

# Minister's Approval for Linkage Projects 2022 Round 1 for Funding Commencing in 2023 Schedule

Approved Organisation, Leader of Approved Research Program  (Columns 1 and 2)	Approved Research Program  (Column 3)	Estimated and Approved Expenditure (\$)			Indicative Funding (\$)			Total (\$)  (Column 10)	Partner Organisation(s)  (Column 11)
		2022-23 (Column 4)	2023-24 (Column 5)	2024-25 (Column 6)	2025-26* (Column 7)	2026-27* (Column 8)	2027-28* (Column 9)		
<b>Australian Capital Territory</b>									
<b>The Australian National University</b>									
LP220100003  Glass, Prof Kathryn	<b>Surveillance and sampling to maintain absence of pests and diseases</b>  This project aims to develop empirically validated statistical and mathematical methods for industry and government to deliver more efficient biosecurity surveillance programs. The project endeavours to enhance biosecurity at the border and within Australia, while minimising the costs and burden of testing. Expected project outcomes include effective surveillance and sampling for high-priority threats, accessible software for decision-makers, and generalisable approaches to address rapidly increasing biosecurity risks. Significant benefits include maintaining absence of key pathogens and pests in Australia.	89,205.50	179,911.00	186,811.00	96,105.50	0.00	0.00	552,033.00	DEPARTMENT OF AGRICULTURE, WATER AND THE ENVIRONMENT
<b>National Interest Test Statement</b>									
Biosecurity surveillance at our border is critical to minimise and mitigate threats to Australia. Threats include disease vectors, plant, animal, and human pathogens. This project aims to develop robust statistical and mathematical methods to support effective and efficient surveillance of high-priority threats, with flexibility to apply these methods to newly emerged risks. Outcomes include new evidence and accessible decision support tools for policy makers to inform biosecurity within Australia and testing of imported consignments of goods. Partnership with the Department of Agriculture ensures practical solutions to Australia's agricultural and food sector, with findings directly applicable to reduction of biosecurity risks. Significant benefits include maintaining absence of key pathogens and pests in Australia, enabling industry to benefit from disease-free status.									
LP220100006  Pasalich, Dr Dave S	<b>Promoting Child and Carer Wellbeing and Placement Stability in Kinship Care</b>  Kinship care is the fastest growing out-of-home care placement in Australia, yet least supported. This project aims to implement and evaluate an attachment and trauma-based program for kinship carers, explore its suitability for cultural adaptation for Indigenous families and co-design practical resources to promote program sustainability and trauma-informed practice. This project is Australia's first randomised trial of a tailored program for kinship carers and expects to generate vital knowledge on evidence-based support. Via implementing an innovative program for kinship carers in statutory child protection, this project should build capacity for research-based practice and benefit family wellbeing and placement outcomes in kinship care.	39,288.50	96,591.50	120,702.00	63,399.00	0.00	0.00	319,981.00	ACT COMMUNITY SERVICES DIRECTORATE, DEPARTMENT OF COMMUNITIES AND JUSTICE
<b>National Interest Test Statement</b>									
Of the 46,200 children living in out-of-home care in Australia in 2021 due to child safety concerns, most (54%) were placed with relatives in 'kinship care'. Demand for kinship carers is rapidly rising, yet they receive very little tailored support in managing child behaviour problems and family strain. These stressors can impede children's recovery from family adversity and cause placement breakdowns. This project partners with statutory child protection in NSW and ACT to trial and evaluate an innovative parent program addressing unique needs of kinship carers, and co-develop practical resources to improve frontline staff practice with these families. Project outcomes include increased capacity in child protection services to provide evidence-based and sustainable therapeutic support for kinship care families, and new insight into how the program may be culturally adapted for kinship carers of Indigenous children. Such outcomes are expected to benefit wellbeing and placement stability in Australian kinship care, and enable broad-scale delivery of an effective support system for families in out-of-home care.									

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(Columns 1 and 2)	(Column 3)							(Column 10)	(Column 11)
LP220100153	<b>Ultrashort pulse laser for ultra-hard machine tools processing</b>	77,146.50	154,293.00	77,146.50	0.00	0.00	0.00	308,586.00	ANCA PTY LTD
Rapp, Dr Ludovic	<p>This project aims to develop an advanced high-precision ultrashort pulse laser technique for shaping and sharpening cutting tools. It expects to generate new knowledge and new technology in machine tool fabrication using an innovative approach for processing ultra-hard materials. The expected outcome is progressive machining capabilities with higher throughput, significantly reduced production time and costs, and increased tool accuracy and life. This should provide significant economic and safety benefits for the advanced manufacturing industry, enabling production of high-performance products across cutting-edge industries including defence, aerospace, medical tools, automotive, and clean-energy technologies.</p> <p><b>National Interest Test Statement</b></p> <p>Australians rely on machine tools such as drills and cutters as they produce all objects in our everyday lives. The lifetime and accuracy of these tools are crucial to the performance and cost of the finished products. After long periods of use, however, these tools become blunt and require frequent resharping or replacement. This project will use the unique capabilities of newly available high-power lasers to develop an innovative laser-cutting technique that will accurately shape and sharpen ultra-hard tools. This advanced method will produce more accurate, durable and robust machine tools, substantially increasing machining precision and tool life span, while also significantly reducing production time and costs. Australia's manufacturing industry and tradesmen will benefit from stronger, cost-effective, and longer-lasting tools, enabling them to make an immense range of products across diverse industries without constant maintenance issues. By introducing this advanced and reliable technique into the industry, the project will reinforce and grow Australia's manufacturing capabilities.</p>								
LP220100215	<b>Dialogue with difficult objects: Mediating controversy in museums</b>	37,455.50	112,001.50	164,842.50	90,296.50	0.00	0.00	404,596.00	ART GALLERY OF BALLARAT, EUREKA CENTRE
McAuliffe, Prof Chris J	<p>This project aims to support proactive engagement with controversial objects in Australian museums. With the Eureka Flag as a case study, new tools for community dialogue and engagement will be developed using innovative methods for voicing and mediating difference. Expected outcomes include new strategies for developing museum exhibitions, publications, and educational resources, as platforms for diversity and tolerance. The project aims to provide significant civic benefits by developing a transferable framework equipping museums to counter social fragmentation with respectful debate and inclusive engagement.</p> <p><b>National Interest Test Statement</b></p> <p>Australia's 1000+ museums house nationally significant objects associated with controversial histories and troubling ideas; the Eureka Flag is a key example. Controversial objects disrupt museum goals of engagement, education and inclusiveness. They can be divisive, and exclude communities who have been dispossessed and marginalised in the past and the present. This project seeks to equip museums to house and display difficult objects in ways that encourage respectful public debate, and promote diversity and tolerance. Working with the Art Gallery of Ballarat and the Eureka Centre, the project will introduce new methods of cultural mediation and civic debate to enable museums to proactively engage audiences and community with the difficult histories of the Eureka Flag. This research will develop workshop methods that can be adopted across the museum and art gallery sector to enhance existing consultation, engagement and education practices. The national museum sector will benefit in achieving operational goals of community engagement and diversity by supporting visitors in coming to agreement on difference.</p>								
LP220100291	<b>The use of nudges as a local government environmental policy instrument</b>	34,248.50	68,497.00	34,248.50	0.00	0.00	0.00	136,994.00	ACT DEPARTMENT OF TREASURY
Sinning, A/Prof Mathias	<p>This project aims to design and rigorously test a range of behavioural nudges to improve the environmental behaviour of residents in the ACT, with a focus on adoption of low carbon technologies and the use of public transport. In partnership with the ACT Government, the proposal leverages recent research on cognitive biases to develop novel interventions and evaluate their effects via randomised controlled trials. Expected outcomes include new concepts for citizen-government interactions; advanced knowledge in public policy and behavioural economics; a new statistical programming tool; new methods to optimise policy and practice; and positive environmental and economic impacts for local governments and individuals.</p>								

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<b>National Interest Test Statement</b>										
Behavioural insights (BI) teams globally have started to apply BI to public policy, combining insights from psychology and economics to study how individuals make decisions in the real world. While various federal government departments are trailblazing in this domain, relatively little is known about how BI can be applied to public policy challenges in local government settings. This timely project in partnership with the ACT Government focusses on how nudges may help community members make environmentally friendly decisions, such as adopting low carbon technologies or using public transport. The project features the design of novel interventions and evaluation of their effects through rigorous randomised controlled trials. The findings, delivered in tailored formats to meet stakeholder needs, are expected to guide the implementation of targeted, low-cost environmental policy interventions for local governments across Australia. The project would deliver environmental benefits by nudging citizens to reduce their carbon footprint whilst simultaneously promoting efficiency savings for local governments.										
		<b>The Australian National University</b>	277,344.50	611,294.00	583,750.50	249,801.00	0.00	0.00	1,722,190.00	
<b>University of Canberra</b>										
LP220100121  Park, Prof Sora	<b>Heartbeat of Australia: Tracking, Understanding and Engaging News Audiences</b>		51,889.50	118,591.50	121,824.00	55,122.00	0.00	0.00	347,427.00	RURAL PRESS PTY LIMITED
This project aims to address the existential crisis of local news by developing a barometer of the health of local news ecosystems informed by longitudinal audience surveys, stakeholder in-depth interviews and case studies of marginalised audiences. Expected outcomes include a robust evidence base to assess the value of local news to audiences and wider society, and innovative new strategies to better address the challenges the news industry faces in adapting to the digital environment. By devising strategies to produce and deliver quality local news that is financially sustainable, the project aims to deliver significant benefits to the news industry and the wellbeing of individuals and communities across Australia.										
<b>National Interest Test Statement</b>										
This project will advance the knowledge base about the relationships between local news, advertisers and audiences, better understand the gaps of local news provision among various audience segments and analyse the enabling factors of audience engagement with local news. Through collaborative research, the team will design and test a research framework that is sustainable beyond this project and will serve as a barometer of the health of local news ecosystems. With this new knowledge, the news industry can develop strategies for a fully integrated online and offline news provision, that will assist news organisations in their digital adaptation and improving their financial sustainability, and contribute to the local economy. Strategies to provide quality local news will improve individuals' and communities' wellbeing across Australia. The research will also identify areas of news provision that may need industry or government subsidies, and provide robust evidence-base for interventions.										
		<b>University of Canberra</b>	51,889.50	118,591.50	121,824.00	55,122.00	0.00	0.00	347,427.00	
		<b>Australian Capital Territory</b>	329,234.00	729,885.50	705,574.50	304,923.00	0.00	0.00	2,069,617.00	

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## New South Wales

### Charles Sturt University

LP220100274	<b>Designing for Communities with Communities: Co-designing Public Libraries</b>	53,733.50	103,215.50	49,482.00	0.00	0.00	0.00	206,431.00	STATE LIBRARY OF NEW SOUTH WALES, ALBURY CITY COUNCIL, FAIRFIELD CITY COUNCIL, YASS VALLEY COUNCIL
Hider, Prof Philip M	Public libraries are critical social infrastructure for communities across Australia. This project investigates how to involve community participation in the design of their public library spaces by analysing the efficacy of co-design activities introduced into three case studies. New knowledge will be generated about engaging community participation in the design and re-design of library spaces, as the societal role of public libraries continues to expand. Expected outcomes include an online guide and overarching framework, and blueprints for community participation that ensure genuine engagement and input.								

#### National Interest Test Statement

State and local governments in Australia spend large sums of money on public libraries, whose mission is to advance their communities' social and cultural wellbeing as well as to ensure access to a range of information resources. The physical spaces of these libraries are thus used for a wide range of group and individual activities, as well as to house the libraries' physical collections. However, these spaces are often designed and redeveloped with no or little creative input from the end-users themselves. This project will document processes and practices that support effective collaboration between community members, designers, and library and council staff, to create a template for public library design that will better serve the needs and desires of future library visitors. This will be done by introducing co-design elements into the development of library spaces in three local government areas of New South Wales. These case studies will result in the creation of a toolkit for user-centred public library design that will be made freely available to all public libraries across Australia.

<b>Charles Sturt University</b>	53,733.50	103,215.50	49,482.00	0.00	0.00	0.00	206,431.00
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### Macquarie University

LP220100164	<b>Using cane toads to eradicate cane toads</b>	100,251.50	205,352.50	210,520.00	105,419.00	0.00	0.00	621,543.00	MINDEROO FOUNDATION LIMITED, DEPARTMENT OF BIODIVERSITY CONSERVATION AND ATTRACTIONS
Shine, Prof Richard	This project aims to develop effective ways to reduce the devastating ecological impact of cane toads, by exploiting the cannibalistic behaviour of tadpoles. This project expects to generate new knowledge in the area of invasion biology and amphibian development utilising recent discoveries about cannibalism. Expected outcomes of this project include a powerful new method to reduce or eliminate recruitment of juvenile toads from natural waterbodies. Benefits of this project include conservation of native wildlife that are threatened by the cane toad invasion across much of tropical and subtropical Australia.								

#### National Interest Test Statement

Cane toads are a devastating invasive species, for which current control methods are ineffective. The tadpoles of cane toads pose little threat to native wildlife, but are voracious cannibals of eggs of their own species, and produce chemicals that disrupt development of those eggs; native amphibian species are not affected. If we can prevent cane toad tadpoles from metamorphosing (transforming into terrestrial toads), those tadpoles will kill any toad eggs laid into the pond, and disrupt the development of any survivors, such that no toads can emerge from that pond. This approach can have massive environmental benefit by eliminating a high-profile invasive species, and saving countless native animals. The proposed methods are simple and well-suited to wide adoption by community-based conservation groups across tropical and eastern Australia.

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LP220100360	<b>Storying and repairing water places in Wiradjuri Country</b>	43,084.00	92,182.50	49,098.50	0.00	0.00	0.00	184,365.00	MUDGEES LOCAL ABORIGINAL LAND COUNCIL, NATIONAL PARKS AND WILDLIFE SERVICE
McLean, Dr Jessica E	This project will centre Aboriginal knowledges to story, care for and repair Wiradjuri Country around the Mudgee area, central west NSW. Sharing information is a key goal of this project. Wiradjuri people are keen to see their cultural, economic, social and environmental knowledge about Country recorded and shared for people in the Mudgee area and beyond. By documenting in story form the proposed on-Country Learning, this project can facilitate this process and serve as a pathway for other co-management contexts. At the heart of the project is on-Country Learning which will bring key collaborators, community members and local school students together on, and with, Country.								
	<b>National Interest Test Statement</b>								
	This project will deepen cross-cultural connections through on-Country Learning involving storying and repair in Mudgee, NSW. The project will develop a strong understanding of environmental issues by sharing stories on-Country to promote pathways for repairing Country that centre Aboriginal knowledges. On-Country Learning will include sharing art and conservation practices that are grounded in cross-cultural exchange and storytelling. This will provide opportunities for custodians to share, collate and curate stories about Country in a collaborative way that will be distributed on a project website. A key output of this learning will be a water storying framework for on-Country Learning that focuses on repair and can be adopted in other places. Both local Aboriginal Communities and NPWS branches could use this framework to develop similar collaborations. As a result, policymakers in environmental management will be better positioned to centre Aboriginal knowledges in future decision making processes.								
	<b>Macquarie University</b>	143,335.50	297,535.00	259,618.50	105,419.00	0.00	0.00	805,908.00	
<b>Southern Cross University</b>									
LP220100073	<b>Enhancing phosphorus use efficiency in macadamia for sustainable production</b>	85,433.00	188,480.00	209,533.50	169,650.00	63,163.50	0.00	716,260.00	DEPARTMENT OF REGIONAL NSW, AUSTRALIAN MACADAMIA SOCIETY LIMITED
Rose, Prof Terry J	Macadamia nuts are an iconic native Australian product worth \$287 million annually at the farm gate. Phosphorus fertiliser management currently threatens price premiums for sustainable production in high value European Union export markets, and 'social license' to farm in their densely populated coastal production areas. The project aims to exploit adaptive root and shoot traits for phosphorus efficiency found in Australian native plants to optimise phosphorus fertiliser management and set the platform for breeding macadamia root stocks/varieties that require less phosphorus fertiliser. The outcome will be a macadamia industry that is able to maintain current market price premiums and maintain social license to farm in coastal Australia.								
	<b>National Interest Test Statement</b>								
	Macadamia nuts are an iconic native Australian product worth \$287m annually for farmers but current farming practices rely on heavy use of phosphorus fertilisers, which can be environmentally damaging if phosphorus-rich soil moves into waterways. This project aims to exploit characteristics of Australian native plants for phosphorus efficiency in order to develop a platform for breeding macadamia root stock and varieties that require less phosphorus fertiliser. Lower reliance on phosphorous fertilisers will increase the sustainability of the industry by lowering production costs and ensuring continued access to high value export markets that demand environmental accountability. Reducing the amount of phosphorus entering the catchments of the population-dense coastal regions in which macadamias are farmed will benefit the health of those coastal waterways and help the industry maintain its 'social licence' to farm.								
	<b>Southern Cross University</b>	85,433.00	188,480.00	209,533.50	169,650.00	63,163.50	0.00	716,260.00	

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## The University of New England

LP220100118	<b>Making Crime Pay: Manufacturing Heritage Experiences in a Digital Age</b>	88,246.50	177,250.00	182,013.00	93,009.50	0.00	0.00	540,519.00	NATIONAL TRUST TASMANIA
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Maxwell-Stewart, Prof Hamish J  
This project aims to create digital tools to allow visitors to experience Australian convict sites and historical big data in new and novel ways. The project expects to forge a synergistic long-term relationship between archives, historical sites and research programs through pioneering thematic digital storytelling techniques, allowing audiences to access research data not previously curated for public consumption. Expected outcomes include enhanced international and disciplinary collaborations, generating standards for curating digital site, archival and collection data, and new means of communicating research results to a wider public, especially descendants. This should provide significant benefits to heritage site operators.

