Minister's Approval for Early Career Industry Fellowships for Funding Commencing in 2024 Schedule

Approved Organisation, Leader of Approved Research Program	Approved Research Program	Estimated and Approved Expenditure ($)	Indicative Funding ($)		Total ($)	Industry Partner(s)
		2024-25	2025-26*	2026-27*		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
Australian Capital Territory						
The Australian National University						
IE240100103 Anenburg, Dr Michael	**Extraction of the critical rare earth elements from mine waste** The transition to a carbon-free economy requires substantial amounts of the critical rare earth elements, for which demand is likely to outstrip supply in coming decades. Vast amounts of rare earths are present in the mine waste of some copper-gold mines, but cannot be economically extracted. This project aims to use molten alkali salts to reprocess mine waste, and transform the rare earths to a readily exploitable form. This project expects to create a scalable industrial separation process to be implemented in existing mines, with the separated ore used as input for extraction. A benefit of this project is the unlocking of a previously inaccessible Australian rare earth resource, comparable in size to the largest deposits globally. **National Interest Test Statement** The Australian mining industry has consistently been a pillar of the country's economy. However, the constant global demand for Australian metals also results in an abundance of mining waste. Importantly, waste from copper-gold mines contains more than 50 million tonnes of rare earth elements, a group of metals with a limited global supply, as their production is dominated by only one country. Currently, these rare earths are not separated from Australian mine waste because of a lack of an economically feasible process resulting from their low grades and complex extraction. This project will develop new concentration and separation processes using environmentally safe chemicals to reprocess existing mine waste and transform the currently inaccessible rare earth elements into an exploitable resource. This process will generate additional economic value by recycling existing waste and substantially increase Australian rare earth resources without establishing new mines, thus positioning Australia among the top global rare earth suppliers. The new resource material will be compatible with other rare earth miners in Australia, leading to commercially optimised extraction operations on a national scale. Australia's own production of rare earth metals could potentially fast-track the manufacturing of important electronic components like magnets used in emission-free technologies including wind turbines and electric motors without dependency on overseas suppliers.	173,949.00	175,949.00	138,297.00	488,195.00	BHP OLYMPIC DAM CORPORATION PTY LTD
	The Australian National University	173,949.00	175,949.00	138,297.00	488,195.00	
	Australian Capital Territory	173,949.00	175,949.00	138,297.00	488,195.00	

* 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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New South Wales

Macquarie University

IE240100038 Nasiri, A/Prof Noushin	**From lab to field: smart sensing technologies for future farming** This project aims to solve the long-standing industry challenge of establishing a non-invasive early-stage pregnancy detection system on farm. Using novel sensing technologies, the university–industry partners will significantly improve livestock and dairy productivity and animal welfare, and reduce costs and rates of operator injury. The outcomes will include enhancing the selectivity of gas-sensing technologies, and gaining advanced knowledge on mass-producing gas sensors; the results are likely to be commercialised after project completion. The economic, commercial, and social benefits will benefit not only the industry partner but a wide range of industries from food and agricultural industries to environmental monitoring sectors.	154,517.00	153,297.00	177,835.00	485,649.00	AGSCENT PTY LTD

National Interest Test Statement

The ability to detect bovine pregnancy early and non-invasively after insemination plays a vital role in the reproductive management in farming industry. Current methods – including rectal palpation and ultrasonography – are invasive with a risk to the pregnancy and the cow's health, and require expensive trained specialists. The university–industry team will develop a cutting-edge, non-invasive sensing technology that will revolutionise cattle management in the meat, livestock, and dairy industries by allowing producers to conduct pregnancy testing safely and accurately without the need to hire a veterinarian. The novel technologies we develop will be a game-changer in the healthy and cost-efficient breeding of cattle, which is essential to help Australian farmers manage highly sustainable herds. We expect the advance to enable significantly improved livestock and dairy operator productivity, to decrease costs, to reduce operator injury, and to improve animal welfare. Our advances will have additional future potential in the manufacturing of complex nanosensors.

IE240100137 Colin, Dr Théotime	**New methods to protect honey bees from Varroa destructor mites** The most destructive pest of the honey bee is the parasitic mite Varroa destructor. This pest arrived in Australia in 2022 and eradication efforts failed in September 2023. We must now manage this pest if Australia's honey bee industries are to survive. The aim of this project is to develop a new chemical free mite control method. In collaboration with two beekeeping companies this project will exploit a specific sensitivity of the mite to heat to create a heat based control method for commercial hives. The outcome will be a new robust method for mite control to enhance bee hive health and management. This will benefit sustainable apiculture in Australia which is vital for both pollination of food crops and honey production.	169,637.00	148,837.00	129,037.00	447,511.00	AUSTRALIAN HONEYBEE PTY. LTD., SWAGMAN HONEY PTY LTD

National Interest Test Statement

Varroa destructor, a dangerous parasite of honey bees, arrived in Australia in 2022 and has rapidly spread in New South Wales. It is the greatest threat to honey bees. Overseas, the mite decimated wild honey bees and drove 50% of beekeepers out of the industry. In Australia we are reliant on bees for pollination of our food crops as well as our rural honey industry. Known chemical treatments are deemed unsatisfactory by beekeepers worldwide, because of their costs, labour, effects on bee health or the recurrent appearance of resistance. Through collaboration with beekeepers and a precision beekeeping start-up, this project will develop an alternative to chemical treatments. The project will use an innovative approach to controlling mites using heat. The project will take advantage of the different sensitivities of mites and bees to heat to apply the minimum amount of stress that is necessary to knock down mite populations in a hive. Modern beekeeping tools developed in Australia such as high insulation hives and hive sensors will be leveraged to rapidly develop this new precision thermal control method. The outcome will be a new option for mite control in Australia that will enhance colony health and the effective management of hives in apiculture. Stakeholders will be involved through presentation at industry events and a workshop to ensure rapid translation. The benefit will be to secure Australia's bee industry which delivers vital crop pollination services to agriculture.

IE240100155 Taylor, Dr Madeline E	**The Foundational Australian Agrivoltaics Regulation Model (FAARM) Project** This project aims to design a just and efficient solar energy legal framework to assist Australia in meeting its ambitious renewable energy targets. Although other countries are moving to co-locate solar facilities with agriculture, in Australia, uptake of this solution is stymied by lack of agreed legal principles and conflicts over land use. This project brings government, industry, and research together to accelerate Australia's adoption of agrivoltaics and generate significant, socio-economic, and environmental benefits. Expected outcomes include a comparative agrivoltaics database, industry-responsive regulatory model, and co-designed strategic	167,897.00	142,897.00	142,897.00	453,691.00	DEPARTMENT OF PRIMARY INDUSTRIES, SPARK RENEWABLES PTY LIMITED

