Test Statement

This project will address the knowledge gap about the experiences of young people in out-of-home care who leave formal placements to stay in unapproved locations, which may expose them to risks and exploitation. The National Framework for Protecting Children 2021-2031 identifies promoting the health and wellbeing of young people leaving out-of-home care as a national priority. There is little Australian evidence pertaining to the motivations for, needs of, and effective responses to this group of vulnerable young people. This knowledge gap must be addressed to combat the significant individual, societal and economic consequences of young people staying in unapproved placements and their associated poor transitions from out-of-home care to adulthood. This project will engage young people and practitioners in building knowledge about the factors contributing to young people leaving formal placements and what is required to support their safety, connection and wellbeing when they stay in unapproved locations. Our findings also inform Government extended care policy by identifying opportunities for supporting young

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		2023-24 (Column 4)	2024-25* (Column 5)	2025-26* (Column 6)	2026-27* (Column 7)	2027-28* (Column 8)	2028-29* (Column 9)	(Column 10)	(Column 11)
	people's transition from out-of-home care, even when they are not connected to formally approved placements. This study will deliver social and economic benefits to the nation by promoting the social inclusion of this group of vulnerable young people and by reducing their risk of involvement with tertiary health, homelessness, and justice systems.								
LP230100166 Peng, Prof Yongjun	Improving the processing of low-grade copper ores The project aims to investigate the electrochemical interaction occurring during the grinding of low-grade copper ores and understand how the interaction affects the recovery of copper minerals and rejection of waste minerals in the subsequent separation process. This project expects to generate new knowledge in the area of minerals processing and materials engineering using interdisciplinary approaches. Expected outcomes of this project include cost-effective new steel products used for grinding copper ores and new chemical solutions to selectively reject waste minerals during mineral separation. This should significantly reduce the operating costs in copper processing plants and increase the copper production from low-grade copper ores.	91,950.00	185,446.50	186,648.50	152,891.00	59,739.00	0.00	676,675.00	VEGA INDUSTRIES (MIDDLE EAST) F.Z.C
	National Interest Test Statement The project addresses two major challenges confronting the copper processing plants: (1) a high operating cost associated with the application of the most expensive steel product used during grinding to break ores, and (2) difficult separation of waste minerals from copper minerals, resulting in low copper production. The project aims to investigate the electrochemical interaction taking place during the grinding of low-grade copper ores and develop cost-effective new steel products for grinding and chemical solutions to selectively reject waste minerals during the mineral separation process. This expects to deliver profound economic and environmental benefits to Australia through reducing the operating costs in copper processing plants, increasing copper production and unlocking base metal and precious mineral deposits. The increased copper production is expected to provide more of this resource critical for the rapidly expanding renewable energy industries. The research outcomes are expected to be disseminated, adopted and commercialised in the copper processing plants in Australia involved in the project during the course of the research. At the same time, the partner organisation, the world's largest grinding media company, is expected to commercialise the research outcomes in other processing plants in Australia and overseas through its technical teams spanning all six continents of the world.								
LP230100179 Maron, Prof Martine	New metrics to measure and track fauna community condition in Australia This project aims to improve how biodiversity is measured by developing a system to describe the condition of animal communities, analogous to those used for plant communities. It develops and tests the system for Australia's birds, then extends the approach to other animal groups. The project expects to develop a data-driven typology of bird communities, accompanying community condition metrics that are scalable from site to national levels, and guidance for using these metrics in practice. These metrics will enable holistic and relevant measures of the biodiversity value of sites, improve evaluation of restoration actions, reveal trends in community condition, and inform monitoring and evaluation tools for emerging biodiversity markets.	97,602.50	216,542.00	234,462.00	115,522.50	0.00	0.00	664,129.00	BUSH HERITAGE AUSTRALIA, BIRDLIFE AUSTRALIA, ACCOUNTING FOR NATURE LIMITED, DEPARTMENT OF ENVIRONMENT AND SCIENCE
	National Interest Test Statement A healthy environment relies on biodiversity: healthy ecosystems are diverse, with many different species contributing to ecological processes. Australia has committed to reversing its decades-long trend of biodiversity loss, including through changes to national biodiversity laws and encouraging private investment in conservation. To track whether this is being achieved and to identify what actions are helping the most, we need to measure biodiversity holistically. Existing tools to measure biodiversity focus on vegetation and individual threatened species. However, this does not tell us how entire animal communities are faring. This project will develop new indicators of the health of entire communities of animals, with an initial focus on Australian birds before extending to other groups. It will define the different types of bird communities that exist in Australia and develop metrics to measure the health of the communities, track how they are trending through time, and identify when they need conservation action. Our partner organisations, and our wider networks, will ensure that these new metrics are adopted to track biodiversity outcomes on farms, private conservation properties, public reserves, and across regions. This project will help identify which bird communities are in trouble, where they are faring well, and what conservation actions are working, as well as providing a new headline measure of the health of Australia's animal communities.								
LP230100181	Time reversed optics The development of technology to precisely control how light travels through	125,888.50	224,615.50	199,231.00	100,504.00	0.00	0.00	650,239.00	NOKIA BELL LABS