### National Interest Test Statement

Tourism contributes over \$2 billion annually to the Tasmanian economy, with local heritage assets internationally recognised for their cutting-edge use of digital technologies. However, there are large historical datasets, originally assembled for research purposes, which are not yet publicly accessible. With strong collaboration from industry experts at National Trust Tasmania, scholars from across Australia and the US we will investigate ways to turn those datasets into novel forms of interactive heritage assets and experience. The study also aims to address longstanding conservation issues, by investigating the ways digital content could be used to develop new forms of engagement with heritage places, options for linking research collections to the archives from which information was originally sourced, contributing to both site and data maintenance. By keeping research datasets alive, it should lead to the creation of better archival finding aids and ensuring that new findings can be rapidly translated into heritage products, benefitting tourism and heritage management and preserving Australia's culture.

<b>The University of New England</b>	88,246.50	177,250.00	182,013.00	93,009.50	0.00	0.00	540,519.00
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## The University of New South Wales

LP220100031	<b>Advanced shield materials for compact fusion energy</b>	138,652.00	275,777.50	193,751.00	56,625.50	0.00	0.00	664,806.00	TOKAMAK ENERGY LTD, ANSTO
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Burr, Dr Patrick A  
We aim to predict how materials used for shielding sensitive components in nuclear fusion reactors will degrade over time. We will use this knowledge to design advanced alloys for radiation shield, which are critical for the development of more compact fusion reactors design, with lower construction cost, and shorter assembly time. These advanced shield materials may also be used in other applications in radiation fields (e.g. space, nuclear medicine). The project also seeks to extend the Australian nuclear research capability by developing an innovative technique to study radiation damage using the OPAL reactor at ANSTO.

### National Interest Test Statement

Fusion energy is developing at a much faster pace than originally predicted into a promising solution for reliable, sustainable and low-cost power. It is now a deployable engineering technology. However, the limiting factor in further cost reduction and performance increase of compact fusion energy is the "shield" component, which degrades over time. The project will develop advanced materials, and manufacturing routes, to provide a stronger and longer-lasting shield. This Australian-led research forms integral part of the technology roadmap of a leading international fusion company, which will advance their technology from TRL 3 to 6. The linkages created in this project will place Australia's advanced manufacturing capability as a pivotal enabler for cheap, reliable fusion energy. Additionally, the domestic capability developed through this Linkage will be applicable to nuclear-powered submarine shielding, components for outer space, and nuclear medicine production, handling and transport.

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LP220100061  Ladouceur, Prof Francois	<b>Towards non-thermal hydrogen-boron fusion</b>  Laser-induced non-thermal fusion of hydrogen and boron 11 is a promising approach to reach practical sustainable energy generation. In addition, being aneutronic, this specific fusion reaction virtually avoids the deleterious environmental impact associated with high energy neutron radiation. The recent observation of this reaction under non-thermal conditions is not only exciting but begs for a better understanding of its dynamics. This industry supported proposal thus aims at establishing an experimentally-proven analysis framework underpinning the future development of a viable hydrogen-boron fusion reactor. In the long term, its successful implementation would constitute a sea change by providing a virtually limitless source of energy.  <b>National Interest Test Statement</b>  This project aims at developing the tools and knowledge necessary to create blueprints for small, clean, and efficient fusion reactors based on the fusion of hydrogen and boron. The traditional approach to nuclear fusion has spawn some of the most complex and expensive science experiments in the world. The pathway proposed by our partner organisation is both simpler and cleaner. Simpler as it can convert nuclear power directly into electricity and cleaner as it avoids the deleterious environmental impact of high energy neutrons present in the traditional approach. Also, an important bonus benefit is the production of low-cost helium, a by-product of the fusion reaction and itself a scarce resource of high demand. The last two decades of economic development has shown that ambitious and well-funded start-ups probably offer the best adoption pathway for high-risk, high-reward proposal such as this one. HB11 is committed to assemble the best team possible to fulfil its goal: this proposal is one piece of this puzzle.	86,671.50	181,956.50	192,837.50	97,552.50	0.00	0.00	559,018.00	HB11 ENERGY HOLDINGS PTY LTD
LP220100186  Xue, Dr Jianfeng	<b>Novel test and design methods for base course reinforced flexible pavements</b>  This project aims to develop the mechanics of geosynthetic-reinforced flexible pavements as an urgent need for the Australian pavement industry to build more sustainable and economical roads. Novel laboratory test apparatus and in-situ test programs, and mathematical models will be developed, for the first time, to capture the responses of reinforced base courses in a complete and optimised way to determine the parameters for pavement design and performance evaluation. The outcomes will enable reliable prediction of reinforced pavement behaviour, leading to better-performing geosynthetic products and more resilient pavements, reduced material usage and damage in pavements, and less environmental impact and maintenance cost.  <b>National Interest Test Statement</b>  The Australian Government is investing \$110 billion over 10 years from 2021–22 in land transport infrastructure. Geosynthetic-reinforced pavements are under increasing demand globally as they are sustainable, cost-effective, environment-friendly, and can be constructed in shorter periods. Road authorities and engineers need efficient tools to quantify the effectiveness of the reinforcements. For the first time, the project will provide novel test devices and mathematical models for engineers to determine the design parameters and assess the performance of reinforced flexible pavements. The benefits are (1) better geosynthetic products to improve the reinforcing effects in pavements; and (2) increased capability of the Australian pavement industry in the wiser application of geosynthetic reinforcements in pavements. The outcomes will enable the Australian government to provide more resilient roads at lower expenditure and enhance Australian companies' capability in providing higher-performance geosynthetic products and services to the global pavement industry.	75,000.00	157,500.00	150,000.00	67,500.00	0.00	0.00	450,000.00	AUSTRALIAN ROAD RESEARCH BOARD, GLOBAL SYNTHETICS PTY LTD, FSG GEOTECHNICS & FOUNDATIONS, ACT GEOTECHNICAL ENGINEERS PTY. LTD.

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LP220100209  Kirby, A/Prof Emma	<b>When caring ends: Understanding and supporting informal care trajectories</b>  This project aims to advance understandings of how, why, when, and for whom caring ends, including the socio-cultural and relational factors that shape experiences before, during, and after caring. Using an innovative, multi-method sociological approach, and foregrounding carers' voices, this project expects to generate new knowledge on the meaning and experience of care and caring. This project is significant in bringing together leading researchers and key carer-focused organisations, spanning service sectors and moving across care relationships, life stages and contexts. Expected outcomes include enhanced service capacity with tangible policy and practice benefits that will enable sustainable and fulfilling informal caring experiences.	69,546.00	147,661.50	170,611.50	92,496.00	0.00	0.00	480,315.00	CARERS NSW LIMITED, CARERS VICTORIA LIMITED
	<b>National Interest Test Statement</b>  This project aims to understand and better support trajectories out of informal caring. When caring ends, carers face profound challenges and aftereffects. Understanding the social conditions in which caring ends is critical for supporting Australia's 2.8+ million carers. As demand for carers increases in coming years, so will the number of carers facing uncertain futures after their caring ends. This project will provide significant social and economic benefits, delivering practice-relevant data to enable improved support for carers by addressing critical research, policy, and practice gaps. The project will be of considerable benefit to our carer-focused Partner Organisations and across government and support sectors, advancing knowledge on how best to sustain caring, and support transitions beyond caring. Expected outcomes include enhanced service capacity with tangible practice benefits that will enable more fulfilling caring experiences. Outcomes will be translated via a suite of public-facing communication strategies including Partner-driven development of resources for sector-wide translation.								
LP220100286  Tani, Prof Massimiliano	<b>Regional Australia' skills shortages and high-skill refugees' employment</b>  Regional Australia loses to cities thousands of professional and trade-related people whose skills cannot be replaced. Focusing on small and medium-size enterprises producing food and beverages, this project aims to determine whether refugee employment (i) is a strategic resource (ii) can alleviate these chronic regional skill shortages, and (iii) can be integrated in immigration policy. In doing so, it will for the first time provide critical empirical evidence on the possible need to separate policy measures aimed at rural vs. urban employers. The outcomes will contribute to reducing the problem of critical skill shortages and wastage at once and do so with an eye to the needs to rural Australia – a key driver of the country's exports.	45,786.00	86,761.50	83,040.00	90,644.00	48,579.50	0.00	354,811.00	REGIONAL AUSTRALIA INSTITUTE LTD, TALENT BEYOND BOUNDARIES LTD
	<b>National Interest Test Statement</b>  This project examines small to medium-sized companies in regional Australia and the opportunity of recent new labour supply initiatives allowing sponsorship of skilled refugees. It explores processes and costs sustained by regional companies to find, recruit, train, and employ skilled immigrants. It delivers benefits including: a focus on a strategic industry, food, and on medium and small-size employers. This study is focussed on highly trained and skilled refugees -an underused but available source of skills, to determine if current immigration policy hinders access to skills for regional and urban employers and whether advancing Australia's immigration policy is an effective tool to alleviate skill shortages. Both Partner Organisations for this project have networks in Rural Australia with employment agencies and will work with the researchers at workshops, and through formal policy recommendations to relevant agencies ensuring the barriers to attracting skilled refugees as rural employees and increase opportunities for rural employers are understood finding skilled staff and enhance the rural economy.								



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LP220100515  Keating, Dr Shane R	<b>Next-generation ocean current forecasting to improve maritime safety</b>  This project aims to measure upper ocean currents at scales of 10-100 km in Australia's marine estate using pioneering satellite radar technology. The Surface Water and Ocean Topography (SWOT) mission will map currents at 10 times the resolution of present-day satellites and revolutionise our understanding of ocean dynamics. Expected outcomes include validation of SWOT data in Australian waters and merging this data into Bureau of Meteorology ocean models. Downstream benefits include improved ocean forecasts for maritime safety, search-and-rescue, spill modelling, and marine conservation. At the same time, the project will build sovereign capability in emerging remote sensing technology with a legacy beyond the life of the SWOT mission.	76,033.50	140,237.50	118,803.50	54,599.50	0.00	0.00	389,674.00	BUREAU OF METEOROLOGY, AUSTRALIAN MARITIME SAFETY AUTHORITY, THE AUSTRALIAN INSTITUTE OF MARINE SCIENCE
	<b>National Interest Test Statement</b>  This project aims to develop the next generation of ocean forecasts using pioneering new satellite radar technology to measure the ocean surface with unprecedented resolution and accuracy. Key outcomes will be improved ocean current predictions for maritime safety, better defined search areas, efficient use of rescue resources, and improved likelihood of saving lives. To achieve this, the project will create new capabilities in merging satellite observations with numerical ocean models that will be adopted by the Bureau of Meteorology's ocean forecasting system. This will translate into better understanding of ocean current variability for key end-users of the Bureau's forecasts, including the Australian Maritime Safety Authority and Australian Institute of Marine Science. Improved ocean forecasts will have downstream benefits for Australia's \$80B/year Blue Economy by assisting decision-making and risk assessment to ensure economic prosperity, maritime safety, and national security. This project supports the Australian Civil Space Strategy by building sovereign capability in emerging satellite technology.								
	<b>The University of New South Wales</b>	491,689.00	989,894.50	909,043.50	459,417.50	48,579.50	0.00	2,898,624.00	
	<b>The University of Newcastle</b>								
LP220100028  Chaves, Dr Igor A	<b>Assessment of structural integrity and deterioration of masonry walls</b>  Brickwork for housing and medium-rise buildings is a traditional material, also much used for modern construction, with aesthetic appeal and modest cost. However, building regulators and others are increasingly concerned about evidence of slow building deterioration, particularly of older buildings. This increases public safety risks, even under normal conditions and more so under high winds or earthquake-induced ground-shaking. This project will help address this issue. It will obtain unbiased evidence of typical masonry building deterioration. It will couple this with mathematical modelling and state-of-the-art non-destructive visual and dynamic techniques to develop tools for making fast, low-cost practical building risk assessments.	74,952.50	144,425.00	140,334.50	115,575.00	44,713.00	0.00	520,000.00	DEPARTMENT OF MINES, INDUSTRY REGULATION AND SAFETY, ENGANALYSIS PTY LTD
	<b>National Interest Test Statement</b>  Tens of thousands of old and new buildings across the nation, residential and commercial alike, are at risk of collapse from falling or dislodged masonry. This has significant implications not only for human life but also for building owners, managers and insurers, local and national economies, and for the urban environment. The problem is caused by the natural deterioration of masonry stability steel fittings that tie the outer leaf walls to the inner structure. The problem is severe even for scenarios such as low to medium windstorm and earthquake events as these will cause area-wide damage, and potential loss of human life that could have been prevented. Population growth, the need to extend the service life of schools and other critical structures, and other environmental influences will only make things worse. The solution is to cost-effectively map which walls are at risk of eminent collapse and intervene with established techniques. This project will provide such grounds for timely infrastructure resilience solutions for the States involved and has Australia-wide urban, rural and regional implications.								

\* 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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LP220100334  Buzzi, Prof Olivier P	<b>A novel design approach for sustainable and resilient railway formations</b>  The project aims to validate a novel design approach for more sustainable and resilient railway formations. The railway network underpins the Australian economy and its maintenance costs tens of millions of dollars every year. This cost will increase with the growing frequency and intensity of climatic events. The research will advance the knowledge on the effect of water on the performance of railway formations and will deliver a novel design tool for end-users that will allow engineers to recycle fouled ballast in formations. The project will yield significant financial benefits for Australia, will strengthen links between Academia and industry partners, and will address environmental and sustainability issues linked to fouled ballast.	137,457.00	209,311.00	166,358.50	94,504.50	0.00	0.00	607,631.00	TENSAR INTERNATIONAL LIMITED, ARTC, SMEC AUSTRALIA PTY. LIMITED
	<b>National Interest Test Statement</b>  The project aims to validate a novel design approach for more sustainable and resilient railway formations (the structure supporting the railway track). The railway network underpins the Australian economy and its maintenance costs tens of millions of dollars every year. This cost will increase with the growing frequency and intensity of climatic events. Maintenance of formations produces huge stockpiles of fouled ballast every year, and tracks must be reconstructed with fresh ballast. The research will advance the knowledge on the effect of water on the performance of railway formations and will deliver a novel design tool for end-users that will allow engineers to recycle fouled ballast in formations. The research will be used to design better performing, more resilient and more sustainable railway formations with clear economical and environmental benefits to Australia								
LP220100375  Mallavarapu, Prof Megharaj	<b>Fate of PAPs and short-chain PFAS in biosolids amended soils</b>  Biosolids generated during wastewater treatment contain PFAS which are persistent, bioaccumulative and toxic. Application of biosolids to agricultural land may result in soil, groundwater and surface water PFAS contamination via leaching and run-off and pose unknown potential risk to soil health, crops and beneficial biota. This study aims to generate novel knowledge on the PFAS fate in biosolid amended soils, crops and toxicity to key soil and aquatic biota at environmentally relevant concentrations. This study is supported by Australian water and its allied industries, as it is important for them to ensure that biosolids application to agricultural land is an environmentally sustainable solution to the Australian farmers and communities.	76,882.50	153,765.00	153,765.00	153,765.00	76,882.50	0.00	615,060.00	MELBOURNE WATER CORPORATION, WATER CORPORATION, SOUTH EAST WATER CORPORATION, SOUTH AUSTRALIAN WATER CORPORATION, INTELLIGENT WATER NETWORKS, HUNTER WATER CORPORATION, WATER RESEARCH AUSTRALIA LIMITED, EPA VICTORIA, ARCADIS AUSTRALIA PACIFIC PTY LTD
	<b>National Interest Test Statement</b>  Biosolids are an important source of nutrients supporting the agricultural industry. However, biosolids generated during wastewater treatment contain PFAS (per-and poly fluoroalkyl substances) which are persistent, bioaccumulative and toxic. Application of biosolids to agricultural land may result in soil, groundwater and surface water PFAS contamination via leaching and run-off. PFAS in biosolids are from diffuse sources, and with 370,000 tonnes generated annually requiring management, it is necessary to understand risks to Australian agroecosystems. Furthermore, PFAS have increased environmental regulatory obligations, and will shortly have world trade obligations. This study will provide necessary data on PFAS accumulation and toxicity to crops, soil and aquatic life. This study is supported by Australian water and its allied industries, as it is important for them to ensure that biosolids application to agricultural land is an environmentally sustainable solution to Australian farmers and communities.								
	<b>The University of Newcastle</b>	289,292.00	507,501.00	460,458.00	363,844.50	121,595.50	0.00	1,742,691.00	