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	guidelines boosting Australia's decarbonisation efforts and agricultural resilience. **National Interest Test Statement** As the world faces the unprecedented three-fold challenges of climate change and an energy and food crisis, Australia needs to adopt as many renewable energy technology solutions as possible. But uptake is slow. Australia needs to reach 82% renewable energy by 2030 but is currently only projected to reach 64%. An important solution rests in the possibility of co-locating solar energy with agriculture, particularly as returns from agriculture have decreased by 14% over the past 12 months, to provide a second income stream and potentially improved agricultural returns for farmers. Advancing agrivoltaics, coupling solar energy and agriculture, depends on confidence, clarity, fairness, value, and predictability for solar energy developers, farmers, and government. Providing expertise and knowledge on how to deliver these for agrivoltaics addresses a gap that industry and government stakeholders acknowledge that research is required to fill. This project responds to this industry need, bringing a fresh perspective that balances decarbonisation, farming, and energy justice to reshape policy globally by delivering co-created knowledge with government and industry partners creating novel tools and models to enhance the consideration of energy justice in agrivoltaics. The project will benefit national efforts in creating a just energy transition to increase socio-economic benefits for farmers and stimulating commercially viable agrivoltaics projects to reduce climate change impacts.					
	Macquarie University	492,051.00	445,031.00	449,769.00	1,386,851.00	
Southern Cross University						
IE240100183 Lehoczki-Krsjak, Dr Szabolcs	**Speed breeding with a twist for water-saving low-carbon rice** Rice has one of the highest environmental footprints among crops world-wide, because of the water use and methane emission during production. This project aims to combine drought and cold tolerance traits of rice, necessary for ecofriendly dryland production, through a field-based speed breeding approach. It will allow to rapidly advance and select drought and cold tolerant rice genotypes and will generate new knowledge on the genetic drivers of combined stress tolerance. Expected outcomes includes tolerant germplasms for further breeding and variety development purposes. This will lead to ‘climate smart’ dryland varieties and will provide significant benefit by transforming rice production to save water and lower the carbon footprint.	142,897.00	138,597.00	135,897.00	417,391.00	NATURAL RICE CO PTY LTD
	National Interest Test Statement Traditional flooded rice production requires large amounts of water for irrigation and to protect the plants from damaging low temperatures with a water blanket. Flooded rice paddies are also a major source of greenhouse gas emission from the puddled soil. Shifting towards well-watered, but non-flooded dryland production would significantly increase the sustainability of rice. However, this requires improved cold and drought tolerance to ensure high and stable yield of rice varieties under dryland conditions. Our goal is to establish a field-based speed breeding stream which will allow the growth of three generations of rice a year, while selecting for drought and cold tolerance. Genetic drivers of the combined stress tolerance will be analysed on the improved rice germplasms. This will create a quick response tool for the Australian rice industry to mitigate climate change and water shortage. The project is built on the unique growing conditions at the NSW Northern Rivers and driven by the need of its dryland rice sector for ‘climate smart’ varieties. It will also support Riverina rice growers to become more profitable, cleaner and greener by saving water and decreasing their carbon footprint. Ecofriendly rice will be an attractive option for Australian and overseas customers.					
	Southern Cross University	142,897.00	138,597.00	135,897.00	417,391.00	
The University of New South Wales						
IE240100041 Jiang, Dr Ze	**A Decadal Roadmap for Water Security and Resource Management** This project aims to enhance water resource management by crafting a reservoir flow forecasting framework spanning seasonal to decadal scales. Utilizing state-of-the-art climate models, hydrological simulations, and statistical methods, this initiative meets an industry-identified need. The expected deliverable - a platform for water security projections - is rooted in this framework and tailored for practical and commercial use. It aids utilities like WaterNSW in decision-making for water supply planning, drought preparedness, and resilience enhancement. By bridging academic innovation with industrial needs, the project stands to benefit Australia’s ability to mitigate the challenges posed by extreme events and climate change.	151,097.00	157,097.00	0.00	308,194.00	WATER NSW
	National Interest Test Statement					

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	This research addresses an urgent issue recognized by Australian water experts: ensuring water security for all Australians under a changing climate. Climate projections indicate that Australia will face a drier future in the coming decades, exacerbated by frequent extreme events. These shifts endanger urban water supplies, agriculture, and ecosystems. To counter this, the project develops a platform that integrates cutting-edge climate models, hydrological simulations, and statistical techniques. This platform delivers water security projections from seasonal to decadal scales, fulfilling critical industry needs. Immediate beneficiaries include water utilities such as WaterNSW, as the platform strengthens their resilience to climatic extremes and informs their strategic planning. This initiative aligns with Australia's National Water Initiative, tackling essential concerns such as water scarcity, drought resilience, and climate adaptability across multiple sectors. Upon commercialization, this platform will provide a scalable solution for jurisdictions with similar challenges, widening its impact. To maximize the reach of this research, close collaboration with industry stakeholders is intended for effective knowledge transfer and practical implementation. Through scholarly publications, public talks, and policy briefs, a wider understanding and adoption of the research are sought, enhancing Australia's capability for climate-resilient water management.					
IE240100124 McConnell, Dr Dylan J	**Developing open energy system modelling to drive rapid decarbonisation** Abundant renewable and natural resources present a unique opportunity for Australia to become an economic superpower, as the global economy decarbonises. There is an urgent need for comprehensive modelling tools capable of providing the analytic insights necessary for decision makers across Australian policy and industry to realise this opportunity. This project will provide this in partnership with The Superpower Institute, a non-profit organisation dedicated to supporting Australia’s energy transition. Through producing models for exploring transition pathways, and authoritative analysis on these, this project aims to help decision makers in Australia maximise the economic opportunities presented by realising rapid decarbonisation.	146,546.00	149,546.00	152,546.00	448,638.00	THE SUPERPOWER INSTITUTE LIMITED
	National Interest Test Statement Australia has some of the highest quality renewable energy and mineral resources in the world, essential to global decarbonisation. These resources present a comparative advantage and immense economic opportunity, if harnessed correctly. To realise this opportunity, there is an urgent need for comprehensive modelling tools to provide analytic insights to key policy and industry decision makers across Australia. In partnership with The Superpower Institute (TSI) this project will deliver open and accessible energy system models and an associated platform to provide insights into impacts and benefits of different energy transition to pathways. This will directly support evidence-based policy reforms and yield commercial outcomes particularly with respect to the development of industrial precincts powered by Australia’s high quality renewable resources. The project is explicitly designed to dovetail with TSI’s existing work providing roadmaps to government and industry on securing the economic benefits of a post-carbon world.					
IE240100153 Gorman, Dr Samuel K	**Scalable state preparation and measurement techniques for spin qubits** This project aims to improve the performance of scalable sensors for the state preparation and measurement (SPAM) of semiconductor spin qubits developed by Silicon Quantum Computing. Through pulse engineering and protocols the SPAM errors using small footprint sensors will be pushed below the fault-tolerant threshold for quantum computing leading to their incorporation into a large-scale error corrected quantum computer. The expected outcomes of project include the discovery of novel SPAM processes that will benefit quantum computing companies in Australia focused on spin qubits. The project will therefore benefit researchers, industries, and further cement Australia’s lead as a leader in the emerging quantum industry.	187,897.00	187,897.00	0.00	375,794.00	SILICON QUANTUM COMPUTING PTY LTD
	National Interest Test Statement Quantum computing is predicted to be able to outperform certain calculations exponentially faster than the largest supercomputers. However, the current size and performance of quantum computers severely limits the algorithms that can be run successfully. To address these performance issues, quantum error correction can be implemented provided that the errors of the individual components of the quantum computer are lower than a certain threshold value. This means that not only do quantum computers require many more processing elements, they also need to maintain the low error rates along the way. The commercial potential of quantum computing is only now starting to be realised where Australia is recognised a global leader. At the Australian-based company Silicon Quantum Computing (SQC) they developed a unique fabrication technique allowing the manufacturing of electronic devices with sub-nanometre precision. The manufacturing technique can be used to create all the building blocks of future quantum computers based on phosphorus atoms in silicon. The goals of this Fellowship is to leverage Australia's leading capability in commercial quantum computing to enable the development of scalable sensors for the next generation of silicon-based quantum processors. These sensors will then lead to future large-scale quantum computer with wide-reaching applications across several industrial sectors including finance, defence, and transportation.					
IE240100252 Dumoulin Stuyck, Dr Nard	**Cryogenic characterization platform for semiconductor quantum processors** This project addresses a critical challenge in the advancement of quantum computing. To enable the full commercial potential of quantum computing, quantum processors needs to scale to millions of qubits. Semiconductor spin qubit are a strong candidate, as research can leverage on	154,897.00	154,897.00	154,897.00	464,691.00	DIRAQ PTY LTD

