

Minister's Approval for Mid-Career Industry Fellowships 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 (\$)	Industry Partner(s)
		2023-24 (Column 4)	2024-25 (Column 5)	2025-26* (Column 6)	2026-27* (Column 7)	(Column 8)	(Column 9)
Australian Capital Territory							
The Australian National University							
IM230100090 Connal, Prof Luke A	Multi material 3D Printing This project aims to further develop a new 3D printing technique commercialised by an Australian start-up company. Current electronics manufacturing is extremely capital intensive, slow and restrictive in 3D design. The 3D printing method proposed in this application will disrupt the current advanced manufacturing eco system; creating unique methods to unlock advances in diverse markets for example, photovoltaics, printed circuit boards and sensors. The expected outcomes of this project are to create new commercial opportunities for the next generation of 3D printed electronics. This will provide significant benefits, creating unique capability to manufacture devices in 3D - faster, cheaper and with reduced reliance on global supply chains.	272,324.00	272,324.00	272,324.00	236,074.00	1,053,046.00	SPARK3D PTY LTD, MAPLE GLASS PRINTING PTY LTD, INVENTIA LIFE SCIENCE PTY. LTD.
National Interest Test Statement							
Electronics manufacturing is an expensive and wasteful process that Australia usually outsources offshore. However, outsourcing often leaves local manufacturers vulnerable to supply chain disruptions. This project aims to revolutionise Australia's local electronics manufacturing industry by developing a new 3D printing technology, or 'additive manufacturing'. Additive manufacturing promises reduced waste, cost and time by making it possible to manufacture electronics on benchtops, eliminating existing geographical and supply chain constraints. For these reasons, additive manufacturing represents the future of electronics manufacturing worldwide. This project will develop new chemistry to create a set of commercially viable inks for use in electronics manufacturing. Through our start-up company Spark 3D, the project will develop this new electronics 3D printing technology for industry application. Adoption of this 3D printing technology across the sector in the future will benefit the local industry through a more sustainable manufacturing future including a flexibility to diversify their markets for example into photovoltaics, printed circuit boards and sensors. In doing so, this project will support Australia to become a leader in the field of electronics manufacturing and boost its sovereign capability to produce the electronics demanded by Australian consumers and businesses in the future.							
IM230100157 Francois, Dr Nicolas	Improving Australian iron ore comminution for green steel production Decarbonisation of the iron ore and steel industry will involve the design of new mineral processing approaches to make the Australian iron ore amenable to green steel production. Energy-efficient ore crushing for optimal ore grades production is key to the development and economics of green steel. This fellowship project, with embedded industry experts, aims at better understanding the fragmentation mechanics of Pilbara iron ore. It will exploit micro-computed tomography coupled with advanced mechanical testing to offer transformative characterisation methods of ore comminution. The project outcomes will help develop new technologies and optimal production paths to realise a higher-grade iron ore needed for a decarbonised steel industry.	309,924.00	239,324.00	239,324.00	0.00	788,572.00	HAMERSLEY IRON PTY. LIMITED
National Interest Test Statement							
Iron and steelmaking produce 8% of the world's carbon emissions. Decarbonising the industry, or "making green steel", requires the production of higher-grade ore products with minimal contaminants. Iron ore is Australia's largest source of export revenue, valued at more than \$100 billion each year; Australian iron ore producers now face the challenge of developing new ore product to support green steel production. Rooted in this industrial challenge, this project will use advanced instruments and X-ray tomography - a technology using X-rays to see inside iron ore - to better understand how crushing, grinding and separating iron ore from contaminants can produce high-grade ore that is compatible with green steel production. We will integrate the new knowledge and co-design technology in the project with our embedded industry-based operational experts, who will act as technology transfer partners and implement the technology into Australian business operations at commercial scale. This real-world uptake of our research will contribute to advancing Australia's position as the preferred supplier of green-ready iron ore products to the global market, and to maintaining the iron ore industry's contribution to the Australian economy in a decarbonised future.							
The Australian National University		582,248.00	511,648.00	511,648.00	236,074.00	1,841,618.00	
Australian Capital Territory		582,248.00	511,648.00	511,648.00	236,074.00	1,841,618.00	