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

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Carpenter, Dr Joel A	space and time yields the ability to deliver light through objects in ways which would not traditionally be possible and hence opens new applications. This project aims to develop new programmable optical systems for transforming the spatial and temporal properties of light, leveraging recent advances in optical beam shaping. Expected outcomes of this project include the construction and testing of two new types of optical systems. This should provide significant benefits in the areas of biomedical imaging, telecommunications, advanced manufacturing and both classical and quantum optical information processing.								
	<p>National Interest Test Statement</p> <p>Controlling light is foundational to many academic and commercial applications, both established and emerging. These include telecommunications, imaging, high-power lasers for advanced manufacturing, and classical and quantum information processing. What all these seemingly different applications have in common, is the need to control how and when light is delivered from one or many locations at an input side, to a set of locations on the output side. This project, in collaboration with international industry partner Nokia Bell Labs, would focus on the creation of first-of-kind optical systems called 'time reversed optics' that compensate for spatial and temporal distortions such that light can be delivered through a scattering object, as if it was never there. The Australian Optical Society's 2020 industry review estimated the Australian photonics industry outputs 4.3b AUD/year, at a gross value add of 139k AUD/employee. The technology of this project aligns with several established and upcoming Australian businesses, particularly in the areas of LiDAR, telecommunications, and materials processing.</p>								
LP230100183	Converting Biomass into Value-Added Catalysts for Water Electrolysis	41,500.00	85,500.00	86,000.00	42,000.00	0.00	0.00	255,000.00	SCHNELL ENERGY PTY LTD
Kaneti, Dr Yusuf V	This project aims to employ agricultural waste to manufacture new highly active and stable non-precious metal catalysts for accelerating hydrogen production from water electrolysis. The project expects to generate new knowledge in the development of low-cost and sustainable catalysts for renewable hydrogen production and new technology for converting agricultural waste into value-added catalysts. The project outcomes are expected to benefit Australia by creating new commercial opportunities in 'waste-to-catalyst' conversion and generating a new pathway for managing and recycling agricultural waste, thus providing both environmental and economic benefits while contributing to a sustainable economy.								
	<p>National Interest Test Statement</p> <p>Water electrolysis, the process of using electricity to produce hydrogen from water, provides a clean and sustainable way of producing hydrogen with zero emissions. However, the wider adoption of this technology is currently impeded by the high cost of the precious metal catalysts that speed up the rate of hydrogen production, and the relatively low water to hydrogen conversion efficiency. Australia generates several million tonnes of agricultural waste annually, where it is either left in the field, disposed of directly into landfill or combusted to produce power or heat. In landfill, this waste decomposes into methane gas, a major source of greenhouse gas emissions. Therefore, it is essential to develop new alternative approaches for recycling and adding value to agricultural waste in Australia. This project aims to address this need by using agricultural waste to manufacture new low-cost and high performance non-precious metal catalysts for enhancing hydrogen production in water electrolysis. The project is expected to yield valuable IP in 'waste-to-catalyst' conversion which will be licensed to industry partner Schnell Energy for pilot-scale production of these biomass-derived catalysts and manufacturing of improved water electrolyzers. These outcomes will support Australia in managing its agricultural waste and reducing the associated greenhouse gas emissions, while simultaneously enhancing its position in global renewable energy production.</p>								
LP230100313	Innovative Double Patterning Strategies for Integrated Circuit Manufacture	146,249.50	275,403.50	263,135.00	133,981.00	0.00	0.00	818,769.00	TOKYO ELECTRON TECHNOLOGY CENTER AMERICA
Whittaker, Prof Andrew K	The global computer chips industry is predicted to be worth in excess of 1.5 trillion USD by 2030. Despite its success, the industry is under threat due to rising costs of manufacture of the latest chips, in large part because of the complexity of the manufacturing process. This project aims to introduce new polymers for production of computer chips and, in collaboration with our industry partner, develop new methods of manufacture to enable the next generation of chips. The project has potential to generate valuable intellectual property, support new processes and equipment for our partners, and help train the next generation of Australian researchers in the growing field of polymeric								

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	nanotechnology.								
	National Interest Test Statement								
	Every aspect of our lives depends on computer chips. They are the drivers of our computers, motor vehicles and appliances. The integrated circuit is a core component of these chips and is arguably the most transformative innovation of the past century. Since their invention over 60 years ago, integrated circuits have continually become faster and can carry more information, thanks to impressive advances in materials science and engineering. However, these advances are threatened by increasing complexity of the methods of manufacture and ballooning cost of production. In this project we will introduce, in partnership with TEL Technology Center America, one of the largest manufacturers of equipment for computer chip production, new methods of manufacture of circuits through innovations in polymer chemistry, leading to more cost effective manufacturing processes and enabling continued advances in integrated circuit technology. The newly developed polymer materials and the manufacturing processes will be protected by patenting and incorporated into products produced by TEL. The platform technologies to be developed have broad potential application, for example in memory storage devices and display technologies, and therefore are expected to generate several valuable patent families. The research has further potential to support growing microelectronics and nanotechnologies in Australia, and to support emerging researchers in the critical technologies of computer chip manufacture.								
	The University of Queensland	620,363.50	1,242,236.00	1,211,667.00	649,533.50	59,739.00	0.00	3,783,539.00	
	University of the Sunshine Coast								
LP230100317 Cristescu, Dr Romane H	Koala Guardians: Empowering community to protect an Australian icon There is an urgent need for innovative approaches to combat widespread decline of koalas. This project aims to develop technology, integrating behavioural change theory and community co-design, to enable the public to participate in koala conservation. This interdisciplinary initiative will harness the power of citizen science to facilitate mutually-beneficial educational interactions. Expected outcomes include the production of innovative solar-powered Bluetooth ear tags and co-designing a smartphone application that educates and incentivises users in recognising signs of koala disease and submitting sightings, by leveraging gamification, outdoor recreation and tourism. This blueprint can be adapted to assist other threatened species.	116,520.50	224,467.00	195,325.50	174,763.00	87,384.00	0.00	798,460.00	REDLAND CITY COUNCIL, ATLAS OF LIVING AUSTRALIA (CSIRO), COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION, THE TRUSTEE FOR THE NOOSA BIOSPHERE RESERVE TRUST, NSW WILDLIFE INFORMATION RESCUE AND EDUCATION SERVICE INCORPORATED, DEPARTMENT OF ENVIRONMENT AND SCIENCE, FRIENDS OF THE KOALA, PORT MACQUARIE KOALA HOSPITAL
	National Interest Test Statement								
	Koalas are iconic, the second most well-known animal in the world, yet were listed as endangered in 2022 and given only a 20% chance of ongoing survival in the wild. While urbanised habitats are now critical to koala survival, these habitats often have lower koala density than in the past. Indeed, human activity induces threats, including vehicle strikes, dog attacks and especially diseases. Research is required to understand how we can use the accessibility of these urbanised habitats, so that human threats are transformed into effective koala guardianship. Natural beauty and unique wildlife, especially koalas, are pillars of Australia. Caring for this icon in readily accessible areas is not only critical economically, but essential to our wellbeing, national identity and culture. This project will deliver a blueprint featuring innovative solar-powered Bluetooth koala ear tags paired to a smartphone application and a digital platform co-designed with the public to maximise success. Our team have a track record of delivering blueprints that are now used across local government areas capable of reducing koala deaths by 40%, especially by dogs, using proven behavioural change theory, marketing and engagement strategies. The project will further extend this impact by encompassing multiple threats, including disease, and by creating lasting behavioural change. Its blueprint can be extended, not only to koalas nationwide, but adapted to other wildlife within the human footprint.								
	University of the Sunshine Coast	116,520.50	224,467.00	195,325.50	174,763.00	87,384.00	0.00	798,460.00	