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<b>The University of Sydney</b>									
LP220100091	<b>Greening the production of peptides and proteins</b>	74,690.50	148,551.00	158,892.00	85,031.50	0.00	0.00	467,165.00	NOVO NORDISK A/S
Payne, Prof Richard J	<p>This project aims to develop a green and sustainable synthetic platform for the production of peptide and protein molecules. The synthetic methodology that will be developed has the potential to solve a major technological gap in the field by providing an efficient and cost-effective method for manufacturing peptides and proteins with a substantial reduction in reagent and solvent waste over currently employed methods. Expected outcomes include the delivery of a breakthrough green technology for accessing high value peptide and protein targets in academia and industry, and the training of industry-ready early career researchers, both of which will benefit Australia's growing biotechnology and pharmaceutical manufacturing sectors.</p> <p><b>National Interest Test Statement</b></p> <p>This project will establish an eco-friendly, sustainable and cost-effective technology for the synthesis of high value peptide and protein biomolecules that have wide ranging application in the biotechnology and pharmaceutical industry. The synthetic methods developed in this project have the potential to transform the way in which peptides and proteins are produced on industrial scale, by lowering the cost of manufacturing and minimising the generation of waste. This project has the potential to provide a number of benefits to Australia. Highlights include: 1) The delivery of green, efficient and scalable methods for manufacturing valuable peptide and protein molecules for the burgeoning Australian biotechnology and pharmaceutical sectors, thus contributing to the advanced manufacturing national science and research priority; and 2) The establishment of critical capacity and advanced interdisciplinary skills in the rapidly growing fields of green chemistry and biomolecule manufacture in Australia by training industry ready early career researchers.</p>								
LP220100162	<b>Thermal Optimisation of Gigascale Solar Photovoltaics</b>	125,000.00	230,000.00	193,338.00	88,338.00	0.00	0.00	636,676.00	SUN CABLE PTY LTD, 5B AUSTRALIA PTY LIMITED
Baldry, Dr Mark	<p>Large-scale solar photovoltaics are critical to decarbonising the global economy. Sun Cable is developing the world's largest solar farm in the Northern Territory, and is considering deploying the 5B MAV solar array. At this scale, temperature-induced panel efficiency losses represent a major challenge that must be overcome through thermal performance optimisation. We will build sophisticated multiscale models to simulate and understand the multiple interacting phenomena that cause panel heating, for the first time. This project will create the tools and know-how to optimise array design and solar farm development, delivering major efficiency gains and enhancing the viability of future gigascale solar projects.</p> <p><b>National Interest Test Statement</b></p> <p>Australia is uniquely positioned to become a renewable energy powerhouse by leveraging our abundant solar resource, if we can address outstanding challenges with large scale photovoltaics. Module overheating can cause substantial losses in electricity generation at the gigawatt scale, which must be mitigated to ensure technical and economic viability. This project will create accurate models to simulate the multi-scale phenomena contributing to module temperature in-situ for the world's largest solar farm, to be built in Australia's NT. It will directly benefit two Australian startups and the solar industry more broadly, by finding new ways to optimise the thermal performance of PV modules, arrays, and fields through improved design. The project is expected to deliver 100s of megawatts in additional capacity from improved efficiency, worth \$10-100+ million. The knowledge created by this research will benefit Australian PV manufacturers and developers, facilitating growth in solar projects, jobs, and sovereign energy resilience.</p>								

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LP220100292  Liu, Dr Sonia Y	<p><b>Sustaining chicken-meat production with alternative protein sources</b></p> <p>This project aims to secure sustainable chicken-meat production by the radical reduction or even elimination of imported soybean meal as the primary protein source in Australian broiler diets by its replacement with feed-grade amino acids and local feedstuffs. This project will expand our comprehension of starch/glucose and protein/amino acid digestive dynamics in poultry diets based on wheat, the primary feed grain in Australia; however, wheat does inherently possess nutritional disadvantages. Expected outcomes include soybean meal-free feed formulations for the Australian chicken-meat industry to enhance the affordable and environmentally viable production of chicken-meat coupled with improved bird welfare and flock health.</p> <p><b>National Interest Test Statement</b></p> <p>Chicken-meat is the dominant animal protein for Australian consumers and its shortage threatens our national food security as experienced during the Covid pandemic. The supply of chicken-meat is currently under pressure from both increasing consumer demand and escalating feed costs. Feed costs represent 70-80% total production costs and imported soybean meal is the primary protein source in broiler diets and its landed cost has escalated by 80% since 2019. The Australian chicken-meat industry presently imports around 700,000 tonnes of soybean meal which represents an approximate impost of \$700 million. This project aims to develop soybean meal-free diets for Australian chicken-meat industry by using feed-grade amino acids and local feedstuffs without the use of in-feed antibiotics. Consequently, dietary protein will be decreased, which will reduce nitrogen excretion and ammonia emissions, improve bird welfare and flock health by improving little quality and shed environment. The poultry industry will become more resilient from enhanced productivity and sustainability with more reliable feed supply.</p>	95,690.00	202,476.50	199,530.50	153,299.00	60,555.00	0.00	711,551.00	EVONIK OPERATIONS GMBH
LP220100406  Park, Prof Robert F	<p><b>Genomics to rust proof the humble oat</b></p> <p>This project aims to reduce the impact of the damaging and currently intractable fungal pathogen crown rust (OCR) in Australian oat production. The expected project outcomes are: new sources of enduring high value resistance to OCR, tools to accelerate the use of these resistances, and locally adapted OCR resistant oat germplasm for use in developing profitable oat varieties. The project will use new approaches to tap very recently released genomic resources and unique oat/ OCR resources assembled over many years. It will lead to responsible stewardship of broadly effective OCR resistance in grazing/milling/hay oats, increasing grower profitability, reducing reliance on fungicides, and underpinning planned growth in our export oat market.</p> <p><b>National Interest Test Statement</b></p> <p>Oat is an important crop to Australia. Demand continues to grow due to its nutritional and health benefits, and we are the world's 4th largest oat exporter. The fungal disease crown rust has become an intractable constraint to oat production here. It causes severe damage to grazing, milling and hay oat, with production losses as high as 50%. Attempts to develop varieties with inbuilt genetic resistance since the 1950s have failed, with all varieties released being rendered highly susceptible by the emergence of new virulent pathogen strains. A significant contributor to this has been lack of coordination of resistance gene deployment across the grazing/milling/hay oat industries. This Linkage Project seeks to solve this problem by facilitating and accelerating the use and responsible stewardship of broadly effective crown rust resistance across the grazing/milling/hay oat industries. The project will help Australia to enhance oat production, food safety and our biosecurity by reducing the impact of crown rust in oat production and reducing or even eliminating the use of fungicides for rust control.</p>	126,687.00	252,274.00	260,713.50	212,148.50	77,022.00	0.00	928,845.00	INTERGRAIN PTY LTD, S&W SEED COMPANY AUSTRALIA PTY LTD

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LP220100410  Alba, A/Prof Avril A	<p><b>Learning from the Past? Evaluating the impact of Holocaust museum education</b></p> <p>This project will determine and assess the long term educational impact of Holocaust education programs. Developed in partnership with Australia's three Holocaust museums, our innovative methodology will enable a comprehensive understanding of these programs' potential to shape ethical thinking and engender behavioural change. The outcomes will generate more targeted and effective programs that engage students on cognitive and affective levels. With the rise of antisemitism, Islamophobia and political extremism in Australia and abroad prompting policy initiatives in which cultural institutions are characterised as agents of social change, maximising the long-term educational benefits of these programs is imperative.</p> <p><b>National Interest Test Statement</b></p> <p>In the face of growing antisemitic, racist and religiously motivated attacks in Australia and abroad, this project will provide the empirical knowledge necessary to create effective education programs to counter these trends. Holocaust and genocide museums are increasingly recognised as powerful affective learning spaces in which learning about difficult and traumatic pasts is presumed to generate greater cultural awareness and sensitivity in the present. Such work cannot be based on assumptions but must be rigorously, empirically tested as the success of these educational initiatives is linked to nothing less than the social cohesion of current and future generations of Australians. The knowledge generated will enrich our understanding of exactly how and what students learn in these settings. The fruits of the project will have wide ranging social and cultural benefits, determining how museum education can be effective in the preservation of Australia's racial and religious diversity.</p>	60,721.00	134,283.00	144,611.00	148,966.50	77,917.50	0.00	566,499.00	SYDNEY JEWISH MUSEUM, MELBOURNE HOLOCAUST MUSEUM, ADELAIDE HOLOCAUST MUSEUM AND STEINER EDUCATION CENTRE INCORPORATED
LP220100527  Williams, Prof Stefan B	<p><b>Visual methods for advanced automation of underwater manipulation</b></p> <p>This project will increase the autonomy of underwater robotic systems engaged in intervention and inspection tasks. Such activities are essential for the operation of subsea robotic systems used in offshore industries, scientific exploration and defence. Our approach will improve perception and situational awareness through the principled fusion of multiple navigation and camera sensors. We will use this improved scene understanding to effectively plan the motion of vehicles and manipulators through larger and more complex workspaces, enabling semi-supervised and autonomous task execution. Our project will demonstrate these capabilities in real-world deployments relevant to industry and marine science.</p> <p><b>National Interest Test Statement</b></p> <p>This project will increase the autonomy of underwater robotic systems engaged in intervention and inspection tasks. Underwater intervention and inspection is a key activity for in offshore industries including oil &amp; gas extraction and wind power generation, as well as in desalination plant outflows, ports and shipping. It also plays an important role in gathering and manipulating samples and instruments for scientific exploration and monitoring and in minefield and ordnance clearing in defence. Our project is focused on developing a perception and situational awareness system for use in underwater intervention tasks through the fusion of data from multiple sources for real-time scene reconstruction. We will also investigate techniques in active perception and visual closed loop control that allow these systems to exploit visual feedback for control of underwater vehicle manipulator systems. Outcomes of this project will be adopted by our industry partners Reach Robotics and Geo Oceans in their service offerings.</p>	69,069.50	138,499.00	140,873.50	71,444.00	0.00	0.00	419,886.00	REACH ROBOTICS, NORWEGIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY, WOODS HOLE OCEANOGRAPHIC INSTITUTION, GEO OCEANS PTY LTD
	<b>The University of Sydney</b>	551,858.00	1,106,083.50	1,097,958.50	759,227.50	215,494.50	0.00	3,730,622.00	

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<b>University of Technology Sydney</b>									
LP220100202  Djordjevic, Prof Steven P	<b>The infectome of NSW dairy calves, a genomic microbial surveillance</b>  Infectious diseases are the main cause of disease and mortality in calves. The knowledge of the diversity of infectious disease-causing agents in NSW dairy cattle is not comprehensive. Thus, the immediate goal of this proposal is to redress this knowledge gap using untargeted microbial genomic sequencing to characterise and identify known and emerging enteric and respiratory pathogens in dairy calves. We will determine the occurrence and distribution of their microbial species across all NSW dairy regions. This will enable the Australian dairy industry to improve animal health and productivity, and diagnostic capacity, which will allow farmers to make informed management decisions about disease control strategies.	93,566.50	190,618.50	123,487.00	26,435.00	0.00	0.00	434,107.00	DAIRY AUSTRALIA LIMITED, STRATEGIC BOVINE SERVICES PTY LTD, DEPARTMENT OF PRIMARY INDUSTRIES
<b>National Interest Test Statement</b>									
The objective of this project is to detect and characterise the distribution of microorganisms that infect dairy cattle. We expect to define the main pathogens that cause diarrhea and pneumonia across the different dairy regions in NSW. In the current global scenario of food supply shortage, improving our understanding of infectious diseases to mitigate the current and potential losses caused by outbreaks is critical to mitigating the risk of losses to the industry. This project will help optimization of dairy farm productivity by reducing the losses caused by infectious diseases. This will have a further impact on making the dairy industry more profitable, will benefit rural communities and promote job creation. The objectives contribute and align with the department of primary industry's strategic focus on Biosecure industries and environment, economic growth, food safety and animal welfare, and response capacity. The outcomes of this project will also be relevant for public health by providing the occurrence of pathogens that are or pose a potential zoonotic threat.									
LP220100389  Ji, A/Prof JC	<b>An intelligent condition-monitoring system for mineral screening machines</b>  This project aims to develop an intelligent condition-monitoring system for screening machines which are widely used for classifying mineral particles in the mining industry. This project will develop new vibration-based methodologies and techniques for fault diagnostics and remaining useful life prediction of bearings and gears in situations with multiple complex sources and interferences. The monitoring system, as the expected outcomes of this project, will modernise the current maintenance practices towards condition-based predictive maintenance, reducing unplanned downtime, increasing productivity and reducing maintenance costs for the Australian mining industry. It will also add more value to the Australian manufactured products.	65,233.50	118,174.00	108,969.50	56,029.00	0.00	0.00	348,406.00	AURY AUSTRALIA PTY LTD
<b>National Interest Test Statement</b>									
Vibrating machines are widely used to classify mineral particles in the mining industry and frequently experience unforeseen component failures due to harsh working environments, leading to unplanned downtime and loss of production. Maintenance expenses typically add up 30 to 50 per cent of the total operating costs of the mining industry (the total expenses of the coal mining industry in Australia amounted to \$55.4 billion in financial year 2021). An intelligent condition-monitoring system will significantly develop current Australian mining industry practices toward predictive maintenance. The system will enable improved condition-based maintenance leading to increased productivity and a reduction in maintenance costs. This condition-monitoring system, to be developed with an Australian manufacturer, will meet an increasing domestic demand from the mining industry for smarter vibrating machines. This project falls under the National Science and Research Priority - Advanced Manufacturing – because it will significantly improve the competitiveness of Australian-made and designed vibrating machines.									

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LP220100390  Zhang, Prof Jian	<b>A Machine Learning Framework for Concrete Workability Estimation</b>  Concrete is the most used construction material in Australia. The project aims to develop a system to measure the workability of concrete in transit in agitator trucks using advanced machine vision and machine learning, and provide a reliable alternative to the current practice of visually testing concrete workability by certified testers. Concrete that fails to meet workability requirements is one of the most frequent reasons for rejection at construction sites, resulting in significant costs, waste, and delays. Multimodal data sources will be used to provide a reliable workability estimate in real time, enabling construction teams to identify and rectify workability issues in transit while continuously monitoring the adjustments effects.  <b>National Interest Test Statement</b>  Australia invests more than \$200 billion every year in construction, of which more than \$80 billion are spent on infrastructure projects. Concrete is used in the construction of more than 28m cubic meters of critical infrastructure and buildings in Australia every year. Concrete quality control and assessment are therefore essential; however, approximately 5% of produced concrete is returned and disposed of due to quality issues. Construction sites typically experience workability issues as one of the most common quality issues. Through this project, the construction industry will be able to detect and fix these workability issues. The project will benefit the Australian economy by reducing costs, waste, and delays in construction projects caused by spoil and unsuitable concrete which needs to be rejected. Indirectly, it will also contribute to the delivery of more durable and long-lasting infrastructure. As opposed to existing solutions, the proposed technology requires little to no modifications to existing equipment enabling rapid local and global adoption facilitated by our partners.	72,233.00	149,755.50	155,751.50	78,229.00	0.00	0.00	455,969.00	BORAL LIMITED
LP220100430  Kodagoda, Prof Sarath	<b>Next-Generation Intelligent Robotic Mobility Aid for Vision Impaired People</b>  More than 253 million people worldwide are blind or have low vision, with over 575,000 in Australia. This research aims to develop the world's first functional robotic guide with advanced robotic sensing, navigation, control, machine learning-based decision making and user interfaces. The project will generate novel theoretical breakthroughs, produce feasible prototypes, train young researchers, innovate industry capabilities and provide new research that will transform the lives of visually impaired people. The project is expected to further benefit the service and mobility aid industry, researchers and wider community in substantial social, economic and diverse terms. The mobility aid has potential for commercialisation  <b>National Interest Test Statement</b>  According to recent reports, there are over 575,000 people living in Australia who are blind or vision impaired. Guide dogs provide mobility support for these people following a time-consuming and costly training process. The dog's performance is affected by their health, physical strength, mental capabilities, ageing and external expectations. This project develops next-generation mobility aid technology overcoming the limitations of real life guide dogs while adding value by comprehending instructions, reacting effectively in numerous environments or contexts and appropriately communicating with the user. Application of this technology is expected to significantly improve the health and wellbeing of vision impaired people leading to build a more equitable and inclusive society. The expected globally competitive technology, along with the industry partner and its contacts has excellent translation potential.	95,272.00	154,511.50	158,040.50	98,801.00	0.00	0.00	506,625.00	GUIDE DOGS NSW/ACT

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LP220100453  Yu, Prof Shui	<b>Secure and Resistant Blockchain for Financial and Business Applications</b>  The aim of this project is to develop a practical secure blockchain technology for the booming applications in finance and business. This project expects to address the leading security threats to the current blockchain applications. The expected outcome is an executable secure and resistant blockchain prototype through the integration of the latest developed and customized techniques. The success of the project will dramatically benefit Australian people and government, especially for the Australian ICT industry for commercializing the research outputs.	54,557.50	111,756.00	117,047.00	59,848.50	0.00	0.00	343,209.00	NEXT GEN GLOBAL PTY LTD
	<b>National Interest Test Statement</b>  Decentralised records of transactions, also known as blockchain technology, are cheap and fairly secure. It is very popular in trading digital currency (e.g. Bitcoin) and is used in financial and business applications. However, this technology is facing new cyber security threats such as token stealing and system failure attacks. This project aims to tackle these two leading security vulnerabilities and establishes the foundation of future commercially available security software packages that data scientists, software developers and software / Cyber security professionals can use. By increasing Australian cybersecurity capabilities in blockchain technology, this project will increase cyber resilience benefiting Australia's ICT industry directly and industries that rely on secure data exchange indirectly. Through collaboration with our linkage partner and their industry networks, the outputs and outcomes of this linkage project will become widely available and benefit the Australian economy and society by keeping financial transactions and personal data safe.								
	<b>University of Technology Sydney</b>	380,862.50	724,815.50	663,295.50	319,342.50	0.00	0.00	2,088,316.00	
<b>University of Wollongong</b>									
LP220100056  Flament, Dr Nicolas	<b>Dynamic Earth Models for Frontier Mineral Exploration</b>  This Project aims to investigate the link between supercontinents, mantle upwelling, and associated mineral resources by combining reconstructions of mantle flow with the global rock record. Mantle upwelling causes eruptions of volcanic provinces and associated rock formations that are rich in minerals. The expected outcomes of the Project include mapping the global potential for magmatic nickel, rare-earth elements, and diamond deposits from 1.8 billion years ago and building a research alliance between the University of Wollongong, Anglo American, and De Beers. Significant benefits will be the development of a digital framework to reduce risks in exploration for minerals that are essential for the transition to a low-carbon economy.	50,621.50	99,493.00	99,943.00	51,071.50	0.00	0.00	301,129.00	ANGLO AMERICAN, DE BEERS GROUP
	<b>National Interest Test Statement</b>  In 2022, the top five Australian exporting industries are from its mineral and energy resources. Over the next 25 years, global demand for rare earth elements and for nickel is likely to exceed the total that has been mined to date. Yet, despite increases in exploration expenditure, exploitation of known mineral reserves currently exceeds the discovery of new mineral deposits. This Project will bring together Australian scholars and industry experts in mineral resource exploration to understand the links between supercontinents, mantle upwelling, and mineral deposits. The results of the Project will be openly available in a new digital framework designed to target mineral resources including rare earth elements and nickel. The benefits will include reduced cost and risk, and improved efficiency for mineral exploration. Potential benefits of the Project include the economic benefit of the discovery of new mineral resources in Australia, and the environmental benefit of locating new deposits of minerals that are essential to transition to a low-carbon economy.								