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New South Wales							
The University of New South Wales							
IM230100079 Chu, Prof Dewei	Bio-inspired Sustainable Materials for Self-powered Environmental Sensing This project aims to address the industry need for self-powered, light-weight and durable Internet of Things (IoT) devices for environmental sensing applications. The goal will be achieved by designing high power moisture-driven electric generators with a bi-layer interfacial architecture, developing non-flammable energy storage devices with cost-effective electrodes, and printing low power environmental sensors with hetero-structured materials. The key outcome will be a new class of IoT devices with high power density, sustainable output, and real time environmental monitoring capabilities, that will directly benefit Australian industry by providing cost-effective, yet efficient ways to monitor and support safe working environments. National Interest Test Statement Sensors that connect via the Internet of Things (IoT) are widely used in industrial settings, like the mining sector, to monitor ventilation, pollutant and toxic gas levels. IoT sensors require electrical power to operate, which can be challenging as they need to be light-weight and are often installed in places where conventional power supply lines and maintenance are hard to reach. This project will address this gap by developing self-powered, cost-effective and light-weight IoT devices for environmental sensing. The project will generate new knowledge and technologies via development of green energy harvesting devices, non-flammable batteries, and low power environmental sensors, creating opportunities for Australia to maintain its competitiveness in the IoT field. Through licensing of IP and existing industry partnerships, these advanced IoT technologies will be commercialised to capture the multi-billion market of IoT, bringing significant economic and environmental benefits to the local mining, resource and energy industries by improving safety and productivity.	229,824.00	262,687.00	264,687.00	262,077.00	1,019,275.00	AAM PTY LTD, STEALTH TECHNOLOGIES PTY LTD
IM230100125 Burr, Dr Patrick A	Life prediction and optimisation of advanced first-wall fusion materials The project focusses on accelerating the development radiation-tolerant materials for fusion energy, in collaboration with HB11 and Tokamak Energy. Specifically, we aim to understand the degradation mechanisms of the "first-wall" component, which is exposed to high energy radiation. In turn, this will (a) enable accurate life assessments of the component, and (b) inform how to optimise it material for longer-lasting fusion devices. The outcomes directly reduce the cost of energy produced by the partner's fusion devices, help bridge the gap from TRL 3 to 6, and provide valuable inputs for techno-economic models and licensing applications. The fellowship will also enhance Australia's prominence in the international fusion energy stage. National Interest Test Statement In the last decade, 'fusion energy' (the vast amounts of energy released when two atoms combine to form a new atom) has gone from being a physics experiment to an industry worth \$4.8B, predicted to grow to \$430B by 2030. Fusion as a novel, 'clean' energy source is limited only by engineering challenges – particularly the need for new advanced materials that can withstand the extreme environment of fusion reactors. This project aims to further understand why materials degrade when they are exposed to fusion radiation, and use this to design more resistant materials. Through licensing of IP and our existing industry partnerships, this new knowledge about material degradation will enable fusion reactor design to be optimised so that devices last longer - key to achieving cost-competitive fusion energy production at scale. This research has potential to increase Australia's reputation in the national and international fusion industry, reducing costs, and getting us one step closer to a commercially-viable, clean, abundant and reliable fusion energy resource.	270,824.00	284,824.00	261,824.00	235,824.00	1,053,296.00	HB11 ENERGY HOLDINGS PTY LTD, TOKAMAK ENERGY LTD

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IM230100222 Tamburic, Dr Bojan	<p>Large scale urban stormwater reuse: safe, clear and odourless water supply</p> <p>This project aims to improve the resilience of Australian water supplies by building capacity in urban stormwater reuse. The project expects to address an industry-identified need to determine the suitability of urban lakes and wetlands for stormwater harvesting and develop chemical-sensory monitoring techniques to assess the quality of harvested water. Expected outcomes include the establishment of satellite-based remote sensing as a key technology for stormwater applications and the widespread use of improved techniques for monitoring odorants by the water industry. This should provide significant benefits by informing adaptive planning and infrastructure readiness at water utilities and guiding Australian policy on stormwater reuse.</p> <p>National Interest Test Statement</p> <p>Australia has a growing population which increases our demand for water, and a drying climate which reduces supply. This project aims to improve the resilience of water supplies by building capacity to reuse stormwater at scale. Satellites will be used to image urban lakes and wetlands and identify the best sites to supply stormwater. New monitoring techniques will be developed to ensure that reused stormwater is safe and fit for purpose. This project will generate environmental and economic benefits: stormwater can be reused to maintain additional street trees and public open spaces, helping develop greener, cooler and more liveable suburbs. This approach will also reduce demand on river water so that it can be used as drinking water or returned to the environment. The project outputs will be shared with our industry partner, Melbourne Water, and more broadly across the sector to inform adaptive planning, future-proof water supplies by guiding where and when to invest in water reuse infrastructure, and to guide Australian policy on stormwater reuse.</p>	281,013.00	283,544.00	301,071.00	0.00	865,628.00	MELBOURNE WATER CORPORATION
IM230100396 Chan, Dr Kok W	<p>Scalable semiconductor quantum processor with flip chip bonding technology</p> <p>Australia is famous for quantum computing research based on electron spin in silicon quantum dot. This project aims to enable the manufacturing of such scalable quantum processor. Currently, superconducting quantum processor has reached >100 of qubits by the utilization of 3D integration fabrication technology such as flip chip bonding. Likewise, for semiconductor spin-qubit to grow, it is inevitable that novel 3D architecture by expanding the building block to the next dimension must be explored to pave the way to scalable semiconductor quantum processor. This project will spearhead Australia's semiconductor quantum processor to the realm of hundreds of qubits and put this technology on par with superconducting quantum processor.</p> <p>National Interest Test Statement</p> <p>The technology to enable the manufacturing of scalable semiconductor quantum processor will position Australia at the forefront of commercialising quantum technologies, to be part of the \$86 billion global industry by 2040. Australia has more than 20 years of quantum computing research experience and recently spun-off several start-ups such as Diraq, Silicon Quantum Computing and Quantum Brilliance focusing on building a commercial quantum computer. By working with Diraq Pty Ltd, we investigate solving fundamental issues in large scale quantum processor such as technique to couple distant quantum bits, scalable 3D architecture, new materials, and interconnectivity. This will pave the way to a feasible and manufacturable quantum processor with hundreds of quantum bits, tailored for specific industry application and education purpose. This project aligns with the government initiative to promote and protect quantum technology by nurturing new quantum engineers, thereby addressing the lack of such talents in Australia's quantum ecosystem.</p>	274,824.00	259,824.00	229,824.00	0.00	764,472.00	DIRAQ PTY LTD
	The University of New South Wales	1,056,485.00	1,090,879.00	1,057,406.00	497,901.00	3,702,671.00	