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(Columns 1 and 2) (Column 3)		2023-24 (Column 4)	2024-25* (Column 5)	2025-26* (Column 6)	2026-27* (Column 7)	2027-28* (Column 8)	2028-29* (Column 9)	(Column 10)	(Column 11)
	Queensland	736,884.00	1,466,703.00	1,406,992.50	824,296.50	147,123.00	0.00	4,581,999.00	

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

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(Columns 1 and 2) (Column 3)

(Column 11)

South Australia

Flinders University

LP230100230	Threats to the water quality and ecosystem of Coffin Bay, South Australia	75,931.00	143,859.00	104,057.50	36,129.50	0.00	0.00	359,977.00	ENVIRONMENT PROTECTION AUTHORITY, DISTRICT COUNCIL OF LOWER EYRE PENINSULA, EYRE PENINSULA LANDSCAPE BOARD, SOUTH AUSTRALIAN OYSTER RESEARCH COUNCIL PTY LTD, DEPARTMENT FOR ENVIRONMENT AND WATER
Werner, Prof Adrian D	Coffin Bay (South Australia) is experiencing worsening environmental conditions despite its major economic and ecological importance. Research is needed to understand the cause of this decline, particularly in light of a recent bacterial outbreak that impacted the aquaculture industry. This multidisciplinary project aims to deliver world-leading scientific advice based on novel field techniques and innovative models of this complex inverse estuary system and its surrounding catchment. The new understanding of the sources, fluxes and fate of nutrients within the bay and the surrounding catchment, arising from this project, is expected to benefit management decision-making and establish a new standard in estuarine water quality investigation.								

National Interest Test Statement

Many of Australia's bays and estuaries require stable water quality to maintain aquaculture, fishing and tourism industries, and to protect sensitive ecosystems. However, marine systems are increasingly exhibiting water quality decline, and determination of the causes is highly challenging, requiring advanced expertise from the fields of oceanography, hydrology and ecology. The lucrative aquaculture industry of Coffin Bay (South Australia) requires an urgent investigation of the decline in the Bay's water quality, for which the causes are unknown. Local and State Government agencies have joined with the oyster industry to support this project, identifying the need for breakthroughs in understanding the sources and fate of nutrients in the Bay. This study will establish a new national standard in the evaluation of nutrient sources and movements within a marine water body through a multidisciplinary investigation of the catchment, Bay and marine ecosystem that includes innovations in chemical and microbiological source tracking and novel catchment-oceanographic modelling tools. Understanding nutrient sources and fluxes within the Bay will allow decision-makers to deploy mitigation measures to protect the Bay for future generations. Insights arising from this project will be disseminated via workshops, open access data and various media to ensure that aquaculture industries across the country can apply them to research and management of water quality at other sites.

Flinders University	75,931.00	143,859.00	104,057.50	36,129.50	0.00	0.00	359,977.00
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The University of Adelaide

LP230100209	Vaccination of poultry infected with multiple Salmonella serovars	92,092.00	185,902.00	185,618.50	178,474.00	86,665.50	0.00	728,752.00	BIOPROPERTIES PTY. LTD., AUSTRALIAN CENTRE FOR DISEASE PREPAREDNESS (CSIRO), GHENT UNIVERSITY, BELGIUM
Chousalkar, Prof Kapil	Salmonella is a zoonotic, foodborne pathogen found on eggs and poultry meat. It is the second largest cause of human gastrointestinal disease, thus, reduction of Salmonella on poultry farms is paramount to public health. This project aims to evaluate the long-term efficacy of a commercial Salmonella Typhimurium vaccine against multiple serotypes, including the emerging Salmonella Enteritidis. This project will generate new knowledge in avian immunology using an innovative approach to evaluate the host response to multi-serovar infection. Outcomes of this project will future proof the Australian poultry industry against exotic Salmonella serotypes benefitting the industry by significantly reducing risks of future outbreaks and economic loss.								

National Interest Test Statement

Salmonella, a foodborne pathogen found on eggs and poultry meat, is the second largest bacterial cause of gastrointestinal disease in humans. Most human Salmonella outbreaks are attributed to the consumption of contaminated eggs or egg products. Current protocols to reduce Salmonella involve strict biosecurity, disinfection, and vaccination of the chickens. Currently, there is no commercially available vaccine in Australia against a new strain of Salmonella called Salmonella Enteritidis (SE), which results in the mass disposal of poultry. This strain was detected in NSW and VIC resulting in closing down of more than 10 egg farms that has resulted in loss of livelihoods for

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	many farmers and farm staff. This project aims to investigate the effectiveness and dosage of a locally manufactured vaccine for poultry against this new strain of Salmonella. Outcomes will benefit and save the Australian poultry industry as well as Australians by overcoming one of the major challenges of producing safe, high-quality food for consumption. Findings will be shared with researchers, health professionals, primary producers, and breeders to develop a prevention strategy against Salmonella and protect the farming business in regional Australia.								
LP230100225 Adelson, Prof David L	Finding the targets of natural products in complex botanical extracts. Many plants are used for nutritional and traditional medicine purposes and have demonstrated, evidence based effects. However, standard methods to identify single chemical compounds responsible for the observed effects fail as they rely on a single compound having a single target and ignore the overall effects of many interacting compounds on many targets. In this application we propose a new method to simultaneously identify the molecular targets of many compounds in complex plant extracts, along with their subsequent validation by responses in gene expression to the plant extract. This research will revolutionise understanding of the nutritional and medicinal effects of plants and will allow our partners to accelerate commercialisation. National Interest Test Statement Indigenous Australians have long known the therapeutic benefits of many plant species in Australia. However, there is a critical gap in the characterisation of the complex mixtures of natural chemicals found in these plants. Where a mixture has demonstrable biological activity, but no single compound in the mixture accounts for all of the activity, there are no viable means to purify and test all combinations of chemicals in the mixture. This project will develop innovative processes to profile these compounds. By analysing how genes are expressed, studying the structure of natural products, and using high-speed technology to study the protein involved, this project will develop a world-first integrated method for the identification of active compounds found in plants. This will open doors to the understanding and commercialisation of plant extracts from indigenous plants used by Aboriginal people. This will have direct benefits for the Chuulangun Aboriginal Corporation and for other Aboriginal communities and their commercial and financial partners, and facilitate the traditional cultural knowledge of these plants to be translated into a scientific context with broader impact outside Aboriginal communities. We will promote this research outside of academia through press releases, articles in open access sources such as The Conversation and through our professional networks that currently market and distribute food supplements, cosmetics and over the counter remedies.	81,964.50	154,693.00	144,366.50	71,638.00	0.00	0.00	452,662.00	CHUULANGUN ABORIGINAL CORPORATION, ZHENDONG GROUP, BOTANIC GARDENS & STATE HERBARIUM, SOUTH AUSTRALIA
	The University of Adelaide	174,056.50	340,595.00	329,985.00	250,112.00	86,665.50	0.00	1,181,414.00	
University of South Australia									
LP230100229 Ma, Prof Jun O	Flame-Retarding and Mechanically Resilient Elastomer Composites This project will develop a new generation of flame-retarding and mechanically resilient elastomer composites by taking advantage of nanoscale effect and synergy. The outcomes will be two types of flame-retarding additive pellets and their elastomer composites; these pellets also suit other polymers such as thermoplastics. The elastomer composites are expected to have excellent flame retardancy, mechanical properties, and fatigue performance, to meet the demands from industrial partners. The project will provide a platform for elastomer manufacturing industry to develop flame-retarding, high-performance products for domestic applications and for export. National Interest Test Statement Manufacturing industries are vital to Australia in terms of national independency and trade surplus. Working with a wholly Australian-owned manufacturing company, supported by two overseas partner organisations, this project aims to develop two types of environmentally friendly, flame-retarding additives . It will then use the additives to develop flame-retarding and mechanically resilient rubber products. The products can be used in varying applications, such as window and door seals for houses, vehicles, aircraft and trains, that can be used domestically and exported. The technology would revolutionize the elastomer processing industry by establishing a world-record fire safety standard , contributing to a new era of advanced manufacturing . Such translational research can also support small and medium-sized enterprises in manufacturing high value-added products, which can help alleviate the impact of rising labour costs.	51,164.50	114,957.50	146,722.00	82,929.00	0.00	0.00	395,773.00	DERBY RUBBER PRODUCTS PTY LTD, JIAXING BEIHUA POLYMER ADDITIVES CO. LTD.