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	traditional transistor manufacturing expertise. While traditional semiconductor testing methods offer a foundation, the unique demands of cryogenic testing of quantum metrics pose significant challenges. Our goal is to develop a rapid cryogenic spin qubit testing platform, ensuring that characterization scales with hardware complexity. This project is essential to propel quantum computing into a new era of technological innovation benefitting Australian society. **National Interest Test Statement** The technology to enable fabrication and characterization of scalable semiconductor quantum processor will position Australia at the forefront of commercialising quantum technologies, to be part of the $93 billion global industry by 2040. Australia has more than 20 years of quantum computing research experience and recently spun-off several startups such as Diraq, Q-Ctrl, Silicon Quantum Computing, and Quantum Brilliance focusing on building a commercial quantum computer. By working with Diraq Pty Ltd, this Fellowship will solve fundamental issues in the progress towards large scale quantum processors by developing a cryogenic quantum testing platform for rapid qubit characterization. This will pave the way to a feasible and manufacturable quantum processors, tailored for specific industry application and education purposes. The project is well aligned with the government initiative to promote and protect quantum technology by nurturing new quantum engineers, thereby increasing the talent pool in Australia's quantum ecosystem.					
	The University of New South Wales	640,437.00	649,437.00	307,443.00	1,597,317.00	
The University of Sydney						
IE240100006 Farajikhah, Dr Syamak	**Portable biosensor for food safety and quality monitoring** The objective of this project is to develop a portable electrochemical biosensor device capable of simultaneous detection of multiple pathogens, even at very low level of concentrations. This device will be a great asset for point of need detection of pathogenic contamination in food and monitor their safety and quality, particularly advantageous in natural disasters or an outbreak for food safety monitoring. In addition to food and water, the successful development of this versatile biosensor device will benefit a wide spectrum of companies such as pharmaceuticals, medical device manufacturing and farms for controlling product quality where detection of life-threatening pathogens is pivotal to prevent risk for consumers. **National Interest Test Statement** This project aims to develop a portable device for point-of-need detection of multiple pathogens in food to reduce the risk of food borne diseases. This device with low limit of detection will be superior to existing techniques that are laborious and time-consuming. This sensor will empower Australian agri-food business and med-tech to capitalise on the rapidly expanding global demand for increasing product safety and quality for consumers in supply chain. This device will prove invaluable in the detection of life-threatening pathogens in various products, including food, potable water, and pharmaceuticals. In the long run, it promises to yield significant socio-economic, environmental, and health advantages by mitigating the risk of distributing and consuming contaminated products—a pressing issue that jeopardizes the lives of millions and leads to extensive socio-economic disruptions. The knowledge developed in this project will be especially beneficial for Australian as small-to-medium agrifood and medical device enterprises by providing them a portable sensor for detecting pathogenic contamination, thereby fostering a globally competitive Australian med-tech and agriculture industry in the short term. These sensors will also reduce the hospitalisation due to foodborne diseases which costs Australian economy AUD 2.5 billion annually. Furthermore, it will set the groundwork for a thriving manufacturing industry focused on advanced diagnostic devices in the long term.	150,637.00	153,277.00	157,604.00	461,518.00	HA TECH PTY LTD
IE240100025 Amin, Dr Ali	**Reducing the severity of cracking in fibre reinforced shotcrete linings** This project aims to advance fundamental knowledge on the serviceability behaviour of fibre reinforced shotcrete tunnel linings with respect to early age cracking induced by restrained shrinkage. The project will establish a theoretical framework and best construction practice guidelines to account for different restraint and geometric conditions to ensure stringent crack control requirements are adhered to for the entire design life of newly constructed large tunnels. A framework to assess and predict the remaining service life of existing tunnel structures will be developed. This project is vital for tunnel asset management as detection and monitoring of early age cracking is critical to both safety and reducing ongoing maintenance costs. **National Interest Test Statement** This project is about developing a detailed understanding of the early age cracking behaviour of fibre reinforced shotcrete tunnel linings. The expected outcomes of this project include benchmark experimental data on	162,897.00	154,897.00	131,897.00	449,691.00	PSM ADMIN PTY LIMITED

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	material and structural behaviour of fibre reinforced shotcrete tunnel linings under varying degrees of restraint, development of robust design procedures for inclusion in design standards for the control of early age cracking in tunnel structures. Total construction works in Australia exceeded $218 billion in 2022 with a significant proportion of this infrastructure on concrete construction in tunnels. Conventional structural concrete can significantly deteriorate with time requiring regular and costly maintenance. With improved understanding of fibres in concrete, improved models can be developed to predict the early-age behaviour of these critical infrastructures. The research will be translated into practice through the development of design guidelines for practicing engineers.					
IE240100061 Tan, Dr Richard	**Developing next generation biomaterials for implantable technologies** The human body's rejection of foreign materials hinders advances in the development of implantable technologies. This project seeks to decipher the key parameters of implantable material design that lead to failure, utilizing insights from the immune system's foreign body response to synthetic polymers. The project expects to generate new cross-disciplinary knowledge at the intersection of material science and immunology. The expected outcomes include streamlined innovation and manufacture of biocompatible materials, enhancing the durability and function of implantable devices spanning applications from medicine to cosmetics and consumer electronics.	137,897.00	137,897.00	137,897.00	413,691.00	ENDOLUMINAL SCIENCES PTY LTD
	National Interest Test Statement This project seeks to develop a fundamentally new approach to the innovation and development of implantable biomaterials. Using a unique biologically-informed approach, the project will address a critical research gap by better understanding how materials integrate with the body. Enhancing integration of implantable technologies is a challenge relevant to a wide range of Australian industries. Addressing this need through innovative material designs can lead to significant improvements in commercial outcomes by minimizing complications, extending device longevity, and reducing the need for replacement surgeries. This may also carry added benefit in environmental sustainability by reducing material demand required for replacement devices, minimizing waste and aligning with global efforts for sustainable practices. More broadly, these advancements can impact the implantable materials industry, increasing demand, manufacturing, and commercialization, causing a ripple effect that would generate job opportunities, attract investments, and foster growth in the innovation economy of Australia and international communities. To promote the research outcomes beyond academia, we plan to engage with industry stakeholders, collaborate on commercialization efforts, and communicate our findings through public seminars and media outlets across a diverse range of sectors that include health, cosmetics, manufacturing, and electronics.					
IE240100096 Bello y Villarino, Dr José-Miguel	**AI & Anticorruption: Unearthing Systemic Corruption in the Public Sector** Corruption is a major challenge to democratic legitimacy but difficult to detect, especially when subtle and systemic in nature. Designed and conducted with the NSW ICAC, this project aims at helping to realise the revolutionary pattern-matching potential of artificial intelligence systems as an anticorruption tool, providing the much-needed legal and policy roadmap that assures it will be deployed well: with the right data, indicia and methods, and properly designed to convey useful and meaningful information to officials. The project is expected to offer vital insights for policy (enabling ICAC and other anticorruption bodies to harness these tools wisely) and scholarship (including a better understanding of systemic corruption).	142,340.00	174,636.00	171,711.00	488,687.00	INDEPENDENT COMMISSION AGAINST CORRUPTION
	National Interest Test Statement This project explores how the superb pattern-matching capabilities of artificial intelligence could be used to support anticorruption agencies to find potential cases of corruption within the public sector. Current methods of detection, such as overt warning signs; random audits or tip offs from whistleblowers can lead to selective enforcement and miss subtle, systemic corrupt activities, that progressively erode citizens' confidence and trust in the public sector. Working with NSW ICAC, this project analyses the legal and technical elements necessary for an AI-driven anticorruption system to safely operate and augment the capacities of anticorruption officials. It will provide state and federal anticorruption agencies in Australia and globally with the necessary guidance to procure the most effective, legal and ethical AI tools to fulfil their functions; and ensure through formal research training and collaboration both new capacity building among ICAC staff and a deeper understanding among anticorruption bodies of the promises and limitations of AI. The research will be continuously tested and assessed with local and global agencies and international experts at every stage, ensuring ongoing wide dissemination and translation of its insights. Domestically, ICAC will offer leadership by example. Internationally, OECD is the perfect vehicle for dissemination, amplifying and reaching representatives from a range of countries that would be impossible to engage directly.					
IE240100143 Cao, Dr Zhenbang	**Sustainable Plasma-driven CO Hydrogenation to Methanol** The mounting CO emissions crisis amplifies the need for novel carbon management solutions. When effectively converted to valuable products such as methanol, CO emerges not only as a solution to the greenhouse effect but also as a cornerstone for a sustainable, circular carbon economy. Employing non-thermal plasma technology for gas conversion offers unrivalled energy efficiency and the potential to be directly powered from renewable energy. This project will	145,897.00	149,897.00	133,897.00	429,691.00	PLASMALEAP TECHNOLOGIES PTY LTD