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(Columns 1 and 2)	(Column 3)					(Column 8)	(Column 9)
The University of Sydney							
IM230100644	Triple hybrid fuel-cell-based propulsion for long-range eVTOL operations	300,801.00	290,960.00	297,711.00	0.00	889,472.00	AMSL AERO PTY LTD
Verstraete, Dr Dries D	AMSL Aero's Vertii is an Australian-developed electric Vertical Take Off and Landing (eVTOL) aircraft that will provide rapid response air ambulance and low-cost passenger transport for rural Australia. This project will optimise a fuel cell/battery/ultracapacitor triple hybrid system for Vertii by combining dynamic energy source models, hardware-in-the-loop simulations, aero-propulsive flight mechanics models, and accelerated degradation testing. The triple hybrid will extend the life of both batteries and fuel cells for eVTOL aircraft. It will allow AMSL to fast-track the improved durability needed for cost-competitive long-range eVTOL operations, giving them an up-front and industry-leading experience on hybrid systems for eVTOLs.						
	National Interest Test Statement						
	Electric Vertical Take Off and Landing (eVTOL) aircraft could provide cost-effective rapid response air ambulance and passenger transport services to rural Australia. However, battery-powered eVTOL aircraft have a limited range, and the fuel cells that enable long-distance flights break down too quickly to be cost-competitive. This project seeks to resolve these issues by developing a fuel cell-based triple hybrid battery system that will enable an Australian company, AMSL Aero, to fast-track cost-competitive long-distance operations for Vertii, its leading eVTOL aircraft. As a result, AMSL will gain industry-leading experience in hybrid systems for eVTOLs, positioning it to become the global leader in inter-city air mobility. This project will benefit the Australian economy by giving our aerospace industry a competitive advantage in a market predicted to reach USD 115 billion by 2035 in the US alone. A long-range, cost-effective eVTOL aircraft will help unlock the economic potential of regional and rural Australia and make health care more affordable for Australians living in remote regions.						
IM230100745	New models of replacement care for working carers	214,259.00	232,694.00	369,721.00	233,959.00	1,050,633.00	CARERS NSW LIMITED, CATHOLIC HEALTHCARE LIMITED
Hamilton, A/Prof Myra G	This project aims to investigate the replacement care arrangements that will support different groups of informal carers of a person with a disability, chronic illness or older relative to participate in paid work in contemporary Australia. Using mixed methods, field trials, and an innovative conceptual approach focused on time synchronicity, it will generate critical new knowledge about the characteristics and effectiveness of sustainable replacement care models that enable carers to enter or increase paid work and maintain work/care balance. Significant benefits include improving aged, disability and carer service models and policies to enhance women's workforce participation, boost national productivity, and improve carer wellbeing.						
	National Interest Test Statement						
	One in 10 Australians provide unpaid care for a person with a disability, chronic illness or frailty. Carers are less likely to be employed and much less likely to work full time than non-carers because of a lack of appropriate replacement (aged and disability) care that aligns with their work needs. To address this problem, working with two large industry partners, this project will be the first internationally to design and pilot new models of replacement care that directly respond to carers' workforce needs, and identify sustainable methods of funding these models. This project will improve the effectiveness of disability, aged care, and carer services in meeting the needs of Australia's carers and respond to a significant and pressing problem for care providers and governments in Australia and internationally. The project will improve the labour market opportunities of carers and, consequently, their financial security, health and wellbeing. It will also benefit Australian governments, employers and communities by boosting labour market participation rates, national productivity, and wellbeing.						
	The University of Sydney	515,060.00	523,654.00	667,432.00	233,959.00	1,940,105.00	

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Western Sydney University							
IM230100371 Umbers, Dr Kate	The plight of the bogong moth: a model for conservation in Australia This project aims to direct conservation actions for the bogong moth, an endangered species of profound cultural, ecological, and economic importance to Australians. Although iconic and famous for their epic migration to the Australian Alps, the bogong moth's distribution and flyways are unknown making conservation actions impossible. This project expects to forge the key partnerships and harness public enthusiasm to generate the data needed for conservation actions via a National Bogong Moth Observatory. The expected outcomes of this project are enhanced capacity to identify and mitigate threats to bogong moths. This should provide significant benefits such as a highly transferable model for continent-wide conservation in Australia.	260,774.00	225,824.00	297,047.00	260,147.00	1,043,792.00	INVERTEBRATES AUSTRALIA LTD, LUND UNIVERSITY, ZOOS VICTORIA, THE XERCES SOCIETY FOR INVERTEBRATE CONSERVATION
National Interest Test Statement		Listed as Endangered in 2021, bogong moths are of profound cultural, ecological, and economic importance to Australians and their conservation requires continent-wide cooperation. Despite being famous for their migration to the Australian Alps, conservation activities are currently impeded by a major knowledge gap: their distribution and migratory flyways are unknown. This project will address this knowledge gap by creating a National Bogong Moth Observatory to facilitate collaborative data collection and sharing among all key interest groups including Traditional Owners, environmental charities, citizen scientists, government scientists, and academics. This research will benefit Australia by establishing the bogong moth as a globally significant flagship species for insect conservation, uniting diverse scientific conservation activities, and creating important opportunities for connections to Country. Our project will establish an exemplar conservation program adaptable to a broad range of Australian species to protect and recover our unique biodiversity across our vast land.					
		Western Sydney University	260,774.00	225,824.00	297,047.00	260,147.00	1,043,792.00
		New South Wales	1,832,319.00	1,840,357.00	2,021,885.00	992,007.00	6,686,568.00