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LP230100345 Prestidge, Prof Clive A	Engineering Hybrid Materials with Functional Bioactivity in the GI Tract This project aims to use an advanced particle engineering approach to develop novel biomaterials with multifunctional activities in the gastrointestinal tract. The project expects to generate new fundamental knowledge of the key interfacial processes that control digestion and identify new pathways for modulating gut microbiome composition. By establishing structure-activity relationships through mechanistic in vitro and in vivo models, the knowledge gain will help guide material design for optimised bioactivity. Technology transfer of the lead formulation through quality by design manufacturing practice is anticipated to position the industry partner for future commercial opportunities within the nutraceutical sector.	70,307.50	150,860.50	163,246.50	82,693.50	0.00	0.00	467,108.00	PHARMAKO BIOTECHNOLOGIES PTY LIMITED
	National Interest Test Statement The gut microbiome is a complex and vitally important ecosystem that is involved in many different biological functions ranging from intestinal health and metabolism to immunity and brain function. But there is limited understanding of how microbial composition can be influenced. This project aims to use an advanced approach to create new materials that alter the gut microbiome through several different actions. By applying advanced scientific techniques, the project is expected to advance fundamental knowledge of key processes that control digestion and identify new pathways for modulating gut microbiome composition. The knowledge gain and development of innovative technologies could open new opportunities for dietary supplements in Australia. As well as offering public health benefits, this has potential to create a clear market advantage that can ultimately promote job growth, expand core manufacturing capabilities, and generate economic outcomes. The team is well-positioned for commercial translation of research findings through an established commercial agreement, joint ownership of background intellectual property, patent protection and implementation of scaled up manufacturing considerations within the project.								
	University of South Australia	121,472.00	265,818.00	309,968.50	165,622.50	0.00	0.00	862,881.00	
	South Australia	371,459.50	750,272.00	744,011.00	451,864.00	86,665.50	0.00	2,404,272.00	

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		2023-24 (Column 4)	2024-25* (Column 5)	2025-26* (Column 6)	2026-27* (Column 7)	2027-28* (Column 8)	2028-29* (Column 9)	(Column 10)	(Column 11)	

Victoria

Deakin University

LP230100412	Advanced protective coatings for thermal energy management devices	82,683.00	168,366.00	171,366.00	85,683.00	0.00	0.00	508,098.00	CONFLUX TECHNOLOGY PTY LTD
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Lei, A/Prof Weiwei
 This project aims to develop new nanomaterial coatings and advanced plasma coating technology to address the global issue of e-waste caused by short lifespan thermal energy management devices (TEMDS) used in energy (solar, wind, oil), transport (aerospace, automotive, marine) and industrial (manufacturing, mining) sectors. The project expects to overcome issues of erosion and corrosion of TEMDS and toxic coating methods by developing new nanomaterial coatings and innovative plasma coating technology. This should provide significant benefits such as improved sustainability of TEMDS with improved corrosion resistance and durability, as well as new manufacturing products and processes that have far reaching economic benefits for Australia.

National Interest Test Statement

Thermal energy management devices (TEMDS), such as heat pumps and cooling devices, are used across many sectors, including energy (solar, wind, oil, gas), transport (aerospace, automotive, marine), industrial (manufacturing, mining) and construction. TEMD surfaces are coated to protect against harsh operating environments, however, most coating materials have short lifespans, poor erosion and corrosion resistance, and use toxic chemicals, such as sulfuric acid and potassium hydroxide. To improve the durability and sustainability of TEMDS, this project aims to develop a new plasma coating technology using advanced nanomaterials to create robust coating layers that increase corrosion resistance and service life while improving thermal conductivity. These advanced materials will have significant benefits for Australia, including reducing waste, manufacturing and operating costs, and greenhouse gas emissions. The project prototypes will have huge commercial viability and applicability, and will be highly attractive to industry partnerships for commercialisation. Success stories from the research will be shared on news outlets and social media to promote the future of coating technologies.

Deakin University	82,683.00	168,366.00	171,366.00	85,683.00	0.00	0.00	508,098.00
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La Trobe University

LP230100176	Hotspots of endemism for invertebrate conservation in south-east Australia	77,610.00	181,605.00	177,421.50	73,426.50	0.00	0.00	510,063.00	ZOOS VICTORIA, DEECA, AUSTRALIAN MUSEUM, SOUTH AUSTRALIAN MUSEUM
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Gibb, Prof Heloise G
 The project aims to identify and predict hotspots of species endemism to guide conservation and restoration efforts. This work is significant in the current extinction crisis because endemic species (those unique to a region) are at higher risk of extinction due to human causes. The project will model the relationship of narrow range endemic species with contemporary and past environments, estimate the historical loss of species through land-clearing and fire, and predict future responses to climate change, to inform conservation planning. Lastly, it will test the efficacy of habitat transplants in restoring local invertebrate assemblages. Benefits include better informed conservation planning and new restoration approaches.