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	develop both the underlying science and engineering advances required to bring this innovation to industrial adoption. This project aims to not only mitigate harmful emissions but convert CO to climate-neutral e-Fuels targeting other hard to abate industries such as shipping. **National Interest Test Statement** The accelerating global climate crisis highlights CO's role as a key ingredient in chemicals and fuels production. Proper management of CO can mitigate industrial emissions and promoting a circular carbon economy. Converting CO into methanol using non-thermal plasma aligns with Australia's dedication to sustainability and the well-being of its businesses and communities. More importantly, this project serves Australia's national interest on multiple fronts: 1) The solution developed will be deployable as carbon capture and ultilisation technology for point-emissions from heavy industries like steel & cement, and in conjunction with direct air capture. 2) The project will support Australia's growing methanol industry and promote circular hydrocarbons, particularly methanol as a sustainable shipping fuel. 3) The project aims to boost Australia's readiness for decentralised Power-to-X solutions. By developing infrastructure that's compatible with renewables, it will enable decentralised chemical manufacturing, which can quickly and dynamically respond to the needs of the National Electricity Market. The project will deliver an integrated approach with R&D input from academia, commercialisation pathways with industry, and regulatory navigation with Government, maximising the potential for the technology's success and impact. The outlined project plan will accelerate the technology scale-up and reinforce Australia's reputation as a global-leader in sustainable innovation.					
IE240100170 Mather, Dr Ben R	**Go with the flow: tracing ancient groundwater pathways to discover copper** The green energy transition requires significant amounts of copper, yet no major copper discoveries have been made in recent decades. This project aims to discover potential new regions of sediment-hosted copper deposits by developing novel continent-scale groundwater models which track the transport of mobile copper through the subsurface. These deposits require less energy to mine and produce less waste than conventional copper deposits. Expected outcomes of this project include new models of copper transport within the Stuart Shelf, South Australia. This will improve the understanding of groundwater flow rates and timescales required for copper formation with significant impacts for resource potential to power the energy transition. **National Interest Test Statement** The demand for copper is expected to double to 50 million tonnes by 2035 as the world transitions towards renewable energy. The impending socio-economic problem is that there are insufficient copper resources to meet the projected demand, driven by government mandates for net-zero emissions by 2050. In the absence of any major copper discoveries in the last few decades, this project aims to develop novel exploration techniques to uncover new copper sources. Groundwater plays a fundamental role in redistributing copper within the landscape and concentrating it into mineral deposits. Through long-term interaction with the water table, these "supergene" deposits require less energy to mine and produce less waste than most conventional copper deposits. This project will combine my expertise in continent-scale groundwater modelling with BHP's expertise in copper exploration to create the first models of copper mobility and secondary concentration within the sedimentary cover of the Stuart Shelf, South Australia. This project addresses a critical gap for the exploration of copper and aligns with National Research Priority 6 "Resources" as well as the Australian government's Modern Manufacturing Priority in "Resources Technology & Critical Minerals Processing". This project fills a critical knowledge gap for BHP and the wider scientific community on the timescales and flow rates required for the concentration of critical metals, with significant impacts for decarbonisation.	160,867.00	142,267.00	142,267.00	445,401.00	BHP GROUP LIMITED
IE240100248 Liu, Dr Sonia Y	**Early bird gets the feed: better nutrition and management in poultry** Chicken and eggs are the preferred and affordable sources of animal protein, and essential for national nutrition and food security. Australia produces approximately 14 million chickens every week and, unfortunately, few, if any, meet day 7 growth performance target. Both parental and early post-hatch nutrition influences early growth and ultimately, final body weight in broilers and egg production in layers. This project aims to investigate amino acid metabolism and digestive dynamics in breeders, chicks and pullets in Australian production systems. Expected outcomes include industry nutrition and management guidelines to improve productivity, reduced environmental footprint and strong, ongoing industry-research collaborations. **National Interest Test Statement** As the nation's most consumed meat, nearly 70% of Australians eat chicken at least twice a week. The average Australian also consumes 262 eggs per year. Chicken-meat consumption has doubled over the past 30 years and cost-of-living increases continue to push consumer preference for this affordable protein option. More food, overall, is needed to feed the growing population. Such strong demand has highlighted urgent gaps in chicken and egg production; most notably around delayed early chick growth and development. The industry has strong opportunities to boost productivity through improved commercial feed models, based on Australian-grown and sourced ingredients, and potentially transformational early management practices for better animal welfare, increased resource utilisation and reduced environmental footprint. Understanding the cost-productivity trade-off of different nutrition and management choices will support producers in their decision making amidst feed (and other resource) availability and price volatility. This will convey improved profitability to the $3.0B gross value of production chicken-meat and $1.1B (sales value) Australian egg industries, and sustained product affordability for consumers. The Fellowship includes close collaboration with poultry producers, breeders, and world-leading	176,522.00	184,012.00	116,897.00	477,431.00	COMPLETE FEED SOLUTIONS PTY LTD, AVIAGEN AUSTRALIA PTY LIMITED

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		2024-25	2025-26*	2026-27*		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
	nutritionists to co-develop and directly deliver improved nutrition and management solutions for immediate implementation and long-term industry benefit.					
	The University of Sydney	1,077,057.00	1,096,883.00	992,170.00	3,166,110.00	
University of Technology Sydney						
IE240100245 Zhao, Dr Sipei	**AI-empowered smart acoustic sensing system for metal additive manufacturing** While metal additive manufacturing technology is gradually accepted for industrial and commercial applications, effective in-situ process monitoring for quality assurance remains a substantial challenge. This project aims to develop an AI-empowered smart acoustic sensing system for real-time monitoring of metal additive manufacturing processes. This project intends to establish a comprehensive acoustic model to characterise the acoustic production mechanics during manufacturing processes and to design an acoustics-informed neural network architecture that combine the acoustic models and deep learning techniques. The anticipated outcomes expect to reduce cost and material waste and lift competitiveness of Australian manufacturing industry.	162,897.00	157,897.00	167,897.00	488,691.00	AUTOMATION ACOUSTICS PTY LTD
	National Interest Test Statement Metal 3D printing has attracted significant attention in the past decade for critical parts fabrication in defence, aerospace, maritime, automotive, and healthcare industries. However, 3D-printed metal products may be poor quality, with pores and keyholes that weaken the mechanical strength of the products. This may lead to serious problems such as engine malfunction or break off, which are dangerous in critical applications in defence and aerospace industries. Therefore, to reduce flaws in 3D-printed metal products, this project proposes an AI-empowered smart acoustic sensing system for process monitoring and defect detection in metal 3D printing. The smart acoustic sensing system can detect abnormalities and defects in real time during the manufacturing process so that the operator is alerted to intervene in the early stage, i.e., either correcting the machine parameters to rectify the manufacturing process or terminating the process to avoid waste of time and materials. The project outcomes expect to regulate quality consistency and enhance competitiveness of Australian manufacturing industry against international competition. To enable adoption of our technology, we will test and scale up manufacturing of our proposed system with our industry partner, promote our system in relevant industry expos, such as Formnext, and invite potential customers to try our systems for free etc.					
	University of Technology Sydney	162,897.00	157,897.00	167,897.00	488,691.00	
University of Wollongong						
IE240100099 Brown, Dr Ronald W	**Building Better Herbicides With 3D Boron and Silicon Building Blocks** This fellowship aims to develop a modern toolkit for building herbicidal molecules, comprised of 3D chemical building blocks containing boron and silicon. The significance of the project is that it uses strategies that have delivered successful pharmaceuticals, such as molecular shape and complexity, and applies these to crop protection to address serious challenges such as genetic resistance, which threatens the effectiveness of almost 70% of herbicide types. The expected outcomes are safer, more effective herbicides, resulting in benefits of increased crop production and alleviated pressure on our agricultural sector, farmers and the environment.	177,477.00	153,477.00	153,477.00	484,431.00	BAYER CROPSCIENCE
	National Interest Test Statement This research is a collaborative effort between the University of Wollongong and Bayer CropScience to develop a modern chemical toolkit for delivering safer, more effective herbicides to the Australian agricultural sector. The project draws on principles that have largely been applied to the pharmaceutical industry so far, such as molecular shape and complexity, and redirects them to tackle serious challenges in the agricultural sector, such as genetic resistance, crop damage and environmental impact. The research aligns with the Australian government's goal of increasing agricultural production to $100 billion by 2030 (Ag2030) and brings the international agrochemical industry to Australia to enable industry-relevant training to the fellow involved and lead to further collaborations. The research is designed to translate directly into the industry product pipeline and the developed chemical toolkit is envisioned to be applicable in the wider agrochemical arena beyond the fellowship.					
	University of Wollongong	177,477.00	153,477.00	153,477.00	484,431.00	

* 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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Approved Organisation, Leader of Approved Research Program	Approved Research Program		Estimated and Approved Expenditure ($)	Indicative Funding ($)		Total ($)	Industry Partner(s)
			2024-25	2025-26*	2026-27*		
(Columns 1 and 2)	(Column 3)		(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
		New South Wales	2,692,816.00	2,641,322.00	2,206,653.00	7,540,791.00	