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Queensland							
Griffith University							
IM230100184	A new catchment gully erosion model for a healthier Great Barrier Reef	258,708.00	258,708.00	258,708.00	258,708.00	1,034,832.00	DEPARTMENT OF ENVIRONMENT AND SCIENCE
Roberts, Dr Melanie E	Sediment impacts Great Barrier Reef water quality and coral health. Erosion of gullies within a river catchment are the dominant source of sediment. This project aims to develop a novel catchment level modelling tool, allowing land managers to compare rehabilitation options and identify optimal actions. The project will generate new knowledge in applied mathematics, using innovative model emulation techniques to bring process insights to the catchment scale. Expected outcomes include a validated land rehabilitation decision making tool, benefiting both natural resource managers by increasing ability to meet Reef 2050 policy targets and landowners through development of Natural Capital Markets.						
	National Interest Test Statement						
	Gully erosion within river catchments is the major source of sediment on the Great Barrier Reef, impacting water quality and coral health. Land managers currently have no ability to compare proposed gully restoration techniques at the catchment level. This project will address this gap, developing a novel fit-for-purpose decision-making tool. The Reef 2050 Water Quality Plan targets a 25% reduction in reef sediment by 2025. The estimated scale of action required to meet GBR fine sediment water quality targets are significant, an estimated \$1 - \$8 billion. The research will directly support natural resource managers to meet these targets through effective and efficient landscape restoration investments, and support development of natural capital (environmental) markets benefiting landowners, providing both economic and environmental benefit to Australia.						
	Griffith University	258,708.00	258,708.00	258,708.00	258,708.00	1,034,832.00	
Queensland University of Technology							
IM230100132	Novel minerals and mix design in low embodied carbon concrete products	253,386.00	274,586.00	266,486.00	266,486.00	1,060,944.00	BRICKWORKS BUILDING PRODUCTS PTY LTD
Xi, A/Prof Yunfei	Research and development in materials and mix design for concrete building products will target utilisation of abundant and low cost mineral materials including natural clay, hard rock quarry fines and unclassified fly ash resources. New mix design and preparation methods are targeting improved strength and production efficiency with reduced Portland cement and embodied carbon. This technology will be used in the manufacture of concrete blocks, roof tiles and brick and block mortar products currently manufactured by Brickworks. Outcomes are efficient and sustainable full scale manufacture of higher value, low embodied carbon, lightweight, large format and/or high durability products that are not currently available to the Australian market.						
	National Interest Test Statement						
	Australian concrete product manufacturing creates \$2.5bn revenue annually but is a major energy consumer and producer of carbon dioxide emission. Attempts to produce lighter weight products with reduced carbon have impacted product quality and reliability, resulting in usability limits, particularly where products require load bearing and energy efficiency properties. This project will develop methods to produce high quality, lighter, concrete products, such as blocks, roof tiles, and mortar using 35-50% less embodied carbon, decreasing emissions and energy use significantly. Using new material compositions and manufacturing processes using cheaper, local materials, the methods developed will enable construction of buildings with high-quality, long-lasting materials with a reduced carbon footprint at a competitive cost. The project builds on past successful innovations by an established collaborative team from Brickworks and QUT. Existing Brickworks manufacturing plants in Australia and the USA will be utilised to translate research outcomes to ensure benefits to Australian industries and consumers.						
	Queensland University of Technology	253,386.00	274,586.00	266,486.00	266,486.00	1,060,944.00	

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The University of Queensland							
IM230100030 Hu, A/Prof Shihu	Transforming urban water management through technology translation Through university and industry partnership, this project will develop and demonstrate, at pilot scale, a highly innovative technology that manufactures an iron salt, FeCO ₃ , for use in urban water management, and simultaneously removes CO ₂ , H ₂ S and NH ₃ from biogas thus achieving biogas valorisation. This project will demonstrate the effectiveness of FeCO ₃ produced, in infrastructure protection, nutrients removal and recycling, and capacity enhancement of wastewater treatment plants. The outcomes of this project will lead to the adoption and commercialisation of the technology, which will substantially enhance the sustainability of urban water management in Australia, and also create jobs in, and bring incomes to Australia.	280,824.00	314,824.00	259,824.00	0.00	855,472.00	QUEENSLAND URBAN UTILITIES
	National Interest Test Statement Iron salts in various forms are among critical chemicals required for wastewater treatment for maintaining public health and the Australian economy. With the current supply chain, these chemicals are produced as by-products of other industries, remotely from where they are required. This project will deliver a technology enabling water utilities to manufacture an iron salt, FeCO ₃ , within a wastewater treatment plant. Via the removal of CO ₂ from biogas, the process simultaneously produces an upgrade biogas suitable as a car fuel or for injection into natural gas networks. The project addresses several federal government's science and research priorities, including advanced manufacturing, energy, resources recovery and environmental change. The process enables the Australian water industry to establish a novel, self-reliant, and more secure supply chain to meet its demand for iron salts, at lower economic and environmental costs, and simultaneously achieve recovery of high-quality bioenergy.						
IM230100831 Pearce, Dr Julie K	Protecting aquifers in the race to net-zero carbon emissions This project aims to address the key risk factor of gas leakage from carbon dioxide geological sequestration and hydrogen or compressed air renewable-energy storage. This project expects to develop innovative methods for monitoring gas leakage contamination into overlying Australian aquifer water resources. Expected outcomes of this project include a multidisciplinary method to detect leakages of CO ₂ and future stored-energy gases that can contaminate aquifers. This should provide significant benefits including enabling greenhouse gas emissions reduction while protecting Australian water resources. This is critically important for Great Artesian Basin aquifers that support over 180,000 Australians and overlie many planned storage sites.	293,804.00	320,224.00	221,274.00	0.00	835,302.00	CARBON TRANSPORT AND STORAGE CORPORATION (CTSCO) PTY LIMITED
	National Interest Test Statement Technologies are essential for greenhouse gas emissions reduction in Australia's race to net-zero. Carbon dioxide geological sequestration, and hydrogen, or compressed air renewable energy storage inject gas underground. Storage reservoirs are below Australian groundwater aquifers including the Great Artesian Basin (GAB). The risk of stored gas leakage, contaminating overlying aquifers, must be identified. This project aims to develop an innovative method identifying leakage of stored carbon dioxide, compressed air, or hydrogen. The GAB is Australia's largest aquifer, groundwaters and springs have cultural, and social significance, providing water to agriculture and town supply, generating \$13 billion/year, supporting 180,000 people, 7,600 businesses and 120 towns. The methodologies developed in this project will support Australian low-emissions technologies predicted to create 100,000 regional jobs, mitigating climate change, while protecting important water resources. The outcomes will provide tools for government, industry, and regional communities to monitor gas leakage impacts to water resources.						