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LP220100332  Susilo, Prof Willy	<b>Cryptographic Group Actions and Their Applications</b>  This project aims to develop innovative techniques to construct cryptographic primitives and explore their applications to secure cloud computing. Cryptographic group actions have recently become a promising candidate for post-quantum cryptography. However, whilst possessing strong mathematical complexity, group actions are still in their infancy, and thus it remains challenging to realise advanced cryptographic constructions. The expected outcomes of this project are new techniques from cryptographic group actions and their applications to secure cloud services. This will provide direct benefits to Australia's Industry 4.0 adoption by enabling advanced technologies developed in Australia in the upcoming era of quantum computers.	79,129.50	169,461.00	116,576.50	26,245.00	0.00	0.00	391,412.00	KDDI RESEARCH INC., CYBERFLARE
	<b>National Interest Test Statement</b>  Post-quantum cryptography (PQC) is an emerging field of research that has attracted significant attention from many government organisations and industries worldwide. Specifically, PQC was introduced to combat the arising future quantum computer attacks. Cryptographic group actions are new and promising candidates for PQC with significant mathematical complexity. Therefore, it remains challenging to realise cryptographic solutions due to the rich underlying mathematical structures. This project will bridge this gap by developing secure and innovative techniques based on group actions, with their applications to cloud security. This will be an enabler for emerging technologies, opening up a whole new range of opportunities for numerous Australian industries to provide secure cloud services with guarantees for long-term security. In the process, significant and necessary updates to Australian cybersecurity standards will be identified, and research training for a new generation of cyber-security experts will be delivered through research collaboration between Australian and international participants.								
LP220100358  Rogers, Prof Kerrylee	<b>Are coastal wetlands vulnerable to bushfires?</b>  The 'Black Summer' fires burned extensive areas of coastal wetland not typically associated with fire impact. These wetlands rely upon plant growth and sediment delivery to respond to sea-level rise, processes which may be impacted by fire. This project aims to quantify the distribution and severity of fire impact, and establish post-fire vegetation and surface elevation trajectories. By integrating fire ecology and wetland science approaches, this project will ascertain the resilience of coastal wetlands to the cumulative impacts of fire and sea-level rise. Expected outcomes of this project include new, spatially-explicit fire management tools which will aid the sustainable, long-term management of coastal wetlands in a changing climate.	118,415.50	193,585.00	151,676.00	76,506.50	0.00	0.00	540,183.00	DEPARTMENT OF PRIMARY INDUSTRIES, DEPARTMENT OF PLANNING AND ENVIRONMENT
	<b>National Interest Test Statement</b>  This project brings together leading experts in the response of coastal ecosystems and landscapes to environmental change with experts in bushfire ecology and impacts assessment. The maps and models generated will provide coastal planners and natural resource managers with the confidence to implement decisions that enhance natural capital and improve the resilience of highly valuable coastal ecosystems to climate change impacts arising from bushfires and sea-level rise. Of particular national interest is the continuing capacity of coastal wetlands to sequester blue carbon and contribute to Australia's efforts to mitigate climate change; this capacity is at risk from bushfires and sea-level rise and may place the blue carbon methodology within the Emissions Reduction Fund at risk. This project fills a global knowledge gap about ensuring the resilience of coastal ecosystems to multiple climate change stressors and will place Australia at the forefront of knowledge advancement in the international community tasked with enhancing the resilience of coastal ecosystems to the impacts of climate change.								
	<b>University of Wollongong</b>	248,166.50	462,539.00	368,195.50	153,823.00	0.00	0.00	1,232,724.00	

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<b>Western Sydney University</b>									
LP220100131  Yang, Prof Richard (Chunhui)	<b>Transforming pastefill delivery system for next-generation mining industry</b>  This project aims to develop a new type of mining pipeline design platform that can vastly improve pastefill (slurry) delivery systems. Using an Artificial Intelligence-based design platform, understanding complex and numerous variables in the fluid dynamics of abrasive pastefill flow will inform a new pipeline design. Consisting of a vertical casing, with our new composite pipeline chokes to replace costly friction loops, improvements in flow efficiency and pipeline deterioration can significantly reduce maintenance costs. This novel and adaptable next-generation pipeline design and analysis platform can be employed by the manufacturing and mining sectors for pipeline failure analysis, managing production and developing new products.	75,500.00	151,000.00	105,500.00	30,000.00	0.00	0.00	362,000.00	METROLOGI PTY LTD, NORTHERN STAR RESOURCES LTD
<b>National Interest Test Statement</b>									
1. This project aims to develop a new type of mining pipeline design platform that can vastly improve pastefill (slurry) delivery systems for filling holes left from mining. The platform's AI system can be used to dynamically adjust pastefill pipeline designs, according to varying site conditions and slurry composition. 2. Outcomes include the construction of a new pipeline design platform and composite pipe chokes, replacing multiple pipe loops that cause too much costly wear and tear due to slurry friction. 3. Economic and commercial benefits include huge cost-savings in reduced maintenance and operation shutdowns, and adaptability of the platform for widespread use in the mining industry. 4. Commercialisation is possible with the project's mining industry Partner Organisations, who will assist with the design, construction and testing of pipeline components and systems.									
LP220100197  Harris, Dr Celia B	<b>Improving aged care with memory conversations</b>  This project aims to investigate conversational techniques known as "elaborative reminiscing" as a tool for aged care staff to practice relationship-based care in their day-to-day interactions with older clients. The project expects to generate new knowledge about which specific techniques increase reminiscing during routine care, and how these tools have ongoing benefits for aged care clients. Expected outcomes include an evidence-based training program and improved understanding of facilitators and barriers to meeting aged care clients' social needs. This should provide significant benefits by improving wellbeing of clients in aged care, reducing hospitalisations, and enabling aged care providers to meet new industry standards.	50,436.50	102,654.00	115,331.50	63,114.00	0.00	0.00	331,536.00	THE WHIDDON GROUP
<b>National Interest Test Statement</b>									
Placing the person at the centre of aged care is a key principle from the Royal Commission into Aged Care Quality & Safety. With over 1 million Australians receiving aged care, supported by \$18B+ from the Australian government, there is an urgent and growing need for new ways to reduce isolation and build connection in aged care. Collaborating with partner Whiddon and their workforce, this project aims to introduce memory conversations as a tool to encourage deep interaction and more meaningful relationships between aged care staff and their clients. In developing this evidence-based, low cost and high impact staff training program with demonstrated outcomes, our research will provide tools to immediately enhance staff and client relationships, increasing wellbeing of people in aged care. A reduction of 10% in older people's hospitalisation would reduce Australia's costs by \$256M. The resulting training program and resources will be readily available for wide and rapid dissemination in the aged care industry and broader community, enabling aged care organisations in Australia to lead in person-centred care.									

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LP220100208  Notley, A/Prof Tanya M	<b>Addressing Misinformation with Media Literacy through Cultural Institutions</b>  Misinformation can harm democratic processes, social cohesion and public health outcomes. Media literacy prepares citizens for misinformation by developing critical analysis abilities. This project partners with Australian public cultural institutions to increase adult media literacy. Through an action-based, mixed methods approach, the project investigates adults' experiences with online misinformation and assesses their ability to identify and challenge it. Research findings will inform the design and evaluation of targeted evidence-based media literacy training and resources that will be shared across broadcast media, physical spaces and online. Through these initiatives Australians will be better equipped to combat misinformation.	101,722.00	174,763.50	152,263.00	79,221.50	0.00	0.00	507,970.00	NATIONAL FILM AND SOUND ARCHIVE OF AUSTRALIA, MUSEUM OF AUSTRALIAN DEMOCRACY, ABC EDUCATION, AUSTRALIAN LIBRARY AND INFORMATION ASSOCIATION LTD
	<b>National Interest Test Statement</b>  Research by the Australian Communications and Media Authority reports that misinformation undermines public health efforts, causes harm to individuals, businesses and democratic institutions, and can incite individuals to carry out acts of violence. While a range of approaches is needed to address misinformation, media literacy has proven to be essential to any comprehensive national strategy. By working with leading Australian Public Cultural Institutions to develop a nationally coordinated approach to increase adult media literacy, this project benefits the nation by: 1) producing a strong empirical evidence base to inform the design of effective media literacy initiatives, 2) developing educational initiatives that help prepare citizens for misinformation so they can be part of efforts to combat it, and 3) enabling inter-organisational collaboration by producing a toolkit that supports public cultural institutions to collaborate to address issues of national significance, including misinformation.								
LP220100456  Khorana, Dr Sukhmani	<b>Place-based employment and enterprise of newly arrived young migrant women</b>  The project seeks to make use of place-based perspectives to map the workforce and business landscape of the Southwest Sydney region. It will identify the types of industry and social enterprises, potential employment and enterprise opportunities, and local organisations' capacity to work with newly arrived migrant women in the context of socio-economic recovery from the COVID19 pandemic. Using a strengths-based approach, a survey and interviews will help understand young migrant women's potential, interests, skills, and knowledge gaps in career advancement. Informed by data from the findings, the project will co-create an online career hub co-hosted with Partner Organisations which will be of long-term benefit to newly arrived communities.	25,000.00	50,000.00	50,000.00	25,000.00	0.00	0.00	150,000.00	LIVERPOOL CITY COUNCIL, WESTERN SYDNEY MIGRANT RESOURCE CENTRE LTD, NAVITAS PTY LIMITED, CURIOUS WORKS, LIVERPOOL NEIGHBOURHOOD CONNECTIONS INCORPORATED, CORE COMMUNITY SERVICES LIMITED, 15/15 FILM FESTIVAL INC
	<b>National Interest Test Statement</b>  Southwest Sydney is home to many young migrant women (aged 18-35 years) from countries such as Vietnam, Cambodia, India, Iraq, and Lebanon. Like young Australian women, these young migrant women have high career aspirations, such as being entrepreneurs. However, they face many challenges due to certain family situations (e.g., young children, domestic violence) and discrimination finding work, which have been made worse due to the COVID-19 pandemic. This project will partner with seven local stakeholders to improve the employment pathways and opportunities for entrepreneurship for these young migrant women by working directly with them to understand their experiences and aspirations and how to best help them to achieve their goals. Thus, this project will benefit young migrant women as well as local industries and organisations, which in turn will benefit local communities and Australian society as a whole. The findings and online career hub model will also be replicable in other national and global contexts with a high proportion of disadvantaged young migrant women.								
	<b>Western Sydney University</b>	252,658.50	478,417.50	423,094.50	197,335.50	0.00	0.00	1,351,506.00	
	<b>New South Wales</b>	2,585,275.00	5,035,731.50	4,622,692.50	2,621,069.00	448,833.00	0.00	15,313,601.00	

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## Queensland

### Queensland University of Technology

LP220100025	<b>Thermoelectric devices for high-performing localised coolers</b>	102,614.50	210,629.00	216,029.00	108,014.50	0.00	0.00	637,287.00	MAPLE DEVELOPMENT GROUP
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Chen, Prof Zhi-Gang

This project aims to develop a lightweight, low-energy-consumption, and high-durability wearable thermoelectric cooler for localised cooling using a novel industry-led approach, coupled with device design and materials engineering strategies. The key breakthrough expected is to design wearable thermoelectric coolers by using flexible substrates and thermoelectric materials with engineered chemistry and unique structures for achieving localised, instant, and controllable cooling with super low power input for personal usage in building and mining industry. Expected outcomes include innovative technologies for achieving high-efficiency cooling, which will provide significant economic and commercial benefits for Australia.

#### National Interest Test Statement

Traditional cooling systems are heavy and high energy consumption. To overcome these issues, this project aims to innovatively develop wearable cooler system by using new-type functional materials. Eco-friendly and wearable coolers will be integrated to form smart localized cooling with super low power input for personal thermal regulation, which will significantly decrease energy consumption and reduce global warming. Such a brand-new technology and innovation will advance the scientific insights and significantly enhance the international visibility and impact of Australia in the development of smart cooling technology. The technology developed can be utilised by many industries for personal cooling management, which will help to create new employment opportunities in the mining, building, and medical industry, and provide economic, commercial and environment benefits for Australia.

LP220100125	<b>Sustainable polymer construction materials from agricultural waste</b>	66,801.00	132,059.00	124,258.00	59,000.00	0.00	0.00	382,118.00	LICELLA HOLDINGS LIMITED
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Moghaddam, Dr Laleh Vash

Agricultural waste is the world's most abundant petroleum alternative for transformation into environmentally friendly bio-based materials for the construction sectors. Bringing together complimentary research expertise between academia and industry, this project aims to address this opportunity and develop technologies that economically convert agricultural wastes to crude-oils to produce bio-based resins, adhesives and polyurethane. This project expects to produce ready-to-use, total replacements for petroleum-based construction materials. This should provide significant benefits including supporting Australian manufacturing by delivering technologies for sustainable and rapid adoption in the construction, resin and coating industries.

#### National Interest Test Statement

The development of renewable alternatives to replace petroleum for the manufacture of fossil fuel-based products is essential to Australia's environmental and economic sustainability. This project will convert low-value agricultural waste into high-value bio-resins and adhesives for use in the construction and manufacturing industries. Bioproducts offer a key growth opportunity for the Australian economy and, because of the feedstocks location, is an inherently regional activity. Australia has significant competitive advantages for bio-resin production, including; access to agriculture waste, existing industry and infrastructure, and a strategic location for export into rapidly growing international markets. The technologies and products developed in this project will be adopted by existing and emerging industry, including resin and adhesive manufacturers, to support the economic growth and future development of the bioproduct manufacturing industries in Australia. This will increase agricultural and manufacturing profitability and sustainability, support regional Australia and create a low carbon future.

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LP220100206  Bally, Dr Julia L	<b>Australia's first Green Biopharm</b>  Protein-based medicines and vaccines represent the fastest growing sector of the pharmaceutical market, but their production by Australian small and medium enterprises is prohibited by the high infrastructure and operating costs of traditional manufacturing systems. This project aims to develop advanced methods to produce protein-based medicines using a native plant. The power of this technology will be demonstrated by making a biologic anti-parasite treatment, as an alternative to outdated chemical treatments. Expected outcomes include a unique scalable technology which will support Australia's sovereign capacity to produce high-value proteins, rapidly, affordably, and at scale, and with less complexity than current plant-based systems.	145,872.50	261,985.00	236,168.00	120,055.50	0.00	0.00	764,081.00	I.A.H. SALES PTY. LIMITED, CYTIVA
	<b>National Interest Test Statement</b>  The demand for vaccines and protein-based medicines is growing rapidly, but Australia's capacity to produce these at scale is limited by the high infrastructure and operating costs of traditional protein factories. This places Australia at risk of medicine shortages and is a barrier to smaller companies from entering the \$380 billion global market for biologics. This project will demonstrate the power of a disruptive plant-based production system, which is being widely adopted overseas. The system will be used to make a new anti-parasite treatment, helping to combat the \$530m in lost productivity that parasitic worms cost to the Australian livestock industries each year. While the new product could earn an Australian Small or Medium-sized Enterprise up to \$40 million/year in extra revenue, wider adoption of this platform technology will also build Australia's sovereign capacity to manufacture biologics at an unprecedented speed and scale, earn valuable export income, create skilled job opportunities, and protect our national security by ensuring the sovereign supply of life-saving medicines for the future.								
LP220100226  Haque, Prof Md. Mazharul	<b>A real-time traffic signal system for safe and efficient intersections</b>  Road traffic crashes result in 1,200 fatalities and another 36,500 injuries on Australian roads each year. Signalised intersections represent a high-risk node in a transportation network, but the current signal designs only consider efficiency but not safety. This project aims to unleash the power of artificial intelligence (AI) and integrate with the advanced extreme value models for proactive and efficient detection of crash risk in real-time. Its innovations lie on developing a novel traffic signal control system balancing safety and efficiency of signalised intersections. The proposed real-time traffic signal system will fundamentally transform the intersection operation and lead to reductions of road fatalities, injuries and emissions.	25,396.00	63,419.50	38,023.50	0.00	0.00	0.00	126,839.00	DEPARTMENT OF TRANSPORT AND MAIN ROADS, ADVANCED MOBILITY ANALYTICS GROUP PTY LTD
	<b>National Interest Test Statement</b>  Road traffic crashes result in 1,200 fatalities and another 36,500 injuries on Australian roads each year. Signalised intersections represent a high-risk location type in the network, with one-third pedestrian and bicycle crashes in addition to a substantial portion of vehicular crashes. This project addresses the Australia's Science and Research Priority in Transport by utilising the power of artificial intelligence for road safety. By applying cutting-edge video analytics, this project aims to analyse and assess risk at signalised intersections in real-time, make short-term safety and congestion forecasts based on current traffic trends, and offer a new traffic signal system balancing both safety and efficiency. The proposed research will bring social, economic, and environmental benefits to the society by reducing the road toll and the significant number of preventable injuries on Australian roads, enhancing transport mobility, promoting active transport users such as cyclists and pedestrians, and saving huge economic losses due to crashes and emissions.								
	<b>Queensland University of Technology</b>	340,684.00	668,092.50	614,478.50	287,070.00	0.00	0.00	1,910,325.00	