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Approved Organisation, Approved Research Program Leader of Approved Research Program		Estimated and Approved Expenditure ($)	Indicative Funding ($)		Total ($)	Industry Partner(s)
		2024-25	2025-26*	2026-27*		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
Queensland						
Griffith University						
IE240100067 Lanctot, Dr Chantal	**Determining the Ecological Impacts of Bushfire Fighting Chemicals** This project aims to determine the ecological impacts of firefighting chemicals (FFCs) used to control bushfires by assessing their fate, persistence, and aquatic toxicity. Increased bushfire activity has led to a significant rise in the use of FFCs, resulting in a critical need to assess the risk they pose to aquatic ecosystems. Working in partnership with government agencies and water utilities, this research will provide decision-makers with the scientific evidence needed to manage the safe use of FFCs around water catchments. The outcomes of this project will deliver direct environmental benefits by informing best practice guidelines and regulations to safeguard water resources and environmental assets during bushfire emergencies.	149,832.00	169,408.00	169,408.00	488,648.00	WATER NSW, ICON WATER LIMITED
	National Interest Test Statement Climate-driven fires are becoming more frequent and severe, leading to a widespread increase in the use of firefighting chemicals (FFCs) to protect lives and property. These chemicals have become an integral tool for the containment and suppression of bushfires, with new formulations continuously entering the market. However, stakeholders, including government authorities and water providers, have raised concerns over the potential risks FFCs pose to valuable water resources and ecosystems and have highlighted a critical need for scientific data to inform decision-making. This project partners with Australian water agencies and utilities to address these gaps by comprehensively assessing the impacts of FFCs on water quality and catchment health. The outcomes of this project will inform risk-based management strategies and practices for FFC deployment around water catchments that will be directly adopted by project partners and stakeholders to protect environmental assets. The project will deliver direct environmental benefits by offering a roadmap for responsible FFC use that will guide positive changes in policy and inform the development of greener alternatives, ensuring effective bushfire management practices that benefit society in the fight against bushfires while minimising harm to Australian ecosystems.					
	Griffith University	149,832.00	169,408.00	169,408.00	488,648.00	
The University of Queensland						
IE240100026 Tan, Dr Xin Fu	**Low Temperature Solders for Energy-Efficient Electronics Manufacturing** Electronics manufacturing consumes substantial energy, heating assemblies above the melting point of solder alloys to form mechanical and electrical connections. The project aims to develop low-melting-point solders based on the tin-bismuth (Sn-Bi) system, the only affordable alloys with suitable melting temperatures. The project expects to overcome limitations related to the atypical electrical and mechanical properties of these alloys through innovative analytical methods. The expected outcomes include reduced process temperatures in electronics manufacturing. This provides significant benefits such as lower energy consumption and the ability to manufacture advanced circuitry incorporating temperature-sensitive components and substrates.	159,497.00	159,497.00	159,497.00	478,491.00	MASTERS & YOUNG PTY. LTD., NIHON SUPERIOR CO. LTD
	National Interest Test Statement Electronics manufacturing is an extremely energy-consuming process as a large amount of heat is required to melt the filler metal (solder) that connects the electronic components to the circuit boards. Low temperature solders (LTS) represent a solution which would allow Australian electronics industry to significantly reduce costs in the manufacturing of electronics. This project aims to develop new low-melting point solders that will lower not only the energy consumption required for assembly but also the potential thermal damage to circuit boards during manufacturing. Translation of the outcomes will be facilitated by the Key Industry Partner, Masters & Young Pty. Ltd., a Brisbane-based designer and manufacturer specialised in defence, medical, and industrial devices who are perfectly placed for introducing LTS to Australian industries. This benefits local companies, strengthening Australia's sovereign industry capabilities in advanced electronics manufacturing and providing significant economic values to Australian society. To amplify the impact and facilitate the translation of the intellectual property developed, this project partners with Nihon Superior Co., Ltd., a global supplier to the electronics manufacturing industry, to bring Australian technology to the global market. Having these partners on board enables rapid entry to established markets, advancing Australia's position in high-value electronic manufacturing industries worldwide.					
IE240100237	**Pulse sequence development for ultra-high field Magnetic Resonance Imaging**	160,540.00	185,631.00	141,530.00	487,701.00	SIEMENS HEALTHINEERS,

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		2024-25	2025-26*	2026-27*		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
Tourell, Dr Monique C	The project aims to develop a suite of Magnetic Resonance Imaging (MRI) pulse sequences at ultra-high magnetic field (UHF) strengths. UHF is at the cutting edge of MRI research but remains largely inaccessible to non-MRI specialists. This project expects to expand the capability of UHF imaging for research fields such as neuroscience and psychology, nationally and internationally. The expected outcome of this project is a suite of robust, commercially viable pulse sequences that allow researchers to use UHF imaging to expand our knowledge in the areas of brain function, anatomy, tissue composition and connectivity. This should provide significant benefits in understanding brain development, disease progression and presentation.					SKOPE MAGNETIC RESONANCE TECHNOLOGIES AG
	National Interest Test Statement Magnetic resonance imaging (MRI) enables unparalleled insight into human anatomy and function, advancing fundamental biomedical knowledge and healthcare. MRI research drives innovations in the fields of biomedical science, neuroscience, psychology and sports medicine, particularly in brain imaging. It also improves the quality and efficiency of clinical scanning, leading to better patient outcomes. Ultra-high-field (UHF) MRI scanners use magnetic fields that are much stronger than clinical scanners, and are capable of imaging at finer detail and higher precision. Through the National Imaging Facility, Australia has invested in UHF MRI to maintain our world-leading role in advanced imaging technology. However, the flexibility and reliability associated with MRI is not easily translated to UHF due to several technical challenges. As such, UHF MRI remains inaccessible to many Australian researchers who use lower-field MRI but would significantly benefit from the advantages of UHF. In collaboration with market leader Siemens Healthineers, and MRI development experts Skope MRI Technologies, this project aims to address these challenges by developing new, specialized imaging methods for UHF MRI. This will significantly improve the capability of Australia's existing investment, allowing Australian researchers to advance knowledge of brain anatomy and function, improve diagnosis and treatment of brain-related diseases, and commercialize innovations for clinical MRI scanning.					
	The University of Queensland	320,037.00	345,128.00	301,027.00	966,192.00	
	Queensland	469,869.00	514,536.00	470,435.00	1,454,840.00	