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IM230100850 Parsell, Prof Cameron S	Research evidence in the not-for-profit sector and consumer-driven change This project has three aims: first, to further build research literacy within the not-for-profit human service sector; second, to contribute new knowledge about how human service sector clients can shape the nature of the services they rely upon; and third, develop a framework for human service clients, human service practitioners, and government stakeholders to more actively and collaboratively engage in social policy development. The project expects to generate new knowledge to underpin consumer led and transformations in the human service sector. Expected outcomes of the project include a greater understanding of how not-for-profit organisations can bring together their clients and governments to collaboratively solve social problems. National Interest Test Statement The project seeks to provide knowledge and resources for the not-for-profit human service sector to improve how it engages with key stakeholders and provides more responsive and client driven services. It aims to provide knowledge that will help the not-for-profit sector achieve its vision of contributing value to Australian society and directly contribute to addressing disadvantage. The research will benefit Australia by enabling clients of human services to exercise greater control over the services they use, and in turn, support the human service sector to more effectively meet the needs of the people it serves. By bringing the human service sector and university in close partnership, the project relies upon highlighting and disseminating the knowledge and expertise that exists in the hands of clients and practitioners in the sector.	279,824.00	279,824.00	279,824.00	249,824.00	1,089,296.00	MICAH PROJECTS LTD	
		The University of Queensland	854,452.00	914,872.00	760,922.00	249,824.00	2,780,070.00	
		Queensland	1,366,546.00	1,448,166.00	1,286,116.00	775,018.00	4,875,846.00	

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South Australia

Flinders University

IM230100527	Transforming harvest surplus into nutritious meals for food relief	262,204.00	259,393.00	262,377.00	267,482.00	1,051,456.00	FOODBANK OF SOUTH AUSTRALIA INCORPORATED, GREEN INDUSTRIES SA
Bogomolova, Prof Svetlana	The project aims to transform currently wasted harvest surplus into nutritious shelf-stable plant-based products for the food-relief sector. It integrates novel social-enterprise models with advanced food manufacturing and bespoke training and volunteering opportunities for food insecure individuals, to facilitate their pathway out of food insecurity. In close collaboration with food relief supply-chain provider Foodbank SA and policymaker Green Industries SA, the project will tackle two major problems for Australia – food insecurity and food waste – through systems thinking and leveraging underused resources, while building collaborations across academia and multiple industry sectors.						

National Interest Test Statement

The project conducted in collaboration with Foodbank SA and Green Industries SA, will devise innovative social-enterprise models to transform currently wasted perishable fruit and vegetable surplus into shelf-stable nutritious plant-based products for >5.5M Australians who are food-insecure. The outcomes will offer solutions to two major problems for Australia: food waste (at farm gate and in supply chains), and food insecurity. We will develop and trial novel social enterprise models combining advanced manufacturing, distribution, and supply chains with bespoke training and volunteering programs to assist food-insecure people on a pathway out of poverty and food insecurity. Successful trials at Foodbank SA will immediately improve food quality at >600 charities it supplies, and the new model will be shared with Foodbank's and Green Industries' networks, improving practice across Australia and beyond. Food-relief recipients – families in vulnerable situations – will immediately benefit through better nutrition and increased opportunities, which will bring longer-term social and health benefits for Australia.

Flinders University	262,204.00	259,393.00	262,377.00	267,482.00	1,051,456.00
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The University of Adelaide

IM230100042	Unlocking the full reproductive potential for hybrid wheat breeding	237,002.00	264,577.00	244,332.00	234,447.00	980,358.00	BASF SE
Whitford, Dr Ryan M	Globally, wheat is cultivated as an inbred self-fertile crop with yield gains stagnating over the last decades. This contrasts with unabated yield gains and yield stability achieved for rice and corn through hybrid breeding and cross-pollination. Wheat hybrids hold potential for a 10-22% yield boost, but commercial deployment is restricted due to high seed production costs, a result of wheat's floral architecture and poor outcrossing characteristics. This project aims to reduce costs by improving wheat's female receptivity to airborne pollen, a major bottleneck to commercial realization of hybrids globally. Higher and more stable yields from wheat hybrids will ensure food security in the face of climate uncertainty and growing population.						