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<b>The University of Queensland</b>									
LP220100036 Zhang, Dr Cheng	<b>Removal of Perfluorinated Chemicals Using New Fluorinated Polymer Sorbents</b>  Per- and polyfluoroalkyl substances (PFAS) are a family of highly persistent chemicals that are linked to a number of human diseases, however existing approaches for removal of PFAS are highly inefficient. This project aims to develop and evaluate novel, reusable polymer sorbents for effective PFAS removal. The polymer sorbents will enable efficient, selective and continuous sorption of PFAS, while maintaining excellent environmental stability for long-term implementation in practical devices. The project will develop novel polymer sorbents to revolutionize the remediation of PFAS with high technical, economic and environmental feasibility, creating a pathway to a PFAS-free world, and ultimately protecting the natural environment.	64,853.00	141,210.50	142,142.50	65,785.00	0.00	0.00	413,991.00	THE CHEMOURS COMPANY, COUNCIL OF THE CITY OF GOLD COAST
	<b>National Interest Test Statement</b>  Per- and poly-fluoroalkyl substances (PFAS) are highly persistent chemicals that have been used extensively in a range of common household products and industrial applications in Australia, including non-stick cookware and fire-fighting foams. Unfortunately, the properties that make PFAS so effective in many applications also make them toxic to the environment and human health. PFAS contamination in the environment, particularly in waterways, is widespread, and the Australian Government has set up a PFAS Taskforce to manage PFAS contamination. This project aims to develop a new, reusable technology for efficient, continuous removal of PFAS. The new technology will enable significant improvements over conventional removal methods. It will also place Australia at the forefront of the \$300 billion/year PFAS remediation global market by licensing the intellectual property to industry partners and translating the technology into commercial products. This new technology is an important first step to a PFAS-free world and ultimately protecting Australia's natural environment and people.								
LP220100058 Thai, Dr Phong K	<b>Using multiple data sources to understand the opioid crisis in Australia</b>  This project aims to improve the quality and integration of population-level data for monitoring the consumption of opioids, licit and illicit, in Queensland communities. The analysis of opioids in wastewater, integrated with opioid use information such as prescription and seizure statistics will vastly increase knowledge of consumption patterns of opioids. By analysing wastewater samples from 2011 and triangulating with other datasets, the expected outcomes include building capacity to estimate consumption of all opioids; detecting the misuse of licit and illicit opioids over time. Anticipated benefit is to provide objective evidence of opioid use patterns for decision makers and a framework for a national opioids monitoring program.	43,268.00	86,536.00	86,536.00	43,268.00	0.00	0.00	259,608.00	QUEENSLAND HEALTH, AUSTRALIAN CRIMINAL INTELLIGENCE COMMISSION, QUEENSLAND HEALTH FORENSIC AND SCIENTIFIC SERVICES
	<b>National Interest Test Statement</b>  In Australia, harm caused by opioid misuse is on the rise and our country could face an opioid crisis like the one happening in the US and Canada. This project is expected to deliver a critical tool to evaluate the potential misuse of prescription opioids and the consumption of illicit opioids in Queensland communities by triangulating multiple data sources. By providing a greater understanding of the relationship between opioid prescription control and the subsequent consumption of other substances of abuse in the communities this project is crucial to our Partner Organisations as they devise policies to reduce the social, health and economic burden of substance abuse. This project will serve as a model to establish a framework that can be expanded nationally for monitoring of opioid use in Australian population.								

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LP220100090  Meale, Dr Sarah J	<b>Utilising novel Pongamia trees to decarbonise Australia's beef value-chain</b>  Progress towards a carbon neutral beef industry typically focusses on nutritional strategies, overlooking potential innovations in farming system configuration. This project aims to develop a framework for the integration of Pongamia into beef production systems, so that not only emissions reductions are maximised, but also to support carbon capture and farm system resilience. This project seeks to determine the impact of Pongamia meal on cattle production efficiency, meat quality and methane emissions. Through quantification of carbon sequestration potential in tree plantations, whole-farm modelling will elucidate production scenarios capable of achieving the reductions needed for a carbon neutral Australian beef industry.	41,636.50	167,243.50	152,203.50	26,596.50	0.00	0.00	387,680.00	TERVIVA AUSTRALIA PTY LTD, AUSTRALIAN AGRICULTURAL COMPANY LIMITED, MEAT & LIVESTOCK AUSTRALIA LIMITED, ARROW ENERGY PTY LTD, SANTOS LIMITED, AUSTRALIA PACIFIC LNG PTY LIMITED, TROFORTE INNOVATIONS PTY LTD
	<b>National Interest Test Statement</b>  Over 40% of Australia's land area supports livestock farming, underpinning the economy and many regional communities. Yet the industry faces continual pressure to improve productivity while reducing greenhouse gas emissions. This project explores how Pongamia, a drought tolerant native Australian tree, can be integrated into cattle farming systems to provide improved feed supplements that reduce enteric methane emissions and sequester carbon in woody biomass. The inclusion of partners AACo. and MLA will ensure industry adoption through their extension networks. Expected project outcomes are: 1) an industry-ready, high lipid feed supplement that reduces cattle methane emissions while maintaining cattle productivity and meat quality; 2) a model for integrating beef-Pongamia co-production that potentially enhances profitability of cattle farming enterprises across different climate and value-chain contexts. These outcomes will benefit Australia by providing feasible and innovative solutions to reduce the beef industry's carbon footprint while securing high quality beef production and farmer income streams.								
LP220100165  Rosenbaum, Prof Gideon	<b>The lost ocean of eastern Australia and its critical metals endowment</b>  This project aims to unravel the tectonic origin and economic potential of ultramafic rocks (rocks which host elevated concentrations of nickel, cobalt, chromium, and platinum-group elements). Such rocks are outcropping in eastern Australia along a contorted ~1500 km long belt that may record relics of an ancient ocean. Through detailed mapping and cutting-edge analytical techniques, the project is expected to fill a crucial knowledge gap in Australian tectonics, while providing information on ore mineralisation. The expected outcomes, including new tectonic models unveiling the scale, geometry, and economic potential of the ultramafic bodies, could benefit critical mineral exploration, carbon storage solutions, and geoecology conservation.	62,650.50	148,473.00	164,400.00	78,577.50	0.00	0.00	454,101.00	GEOLOGICAL SURVEY OF QUEENSLAND, GEOLOGICAL SURVEY OF NSW
	<b>National Interest Test Statement</b>  Australia's goal to reach net zero emissions requires growing supplies of critical metals and solutions for carbon storage. Both issues could benefit from research on ultramafic rocks, which are potentially suitable carbon traps, and host cobalt, chromium, platinum-group elements, and nickel (used for rechargeable batteries, fuel cells, and stainless steel). But ultramafic rocks are rarely exposed in continents and are typically restricted to narrow zones that once formed the substrate of ancient oceans. Focusing on an ultramafic belt in eastern Australia, the project's anticipated outcome will generate detailed geological maps, new analytical data, and innovative tectonic models, which could help identify mineralised zones. Partner organisations will be provided with highly specialised geological data that will be disseminated to industry in the form of exploration packages that can be used for critical mineral exploration and developing carbon storage solutions. Outcomes will also benefit Australia's economy and industry by providing training to research students in highly sought geological mapping skills.								

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LP220100200  Knight, Dr Emma R	<b>Chemicals in compostable food contact paper packaging materials</b>  The aim of this project is to understand the presence of persistent chemicals in recyclable and compostable food contact materials (FCMs). These types of products are destined for recycling or biowaste streams that bridge the gap from take-make-dispose and into a circular economy. Currently, the knowledge of the chemicals in these products is limited but we need to ensure that they are safe and do not unnecessarily contaminate resource recovery streams. It is expected that this project will develop a framework that could be used by industry and government to prevent chemicals of concern persisting in a circular economy, providing environmental and economic benefits through reduced risk of chemical exposure and unnecessary remediation costs.	26,850.00	52,944.00	52,739.50	26,645.50	0.00	0.00	159,179.00	FOOD PACKAGING FORUM, AUSTRALIAN PACKAGING COVENANT ORGANISATION LTD, AUSTRALIAN ORGANICS RECYCLING ASSOCIATION LIMITED, CANDY SOIL HOLDINGS PTY LTD, EUROFIN ENVIRONMENT TESTING AUSTRALIA PTY LTD, DEPARTMENT OF PLANNING AND ENVIRONMENT, DEPARTMENT OF ENVIRONMENT AND SCIENCE, QUEENSLAND HEALTH
<b>National Interest Test Statement</b>									
Conventional paper food packaging materials used in Australia are known to contain chemicals of concern presenting risks for human and environmental health. This project investigates what chemicals are present in biodegradable, compostable and/or recyclable paper food packaging products and whether they persist when composted. Aligning with the Recycling and Clean Energy National Manufacturing Priority and the Food Science and Research Priority as well as Australia's waste policies and action plans, this investigation is imperative as Australia moves towards a circular economy and we look for environmentally friendly packaging alternatives. This collaboration will develop a framework to help guide industry and policy makers in ensuring the sustainability of Australia's paper food packaging materials, reducing waste as well as the environmental and economic burden associated with chemical exposures.									
LP220100309  Hou, Dr Jingwei	<b>Integrated solar to chemical production and membrane concentration system</b>  The efficient conversion of low-cost raw materials to high-value chemicals using solar energy has been a long sought-after goal. This project aims to create an integrated photoreactor and membrane separation system for efficient photocatalytic water splitting. The integrated system will efficiently produce hydrogen and ultrapure hydrogen peroxide, a critical and costly reagent used in the semiconductor and solar panel manufacturing industries. The integrated system addresses current challenges in the production of high-quality hydrogen peroxide and demonstrates a practical solar-to-chemical process with economic benefits. It also advances knowledge in the fields of nanomaterials engineering, photocatalytic devices, and membrane technology.	93,043.50	221,699.50	229,155.50	100,499.50	0.00	0.00	644,398.00	GRAPHENEX PTY LTD
<b>National Interest Test Statement</b>									
The goal of this project is to create a photocatalytic reactor and a membrane separation integrated system. Renewable solar energy will be combined with pure water raw materials to produce value-added chemicals (green hydrogen and hydrogen peroxide). This project represents genuine opportunities to produce high-value-added products using solar energy, in addition to advances in photocatalytic materials engineering and membrane separation. The intended product (high purity hydrogen peroxide) of this Linkage project can meet the rapidly increasing demand in the LED, solar panel, and semiconductor manufacturing industries, particularly in East Asia. This project would allow Australia to use its abundant renewable energy resources to produce green chemicals, allowing the country's economy to diversify and restructure in the future by exporting high-value-added chemicals. Furthermore, the integrated system will shed light on the synthesis of other chemical products, resulting in additional commercial opportunities that go beyond the scope of the current project.									



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LP220100336  Carvalho, Dr Gilda	<b>Biofilm-based solution for cost-effective high-quality drinking water</b>  Approximately 90% of the drinking water in Australia is sourced from surface water bodies, which are naturally rich in nutrients and organic matter. This leads to the growth of cyanobacteria, which are known to be a major cause of taste and odour compounds and cyanotoxins. Climate change is causing increased cyanobacterial growth due to higher temperatures, exacerbating this existing challenge to water utilities. This project proposes a novel biofilm-based approach for cost-effective drinking water treatment production. Our approach represents a simple retrofit to existing processes and drastically reduces the chemical dosing costs and improve climate resilience while ensuring the production of high-quality, safe drinking water.	121,288.50	250,582.50	237,918.00	108,624.00	0.00	0.00	718,413.00	SEQWATER, SOUTH AUSTRALIAN WATER CORPORATION, VEOLIA WATER TECHNOLOGIES AB - ANOXKALDNES, QUEENSLAND HEALTH
	<b>National Interest Test Statement</b>  Australia resources most of its drinking water from surface water sources, which are naturally rich in nutrients and organic matter. The high solar exposure also promotes the growth of cyanobacteria, which are known to be a major cause of taste and odour compounds (e.g. geosmin and MIB), as well as cyanotoxins, problems that are being exacerbated due to climate change. Dissolved organic matter needs to be removed prior to disinfection as it is the major precursor of potentially harmful disinfection by-products. Cost-effective drinking water treatment that yields safe, high-quality water is needed to sustain utilities and augment consumer confidence in their tap water. For these reasons, the novel technological solution presented in this project is highly relevant to the Australian Water industry and population in general. This project, supported by 2 major utilities in Queensland and South Australia serving 20% of the national population, will facilitate the implementation of this technology by water utilities across the country, presenting high national benefit to the economy, environment and public health.								
LP220100357  Ye, A/Prof Liu	<b>Reducing direct greenhouse gas emissions from urban wastewater systems</b>  This project aims to develop a systematic framework for water utilities to monitor and reduce direct greenhouse gas (GHG) emissions from wastewater systems. A standardised monitoring protocol will be developed to conduct an unprecedented nationwide sampling campaign. The obtained data, with microbial characterisation and mechanism analysis, will be used to develop novel models for accurate prediction of GHG emissions. Expected outcomes include protocol to accurately monitor emissions, models to predict emission under various conditions, and mitigation guideline for typical plant configurations. The anticipated benefit is a significant reduction in GHG emissions from urban water industry and support it to meet net-zero-emission goal by 2050.	122,523.50	251,066.00	228,011.00	99,468.50	0.00	0.00	701,069.00	WATER CORPORATION, SOUTH AUSTRALIAN WATER CORPORATION, MELBOURNE WATER CORPORATION, ICON WATER LIMITED, HUNTER WATER CORPORATION, GHD PTY LTD, WATER RESEARCH AUSTRALIA LIMITED, WATER SERVICES ASSOCIATION OF AUSTRALIA LIMITED, SOUTH EAST WATER CORPORATION, CENTRAL SEQ DISTRIBUTOR-RETAILER AUTHORITY
	<b>National Interest Test Statement</b>  Direct GHG emissions from water utility treatment systems and sewers are the 7th largest contributor to global emissions. Adoption of emission reduction strategies is hindered by a lack of reliable monitoring protocols as well as methods to predict the effect of different reduction strategies. The collaboration between researchers and water utilities in this project on a nationwide emissions monitoring campaign will underpin development of a reliable emission monitoring protocol as well as new methods and software to accurately predict emissions for different treatment pond and sewer biological and operational conditions. In parallel, laboratory studies of microbial activity will suggest potential emission reduction strategies for different pond and sewer conditions. The new tools and knowledge developed will give water utilities confidence to implement emission reduction strategies, leading to a more sustainable water industry, supporting Australia's push toward net-zero emissions by 2050 and informing GHG accounting guidelines for the water industry worldwide.								

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LP220100450  Thurecht, Prof Kristofer J	<b>Understanding production and application of alpha emitting radionuclides</b>  This project aims to develop new materials to improve the efficiency of production of radionuclides, as well as tools to improve our understanding of isotope decay products to improve efficiency of delivery. High performance polymers will be evaluated to establish optimal design properties for enhanced radionuclide collection from novel generators of isotopic lead (Pb-212), and new methods will be developed to improve understanding of isotope product stability. Anticipated outcomes will provide greater production and utility of radioisotopes in radiopharmaceuticals, while building strong ties with partner AdvanCell Isotopes. This could improve manufacture of radionuclides, expanding capability and applications in radiopharmaceuticals.	104,079.00	205,658.00	142,368.50	40,789.50	0.00	0.00	492,895.00	ADVANCELL ISOTOPES PTY LIMITED
	<b>National Interest Test Statement</b>  This project describes the exploration of new processes to enhance the impact and outcome of applications that involve alpha radionuclides. These form part of the emerging and highly potent class of radiopharmaceuticals. New polymer materials will be evaluated as a means to improve manufacturing and production efficiency of the radionuclides, while dedicated assays will be designed to facilitate new knowledge regarding the effect of isotopes and the decay products on biological materials. The project addresses key manufacturing and technological gaps in translation of next generation radiopharmaceuticals; Australia is a key international player in this field and this project seeks to ensure sovereign capability and capacity to produce the necessary radionuclide at economically-viable scale. Outcomes of the research will streamline the production of radioisotopes, providing economic benefits through new and more efficiently produced products. The project works collaboratively with industry, addressing industry-focussed challenges in the production of radiopharmaceuticals to address future health challenges.								
	<b>The University of Queensland</b>	680,192.50	1,525,413.00	1,435,474.50	590,254.00	0.00	0.00	4,231,334.00	
	<b>University of Southern Queensland</b>								
LP220100084  Martin, A/Prof Anke	<b>Novel biological and genetic disease control tools for the barley industry</b>  This project places Australian barley breeders at the forefront of disease resistance by providing them with novel tools to develop varieties with enhanced protection against fungal diseases. The aims are to produce fungal strains with multiple virulence genes for fast and cost-effective testing of barley lines, untangle the fungal/host gene interaction for resistance breeding and identify new sources of resistance. The outcomes will lead to the commercialisation by Australian breeding companies of barley varieties with durable fungal resistance. This will benefit the Australian economy by providing sustainability and protection for barley breeding thereby significantly reducing crop losses for this important global agricultural commodity.	96,615.50	195,695.50	196,748.50	97,668.50	0.00	0.00	586,728.00	INTERGRAIN PTY LTD, DEPARTMENT OF AGRICULTURE AND FISHERIES, ACKERMANN SAATZUCHT GMBH AND CO.KG
	<b>National Interest Test Statement</b>  Barley is grown across Australia and is worth \$3 billion/year. For barley production to be sustainable, there is a critical need for effective genetic resistance to fungal pathogens. The industry currently suffers up to \$117M annually in lost yields. This project brings together Australian researchers, breeding companies and a state department, to develop innovative solutions to major fungal disease challenges facing the barley industry. We expect to provide Australian barley breeders with ground-breaking biological and genetic tools to speed-up the production of barley varieties resistant to fungal disease which will lead to the development of new varieties of resistant barley. Working with our industry and state government partners, we envision a new variety will be commercialised within five years post-project completion. This will enable a clear adoption and transfer pathway to barley breeders, thereby increasing market uptake.								