National Interest Test Statement

This project will inform conservation and land management planning under State and Commonwealth environmental protection legislation by addressing a significant gap in knowledge of Australia's biodiversity. Biodiversity is declining globally, with endemic species of invertebrates (those unique to a region) at higher risk of extinction due to threats such as bushfires, habitat destruction and climate change. Invertebrates perform vital ecosystem functions

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such as decomposition and nutrient cycling, yet less than 30% of these species are described. Determining their identities and distributions is critical to developing strategically targeted conservation efforts. The project will document and map distributions of forest invertebrates across south-east Australia. Further, it will test the impact of a new approach to restore species to bushfire-affected sites. Key benefits include better informed conservation planning and new restoration approaches to protect Australia's environment. Research outcomes will be promoted to land managers via partner organisation Victoria's Department of Energy, Environment and Climate Action. The findings will be communicated to the public via museum partners and Zoos Victoria, as well as social media and media releases. Data will be made available online for conservation efforts via open access platforms such as Atlas of Living Australia.

La Trobe University 77,610.00 181,605.00 177,421.50 73,426.50 0.00 0.00 510,063.00

Monash University

LP230100282	Precise, Cytosolic Dendrimer Delivery Systems	92,744.00	191,085.50	197,778.50	99,437.00	0.00	0.00	581,045.00	STARPHARMA PTY LTD
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Johnston, A/Prof Angus P
This project aims to use precisely targeted dendrimer technology to improve the delivery of poorly permeable molecules to their subcellular sites of action. Our cutting edge approach combines innovative phage screening techniques and advanced dendrimer synthesis. The outcomes of this proposal will be: 1) a targeting system that is manufacturable at scale and reasonable cost, 2) a dendrimer delivery system that is rapidly internalised into specific target cells and 3) bio-responsive dendrimers that promote delivery of their cargo into the cytosol. This work will strengthen a highly successful collaboration between the Australian biotech company Starpharma and Monash University, to design the next generation of nanomaterials delivery systems.

National Interest Test Statement

This project will harness the expertise, infrastructure and capabilities of Monash University to support expansion and enhancement of the technology and intellectual property base of the Australian Biotechnology company, Starpharma. Australia is emerging as a world leader in the field of biotechnology and this project will provide significant support for the economic growth and commercial success of Starpharma as it transitions to the world stage in the field of advanced biomedical manufacturing. It will provide valuable intellectual property for commercialization by Starpharma. This is particularly vital in this time of economic uncertainty, where maintaining and developing the high value manufacturing base is critical. The project will also promote employment and training opportunities and expand the national science base in the rapidly growing field of macromolecular biotechnology and synthetic biology.

LP230100385	Before and after the Last Ice Age: GunaiKurnai archaeology along the Snowy	99,046.00	197,192.50	211,073.00	207,041.00	188,098.50	93,984.00	996,435.00	GUNAIKURNAI LAND & WATERS ABORIGINAL CORPORATION RNTBC, ROCK ART AUSTRALIA
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David, Prof Bruno
This project aims to transform our understanding of the deep-time Aboriginal occupation of Victoria's Snowy River landscape, by excavating a network of sites dating back to >52,000 years. This project expects to generate new knowledge in archaeology and palaeoclimatology through partnership research in GunaiKurnai Country. Expected outcomes of this project include unprecedented details of Aboriginal occupation, ritual installations, wooden artefacts, ancient human DNA, use of deep caves and open landscapes, and economic strategies dating back to the Last Ice Age and beyond. This should provide significant benefits in community research, greater social understandings of Aboriginal connections with Country, and a more inclusive Australia.

National Interest Test Statement

Before and After the Last Ice Age investigates Australia's deep-time Aboriginal history by applying a community partnership approach to archaeological and palaeoclimate research in the Victorian Buchan-Snowy River landscape. Partnered with the GunaiKurnai Land and Waters Aboriginal Corporation (GKLaWAC) and Rock Art Australia, this project promises to transform how this landscape is understood by uncovering new information about superbly preserved ancient artefacts, including ancient DNA and buried 12,200 year-old ritual structures with wooden artefacts. These are among the longest archaeologically traced continuous ritual sites and items of material culture