National Interest Test Statement

Australia's \$9.9b wheat industry is now at considerable risk because of large variations in our climate including extreme temperatures and limited rainfall, reducing crop growth and grain production. There is a pressing need from the agriculture industry to develop new wheat varieties that are more resistant to extreme and variable climates. The introduction of hybrid wheat, produced by crossing two different varieties, is one way to solve this industry problem. At present, it is difficult to commercialise hybrid wheat due to high seed production costs associated with poor pollination between different wheat varieties. This project will use cutting edge genetic and imaging technologies to improve the efficient production of climate-adaptable hybrid seeds. In partnership with key agricultural industry partner, BASF, the project will produce new varieties of wheat and fast track them for commercialisation and adoption by wheat growers. The production of superior wheat varieties will lift Australia's economy through increased on-farm profits and technological innovations, as well as improving food security.

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		2023-24 (Column 4)	2024-25 (Column 5)	2025-26* (Column 6)	2026-27* (Column 7)	(Column 8)	(Column 9)
IM230100767 Spandler, A/Prof Carl	Securing the pipeline of lithium for the renewable energy transition A major risk to global renewable energy is sustaining the supply of lithium needed for green energy storage via batteries. This project aims to fast-track new lithium resource discoveries, both from conventional hard rock deposits in Australia and newly emerging targets such as saline groundwater reservoirs. It will accelerate our ability to determine how and where lithium ore deposits form in the Australian continent, and develop novel mineral-based exploration tools for rapid and cost-effective discovery of new deposits. This will be advanced by a strong nexus between the minerals industry, government and academia, benefitting Australia as a dominant global lithium supplier by realising the potential of its enormous lithium resources.	256,887.00	250,287.00	259,487.00	246,755.00	1,013,416.00	CORE LITHIUM LTD, NORTHERN TERRITORY GEOLOGICAL SURVEY, GEOSCIENCE AUSTRALIA
National Interest Test Statement							
Green energy storage in batteries requires lithium. However, projected shortfalls of lithium supply threaten to derail efforts to meet global emissions reduction targets by 2050. Australia, the world's largest lithium producer, has enormous potential to increase lithium production, provided new lithium resources can be discovered in the immediate future. Working closely with our Key Industry Partner, Core Lithium Ltd, as well as government geological agencies, this project will deliver the new knowledge and novel mineral-based exploration tools needed by industry to accelerate lithium ore discovery. It will not only provide new pathways to fast-track ore discovery with minimal cost but also prioritise low environmental footprints in resource recovery. The outcomes will drive economic and environmental benefits to Australia, cementing its role in responsibly providing the pipeline of lithium needed for the global renewable energy transition. Further, a new Lithium Ore Research Network will be a platform for expanded and ongoing research coordination to benefit lithium ore systems into the future.							
		The University of Adelaide	493,889.00	514,864.00	503,819.00	481,202.00	1,993,774.00
		South Australia	756,093.00	774,257.00	766,196.00	748,684.00	3,045,230.00

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Victoria							
Deakin University							
IM230100048 Henderson, Prof Luke C	Developing a recyclable carbon fibre composite capability for Australia This project will use innovative surface modification techniques on reclaimed and virgin carbon fibres to enhance their compatibility with thermoplastic polymers. Valorising reclaimed carbon fibres and optimising thermoplastic composite materials will overcome the global industry challenges of: Raw material shortfall and High-volume manufacture, respectively. The successful implementation of this work will enable the critical role that high performance carbon fibre composite materials will play in transitioning to alternative energy sectors such as wind and hydrogen. This fellowship will create a sovereign capability and source of high value materials for Australia that will benefit energy, construction, mining, and defence.	257,324.00	260,324.00	262,324.00	272,324.00	1,052,296.00	GEN 2 CARBON (AUSTRALIA) PTY LTD, SOLVAY
	National Interest Test Statement In the near future, the annual demand for carbon fibre will exceed global production capability, leaving the recycling of existing carbon fibre products as the only feasible way to access this critical raw material. Currently, only around 2% of all carbon fibre produced are recycled each year. In addition, the resulting material is not suitable for the mass production of parts to support the renewable energy, mining and defence sectors. We will work with established local and international industry partners to improve and optimise carbon fibre manufacturing and recycling processes. This project will focus on developing the technology to enable the use of recycled carbon fibre in the mass production of high-performance parts for renewable energy applications – including wind, solar and hydrogen energy. This will grow an Australian-based carbon fibre recycling and re-manufacturing industry, creating jobs in multiple sectors across the economy, supporting Australia's transition to a renewable energy future, and benefiting the environment by reusing this valuable resource.						
	Deakin University	257,324.00	260,324.00	262,324.00	272,324.00	1,052,296.00	
Monash University							
IM230100002 Chen, Dr Zhaolin	Artificial intelligence empowered multi-modal biomedical imaging This Industry Fellowship aims to transform biomedical imaging using artificial intelligence with world-leading industry partners. The project expects to make a major advance in multi-modal Magnetic Resonance Imaging and Positron Emission Tomography image reconstruction for robust, accurate and efficient imaging. This project timely addresses industry needs with novel solutions and will establish a technology roadmap to inform and de-risk future research and development in image reconstruction. The project outcomes should provide benefits to Australians with cost-effective imaging and benefits to Australia's biomedical industry with well-aligned intellectual properties and training of future scientists with industry knowledge.	253,598.00	272,851.00	267,164.00	262,436.00	1,056,049.00	SIEMENS HEALTHINEERS, FORSCHUNGSZENTRUM JUELICH GMBH
	National Interest Test Statement This project seeks to improve medical imaging technology, using artificial intelligence to enhance image quality and efficiency. Every year, more than 9 million Australians access radiology services that produce different kinds of scans, but the current technology lacks the ability to effectively combine these scans. The project aims to create a better way to combine scans by developing artificial intelligence-based image reconstruction theories and software, co-designed with industry partners. The new technology has the potential to benefit health professionals to diagnose patients more quickly, reducing the number of hospital visits and therefore the cost of healthcare in Australia. Furthermore, the project will develop intellectual property and train future scientists in this new technology, which can contribute to Australia's competitive advantage in biomedical imaging, biomedical engineering, and artificial intelligence in digital health. Industry partners will be able to commercialise the technology to benefit Australian patients.						