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LP220100278 Song, Prof Pingan	<b>Fire-Retardant Composite Resins for Bushfire-Safe Wind Farm Infrastructures</b>  This project aims to develop advanced fire-retardant composite resins for manufacturing bushfire-safe wind farm infrastructures. The innovation of the project is the development of a new class of low-cost, novel, highly effective fire retardants and their value-added fire-retardant composite resins with well-preserved physical properties. This will be achieved by understanding the composition-property relationship of fire retardants and optimising their synthetic parameters. The project will help position Australia's advanced composite manufacturing at the forefront of technology. It will also accelerate Australia's energy transition to renewables by enabling bushfire-safe wind farm infrastructure.	65,212.50	154,720.00	155,084.00	65,576.50	0.00	0.00	440,593.00	NINGBO MIRUO ELECTRONIC TECHNOLOGY CO., LTD., ALLNEX COMPOSITES, ACCIONA ENERGY OCEANIA PTY LTD
	<b>National Interest Test Statement</b>  Wind turbine blades are highly susceptible to the risk of Australian seasonal bushfires. Existing fire retardants are either not eco-friendly, too expensive, or have limited efficiency. By addressing these key technical challenges, this project will develop green, highly effective yet commercially competitive fire retardants for developing new fire-retardant materials used for the manufacture of wind farm infrastructures. Key benefits of the project include strengthening the Australian advanced composites manufacturing supply chain for bushfire-safe wind farm infrastructures, and creating new job opportunities. The project will position Australia as a lead in skills development for clean energy manufacturing – a priority in regional Australia. Environmentally, the project will help accelerate Australia's transition to clean energy. Patentable technologies for producing these new materials will be commercialised by industry partners collaboratively. The project will advance the maturation of these novel materials, so they are closer to commercialisation.								
	<b>University of Southern Queensland</b>	161,828.00	350,415.50	351,832.50	163,245.00	0.00	0.00	1,027,321.00	
	<b>Queensland</b>	1,182,704.50	2,543,921.00	2,401,785.50	1,040,569.00	0.00	0.00	7,168,980.00	

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(Columns 1 and 2)	(Column 3)							(Column 10)	(Column 11)
<b>South Australia</b>									
<b>Flinders University</b>									
LP220100143 Brady, A/Prof Liam M	<b>Investigating the archaeological values of Marra cultural heritage sites</b>  This project aims to investigate the archaeological landscape of Limmen National Park, the traditional Country of the Marra people, and to inform the creation of a cultural heritage management plan. It builds on a long-standing relationship with the Marra and the urgency to preserve their cultural knowledge associated with the Park. The project will use a two-way thinking methodology, combining contemporary Aboriginal knowledge with archaeological and anthropological data to understand the meaning of the archaeological record for Aboriginal people today. Key outcomes include data for continent-wide archaeological narratives, a holistic blueprint to help manage the Park's cultural heritage, and an archive for Traditional Owner research.	71,500.50	162,639.50	187,050.50	190,316.50	145,844.50	51,439.50	808,791.00	PARKS & WILDLIFE COMMISSION OF THE NORTHERN TERRITORY, THE TRUSTEE FOR MCARTHUR RIVER MINE COMMUNITY BENEFITS TRUST, MABUNJI ABORIGINAL RESOURCE INDIGENOUS CORPORATION
<b>National Interest Test Statement</b>									
This research will raise awareness of the rich archaeological and Aboriginal history in one of Australia's most remote National Parks. The research will add a new layer to the story of Australia's past and provide new insights into the relationship between cultural heritage and Indigenous health and well-being. Project results will generate benefits for the Northern Territory tourism industry and contribute to national conversations around how best to manage Australia's cultural heritage and history in remote areas. The project's social benefits include promoting Indigenous connection with their cultural heritage and helping facilitate cultural education programs in remote areas. By collaborating with Traditional Owners and the Park's managers, the project also seeks to build employment pathways for younger generations to work in the nation's National Park system.									
LP220100220 Cations, Dr Monica L	<b>Safe and accessible care for older survivors of psychological trauma</b>  This project aims to improve the safety and accessibility of community aged care services for older survivors of psychological trauma, particularly those from diverse populations. We will co-design and test a practice framework that transforms the conceptual principles of trauma-informed care into actionable care behaviours and processes for implementation. Outcomes will include a world-first roadmap to guide implementation of trauma-informed aged care, as well for policy makers to regulate and monitor its delivery. The project will also increase knowledge about the priorities for change within aged care from the perspective of older trauma survivors, and improve understanding of how best to engage this group in co-design.	30,638.50	73,138.50	67,500.00	25,000.00	0.00	0.00	196,277.00	AGED CARE & HOUSING GROUP INC, SA DEPARTMENT FOR HEALTH AND WELLBEING
<b>National Interest Test Statement</b>									
Community aged care services provide older people with support to live well and avoid hospitalisation, premature entry into residential aged care, and other outcomes with major associated public costs. However, research demonstrates that people who have survived psychologically traumatic events, commonly from diverse groups including veterans, migrants, and Care Leavers, delay or avoid accessing aged care for fear of re-traumatisation. The recent Royal Commission into Aged Care Quality and Safety recommended implementation of trauma-informed models of care into aged care, but providers and policy makers lack tools and expertise to guide them. Working together with older trauma survivors, aged care providers, and policy-makers, we will co-design and test a Framework to support the sector to implement and monitor the delivery of trauma-informed care. By supporting the aged care sector to deliver safe, suitable, and accessible care, this project will promote early access to effective care for marginalised older Australians, promote quality of care delivery, and reduce the risk of costly adverse outcomes.									
<b>Flinders University</b>		102,139.00	235,778.00	254,550.50	215,316.50	145,844.50	51,439.50	1,005,068.00	

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(Columns 1 and 2)	(Column 3)							(Column 10)	(Column 11)
<b>The University of Adelaide</b>									
LP220100022	<b>Multiscale geomechanical modelling of basin-scale CO2 storage</b>	55,459.00	171,576.00	197,818.00	81,701.00	0.00	0.00	506,554.00	DEPARTMENT FOR ENERGY AND MINING, TECH LIMIT PTY LTD, BEACH ENERGY LIMITED
Holford, Prof Simon P	This project aims to develop innovative geomechanical models that will provide rapid assessments of the potential for reservoir deformation, including induced seismicity, during geological storage of CO2. The main expected outcome is a multiscale modelling approach that will help to identify storage locations at low risk for deformation and CO2 leakage in regions of little existing geomechanical data. The project will elucidate the technical and commercial viability of CO2 storage in Australia's Cooper-Eromanga basins and provide broad economic and environmental benefits by reducing the geomechanical uncertainties that provide a barrier to the global need to upscale carbon capture and storage.								
	<b>National Interest Test Statement</b>								
	Carbon capture and storage is a priority technology required to meet Australian and global goals of net zero greenhouse gas emissions by 2050, though its deployment requires considerable upscaling. The most common approach to geological carbon storage is CO2 injection into porous sedimentary rocks, though it is widely known that the injection of fluids (including CO2) into underground geological formations can increase pressures. This can cause faults that are present to weaken and reactivate, which could trigger earthquakes, and allow injected CO2 to escape back to the atmosphere. This project will develop innovative computer models that can be used to identify reservoirs where CO2 injection may trigger earthquakes, and hence assist in the determination of safe and secure sites for underground CO2 storage. Our new approach will be applied to the Cooper-Eromanga Basin in central Australia to help accelerate its status as a leading global hub for carbon capture and storage, whilst contributing to Australia's energy security and emissions reduction goals.								
LP220100403	<b>Ultra-low-loss fluoride glass optical fibres for the future global network</b>	149,790.50	299,709.00	299,661.50	149,743.00	0.00	0.00	898,904.00	FLAWLESS PHOTONICS INC
Ebendorff-Heidepriem, Prof Heike	The transmission loss of silica optical fibres limits the capacity of the global internet. Fluoride glass fibres have the potential of reducing the loss by more than 10 times. This project aims to overcome two of the technological challenges of the ultra-low-loss fluoride fibre optics network: (1) commercial-scale manufacturing of improved fibres and (2) signal amplification at 2.3m. By generating new fundamental knowledge on rare-earth transitions and glass crystal formation, expected outcomes include innovative fibre fabrication methods optimised for space manufacturing. Benefits will include enhanced internet capacity with lower energy requirements, and opportunities for sovereign capability in fluoride fibre fabrication in Australia.								
	<b>National Interest Test Statement</b>								
	The project is about developing key components for the next generation of fibre optic networks to overcome current limits in internet capacity. New optical fibres will be developed based on the fluoride glass type, which has the potential to achieve 10 times higher performance compared to the glass used for current optical fibres. One outcome of the project will be innovative optical fibre fabrication methods that are suitable for manufacturing in space to unleash the potential of fluoride glass fibres for enhanced performance. A second outcome is the development of a new type of signal amplifier that can be used in conjunction with the novel fibres. Further outcomes are Intellectual Property for commercialisation and training of a new generation of researchers. The next generation fibre optics network to be developed in this project will provide greater data capacity bringing Australia virtually closer to the rest of the world. This project provides access to an international partner with a depth of experience in working in space, boosting the emerging Australian space industry.								
	<b>The University of Adelaide</b>	205,249.50	471,285.00	497,479.50	231,444.00	0.00	0.00	1,405,458.00	

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<b>University of South Australia</b>									
LP220100351 O'Boyle, Prof Ian	<b>Social Impact and Connection Outcomes Associated with Community Sport</b>  Outcomes of social connection from community sport are widely touted and supported to exist. However, we know little about how social infrastructure actually delivers these benefits. It is difficult to understand and develop practices that organisations can use to maximise the outcomes of sport participation. This research aims to investigate how social infrastructure delivers social connection outcomes associated with community sport. Expected outcomes include novel practice based tools and guidance for community groups to enhance social connection outcomes and new understanding about the role of social infrastructure in enhancing community connection. Improved social connection is expected to improve resilience and community wellbeing.	95,660.00	185,295.00	182,880.00	93,245.00	0.00	0.00	557,080.00	GOLF AUSTRALIA LIMITED, TOUCH FOOTBALL AUSTRALIA LIMITED, GYMNASTICS AUSTRALIA LIMITED, FOOTBALL FEDERATION AUSTRALIA , BA LIMITED, TENPIN BOWLING AUSTRALIA LIMITED, SURF LIFE SAVING AUSTRALIA LIMITED, SPORTS FEDERATION OF VICTORIA INC, OFFICE FOR RECREATION, SPORT AND RACING
<b>National Interest Test Statement</b>  Australia is being confronted by a rising tide of mental health issues and decreasing levels of community connection. Australia needs to identify and promote pathways to promote community connection which is a recognised key driver of community wellbeing. Among the many positive impacts of participation in community sport in Australia is its ability to deliver positive social, physical and mental health outcomes. The direct physical health benefits of active involvement in sport have been well established, while there is a growing evidence base for the mental health benefits associated with sport. What is not as well established are the social and broader community benefits and outcomes related to social connection, and the social infrastructure that helps to deliver these outcomes. The outcomes of this project will provide actionable strategies to inform best practice and maximise investment in social connection infrastructure in the community sport sector. Specifically, the outcomes of the project will provide guidance to how a strengths-based approach can positively activate social connection.									
	<b>University of South Australia</b>	95,660.00	185,295.00	182,880.00	93,245.00	0.00	0.00	557,080.00	
	<b>South Australia</b>	403,048.50	892,358.00	934,910.00	540,005.50	145,844.50	51,439.50	2,967,606.00	

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## Tasmania

### University of Tasmania

LP220100130	<b>Fostering school attendance for students in Out-of-Home Care</b>	55,407.50	147,261.50	173,766.50	81,912.50	0.00	0.00	458,348.00	LIFE WITHOUT BARRIERS, CREATE FOUNDATION LIMITED, BERRY STREET VICTORIA INCORPORATED, STRONGER SMARTER INSTITUTE LIMITED, ALLAMBI CARE LIMITED, ANGLICARE NSW SOUTH NSW WEST AND ACT, KEY ASSETS THE CHILDREN'S SERVICES PROVIDER (AUSTRALIA) LIMITED, MACKILLOP FAMILY SERVICES LIMITED, COMMISSIONER FOR CHILDREN AND YOUNG PEOPLE TASMANIA
Te Riele, Prof Katarina M	This project aims to investigate why children and young people in Out-Of-Home-Care in Australia are absent from school far more than their peers. The project expects to generate new knowledge about the reasons for their absences and to develop solutions to improve attendance through: children's own voices; detailed absence data; policy audit; and case studies of promising practice. Expected outcomes include a comprehensive conceptualisation of absences including those triggered by schools or the care context; and an evidence-informed, child-centred framework to enable attendance and, thereby, improved educational outcomes. This should provide significant social and economic benefits both for children in care and for the community.								

#### National Interest Test Statement

Absence from school harms students' social and academic outcomes. Students in Out-Of-Home-Care are absent from school far more than their peers and have lower academic attainment and Year 12 completion. Attendance as a fundamental enabler for improving their outcomes has been largely overlooked in research, policy and practice. This project will address this gap and overcome traditional silos by using an interdisciplinary approach to 1) ascertain why students in care are absent from school and 2) create a practical toolkit for schools, education systems, and Out-Of-Home-Care providers to improve attendance. Improved attendance will lead to better educational outcomes and life opportunities for students. In turn, for Australia this will enhance social cohesion and productivity, and reduce fiscal and social costs of welfare dependency, crime and ill-health. The project has wide reach across jurisdictions and sectors and will substantially contribute to government priorities for vulnerable students in the Alice Springs (Mparntwe) Education Declaration, Out-of-Home Care Standards, and Closing the Gap Agreement.

LP220100252	<b>Improved electrophoretic analyser for water quality monitoring</b>	129,637.00	259,274.00	242,782.00	140,268.00	27,123.00	0.00	799,084.00	ECO DETECTION PTY LTD
Breadmore, Prof Michael	This proposal will advance the Australian made Eco Detection portable electrophoretic analyser for autonomous monitoring of water chemistry - the Eco Sensor. We will re-design and miniaturise the fluidic manifold to reduce capital- and per-sample cost, increase the sensitivity of nutrients - nitrate and phosphate - by 100-times in both fresh- and sea-waters, and develop new ultra-sensitive reagents for heavy metal detection at environmentally regulated levels. This will provide a single platform for at-site near-real-time monitoring of water chemistry for agricultural, mining, water corporations and other industries that use and/or discharge water to the environment.								