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
South Australia						
Flinders University						
IE240100131 Milte, Dr Rachel	**Partnering with aged care providers to develop accessible outcome measures** This project aims to develop evidence-based tools designed for Aged Care organisations to drive inclusivity in self-reporting by older people as part of the National Mandatory Quality Indicator Program. Recommended by the Royal Commission into Aged Care Quality and Safety, it will allow Aged Care providers to include people with dementia themselves when assessing their quality of their care. Expected outcomes include accessible-communication versions of the validated person-centred quality assessment tools recently implemented as part of the National Mandatory Quality Indicator program (namely the Quality of Life Aged Care Consumers and Quality of Care Experience Aged Care Consumers Instruments).	150,869.00	144,173.00	144,960.00	440,002.00	THE SOUTH AUSTRALIAN INNOVATION HUB LTD, DEMENTIA AUSTRALIA, UNITING AGEWELL LIMITED, AGED CARE QUALITY AND SAFETY COMMISSION
	National Interest Test Statement Aged Care providers encounter a challenging task when seeking information from individuals with dementia regarding the quality of care they are receiving, because of a gap in our understanding of how data collection from these individuals can be optimised. This project will address the problem by working with Australian Aged Care providers to develop practical tools for the collection of data from these individuals. The tools will be co-developed with the Aged Care Industry and people living with dementia, ensuring they are fit for purpose and ready for immediate implementation. Crucially, this research supports the effective rollout of the new National Mandatory Quality Indicator Program, which aims to measure and report on the quality of the Australian aged care system, by providing meaningful input from people living with dementia into the Program. Implementation of the tools into the existing Program will occur through industry partners SA Innovation Hub, Uniting AgeWell and Aged Care Quality and Safety Commission. Australia will benefit from improved care for people with dementia via the ability to respond to feedback from those who are reliant on the care. Importantly, the outcome will also increase Australia's trust in the quality of care for some of society's most vulnerable. Information on the tools and research outcomes will be broadly communicated to the industry through presentations at aged care industry events and publications in aged care industry journals.					
IE240100140 Fisher, Dr Jody C	**Including influence activity in complex conflict modelling** Influence activity in information warfare seeks to obtain an advantage through manipulating perceptions and behaviours. Influence activities are subtle and change over time, making them difficult to detect or mitigate. This project aims to develop a novel modelling tool which quantifies their effects, facilitating strategic and operational planning for Defence. The project will develop new mathematical knowledge by using innovative techniques to analyse transient interactions in large complex systems. The expected outcome is a model toolkit that can quickly inform Defence of optimal strategies to counter influence activity impacts. Key project benefits include an operational edge and essential security capability for Australia.	120,496.00	115,497.00	118,497.00	354,490.00	DEFENCE SCIENCE AND TECHNOLOGY GROUP
	National Interest Test Statement Modern defence-related conflict environments are fast changing and uncertain. Currently, strategic and operational decision making in the Australian Defence Force is complex and labour intensive because of the many interacting and dynamic factors involved and the difficulty in predicting the impact of indirect or transient effects on these interactions. The speed and flexibility of existing decision making tools are insufficient for assessing impacts across the Force as a whole. This Fellowship aims to address the deficiency by developing new mathematical methods and models to support decision making in complex conflict scenarios, delivering a robust mathematical framework tool for rapid strategic and operational decision-making for Defence. The tool will allow individual capabilities across the whole of Defence to be synchronised and optimised to best effect, providing an operational edge for the Australian Defence Force and essential security capability for Australia. This advances the 2023 Defence Strategic Review's vision of an integrated force. Translation will occur in conjunction with the Key Industry Partner, Defence Science and Technology Group, by direct engagement with and implementation by Australian Defence.					
IE240100269 Deegan, Dr Simone J	**Disrupting the Abuse-to-Prison Pathway for Girls** One in ten children in detention in Australia are female, 81% of whom have histories of being abused. 56% are Indigenous. These young females are detained in places designed for males which compounds and causes them further harm. This Fellowship aims to work with the Office of the Guardian for Children and Young People to create and implement new system-wide policies and practices to better engage with vulnerable girls. Using a co-design method, the project will	159,579.00	161,681.00	163,641.00	484,901.00	OFFICE OF THE GUARDIAN FOR CHILDREN AND YOUNG PEOPLE

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		2024-25	2025-26*	2026-27*		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
	develop a gender responsive Model of Care. Expected outcomes will disrupt the abuse to detention pathway and improve both short and long term outcomes for girls in detention. Benefits include enhancing the safety of Australian communities.					
	National Interest Test Statement					
	Females are the fastest growing population in prisons in Australia. Girls are most often incarcerated for relatively minor offences linked to childhood trauma and violence. Because the stereotypical incarcerated juvenile is a 'violent, young male,' care practices for youths in detention are based on the needs of adolescent boys. These practices cause further harm to incarcerated girls, underlining a gap in our knowledge of practices that would optimise positive outcomes for the girls. This project will address this gap by designing and gaining evidence for the effectiveness of a model of care that allows incarcerated girls to improve their own wellbeing and prospects for rehabilitation and re-joining their communities. This project is independent of the child protection and youth justice systems and interactions, to avoid findings being affected by already damaged relationships or limited by established policy. Australia will benefit from a safer community through the reduction in the number of girls re-offending, with a resulting significant economic benefit for Australia. It will also benefit the girls themselves who will have improved prospects following incarceration. Implementation of a new model of care will be promoted directly to organisations that work with girls in child protection, residential care, children's courts and detention centres. Research findings will also be presented in media to broadly raise awareness and encourage change that benefits Australians.					
IE240100282	**Optimal circadian timing: Wearable light device and customised technology**	136,977.00	161,057.00	130,647.00	428,681.00	RE-TIME PTY. LTD.
Lovato, A/Prof Nicole	Maintaining circadian rhythms is vital for optimal sleep, alertness, safety, and performance but circadian misalignment is very common. This project aims to address the key impairments associated with circadian misalignment by advancing the tailored delivery of bright light administration. The project will deliver a novel Australian-industry-pioneered wearable device and accompanying technology to provide automated, interactive, customised, best-evidence based light therapy to retime the body-clock. This combination of a wearable device and customised technology does not yet exist in Australia or globally. The project benefits include excelerating existing knowledge and application of lighting strategies for effective circadian retiming.					
	National Interest Test Statement					
	More than 10 million Australian adults suffer from inadequate sleep and impaired daytime functioning, alertness, and performance due to their mistimed body clocks. However, less than 1% can access the evidence-based light technologies needed to retime these. The 2019 Parliamentary Inquiry into Sleep Health Awareness identified an urgent need to translate circadian rhythm technologies into the homes of Australians, including for our rural and remote communities. To address this gap, the fellowship seeks to examine the impact, on sleep-deprived Australians, of a new Australian-made designed and manufactured smart wearable light delivery device and accompanying customised technology. The research will define and provide evidence-based validation for light exposure patterns for optimal effectiveness of the device. The benefits to Australians are clear. Australians with impaired sleep will enjoy improved sleep and improved daytime productivity, no matter where in Australia they live. In addition, leveraging this strong research-industry partnership at the interface of sleep science and wearable technology will accelerate Australian industry growth through optimising a pioneering sleep management device. The knowledge generated will be disseminated directly to the industry partner and via presentations to major relevant industry associations where it will guide the design of new methods and cost-effective devices that mitigate circadian mistiming.					
	Flinders University	567,921.00	582,408.00	557,745.00	1,708,074.00	
The University of Adelaide						
IE240100040	**Decoding airborne volatiles in environmental smoke that taint wine**	152,897.00	147,897.00	152,897.00	453,691.00	THE AUSTRALIAN WINE RESEARCH INSTITUTE, COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION, DEFENCE SCIENCE AND TECHNOLOGY GROUP
Parker, Dr Tangerine	Smoke-taint in grapes is recognised as the most important agricultural production risk to national, and international, winemakers. This project aims to minimise risk to the wine sector by focussing not on grapes, but on the smoke itself. This Fellowship seeks to generate new data and capability to detect and measure volatiles in smoke at the time of exposure, to inform evidence-based strategies for assessing real-time smoke-taint risk to support Partner service offerings and industry decision-making. Further, it expects to co-develop commercial vineyard sensors through Partner collaborations, while also providing new information to enhance smoke forecasting by Partners, and burn management strategies to benefit grape-growers.					
	National Interest Test Statement					