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		2023-24 (Column 4)	2024-25 (Column 5)	2025-26* (Column 6)	2026-27* (Column 7)		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)	(Column 9)
IM230100008 Tabor, A/Prof Rico F	Reinventing compostable packaging This project aims to develop a new generation of authentically home-compostable packaging materials, focused around meeting immediate and future needs for food packaging. The materials used will be of sustainable origin, helping to decarbonise our packaging industry, and presenting a new paradigm in protecting consumer goods in a more responsible way. In doing so, it is anticipated that Australia will be able to reduce and eventually avoid reliance on single-use plastic packaging in foods and the environmental problems it causes, without compromising on food safety or freshness.	296,473.00	296,473.00	296,473.00	0.00	889,419.00	VARDEEN PROCESS PTY LTD
	National Interest Test Statement This project aims to generate new, home-compostable packaging materials for food products, to help address the environmental crisis generated by single-use plastic packaging. This new packaging will stop air and water getting through, keeping foods fresh and safe, and will be made from sustainable sources. These products will increase the capacity for Australian manufacturers to meet the 2025 target for 100% of packaging to be compostable, reusable or recyclable. The key industry partner is an innovative start-up with the connections required to take newly developed products directly to Australian and international consumer markets. Using food-safe components will ensure simple routes to product approval. In demonstrating the potential for new packaging modes, other Australian manufacturers can leverage developed technology in producing home-compostable packaging products attractive to both domestic and international food producers, and the technological advancements also have potential applications in providing sustainable product packaging for other industries.						
IM230100534 Velkov, Dr Tony	NOVEL MASS-SCALE BIOSYNTHESIS: TAILORING CHEMICAL LOGIC & BIOSYNTHESIS No new antibiotics against Gram-negative 'superbugs' are expected to be available in the near future. We have exhausted the chemical space from the natural product pool and lack a fundamental understanding of antibiotics in nature, this is a major hurdle for antibiotic design targeting bacterial resistance. This proposal aims to engineer unique chemo-enzymatic platforms for the synthesis of new lipopeptide scaffolds which will significantly expand the chemical space available for novel antibiotic discovery. The development of these unique platforms will greatly expand our inventory of natural product antibiotics and will represent a major technological break-through for Australia's biotechnology and pharmaceutical manufacturing sectors.	218,524.00	218,524.00	218,524.00	218,524.00	874,096.00	SLIABX PHARMACEUTICALS PTY LTD
	National Interest Test Statement There exists a major disconnect between our ability to rationally design novel antibiotics and our understanding of their function in nature, biosynthesis, resistance mechanisms and mode of action. This proposal represents the culmination of a great depth of experience in chemical biology, NRPS and lipopeptide antibiotics. To date there have been no efforts to construct recombinant NRPS or chemo-enzymatic platforms for the production of novel, safer polymyxin lipopeptides, nor to understand their precise mechanisms of action and role in nature. This Fellowship will close all these gaps and develop novel chemo-enzymatic platforms and expand our mechanistic knowledge-base which will greatly facilitate the future development of much-needed novel antibiotics targeting 'superbugs' that are resistant to all current antibiotics. Built upon my internationally leading antibiotic research the novel technologies developed by this project will make a significant global impact towards addressing an urgent unmet need, the lack of novel antibiotic design concepts and manufacturing processes.						
IM230100544 Gaby, A/Prof Alice R	Unlocking the archive: reuniting Indigenous languages and their communities Australia is experiencing a crisis in the loss of Indigenous languages. Drawing on both international best practice and local knowledge, this project aims to develop innovative and enduring resources for community-driven language maintenance and revitalisation. By collaborating with and building the capacity of Indigenous language workers and organisations, the following transformative outcomes are anticipated: (1) tools to unlock linguistic terminology and methods; (2) resources for language revitalisation; (3) an evaluation of existing strategies for language revitalisation; (4) new understanding of Indigenous people's perceptions of language change and how this informs their language goals.	308,373.00	266,341.00	288,238.00	0.00	862,952.00	RESOURCE NETWORK FOR LINGUISTIC DIVERSITY