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	<b>National Interest Test Statement</b>	<p>The project will develop the most advanced near-real-time water quality monitoring system in the world for nutrients and heavy metals in natural and industrial waters. This will be of benefit to agricultural, mining, water corporations and other industries. Specifically, providing high quality high time-resolution data in near-real time will allow decisions to be made, such as whether effluent is below environmental guidelines and is safe to discharge into our rivers. This will benefit Australia by generating timely and accurate information which will enable environmentally responsible decisions concerning water use to be made, and will allow organisations to be more accountable for their immediate environment. The instrument is based on Australian research – prototype funded through LP140100858 – and is manufactured in Melbourne by Eco Detection, and will have global impact as the only platform capable of providing single-figure ppb detection limits for all the major nutrients in waters ranging from fresh- to sea-water.</p>							
LP220100362  Jones, Prof Menna E	<b>Experimental translocations to understand and combat eastern quoll declines</b>  The project aims to understand the causes of observed declines of the eastern quoll in Tasmania, and develop tools to safeguard this species in their last wild stronghold. The project will test the innovative approach of undertaking a series of experimental translocations at an early stage of a population decline. This approach will provide reliable information on the causes of observed declines, while simultaneously testing the effectiveness of translocations of captive-bred animals as a management tool for the species. It will also develop evidence-based protocols for undertaking captive-bred translocations, to improve the outcomes of eastern quoll recovery efforts as well as promoting early intervention for other declining species.	57,446.00	162,479.00	222,831.50	249,960.00	209,611.50	77,450.00	979,778.00	TASMANIAN LAND CONSERVANCY INC., WORLD WIDE FUND FOR NATURE AUSTRALIA
	<b>National Interest Test Statement</b>	<p>The project aims to understand the causes of observed declines of the eastern quoll in Tasmania, its last remaining wild stronghold. It also aims to develop evidence-based tools to address these declines before numbers of the species reach critically low levels. The research will therefore help to protect the nationally endangered eastern quoll, one of the 100 priority species named in the Australian Government's Threatened Species Strategy 2021-2031. This iconic carnivore is a key component of Tasmanian ecosystems, and an important predator of agricultural pest species such as corbie grubs and cockchafer beetles, which damage pasture and forage for livestock industries. The project will also benefit Australian conservation more generally by establishing early intervention protocols, which can be applied beyond the current case study to reduce the costs and risks of recovery efforts for other native species. Partner Organisation WWF Australia is well-placed to implement research outcomes beyond the current project, as they are integral to ongoing wildlife restoration projects in Australia and globally.</p>							
	<b>University of Tasmania</b>	242,490.50	569,014.50	639,380.00	472,140.50	236,734.50	77,450.00	2,237,210.00	
	<b>Tasmania</b>	242,490.50	569,014.50	639,380.00	472,140.50	236,734.50	77,450.00	2,237,210.00	



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## Victoria

### Deakin University

LP220100053	<b>Supporting the sustainability of Australia's local news ecosystem</b>	65,513.00	130,423.50	92,836.50	27,926.00	0.00	0.00	316,699.00	AUSTRALIAN BROADCASTING CORPORATION
Hess, Prof Kristy M	<p>This project aims to understand how Australia's main public broadcaster, the ABC, can best support public interest journalism in rural and regional communities, with a specific focus on fragile and underserved areas of the nation's local news ecosystem. The project will develop new knowledge around media power and how news providers can work together to secure the sustainability of local news. Expected outcomes include a framework to identify and define areas of news need, an assessment of existing interventions and road-tested approaches to improve information quality. The project should provide benefits by supporting forms of local journalism that ultimately enhances the demographic health and social fabric of small towns and cities.</p> <p><b>National Interest Test Statement</b></p> <p>The sustainability of local news is an urgent national policy issue yet there is little research that examines the effectiveness of existing solutions and interventions and what role public broadcasting can play in leading collaborations and initiatives to secure news sustainability. This project will examine how Australia's main public broadcaster, the ABC, can best support public interest journalism in rural and regional communities, with a specific focus on fragile and underserved areas of the nation's local news ecosystem. Expected outcomes include defined areas of news need, an assessment of existing interventions and road-test targeted approaches to improve the quality of news and information. Addressing this knowledge gap will benefit hundreds of rural/regional communities by ensuring access to quality, reliable and relevant information essential to democracy and which strengthens the social fabric. The project will also benefit policymakers, researchers and industry by providing an evidence-based framework to guide initiatives that enhance public interest journalism.</p>								
	<b>Deakin University</b>	65,513.00	130,423.50	92,836.50	27,926.00	0.00	0.00	316,699.00	

### La Trobe University

LP220100293	<b>Outcomes of specialist disability housing for people with disability</b>	94,175.50	178,789.50	172,164.50	87,550.50	0.00	0.00	532,680.00	SUMMER FOUNDATION LTD, TELSTRA FOUNDATION LTD, LIGHT WARRIOR GROUP, NATIONAL DISABILITY INSURANCE AGENCY, ENLIVEN HOUSING PTY LTD, SPECIALISED ACCOMMODATION SOLUTIONS PTY LIMITED, SANA LIVING, LIGHTHOUSE INFRASTRUCTURE MANAGEMENT LIMITED
Douglas, Em/Prof Jacinta M	<p>This project aims to systematically investigate the experience, outcomes and economic impact of people with disability moving into specialist disability accommodation housing. Health, wellbeing, community participation, support outcomes and lived experience of people with disability will be measured before moving and over 2 years after they move. The project provides the opportunity to identify the personal, disability, housing and support factors that shape outcomes for people with disability. The intended outcome is comprehensive knowledge that can inform policy, build evidence across housing, technology, support and disability sectors and ultimately benefit people with disability by generating innovative practice in housing and support.</p>								

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<b>National Interest Test Statement</b>									
Suitable accessible and affordable housing is critical to the health, wellbeing and economic and social participation of National Disability Insurance Scheme participants. This project focuses on understanding the lived experience, individual outcomes and economic impact of people with disability moving into housing with specialist disability accommodation funding. The housing developed by the SDA market for 28,000 people with disability is social infrastructure that will be used for the next 30 years. Findings from this project will create evidence that reflects the diverse needs of people with disability and provides insights and market data to inform policy and influence the development of quality, cost-effective and innovative housing for people with disability. Measuring outcomes and impact is critical to expanding social investment in housing for people with disability. This project will generate new knowledge and establish Australia as a leader in evidence-based, innovative and cost-effective housing, technology and support options that generate lasting positive outcomes for people with disability.									
	<b>La Trobe University</b>	94,175.50	178,789.50	172,164.50	87,550.50	0.00	0.00	532,680.00	
<b>Monash University</b>									
LP220100016  Kulic, Prof Dana	<b>Intelligent Robotics for Pharmaceutical Formulation Development</b>  This project aims to transform the labour and time-intensive process of drug formulation development by optimising the process workflow, through collaboration between biochemists and the proposed intelligent and scalable robotic system. This project expects to enable the robot to leverage the expert knowledge of the biochemists while automating rote tasks. The expected outcome of this project is an intelligent robot that can collaborate with human coworkers to accelerate drug formulation. This should provide significant benefits by lowering drug costs and the development time of new drugs.	79,085.00	162,630.50	158,708.50	75,163.00	0.00	0.00	475,587.00	CSL BEHRING (AUSTRALIA) PTY LTD
<b>National Interest Test Statement</b>									
The COVID-19 pandemic has taught us that fast development and manufacture of drugs or vaccines to combat an emerging virus or disease are crucial for both health and economic wellbeing. Yet, the current drug formulation process is slow and laborious and requires biochemists to perform many experiments manually. This project seeks to develop an intelligent robotic system that can collaborate with humans and automate some of these laborious experimental tasks more efficiently and effectively, which is an essential step to bring us closer to Industry 5.0, for humans and robots to work together for more efficient and cost-effective solutions. This ultimately leads to significant commercial benefits for the industry and millions of Australians in need, through lower drug costs and faster delivery of crucial new drugs.									
LP220100196  Moore, A/Prof Anthony B	<b>Comedy Country: Australian Performance Comedy as an Agent of Change</b>  Comedy Country aims to investigate the development of comic performance and its transformational relation with, and impact on, Australian society, culture and the creative industries from the aftermath of World War 2 until the present. The project's key hypothesis is that since the 1950s comic performance has not merely reflected a changing Australia but helped drive social and cultural transformation. The project partners with two festivals, five cultural collecting organisations and a media production company to build interdisciplinary Humanities and Social Sciences/industry collaborations in digital methods for archive research and transmedia communication, and deliver digital exhibitions, documentaries, podcasts and scholarly histories.	118,067.00	229,608.50	217,649.00	189,684.50	83,577.00	0.00	838,586.00	ARTS CENTRE MELBOURNE, MELBOURNE INTERNATIONAL COMEDY FESTIVAL LIMITED, STATE LIBRARY OF SOUTH AUSTRALIA, HISTORY TRUST OF SOUTH AUSTRALIA, ADELAIDE FRINGE INC, ROAR FILM PTY LTD, STATE LIBRARY OF VICTORIA, ADELAIDE FESTIVAL CENTRE TRUST

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<b>National Interest Test Statement</b>									
Comedy is a central element of Australia's identity, and a major contributor to our creative industries. However, its tangible value is poorly understood. This project seeks to establish the cultural and economic value of performance comedy to Australia, examining a range of live and mediated forms and recognising the contribution of Indigenous comedy. The project will enable the emergence of new knowledge by collaborating with industry and archival collections to identify the innovative ways in which comedy has adapted to changing conditions over the past seventy years. The findings will benefit Australia through a range of engagement strategies aimed at policy makers, industry and the public. These will inform policy development for the continuing economic and cultural vitality of comedy; deliver skills for the new cultural economy by creating an online collaborative and interactive hub, linking researchers, collections, festivals and performers; and communicate the cultural value of comedy through the public distribution of curated forms of media content and interactive storytelling.									
LP220100365	<b>Nanoengineered, Encapsulated Catalysts from Fly Ash Waste</b>	120,292.00	264,216.50	253,343.00	109,418.50	0.00	0.00	747,270.00	ADVANCED FUEL INNOVATION PTY LTD, LATROBE MAGNESIUM LIMITED
Zhang, A/Prof Lian	This project aims to deliver advanced catalysts and novel catalyst synthesis methods from the use of iron-rich fly ash, an otherwise abundant valueless waste with projected steady growth across Australia and globally. The as-synthesised catalysts are expected to be applicable to and exhibit excellent activity in the production of green hydrogen and renewable bio-fuels from lignocellulosic waste. These efforts are significant and beneficial in restoring the manufacturing capability of Australian industry, driving Australian industry towards the development of a circular economy for the appropriate management of solid waste, as well as for a seamless introduction of renewable and clean energy sources to address the pressing climate change.								
<b>National Interest Test Statement</b>									
Coal-fired power plants produce a large amount of a solid waste product known as fly ash. This fly ash is collected and, traditionally, landfilled, causing long-term environmental concerns such as soil and water contamination. These negative impacts are felt mostly in rural areas, where power plants are mainly located, and millions of tonnes of fly ash have been produced as a legacy from the existing and decommissioned power plants. The project seeks to divert fly ash from landfilling into higher-value products. It will develop new chemical catalysts and demonstrate their use at pilot-scale. Their scale up through local manufacturing would foster the creation of substantial jobs and revenue streams. These new products could then be commercialised in a broad variety of clean and renewable energy applications, which will promote a smooth transition to a carbon-neutral future economy for Australian industry.									
LP220100400	<b>Hybrid additive manufacturing of critical metallic components</b>	94,449.00	166,372.50	139,225.00	67,301.50	0.00	0.00	467,348.00	AMPRO INNOVATIONS PTY LTD
Huang, Prof Aijun	This project aims to combine world-class expertise and facilities to deliver on-demand and advanced alloy components produced by revolutionary hybrid additive manufacturing technology, along with applicable processing parameters and post-process schemes for fabricating high-performance metal products for space and aerospace applications. The intended outcomes of this project include the delivery of a knowledge platform for fabricating alloy parts that have unprecedented high-temperature mechanical properties and environmental performance and providing significant benefits for the industry partner to establish its international portfolio of high-profit products.								
<b>National Interest Test Statement</b>									
Additive manufacturing, or 3D printing, is widely regarded as a game-changing emerging technology. However, its use for printing load-bearing metal components required by the space and aerospace industry is extremely limited due to printing defects and concerns over product strength and durability. This project aims to overcome current limitations by using a revolutionary hybrid additive manufacturing technology to reduce underlying defects and produce a more reliable product. The research will provide a crucial knowledge platform and enable development of a novel hybrid micro-rolling and printing technology to create a wide range of novel critical products with superior performance for the aerospace industry. The hybrid additive manufacturing system and the new printed products they enable will be high-profit and generate significant revenue, expanding the technology to a much wider range of load-bearing and critical applications. This will substantially improve the international competitiveness of Australian industry, enhancing Australia's sovereign capability in emerging cutting-edge manufacturing.									
	<b>Monash University</b>	411,893.00	822,828.00	768,925.50	441,567.50	83,577.00	0.00	2,528,791.00	

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<b>RMIT University</b>									
LP220100066 Innocent, Dr Troy C	<p><b>Play about Place: Expanding the impact of Creative Placemaking after COVID</b></p> <p>This project aims to establish a new approach to placemaking through the development of urban play projects. The project expects to generate affordable and engaging experiences that activate existing public spaces, a typology and methodology for analysing the impacts of urban play, and a comparative study of urban play in Melbourne and Christchurch. Expected outcomes include creative placemaking strategies and projects, a connected impact study, and an industry resource for local government outlining our approach. This should provide significant benefits, including First Peoples storytelling experiences, city activation post-pandemic, community engagement, the potential to create jobs and provide economic and social benefit for Australia.</p> <p><b>National Interest Test Statement</b></p> <p>The COVID pandemic has changed the way that people use urban spaces. This project will demonstrate how urban planning can use creativity and playfulness to invigorate the social and cultural life of our cities. This project will establish and test playful urban environments to show how cities can adapt to the way we now live. This research will seek to influence the design of cities to create environments that offer more flexible lifestyle choices, nurture our physical and mental health, and provide a range of business and employment opportunities. This will lead to improved economic outcomes for small businesses; community cohesion through opportunities to participate in local activities; and improved health and wellbeing from increased time spent outdoors. The researchers will work collaboratively with local government strategists and policy makers to activate public spaces. To promote the research more broadly, we will share our findings through articles for arts industry networks, public presentations, and an app that playfully links people to local arts and cultural events.</p>	53,678.50	108,607.50	107,152.00	52,223.00	0.00	0.00	321,661.00	GAP FILLER, CITY OF PORT PHILLIP, STONNINGTON CITY COUNCIL, CHRISTCHURCH CITY COUNCIL, CHRISTCHURCHNZ
LP220100088 Ma, Prof Tianyi	<p><b>Engineering vanadium oxide-based cathode for aqueous ammonium ion batteries</b></p> <p>This project aims to develop the next-generation rechargeable aqueous ammonium ion batteries and the scaled-up prototypes. It will be innovatively powered by nonmetallic charge carriers to show superior safety, low cost, high rate and cycle performance, and large capacity, ensuring realistic implementation for industrial purposes. Expected outcomes include a series of chemically and morphologically tuned vanadium oxide-based cathode materials, a novel and reliable working principle based on reversible ammonium ion storage, and battery pack prototypes targeting industry demanded energy density and lifespan. Via industrial pilot trials, commercial benefits will be fast tracked for clean energy storage, net zero future and industry upgrades.</p> <p><b>National Interest Test Statement</b></p> <p>This project will design and fabricate at lab scale and manufacture on an industry production line, the rechargeable aqueous ammonium ion batteries from environmental-friendly and cheap raw materials. This novel energy storage technology will address common and major concerns of existing battery technologies by substantially outperforming them with high safety, low price, large power and long life. By boosting lab-scale research to industry manufacture and real-world deployment, the project will facilitate R&amp;D of new energy storage materials and devices, putting Australia at the forefront of renewable energy science and technology, as well as promote battery, auto and related industry upgrades, reaping huge savings for the clean energy industry and creating substantial job opportunities. Via the co-development of academia and industry with combined research, manufacture and market development capabilities, a clear pathway is secured starting from fundamental battery technology breakthroughs, battery scaled-up production, end-user engagement, to potential commercialisation.</p>	89,448.00	187,739.00	194,122.50	95,831.50	0.00	0.00	567,141.00	GRAPHENEX PTY LTD

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(Columns 1 and 2) (Column 3)									
LP220100191	<b>Extinction Imaginaries: Mapping Affective Visual Cultures in Australasia</b>	43,141.50	113,229.50	123,289.50	53,201.50	0.00	0.00	332,862.00	SAFFRON AID (AUSTRALIA) PTY LTD, GREENPEACE AUSTRALIA PACIFIC LIMITED
Williams, Em/Prof Linda V	This project aims to provide NGOs with new strategies for raising awareness of environmental change by investigating what animal extinction means to Australians. Australasia has the highest global extinction rates, yet despite the wide circulation of visual images of extinction little is known about how they affect people. The project expects to address this critical gap by bringing innovative methodologies to the analysis of public responses to images of extinction and how they affect social imaginaries. Expected outcomes include research translations with environmental NGOs which should provide significant benefits by addressing public concern for the deteriorating ecosystems that future generations will inherit.								
	<b>National Interest Test Statement</b>								
	There is little public awareness of the fact that Australasia faces a crisis of declining biodiversity due to the highest rates of species extinction in the world. This project aims to understand what images of extinction mean to Australians, and how imagery can spur people to redress extinction rates. The research will document recent images of extinction and the ways people feel about them. We will then use this data to design a model for effective extinction prevention strategies. Seeking to influence Australian culture towards a greater appreciation of our fragile ecosystems, this research will lead to improved, targeted conservation campaigns that will strive to protect our natural environment. In collaboration with key environmental organisations, the research team will develop strategies and resources, such as an archive of effective images, designs and data visualisation to maximise the benefit of environmental campaigns.								
	<b>RMIT University</b>	186,268.00	409,576.00	424,564.00	201,256.00	0.00	0.00	1,221,664.00	
<b>Swinburne University of Technology</b>									
LP220100099	<b>Biocemented recycled glass columns: Green technology for ground improvement</b>	85,000.00	170,000.00	170,000.00	85,000.00	0.00	0.00	510,000.00	ASAS FOUNDATIONS PTY LTD, STRETFORD CIVIL CONSTRUCTIONS PTY LTD
Arulrajah, Prof Arul	This project aims to develop a green ground improvement technology using biocemented recycled glass column inclusions. This project expects to generate new knowledge on the performance of novel biocemented glass wastes when used as ground inclusions to improve the engineering properties of problematic soils subjected to traffic loads, through experimental, numerical approaches and field trials. Expected outcomes include evaluating the performance of biocemented recycled glass via experiments, establishing constitutive models, developing numerical tools and building enduring collaborations with industry. Benefits include diversion of wastes from landfills, reduction in greenhouse gas emissions and commercial applications of glass wastes.								
	<b>National Interest Test Statement</b>								
	Current technologies used for ground improvement in construction utilise virgin quarry materials and significant quantities of cement or lime. This project explores an alternative green ground improvement technology by using recycled glass wastes and an environmentally friendly biocement. This project will benefit Australian civil construction and waste management industries by opening new markets for recycled wastes and biocement in ground improvement projects, significantly reducing carbon footprint, and achieving longer lifespan than traditional methods. National benefits arising from this research include: (a) carbon savings by the diversion of 1.2 million tonnes of glass wastes annually from Australian landfills, (b) reducing carbon emissions by 50% compared to traditional methods with the novel usage of biocement, (c) significant reduction in the need for quarry materials, (d) economic benefits in cost savings by eliminating long-haul transportation of depleting quarry resources (~ \$82 million/annum), and (e) opening new markets for Australia's civil construction and waste management industries.								