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
	Bushfires, stubble burns, and controlled burns all pose major risks to the international winemaking industry. Smelly volatile chemicals in the smoke are absorbed by grapes, making them unfit for winemaking. Australia's vignerons have suffered $1.4B in losses in winegrape quality from smoke damage over the last 20 years and the problem is only expected to get worse with climate change. Currently, grapes need to be ripe before testing, so growers need to maintain crops for several months only to find that they are worthless at harvest. This project aims to develop new capabilities to detect and measure volatile agents directly in smoke, allowing growers to make more cost-effective vineyard management decisions and mitigate risk. This will result in tangible benefits to the wine industry, such as, the preservation of wine quality, reduced waste and reduced costs. I will work with the Australian Wine Research Institute to develop state-of-the-art analytical protocols to identify and measure trace levels of smoke volatiles known to damage winegrapes. I will work with wine industry partners to translate this new technology into commercial sensors that can be installed in vineyards. Further opportunities with the National Smoke Forecasting system being developed by CSIRO will involve me integrating the research data into the Air Quality Forecasting System.					
IE240100056 Scholten, Dr Sarah K	**Quantum clock for assured global navigation: Global Positioning System 2.0** This project aims to develop a new high-performance atomic clock suited for operation on a satellite as part of a next generation Global Positioning System. With industry partner QuantX Labs, this project will design and deliver a high-performance clock with low size, weight and power consumption. Expected outcomes include a next-generation clock with 10 times improved performance when compared with current commercial clocks and reduced vulnerability to intentional disruption of next-generation satellite navigation signals. This will provide significant benefits through building sovereign capacity and providing a future of assured position, navigation, timing and robust satellite navigation service for all.	162,000.00	115,000.00	115,000.00	392,000.00	QUANTX LABS
	National Interest Test Statement Satellite technology is vital for everyday purposes including navigation, communication, defence and finance. Large satellites need large orbits resulting in weaker signal strength on Earth. By reducing the size of satellites, we can reduce orbit size resulting in stronger signal strengths. The next generation of satellites will need smaller and more efficient clocks. I have been able to show that laser interaction with rubidium atoms can significantly improve clock performance, and reduce size, weight, and power consumption. In partnership with QuantX Labs, this project will create the quantum clock required for the next generation of low orbit satellites. The project outcome will be smaller clocks which will enable smaller satellites in lower orbits providing stronger signal strengths. Stronger and more reliable signal strengths will benefit any Australian who uses a Global Positioning System or phone, flies in a airplane, and earns or spends money. QuantX's strong record of technology translation and commercialisation will see rapid adoption of the technology created. Research outcomes will be further promoted through my outreach activities as a Superstar of STEM. This includes school visits and media engagements as well as wider community communication events.					
IE240100074 Liang, Dr Gemeng	**Cobalt-free nickel-based lithium-ion battery cathodes for electric vehicles** Current electric vehicles encounter challenges related to range anxiety and price premiums, primarily stemming from the limitations of lithium-ion batteries. Working with the key industry partner, this project aims to develop low-cost, high-energy, and durable lithium-ion batteries to advance electric vehicle technology through the creation of competitive cobalt-free, ultrahigh-nickel battery cathode materials. This project expects to elevate the technology readiness level of this promising candidate from 3 to 6 and expedite its integration into electric vehicle models. This project offers substantial opportunities for Australia to establish global leadership in battery manufacturing and to add high values to Australia's mining products.	136,897.00	136,897.00	136,897.00	410,691.00	IONDRIVE TECHNOLOGIES PTY LTD
	National Interest Test Statement Attaining carbon neutrality is an urgent imperative for Australia, with a substantial shift to electric transportation at its core. The development of electric vehicles (EVs) currently depends on lithium-ion batteries (LIBs), while LIBs face issues of high fabrication cost and unsatisfactory battery performance, resulting from the reliance on costly cobalt and limited battery energy density, respectively. This project aims to develop cobalt-free and ultrahigh-nickel battery cathode materials that feature cost effectiveness and high battery performance by novel structural and surface modifications to promote the advancement of EV technologies. This project will build a comprehensive and clear roadmap of cathode material productions and unveil their working mechanism during battery functioning. Through intellectual property licensing and close industry collaboration, these competitive materials will replace existing cathodes in EVs, ushering in sustainable, cost-efficient, and high-performance electric transportation. In addition to enhancing Australia's capabilities in the EV industry and integrating Australia into the global LIB supply chain, this project holds the potential to create numerous job opportunities and contribute to the long-term economic prosperity. Furthermore, it offers a significant opportunity for Australia to harness its abundant natural resources, including lithium, nickel, and manganese, to further enrich industry from its mineral wealth.					
IE240100106 Marsh, Dr Jessica R	**Conserving caves: Developing tools to safeguard subterranean biodiversity** This project aims to develop innovative techniques to document and protect the biodiversity of the Nullarbor caves, an iconic Australian ecosystem. We will develop standardised methodologies to	167,897.00	164,897.00	134,897.00	467,691.00	INVERTEBRATES AUSTRALIA LTD, AUSTRALIAN SPELEOLOGICAL FEDERATION

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
	monitor biodiversity, detect centres of endemism, and identify threats, plus guidelines to inform conservation. Novel techniques will be employed to survey areas inaccessible to humans, thus solving a major challenge to environmental monitoring of caves globally. Outcomes of this project are enhanced capacity to monitor cave biodiversity, prevent extinctions, and protect areas of high biodiversity importance, which we will translate to industry and the community via museum displays, talks, and conservation and sustainable development guidelines.					INCORPORATED, QUEENSLAND MUSEUM, WESTERN AUSTRALIAN MUSEUM, INTERNATIONAL UNION FOR NATURE CAVE INVERTEBRATE SPECIALIST GROUP
	National Interest Test Statement In 2022 Australia made a global conservation commitment that by 2030 biodiversity loss would be reduced, areas of high biodiversity importance protected, and extinctions of known threatened species halted. These ambitious goals are important, but for most of Australia's invertebrates the information required to meet them is currently unavailable. We will address these data gaps for an imperilled area of high biodiversity importance, the Nullarbor caves. New and innovative surveillance techniques for sampling environmental DNA and surveying invertebrate biodiversity will be utilised to identify the caves of importance for conservation. These standardised protocols will form an industry standard for environmental monitoring of caves in Australia and globally. Research findings will be transferred into impact through threatened species assessments, and via production of guidelines to inform conservation planning and sustainable development. Involvement of primary invertebrate conservation agencies in Australia and internationally will ensure immediate translational value and ready uptake, through threatened species listings and adoption of protocols. We will produce museum displays, talks, and media releases to communicate research findings to industry and stakeholders. This project will ultimately provide information to enable Australia to protect an area of high biodiversity significance, prevent extinctions, and help it meet its conservation commitments.					
IE240100186 Liu, Dr Sailin	**All-temperature aqueous zinc ion batteries for stationary energy storage** The aim of this project, which partners with IonDrive Technologies, is to design harsh-temperature-adaptable aqueous zinc ion batteries (AZIBs) for application in the booming stationary energy storage market. This will be achieved by novel electrolyte solvation structure design, advanced cathode preparation, and adjustable in-situ solid electrolyte interphase, followed by pilot-scale demonstration. Project success will provide an all-temperature AZIBs system for renewable and stationary energy storage, reinforcing Australia's research strength in promoting clean and sustainable energy technology. It will bring both scientific and economic benefits to Australia, including promoting green energy pathways to mitigate climate change.	136,697.00	137,897.00	136,697.00	411,291.00	IONDRIVE TECHNOLOGIES PTY LTD
	National Interest Test Statement Widening the operational temperature range is an urgent requirement for grid-scale battery storage that is expected to experience significant growth in demand over the next decade with the expansion of renewable energy. The emerging safe and low-cost rechargeable aqueous zinc ion battery (AZIB) is one of the most competitive candidates to lithium ion for stationary deployment. However, its adoption is currently limited by performance degradation at extreme temperatures. This industry project will design AZIBs with a wide operational temperature range, long calendar life and high energy density. Working with Iondrive Technologies P/L these research outcomes will be disseminated through publications, patents, and large battery cells. The research will yield multifaceted benefits, including expanding Australia's ability to develop practical AZIBs, developing new research frontiers and leading to the development of technology platforms for high-efficiency and scalable energy-storage devices. This will have the potential to drive long-term economic prosperity, create jobs and promote green energy uptake. Finally, Australia also has an enormous opportunity in the global energy transition to benefit from its natural zinc mineral resources, which are the largest in the world.					
IE240100275 Chen, Dr Weitong	**Future of Work: Achieving Efficiency and Productivity through Optimisation** This project's core objective is to address scheduling and resource allocation challenges in service-oriented businesses, in collaboration with SA Pathology. It introduces a novel data-driven optimizer to identify optimal resource allocation in these industries, promising accurate workload forecasting, reduced task duration, and enhanced public well-being. It aligns with digital transformation and Industry 4.0 principles. The project's significance lies in generating new interdisciplinary knowledge, with outcomes including improved collaboration, theory development, refined methods, and shorter task completion times. It offers substantial benefits to SA Pathology and similar organizations, enhancing efficiency and resource management.	147,147.00	161,147.00	150,147.00	458,441.00	SA PATHOLOGY
	National Interest Test Statement The project's central aim is to confront the scheduling and resource allocation encountered by service-oriented businesses with SA Pathology. It addresses a research gap in Australia by responding to the urgent need for a data-driven optimizer that identifies an optimal scheme and resource allocation within service-oriented industries. These solutions not only promise to accurately forecast future workloads, minimize task duration and contribute					