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Approved Organisation, Leader of Approved Research Program (Columns 1 and 2) (Column 3)	Approved Research Program (Column 3)	Estimated and Approved Expenditure (\$)		Indicative Funding (\$)				Total (\$)	Partner Organisation(s)
		2023-24 (Column 4)	2024-25* (Column 5)	2025-26* (Column 6)	2026-27* (Column 7)	2027-28* (Column 8)	2028-29* (Column 9)	(Column 10)	(Column 11)
	anywhere in the world, and the oldest known wooden artefacts in Australia. Grounded in a partnership that centres on the needs and aspirations of a First Nations community, benefits of this project include helping to tell the stories of the GunaiKurnai Old Ancestors via their ancestral residential, resourcing, and special-purpose secluded places. Results of the project would be shared on-Country with the GunaiKurnai community and incorporated into the public education and visitor programs of GKLaWAC. They would also be promoted through the public networks and social media resources of Rock Art Australia, as well as in a range of public forums and national and international media.								
	Monash University	191,790.00	388,278.00	408,851.50	306,478.00	188,098.50	93,984.00	1,577,480.00	
	RMIT University								
LP230100121 Zhu, Dr Anna	The Intended and Unintended Impact of Policy for Adaptive Policy Management The project aims to advance knowledge about the intended and unintended consequences of policy on health and well-being. It expects to innovate through new methods and novel data to integrate policy evaluation into the policy cycle in a timely fashion to prevent harm from occurring. It also leverages technology to track policy effects in real time. Expected outcomes of this project include new knowledge and enhanced policy infrastructure using new methods and interdisciplinary approaches. Significant benefits include improvements to: (1) policy management by government departments; (2) the health and wellbeing of the Australians they serve; (3) our Partners' capacity to consult governments on how technology can assist policy management.	101,319.50	210,431.00	218,747.50	109,636.00	0.00	0.00	640,134.00	GRADIENT INSTITUTE LTD, ROYAL FLYING DOCTOR SERVICE OF AUSTRALIA, RESERVE BANK OF AUSTRALIA, CORBETTPRICE, AGILE DIGITAL ENGINEERING PTY LTD, THINKPLACE AUSTRALIA PTY LTD, THE TRUSTEE FOR SALSA DIGITAL TRUST, COMMUNITIES IN NUMBERS, NSW DEPARTMENT OF PREMIER AND CABINET, CENTRE FOR PUBLIC IMPACT AUSTRALIA AND NEW ZEALAND LTD, APOLITICAL, DEPARTMENT OF THE PREMIER AND CABINET, QUALTRICS, LLC
	National Interest Test Statement Social policy determines how a society accesses welfare, education, housing, healthcare and other essential services. When designed poorly, social policy can unintentionally direct scarce resources to those who least need it and away from the most vulnerable, creating further inequality that social policy is designed to address. This project will advance knowledge about the intended and unintended consequences of social and economic policy in Australia. At present, policies are not routinely evaluated and when they are, it may be done as a once-off exercise and not in a timely way. This project will create tools that allow policy evaluation to occur during implementation and to prevent potential harms before they occur. The economic and social benefits of this enhanced policy infrastructure to Australia is substantial as it will enable policy decision-making to be (1) more adaptive to continuous evaluation findings; (2) better tailored to the needs of different communities; and (3) cognisant of both intended and unintended impacts. New insights and policy infrastructure will be shared with stakeholders through several channels such as regular meetings with policy-makers, our steering committee meetings, media articles, academic journal publications and dedicated workshops.								
LP230100228 Currell, Prof Matthew J	Towards sustainable co-management of groundwater in the Beetaloo region, NT This project aims to improve understanding of connections between groundwater, climate, surface water and Indigenous cultural values, in a region of major resource development in the Northern Territory. It will use a novel, inter-disciplinary approach, involving remote sensing of climate-water-landscape interactions, documenting Indigenous water knowledge, environmental isotope monitoring, and water policy analysis. The project	70,496.50	128,878.00	93,708.00	35,326.50	0.00	0.00	328,409.00	THE ENVIRONMENT CENTRE NT INC, NORTHERN LAND COUNCIL

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

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	<p>expects to generate enhanced understanding of hydrological processes, and associated Indigenous cultural values. This is anticipated to improve capacity to analyse risks to groundwater-dependent values, and foster greater Indigenous participation in water planning and monitoring, benefiting multiple stakeholders.</p> <p>National Interest Test Statement</p> <p>Groundwater is becoming an increasingly important water resource in Australia as climate change, population and economic growth stimulate demand for freshwater. The Northern Territory hosts one of the largest inter-connected aquifer systems in Australia – the Cambrian Limestone Aquifer (CLA). The agriculture and oil and gas sectors plan to greatly increase extraction of water from this system in the near future. However, detailed knowledge to understand the impacts of such extraction on environmental and Indigenous cultural values and sites, such as key springs and wetlands, is currently lacking. By collecting and analysing new data from satellite observations, field surveys and Traditional Owner knowledge, this project will build a stronger basis to sustainably manage the CLA groundwater, resulting in a healthier environment, protection of Indigenous cultural values, and long-term water security for the NT. Simultaneously, it will build capacity among Indigenous peoples and organisations partnering in the research, to assess the impacts of future groundwater development proposals and identify opportunities for groundwater to support further economic development, environmental and social benefits. The research findings will be translated into accessible formats such as maps and animations of groundwater recharge and storage changes over time, and reports that help to build groundwater knowledge and capacity among the Partner Organisations and wider Australian community.</p>								
LP230100276 Tari, Prof Zahir	<p>Secure Management of Internet of Things Data for Critical Surveillance</p> <p>This project aims to develop innovative models/algorithms to manage Internet of Things (IoT) data safely and reliably. This project expects to generate new knowledge in the area of classified information governance using innovative data collection, transmission and analysis techniques that overcome the security concerns in large-scale collaborative sensing. Expected outcomes include novel abstract interfaces for IoT, adaptive trust and integrity preserving methods, and reliable distributed data processing mechanisms to mitigate vulnerabilities in real-time IoT-enabled critical surveillance. This should provide significant benefits to Australia's economy, one of which is the enhanced consumer-centric adoption of IoT for sensitive operations.</p> <p>National Interest Test Statement</p> <p>The project is to enhance the security and reliability of critical surveillance operations by developing innovative models and algorithms to manage sensor data safely and reliably to generate new knowledge in classified information governance. It aims to address the growing security risks associated with collecting, storing, and analysing Internet of Things data, which are essential for effective surveillance and law enforcement activities. The project addresses such security concerns in large-scale collaborative sensing using innovative data collection, transmission and analysis techniques. The project will enable secure and efficient data management across multiple devices and platforms by leveraging advanced encryption and authentication technologies. The research will benefit Australians economically by allowing faster and more accurate sensor data processing, increasing efficiency and productivity in the health, agriculture and transportation industries. It will also enhance the ability of Australian law enforcement agencies and other critical infrastructure operators to detect, prevent, and respond to security threats, thereby protecting national security and public safety by fostering consumer-centric adoption of intelligent sensors. The project will promote the research outcomes beyond academia and maximise understanding, translation and future research use by presenting research findings at relevant industry conferences.</p>	75,000.00	140,000.00	132,500.00	67,500.00	0.00	0.00	415,000.00	ERATOS GROUP PTY LTD
LP230100439 Jalili, Prof Mahdi	<p>Explainable machine learning for electrification of everything</p> <p>The energy sector is the largest contributor to greenhouse gas emissions. "Electrification of Everything" combined with electricity generation from renewables is a key solution to decarbonise the energy and transport sectors. This project aims to develop an explainable machine learning based data-driven technology to accurately predict the impact of electrification on consumers energy consumption and cost. The expected outcome of this project includes a data-informed decision support technology to help consumers choose the best electrification technologies and solutions. This should provide significant benefits, such as increasing community engagement with electrification, and thus reducing their carbon footprint.</p>	66,608.00	161,948.50	189,204.50	93,864.00	0.00	0.00	511,625.00	SPENDWATT PTY LTD, CENTRE FOR NEW ENERGY TECHNOLOGIES LTD