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(Columns 1 and 2) (Column 3)		(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)	(Column 9)	(Column 10)	(Column 11)
LP220100419 Pedell, Prof Sonja	<p><b>Codesigning processes to improve technology service provision for aged care</b></p> <p>This research investigates the learning and implementation of novel technologies applying a participatory approach with aged care residents. In partnership with Martin Luther Homes (a not-for-profit aged care provider) and The Brainary (an educational technology provider), we will co-design recommendations and innovative services that are necessary to enable strategic planning and technology uptake of residents. We create value through the shared goal orientation bringing use of technology in aged care and business together as a service. Co-creating processes exploring technologies with older adults will translate into residents receiving the support they need. We can expect to achieve better quality of care and equity in technology use.</p> <p><b>National Interest Test Statement</b></p> <p>This project aims to improve the experience of technology use and provision in residential care. Despite using technology such as smartphones for information and connection, older adults often feel overwhelmed by technology. Staff in residential care often do not have the time or skills to support technology set up or training for residents as part of their activity programs. There is no possibility for trialling different novel technologies before purchasing, so expensive technology remains unused or is not updated due to inadequate business models. In collaborating with a technology provider for educational robots and robotic kits used in schools, older adults can explore and gain an understanding on the mechanics and benefits of technologies. We anticipate our approach will increase self-efficacy and enable residents to transfer the knowledge to other technology. We will co-design a set of recommendations for innovative service models to bring effective use of technology in aged care and business together. These outcomes can be implemented by businesses to improve technology take up in aged care settings.</p>	29,432.00	58,864.00	58,864.00	29,432.00	0.00	0.00	176,592.00	MARTIN LUTHER HOMES BORONIA INC., BRAINARY INTERACTIVE
LP220100482 He, A/Prof Qiang	<p><b>Cost-effective and Reliable Edge Caching for Software Vendors</b></p> <p>This project aims to deliver a suite of models and techniques for cost-effective and reliable data caching in the multi-access edge computing (MEC) environment facilitated by 5G mobile network. MEC offers great promises for rapidly advancing mobile and IoT applications in various domains in Australia, e.g., smart cities, remote medical services, advanced manufacturing, etc. Combining graph analytics, optimisation techniques and game theory, this project tackles the new challenges in the placement, update and adaptation of edge data faced by software vendors embracing 5G. The outcomes can ease software vendors' cost and security concerns during the transition from 4G to 5G, and significantly promote the wave of 5G innovation in Australia.</p> <p><b>National Interest Test Statement</b></p> <p>Innovations in many Australian industries like health, education and manufacturing require a fast and powerful mobile data network. Over 5G networks, software vendors can provide ultra-fast data access by hosting their data at locations close to end-users and their devices (known as edge caching). Since edge caching follows the pay-as-you-go business model, it is important to decide which and how many computing resources a business requires. What is the best way to utilise these resources to reduce costs, minimise service delays, and improve data reliability? This project will investigate and develop a suite of techniques offering practical solutions to how a business chooses to store and access data over 5G networks. The techniques will be used by our industry partner to economically and securely provide virtual and augmented reality classes on their education platform. The outcomes will help remove an economic barrier to Australian businesses' transition to 5G, particularly small businesses in telehealth, remote work and online education, where fast, cost-effective, and reliable communication is essential.</p>	83,793.00	163,222.50	162,532.50	83,103.00	0.00	0.00	492,651.00	AIBUILD PTY LTD
	<b>Swinburne University of Technology</b>	198,225.00	392,086.50	391,396.50	197,535.00	0.00	0.00	1,179,243.00	

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<b>The University of Melbourne</b>									
LP220100076 Diprose, Dr Rachael	<p><b>Building Durable Responses to Gender Inequality in Indonesia</b></p> <p>This project aims to produce the first longitudinal and comparative study of which aspects of gender equity and women's empowerment interventions prove most durable for addressing gender inequality in Indonesia, despite external shocks such as the pandemic. The project produces an analysis of how women might remain resilient over time and the pathways by which durability is achieved in improving women's wellbeing and gender relations in communities, and inclusive policies and institutions. Analysis will generate, translate and share new knowledge benefiting civil society partners, academics, policy makers and development practitioners in Indonesia, Australia and beyond, so gender equality interventions can better withstand future shocks.</p>	82,370.00	155,717.00	148,849.50	156,638.00	81,135.50	0.00	624,710.00	KOPERNIK, KAPAL PEREMPUAN, PEKKA, WOMEN HEADED FAMILY EMPOWERMENT, THE INDONESIAN FOUNDATION FOR RURAL CAPACITY BUILDING, THE FORUM FOR SERVICE PROVIDERS, THE EASTERN INDONESIA KNOWLEDGE EXCHANGE FOUNDATION, GADJAH MADA UNIVERSITY
	<p><b>National Interest Test Statement</b></p> <p>The Governments of Australia and Indonesia, our neighbour and strategic partner, recognise that gender equality is key to socioeconomic prosperity and have a direct interest in halting and addressing any reversals in gender equity resulting from the pandemic. This project supports Australia's foreign policy objectives of achieving gender equality and mitigating poverty in the Asia-Pacific region, thereby strengthening Australia's political and economic security. External shocks, such as the recent pandemic, can increase inequalities and regional instability, undermining the effectiveness of Australia's past (\$1.3 billion) and future (\$128 million in Indonesia) aid investments aimed at advancing gender equality. The project produces an analysis of how women might remain resilient over time and the pathways by which durability is achieved in improving women's wellbeing and gender relations in communities, and inclusive policies and institutions. By increasing understanding of how to build gender equity interventions whose outcomes can withstand such shocks, and translating and sharing these findings via a dual-language interactive digital platform and engagement with end-users, the project will help practitioners, including governments and NGOs, to deliver long-lasting and resilient increases in gender equity and regional security.</p>								
LP220100256 Praver, Prof Steven	<p><b>Next generation closed-loop brain-machine interfaces</b></p> <p>Our partners Carbon Cybernetics have developed high-density neural recording and stimulation arrays that employ fine carbon fibres as the electrode material. The aim of the project is to exploit the properties of these materials to develop miniature implantable devices that are able to achieve long-term, closed-loop, high-resolution recording and stimulation within the brain. We aim to demonstrate an advanced algorithm for control of neural function. Devices that interface directly with the brain are increasingly important in neuroscience to understand how the brain processes information and creates memories and self awareness and are critically important to the development of technologies that interface electronics with the human body.</p>	53,000.00	178,000.00	255,000.00	240,184.50	110,184.50	0.00	836,369.00	CARBON CYBERNETICS PTY LTD, GEZELL INC, AUSTRALIAN COLLEGE OF OPTOMETRY
	<p><b>National Interest Test Statement</b></p> <p>This project aims to develop the technology for the next generation of brain machine interfaces using carbon fibre electrodes which interface more smoothly with the brain than existing silicon based devices. The outcome from the project will be a closed-loop, a carbon-based neural stimulation/recording system and advanced neurofeedback algorithms which will provide new tools to understand how the brain processes information to create memories, sensations and cognition. The technology may also significantly improve the performance of cortical prostheses in the treatment of chronic neurological diseases such as epilepsy and depression. Our partners (Carbon Cybernetics, Gezell, Sherbrooke Uni) are actively pursuing commercialization of carbon fibre based devices, thus providing a smooth pathway for the licencing of project outcomes. The project will provide excellent opportunities for the expansion of Australia's advanced manufacturing capability and outstanding opportunities for training a new generation of interdisciplinary scientists who form the backbone of Australia's medical bionics capability.</p>								

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		2022-23 (Column 4)	2023-24 (Column 5)	2024-25 (Column 6)	2025-26* (Column 7)	2026-27* (Column 8)	2027-28* (Column 9)	(Column 10)	(Column 11)
LP220100323  Barraket, Prof Josephine	<p><b>Activating employment futures through work integration social enterprise</b></p> <p>This project aims to understand how Australia can better include people experiencing disadvantage in employment. Social enterprises are increasingly recognised for creating work and pathways into work for those who are typically excluded. Yet, little is known about how they can scale their operations and effectively transition workers into mainstream jobs, and what can be learned from social enterprise in designing other inclusive workplaces. Underpinned by a unique learning partnership, this project is expected to shed light on how decent and inclusive work through social enterprise can be grown. Project insights will contribute to more effective employment services and workplaces that increase the shared benefits of a diverse workforce.</p> <p><b>National Interest Test Statement</b></p> <p>Australia's labour market and employment services have historically under-served people who experience barriers to participation, especially young people, people with disabilities, Indigenous people, refugees and women. Such inequality is deepening under current conditions. At the same time, national priorities for industry transitions to support a more advanced and sustainable economy need a future-ready workforce. This project will advance new solutions to labour market activation in Australia by examining the conditions through which work integration social enterprise (WISE) can scale their employment outcomes for disadvantaged jobseekers. The project will provide positive social benefits by producing knowledge for practitioners and policy makers about how to improve the inclusivity of Australian employment programs and workplaces. It will play an important role in improving employment opportunities for people typically excluded from work by shedding light on the organisational and policy approaches needed to support the scaling of Australian employment outcomes by WISE.</p>	51,442.00	108,383.50	112,539.00	55,597.50	0.00	0.00	327,962.00	WHITE BOX ENTERPRISES LTD, WESTPAC FOUNDATION, STREAT LIMITED, OUTLOOK (AUST.) LIMITED
LP220100407  Ngo, Prof Tuan D	<p><b>Ultralow emission panel systems for rapid modular construction</b></p> <p>This proposed project aims to develop an innovative ultra-low emission precast panel comprising a novel ultra-low carbon concrete mixture that is cast in vertical battery moulds. The new precast panels will have several significant enhancements compared to traditional precast panels, including faster manufacturing, reduced cost, and a much lower carbon footprint and life-cycle costs. A holistic theoretical and design framework will be developed for predicting the behaviour of the innovative precast panel under structural, fire and impact loading. The panel will offer desirable benefits such as industry leading durability, ease of construction and assembly, economy and recyclability.</p> <p><b>National Interest Test Statement</b></p> <p>This project aims to develop a sustainable prefabricated panel system for buildings with a significant enhancement over conventional systems in terms of protection against extreme loads and energy performance over the life of the building. The outcomes from this project will also support more sustainable buildings and improved safety. Design guidelines will be developed to support immediate uptake of the new system in Australia. This project has multiple economic, social, and industry-specific benefits that have the potential to transform the building industry. Each year, the production of cement – a key ingredient in concrete – accounts for around 7 million tonnes of carbon emissions in Australia. The production of the proposed system is expected to generate emissions that are 65% lower than conventional precast concrete panels. This outcome directly supports Australia's Long-Term Emissions Reduction Plan. The project will support employment in offsite advanced manufacturing and build Australia's profile as an international leader in low emissions building technology.</p>	88,832.00	183,998.50	183,754.50	88,588.00	0.00	0.00	545,173.00	SPARK PROPERTY DEVELOPMENT PTY LTD



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(Columns 1 and 2) (Column 3)								(Column 10)	(Column 11)
LP220100417	<b>Muscle-based Signals for Responsive Physically-Assistive Robotics</b>	54,108.50	97,667.00	88,733.50	45,175.00	0.00	0.00	285,684.00	FOURIER INTELLIGENCE CO LTD, THE WOOLMARK COMPANY PTY. LTD.
Oetomo, Prof Denny O	<p>This project aims to develop a physically assistive robot for industrial use that interprets signals from the human user's muscles during a physical activity and responds with appropriate assistance. This is significant because the robot must accommodate the complexity of movement required in industrial settings and adapt to variabilities in muscle activation signals among users that also change in time. The expected research outcome is an intuitive, assistive robot worn by the human workforce that enhances their productivity and longevity, improves working conditions, lowers production costs, and increases workforce resilience. The robot's capabilities will be demonstrated in this project through the challenging activity of sheep shearing.</p> <p><b>National Interest Test Statement</b></p> <p>This project develops a novel human-robot system that accurately interprets the human's intentions and contributes physical assistance in real time. Suitable for industrial applications, the robot will help improve workforce productivity and safety, and quality of work. Sheep shearing will be adopted as a demonstration of the robot's capabilities. Boosting productivity and improving working conditions for shearers is expected to help combat the current workforce shortage, high shearing costs and shearing delays that in recent years, have all impacted Australia's 3.4 billion dollar wool industry. The Woolmark Corporation will represent shearers and wool growers while Fourier Intelligence will manufacture the assistive robots. The project has direct alignment with advanced manufacturing with the assistive robots expected to support the workforce in regional and metropolitan areas in sectors such as construction, advanced manufacturing, mining and healthcare.</p>								
LP220100426	<b>Early life nutrition to improve feed efficiency in commercial dairy goats</b>	107,841.50	183,726.50	157,942.50	82,057.50	0.00	0.00	531,568.00	MEREDITH DAIRY PTY LTD
DiGiacomo, Dr Kristy	<p>This project aims to improve the productivity and welfare and reduce resource waste in commercial dairy goat kids. The Australian dairy goat industry is expanding (~20% per annum) yet there is little research to overcome hurdles to improving milk and meat production. There is also increased societal pressure to improve sustainability, reduce waste and maintain animal welfare. By investigating nutritional methods to improve productivity of male (for meat) and female (for milk) kids, this project will generate new knowledge relevant to Australian and international goat production systems. This project will assist goat producers to make decisions that maximise animal productivity with flow on benefits to manufacturers of goat products.</p> <p><b>National Interest Test Statement</b></p> <p>Food is a key research priority of the Australian government. The continued development of our agriculture sector to meet global demands for animal-based food in a competitive, profitable, sustainable, and high production capacity is critical. Dairy products and ruminant meat are a large source of quality protein and nutrition for human consumption, and production has been steadily increasing in recent years. This project will directly address this priority by examining dairy goat kid feeding practices during growth in an effort to improve feed efficiency by reducing feed costs and waste whilst improving animal welfare. This project will explore ways to grow male dairy goat kids more efficiently as a source of meat for human consumption, reducing animal waste and contributing to a circular economy. Project outcomes will be published in top journals and communicated to producers via fact sheets and industry presentations. In a collaboration between Australia's largest goat dairy producer and top university, this project aims to deliver high quality outcomes of interest to domestic and international producers.</p>								
	<b>The University of Melbourne</b>	437,594.00	907,492.50	946,819.00	668,240.50	191,320.00	0.00	3,151,466.00	
	<b>Victoria</b>	1,393,668.50	2,841,196.00	2,796,706.00	1,624,075.50	274,897.00	0.00	8,930,543.00	

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## Western Australia

### The University of Western Australia

LP220100185 Fritz, Dr Georg	<b>Building a CO2 foundry for sustainable carbon capture and utilisation</b>  This project aims to develop innovative carbon capture and utilisation technology that fuses synthetic biology with inorganic chemistry. The project expects to develop nano-structured electrocatalysts to efficiently convert CO2 from industrial emission into acetate, and genetically-engineered microbes to rapidly transform acetate into platform chemicals and biopolymers. Expected outcomes include an integrated electro-/biocatalytic prototype with unprecedented CO2 conversion efficiency, as well as building a multidisciplinary research capacity in synthetic biology and nanotechnology. This should provide significant benefits, by reducing greenhouse gases and providing the basis for a carbon-negative chemical industry.	131,376.00	262,752.00	247,752.00	225,252.00	108,876.00	0.00	976,008.00	WOODSIDE ENERGY LTD.
	<b>National Interest Test Statement</b>  Carbon capture and utilisation (CCU) technology has immense potential to reduce carbon dioxide emissions from industrial processes and convert them into value-added products. Coupling electrochemistry with synthetic biology, this project seeks to develop a highly efficient CCU technology, which harnesses power from sunlight to convert carbon dioxide into value-added chemicals and biopolymers. The research will enhance the Australian multidisciplinary research base in world-leading CCU technologies. It will benefit Australia environmentally via decarbonising Australia's carbon-intensive industries and providing a greener way of manufacturing chemicals and bioplastics that are traditionally made from crude oil. The outcomes will open up new opportunities for building an economically and environmentally sustainable, carbon-negative chemical industry that leverages Australia's rapidly expanding solar power sector.								
LP220100384 Gaudin, Prof Christophe	<b>Securing Australian floating wind developments with helical anchors</b>  This project will reduce the cost of offshore floating wind energy by uniting leading academic expertise and innovative industry partners to develop the knowledge and practical tools that will enable the deployment of helical anchors as a cheap and reliable anchoring system for floating wind. Helical anchors are seen as the most promising solution to anchor wind turbines, but their deployment has been limited by uncertainties associated with the torque and vertical force required for installation in complex seabeds, and their performance under environmental loading. The project will address these specific points through a combination of physical, numerical and analytical modelling, using data and design scenarios provided by industry.	70,000.00	140,000.00	140,000.00	70,000.00	0.00	0.00	420,000.00	OCEAN INFINITY (AUSTRALIA) PTY LTD, UNIVERSITY OF DUNDEE, GEOWYND OFFSHORE ENGINEERING
	<b>National Interest Test Statement</b>  The project will develop the science to underpin new offshore engineering design methods for the next generation of anchors for offshore wind turbines. This will reduce the cost and accelerate the deployment of offshore floating wind energy, contributing to the decarbonisation of electricity production. The reduction of capital cost, for which anchoring system can contribute up to 35%, is widely acknowledged as the key enabler for large scale deployment of offshore floating wind. Australia has current plans for 11 GW of floating wind projects around its coastlines, sufficient to power over 6 million Australian homes, with an expected total capacity of 260 GW by 2050. The knowledge and tools developed by the project will maintain Australia at the leading edge of offshore geotechnics and will support the rapidly growing offshore wind industry.								
	<b>The University of Western Australia</b>	201,376.00	402,752.00	387,752.00	295,252.00	108,876.00	0.00	1,396,008.00	
	<b>Western Australia</b>	201,376.00	402,752.00	387,752.00	295,252.00	108,876.00	0.00	1,396,008.00	

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		6,337,797.00	13,014,858.50	12,488,800.50	6,898,034.50	1,215,185.00	128,889.50	40,083,565.00	

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