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National Interest Test Statement							
Australian Indigenous languages are at risk of extinction. Most of the original 490 Indigenous languages spoken in Australia only exist as academic or archival records, with fewer than 100 still spoken, and some of these by only one person. This Industry Fellowship seeks to develop widely accessible educational tools and resources that enable Indigenous communities to reclaim and revitalise their language and heritage. The plan to achieve this outcome involves working directly with Indigenous organisations to help them re-engage with, and revitalise, their languages. This will be achieved through the co-development of training programs, widely accessible multimedia training resources, and expert evaluation and delivery of linguistic training. Built around the needs of the Key Industry Partner, this project aims to produce enduring and usable language resources that are of benefit Indigenous communities, and other Australians, around Australia.							
IM230100702 Sletten, Dr Tracey L	Optimising sleep, alertness and safety in shift work industries This project aims to address the impaired alertness, and high risk of workplace errors and accidents that are associated with sleep loss and circadian misalignment during shift work. The project will deliver an innovative industry-driven digital technology to provide automated, customised sleep management strategies to shift workers, and will develop a framework for effective wide-scale deployment of the technology within Australian shift working organisations. The project will close the gap in resources currently available to support sleep in shift workers and will reduce the significant burdens of shift work for alertness, productivity and safety.	323,078.00	269,392.00	267,002.00	0.00	859,472.00	QANTAS AIRWAYS LIMITED, WELLTEQ AUSTRALIA PTY LTD
National Interest Test Statement							
Shift workers experience increased risk of workplace injuries and errors, and up to 36% increased risk of accidents. Sleep disruption and circadian misalignment among shift workers are significant contributors to these risks. By providing a personalised, digital technology that provides scientifically validated recommendations for sleep management in shift workers, this research will target the personal and economic costs of workplace accidents and errors, estimated to cost more than \$400 million to the Australian economy each year. With demonstrated deployment in a safety-critical industry, the project will establish the essential framework to facilitate wide-scale implementation across a broad range of shift working industries in Australia, providing effective management of alertness and safety risks to the 16% of employees that are engaged in shift work nationally. This project responds to the 2019 Parliamentary Inquiry into Sleep Health Awareness in Australia, which identified sleep health in the workplace as a national priority to reduce safety risks.							
Monash University		1,400,046.00	1,323,581.00	1,337,401.00	480,960.00	4,541,988.00	
The University of Melbourne							
IM230100025 Van De Wouw, Dr Angela P	Using the blackleg fungus as a model for maximising fungicide efficacy Resistance to chemicals impacts the ability to control many diseases across many crops. This project aims to identify key epidemiological factors contributing to fungicide resistance in an emerging model system, blackleg disease of canola, using innovative approaches. The outcomes of this research will be management strategies for minimising the risk of evolution of fungicide resistance, a key industry need. This will also enhance interdisciplinary collaborations through combining field and molecular research. These management strategies will provide significant economic benefits by ensuring increased canola yields, whilst providing health and environmental benefits through minimisation of unnecessary use of fungicides.	249,042.00	249,042.00	249,042.00	0.00	747,126.00	MARCROFT GRAINS PATHOLOGY PTY LTD, SYNGENTA AUSTRALIA PTY LTD
National Interest Test Statement							
Fungicides are essential for minimising disease in crops, however plant pathogens can rapidly evolve resistance leading to reduced efficacy, decreased yields and wasted input costs. The major outcomes of this project are to develop fungicide resistance management strategies for farmers to reduce the risk of resistance evolving or minimise its impact if already present. These findings will benefit Australia both economically and environmentally. Economically, Australian farmers will have improved yields through minimising disease as well as reduced input costs through strategic fungicide use. This research will also have commercial outputs for Australia as minimising blackleg disease is essential for reopening canola grain exports to China, who do not currently have blackleg and have banned Australian canola due to this disease. This research will be used in apps that assist farmers to select the most effective treatment for blackleg fungus, minimising the unnecessary use of fungicides, which may be harmful to human health and the environment.							
The University of Melbourne		249,042.00	249,042.00	249,042.00	0.00	747,126.00	

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		Victoria	1,906,412.00	1,832,947.00	1,848,767.00	753,284.00	6,341,410.00

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

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		2023-24 (Column 4)	2024-25 (Column 5)	2025-26* (Column 6)	2026-27* (Column 7)		

Western Australia

The University of Western Australia

IM230100154	Fungi Power: Designer Fungal Cell Factories for Advanced Biomanufacturing	268,613.00	272,786.00	248,312.00	260,193.00	1,049,904.00	MICROBIAL SCREENING TECHNOLOGIES PTY. LTD., NATURAL MEDTECH PTY LTD, NOURISH INGREDIENTS PTY LTD
Chooi, Dr Yit-Heng	This project aims to build an advanced biomanufacturing platform based on filamentous fungi in collaboration with industry. Using synthetic biology, the project expects to engineer superior fungal host strains customisable to the needs of the industry and to address their technological gaps. The expected outcomes include the development of cost-efficient and sustainable fungal-based bioprocesses for the companies to produce products, such as fine chemicals, pharmaceutical actives and food ingredients. The project would provide significant benefits by enabling existing and emerging companies' commercial successes and competitiveness in global markets, creating new jobs and resulting in the growth of the bio-economy in Australia.						

National Interest Test Statement

Fungi have enormous potential to produce valuable products, including life-saving drugs and antibiotics. Through recent advancements in DNA technology, it is now possible to modify fungi to produce an even wider range of useful substances. However, Australia is falling behind in adopting these fungal technologies. Our project aims to bridge this gap by working with industries to develop new fungal technologies that can be used to produce a range of high-value products in a sustainable manner, such as pharmaceutical drugs, biopesticides, fine chemicals, and specialised food and health ingredients. Our research will develop new, cost-efficient, and sustainable manufacturing processes to create these valuable substances. This will benefit our industry partners (Microbial Screening Technologies, Natural MedTech and Nourish Ingredients) and the Australian public by improving our competitiveness in global markets, addressing important challenges in our society, and meeting the needs of our growing population.

The University of Western Australia	268,613.00	272,786.00	248,312.00	260,193.00	1,049,904.00
Western Australia	268,613.00	272,786.00	248,312.00	260,193.00	1,049,904.00
	6,712,231.00	6,680,161.00	6,682,924.00	3,765,260.00	23,840,576.00