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

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National Interest Test Statement									
<p>The energy sector is the largest contributor to greenhouse gas emissions and together with the transport sector account for over three quarters of the emissions. "Electrification of everything" combined with electricity generation from renewables is a key solution to decarbonise the energy and transport sectors and meet the zero-emission targets. The lack of highly accurate cost-benefit analysis of electrification on consumers energy consumption and costs hinders their engagement, which is required for successful electrification. This project will develop explainable machine learning technologies to enable accurate personalised cost-benefit analysis for consumers. The project will also develop a data-informed decision support tool that will recommend optimal choice of one or multiple service electrification technologies depending on consumer data including consumption levels and emission reduction targets. This will help consumers in choosing the best technology and reduce their bills and/or carbon footprint. The system is expected to facilitate community engagement in decarbonisation of Australia's energy and transport sectors and help reach our emission reduction targets sooner rather than later. The project equips the POs with a decision support tool to encourage more consumers to invest in electrification technologies, lowering their bills and carbon footprint.</p>									
RMIT University		313,424.00	641,257.50	634,160.00	306,326.50	0.00	0.00	1,895,168.00	
The University of Melbourne									
LP230100187	Improving the success of hybrid living shorelines for coastal protection	84,088.00	167,813.50	112,533.50	28,808.00	0.00	0.00	393,243.00	DEPARTMENT OF PRIMARY INDUSTRIES, MID COAST COUNCIL, PORT MACQUARIE HASTINGS COUNCIL, THE TRUSTEE FOR THE NATURE CONSERVANCY AUSTRALIA TRUST
Morris, Dr Rebecca L	<p>This project aims to improve the success of hybrid living shorelines that combine the restoration of mangroves and oysters with engineered structures to enhance restoration outcomes and coastal hazard resilience. It expects to generate new knowledge on the effectiveness of innovative coastal-manager-led solutions that have not yet been robustly evaluated. Expected outcomes of this project include delivery of the technical guidelines needed to practically design and implement nature-based coastal protection at scale. This should provide significant socio-economic and environmental benefits through improving Australia's capacity to adapt to increased erosion and flood risk caused by climate change and coastal urbanisation.</p>								
National Interest Test Statement									
<p>Half of Australia's coast is vulnerable to erosion and flooding caused by climate change and urbanisation, representing a risk of more than \$226 billion dollars' worth of infrastructure. At this scale, continuing to rely on conventional engineering structures (e.g., seawalls) is environmentally and economically unsustainable. This project will restore mangroves and oysters with engineered structures to protect our coasts making use of "hybrid living shorelines". Hybrid living shorelines are a novel approach that combines the research of marine ecology and engineering to provide an adaptive solution that will benefit Australian's through: (1) a more cost-effective approach to increasing coastal resilience; (2) balancing coastal protection with ecosystem restoration; and (3) maintaining natural land-sea boundaries that support communities and culture. Although there is considerable understanding of the protection provided by conventional engineered structures and natural features in isolation, a key gap is how to optimally integrate both of these for maximum benefit. In addition to the implementation of this new hybrid approach, this project will deliver technical guidelines and spatial data for NSW, enabling coastal practitioners to design and implement hybrid living shorelines at scale. The technical guidance will translate to similar environments in Australia and internationally, increasing uptake of sustainable solutions to meet this global challenge.</p>									
LP230100359	Transforming museum industry to cryopreserve Australia's diverse wildlife	84,500.00	164,000.00	163,500.00	84,000.00	0.00	0.00	496,000.00	MUSEUMS VICTORIA, AUSTRALIAN MUSEUM
Pask, Prof Andrew J	<p>This project aspires to develop methods for collecting, culturing and cryopreserving cells from wildlife in line with museum industry practice. The project expects to generate new knowledge about the collection of live cells from animals under field conditions and their long-term maintenance in museum collections. Expected outcomes of the project include enhanced capacity of museums to build live cell collections and to support and collaborate with cellular biologists. Growth of live cell collections in Australian museums will fuel innovation in cellular technologies, advance fundamental biological knowledge, and shift museums from the role of documenting losses of genetic variation to preserving that genetic variation in living form.</p>								

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National Interest Test Statement									
Australia is home to irreplaceable, unique, and diverse wildlife. Many of these species are at risk of extinction, despite the best efforts of conservationists and land managers. A loss of genetic diversity within species can reduce their ability to adapt to changing environments and increase the likelihood of extinction. This is particularly concerning given the ongoing threat of climate change. Fortunately, a technological revolution is underway that presents a potential solution to this problem. Cryopreservation of live cells, such as sperm, eggs, and cell lines has the potential to preserve the genetic diversity of native species. By cryogenically freezing cells now and storing them safely in museums, we can ensure that this genetic diversity is available for primary research programs that may ultimately lead to the genetic diversity being reintroduced into wild populations in the future. The aim of this project is to develop reproducible protocols for the cryopreservation of living cells, specifically those of Australia's biodiverse fauna. This project is of critical national interest as it addresses a significant environmental issue facing Australia: the loss of genetic diversity within native species that has the potential to cause species extinctions and the irreparable damage to our unique ecosystem. This project represents an opportunity to develop innovative solutions to preserve Australia's biodiversity for future generations.									
LP230100436 Polyzos, A/Prof Anastasios	AI Assisted Continuous Flow Electrochemistry for Pharmaceutical Manufacture This project aims to develop new chemical manufacturing processes for pharmaceutical products. In collaboration with Sun Pharma, it will tackle the challenge of replacing expensive and toxic chemicals in industrial reactions, to lower cost of manufacturing and improve its sustainability profile. Central to the realisation of this ambition is the use of electrocatalysis, machine learning and implementation of advanced continuous flow methods. These electricity- and technology-driven reactions will develop new strategies for the generation of important classes of molecules relevant to the Australia's pharmaceutical sector, as well as their manufacture at industrially relevant scales.	74,997.50	149,843.50	74,846.00	0.00	0.00	0.00	299,687.00	SUN PHARMACEUTICAL INDUSTRIES (AUSTRALIA) PTY LTD
National Interest Test Statement									
The Australian pharmaceutical industry is contracting under the pressures of steadily increasing manufacturing costs and disrupted supply chains. This project will develop a AI continuous flow electrochemistry process for the domestic manufacture of high value pharmaceutical products. This will be achieved by combining novel chemistries with electricity and enabled by new digital, and flow technologies. The implementation of AI in the development of new manufacturing methods, will reduce the time for process development, and lead to chemical manufacturing processes that are more cost effective and less wasteful. The outcomes will support and enhance the competitiveness of local pharmaceutical manufacturer, Sun Pharma, by the sustainable manufacture of new products in Australia. This will benefit Australia by expanding the pharmaceutical and chemical industry and positioning Australia as a reliable supplier of quality pharmaceutical products, for local and international markets, whilst strengthening sovereign manufacturing capability. Research outcomes from the project will support our nation's pharmaceutical manufacturing capacity through the uptake and implementation of advanced manufacturing technologies more broadly. This will benefit Australia economically and commercially by enhancing the global competitiveness and sustainability of our pharmaceutical industry, leading to creation of new jobs, whilst ensuring the supply of medicines to all Australians.									
The University of Melbourne		243,585.50	481,657.00	350,879.50	112,808.00	0.00	0.00	1,188,930.00	
Victoria		909,092.50	1,861,163.50	1,742,678.50	884,722.00	188,098.50	93,984.00	5,679,739.00	

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		2023-24 (Column 4)	2024-25* (Column 5)	2025-26* (Column 6)	2026-27* (Column 7)	2027-28* (Column 8)	2028-29* (Column 9)	(Column 10)	(Column 11)

Western Australia

Murdoch University

LP230100371	Unlocking mine waste potential: carbon sequestration and metals extraction	102,598.50	206,828.00	208,847.00	104,617.50	0.00	0.00	622,891.00	BHP GROUP LIMITED
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Xia, A/Prof Fang

This project aims to systematically investigate a proof-of-concept engineering process for transforming mine waste into value. The research will develop and employ state-of-the-art tools to advance our knowledge of efficiently sequestering carbon dioxide using ultramafic nickel mine tailings, while also enabling the extraction of critical metals—particularly nickel—and the production of value-added products, such as high-purity magnesium carbonate hydrate and silica. Successful outcomes from this research will provide benefits for mitigating global warming, supplying critical metals for renewable energy technologies, and facilitating the transition of Australia's mining industry towards sustainability.

National Interest Test Statement

The minerals industry underpins the nation's economy, but its mining and processing activities generate a tremendous amount of CO2 and solid waste in the form of waste rocks and tailings, totaling millions to billions of tons per year. These waste materials contain not only silicate minerals that can permanently capture and lock large amounts of CO2 into stable carbonate materials but also valuable critical metals. This project aims to turn mine waste into value by developing a profitable proof-of-concept strategy to achieve efficient carbon sequestration using abundant silicate minerals in mine tailings, while simultaneously recovering critical metals and producing value-added materials. The commercial adoption of this strategy in the future can significantly benefit the transition of Australia's minerals industry toward sustainable mineral processing, achieve zero-emission metal production, and contribute to Australia's net-emission target by 2050.

Murdoch University	102,598.50	206,828.00	208,847.00	104,617.50	0.00	0.00	622,891.00
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The University of Western Australia

LP230100307	Foundations for offshore wind turbines in Australian carbonate seabed soils	86,325.50	160,026.00	146,476.00	72,775.50	0.00	0.00	465,603.00	NORWEGIAN GEOTECHNICAL INSTITUTE PTY LTD
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Bienen, Prof Britta

This projects aims to enable performance prediction of foundations for offshore wind turbines in the challenging carbonate sandy sediments which are prevalent offshore Australia. This is significant for an emerging industry with each project costing tens of billions of dollars and foundations accounting for a quarter of the development cost. This project expects to provide guidance for these complex different soil conditions that is based on advanced understanding obtained from innovative experimental and numerical techniques. Expected outcomes include de-risking through significantly reduced uncertainties. This research should therefore lead to significant economic and societal benefits of affordable clean energy and generation of jobs.

National Interest Test Statement

This project is timely for the emerging Australian offshore wind industry as current understanding and prediction of foundation response relates to North sea conditions. The carbonate sands that are typical in Australia behave very differently. These are the types of soil that led to remediation costing hundreds of millions of dollars in the early days of the oil and gas industry. Large diameter monopiles supporting offshore wind turbines experience millions of

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Approved Organisation, Leader of Approved Research Program (Columns 1 and 2) (Column 3)	Approved Research Program (Column 3)	Estimated and Approved Expenditure (\$)		Indicative Funding (\$)				Total (\$)	Partner Organisation(s)
		2023-24 (Column 4)	2024-25* (Column 5)	2025-26* (Column 6)	2026-27* (Column 7)	2027-28* (Column 8)	2028-29* (Column 9)	(Column 10)	(Column 11)
	lateral loading cycles, which differs substantially from the conditions of oil and gas platform piles and is hence beyond current understanding. Therefore, neither the experience from the overseas offshore wind industry nor the Australian oil and gas industry can ensure safe, reliable foundation design for offshore wind turbines in Australian carbonate sandy seabed conditions. Advanced understanding minimises uncertainty and identifies optimisation potential. Foundations account for a quarter of the development cost and each offshore wind farm costs of the order of ten billion dollars. Offshore wind is a key clean energy technology with proven benefits of job creation, powering manufacturing and economic value-add. This research should therefore lead to significant economic and societal benefits of affordable clean energy and jobs generation.								
LP230100351 Edwards, Prof David	Accelerating pulse breeding using machine learning Advances in genomics and high throughput phenotyping are generating vast quantities of data that can be applied for crop improvement, however the lack of computational analysis tools and approaches limits the full exploitation of this data. Pulse legumes are currently under utilised in Australian agriculture due to poor adaptation, however they offer significant benefits both for soil improvement and the production of high protein crops. This project will develop machine learning (ML) tools for the analysis of pulse legume crop traits and their association with genomic variation to accelerate the breeding of high performance pulse legumes for Australian growers. National Interest Test Statement Understanding how variation in the structure of DNA in plants affects how they grow has implications for agriculture. One of the global problems is food security, being able to grow enough food for the expanding population in the face of climate change. Therefore, scientists are trying to find new ways to increase crop yields. Our proposed project aims to use the massive amount of crop data being generated to understand how differences in DNA change crop growth which will help in breeding better crops. The expected outcomes of our project are more reliable crop yields to support Australian rural economies and global food security as well as training staff and students in this growing field of research.	115,533.00	227,566.00	222,566.00	110,533.00	0.00	0.00	676,198.00	INTERGRAIN PTY LTD
	The University of Western Australia	201,858.50	387,592.00	369,042.00	183,308.50	0.00	0.00	1,141,801.00	
	Western Australia	304,457.00	594,420.00	577,889.00	287,926.00	0.00	0.00	1,764,692.00	
		4,180,415.00	8,397,614.50	8,184,790.00	4,494,960.50	673,789.50	146,419.50	26,077,989.00	