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		2024-25	2025-26*	2026-27*		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
	to public well-being but also align perfectly with the principles of digital transformation and the Industrial 4.0 revolution. This new technique holds the potential to usher in economic benefits for Australia by streamlining task scheduling and resource allocation, particularly in businesses like SA Pathology. Such optimization can translate into cost savings and efficient response, benefiting stakeholders. Furthermore, it strengthens Australia's global leadership in the domains of operational efficiency, positioning the nation for continued growth within the burgeoning AI industry, creating new job opportunities. Beyond academia, SA Pathology will serve as a real-world testbed, allowing us to fine-tune and validate our solutions within an operational business. The project is committed to disseminating its research through conferences, media, and IP commercialization. These concerted efforts aim to ensure widespread understanding and adoption of the research findings, benefiting both SA Pathology and a broader spectrum of businesses.					
	The University of Adelaide	903,535.00	863,735.00	826,535.00	2,593,805.00	
	South Australia	1,471,456.00	1,446,143.00	1,384,280.00	4,301,879.00	

* 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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		2024-25	2025-26*	2026-27*		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
Victoria						
Deakin University						
IE240100274 Makhlooghiazad, Dr Faezeh	**Designing innovative, eco-friendly materials for renewable energy storage** This project will advance Australian's energy storage capability by developing safe, eco-friendly, and affordable materials for battery technology. The project addresses a significant gap in battery materials for Australia by delivering high-performance materials that excel in harsh conditions, including high temperatures, while delivering significant energy storage capacity and rapid discharge capabilities. The expected outcomes include developing new batteries that reduce environmental impact and avoid the use of expensive and exotic metals, that can be better utilized for energy storage under Australian conditions. This will provide significant benefits to the renewable energy sector and contribute to Australia's transition to net zero.	166,497.00	147,897.00	173,397.00	487,791.00	PROTON SYSTEMS PTY LIMITED
	National Interest Test Statement The current state of battery technology primarily relies on lithium batteries, which are made of expensive, flammable, and toxic materials. Additionally, while these batteries can store high energy, they cannot deliver this energy quickly. They also have challenges operating safely in the extreme temperatures in certain remote areas of Australia, where temperatures can exceed 50°C. Given Australia's diverse landscape, harsh climates, and dispersed population, there is a pressing need for affordable energy storage solutions capable of providing high power density and withstanding elevated temperatures. Proton-based batteries show promise in meeting this demand, but currently the efficiency of these batteries is low. To improve stability and reliability of these batteries, this project will develop new materials that have advantages of being safe, eco-friendly, affordable, and stable at high temperatures. These materials will be specifically designed for storing renewable energy generated from Australian solar and wind sources. This development not only addresses national importance of efficient energy storage infrastructure but also paves the way for establishing local manufacturing capabilities and creating hundreds of local jobs. Through collaboration with an Australian industry partner, the project will have greater potential to deliver the technology to market and serve Australians, support a financially sustainable energy transition that aligns with Australia's needs.					
	Deakin University	166,497.00	147,897.00	173,397.00	487,791.00	
Federation University Australia						
IE240100198 Neilly, Dr Heather L	**Restoring a resilient mallee woodland by translating ecology into action** The conservation industry must deliver landscape-scale, cost-effective restoration, that is resilient to disturbances. This project aims to examine how best to restore function and resilience to 1 million ha of degraded Eucalyptus mallee woodland: critical habitat for many threatened species. This project expects to improve our understanding of the complex interactions between fire, grazing and climate in this system, and the synergistic roles of plants and animals. It is anticipated this project will enhance the capacity of land managers to effectively restore functional mallee woodland, and more broadly, provide significant benefits to the conservation industry regarding the restoration of arid landscapes in an altered climate future.	177,297.00	137,697.00	138,677.00	453,671.00	AUSTRALIAN LANDSCAPE TRUST, MURRAYLANDS AND RIVERLAND LANDSCAPE BOARD, DEPARTMENT FOR ENVIRONMENT AND WATER, BIRDLIFE AUSTRALIA, TREES FOR LIFE INC, NATIONAL PARKS AND WILDLIFE SERVICE, THE RIVER MURRAY AND MALLEE ABORIGINAL CORPORATION RNTBC
	National Interest Test Statement Australia's arid interior makes up 70% of our continent and is home to a vast array of plants and animals. Australians value healthy and resilient ecosystems, however, the survival of this unique biodiversity is under threat. Arid landscapes has been severely degraded by livestock grazing, feral animals, and inappropriate fire regimes, and now face the additional impacts of climate change. Restoring degraded areas is critical, but delivering this in a cost-effective way and at an appropriate scale is a huge challenge. This project will examine how best to restore 1 million ha of degraded Eucalyptus mallee woodland: the largest connected patch of mallee in Australia, and critical habitat for many endangered species. This area is a 'Priority Place' (National Threatened Species Action Plan) and includes the Mallee Bird Threatened Ecological Community (EPBC Act, 1999). Working with an established network of land managers, this project will determine how fire, grazing and climate impact this system, and how innovative restoration techniques can be used to effectively restore functional mallee woodland. Results are applicable to the global conservation industry, informing the restoration or arid landscapes in an altered climate future. Project findings will be directly applied to the project area by partners,					

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
	and communicated to the broader conservation community through field days, workshops, journal articles and conference presentations.					
	Federation University Australia	177,297.00	137,697.00	138,677.00	453,671.00	
La Trobe University						
IE240100294 Gionfriddo, Dr Caitlin M	**Assessing risk of toxic methylmercury in the Australian marine environment** This project aims to address the impact of mercury contamination on marine ecosystems by advancing our understanding of how mercury behaves in the Australian offshore environment. This project expects to generate new knowledge in the area of marine ecology using emerging genomic sequencing methods and an interdisciplinary approach to investigate mercury biogeochemistry. Expected outcomes include development of a predictive tool for use by mercury-emitting industries and Australian regulators to assess risk of mercury to marine ecosystems. This should provide significant benefits, such as informing Australian regulatory policy on mercury emissions, limiting the toxic effects of mercury on humans and wildlife, and its burden on food safety.	148,987.00	156,337.00	141,397.00	446,721.00	ANSTO, THE AUSTRALIAN INSTITUTE OF MARINE SCIENCE
	National Interest Test Statement The decommissioning of offshore oil and gas infrastructure is a significant challenge facing Australia, with the cleaning and removal of infrastructure estimated to cost over $50 billion. If a net environmental benefit can be demonstrated from leaving decommissioned infrastructure in place, then significant economic and environmental benefits can be achieved. However, this strategy risks the release of mercury accumulated in the infrastructure, threatening marine life and public health. This project will assess this risk by addressing critical knowledge gaps about how marine mercury from offshore oil and gas infrastructure affects the surrounding environment. A key outcome will be the development of reliable tools for predicting the long-term risks of mercury contamination from left-in-place decommissioning. Working closely with the Australian Nuclear Science and Technology Organisation, who are playing a critical role with industry and regulators on this issue, will enable knowledge translation into management of Australia's offshore oil and gas assets. Research findings will be communicated to diverse stakeholders through publications, presentations, and open-source repositories, enabling broad adoption of outcomes by mercury-emitting industries and federal regulators. This project will help safeguard the marine environment against mercury contamination and assist Australia's commitment to the United Nations Minamata Convention on Mercury.					
	La Trobe University	148,987.00	156,337.00	141,397.00	446,721.00	
Monash University						
IE240100013 Johnston, Dr Molly L	**Meeting the demand for donor eggs: Ethical, social and regulatory issues** This project aims to address the significant shortfall of donor eggs needed for assisted reproduction. It expects to generate new insight into the ethical, social, and regulatory issues hampering egg donation in Australia. Expected outcomes include ethical and regulatory guidance, underpinned by comprehensive social research, on the procurement, management, and use of donor eggs to optimise the practice of egg donation. The project is expected to have major benefits, addressing the gap between the demand for and supply of donor eggs needed to service the needs of patients into the future and maintaining Australia's position as a global leader in assisted reproduction.	163,876.00	165,424.00	158,929.00	488,229.00	MONASH IVF PTY LTD, ROYAL WOMEN'S HOSPITAL, THE FERTILITY SOCIETY OF AUSTRALIA AND NEW ZEALAND
	National Interest Test Statement People seeking to use donated eggs for assisted reproduction in Australia face a significant shortfall of available eggs. Australia's assisted reproduction industry is hampered in addressing this shortfall by obstacles in the regulation and management of egg donation. This project aims to address this industry challenge by partnering with Monash IVF Group, a leading provider of assisted reproduction, the Royal Women's Hospital, as caretakers of the newly established public egg bank, and the FSANZ, the peak professional body for the assisted reproduction industry. It will incorporate the views of multiple stakeholders and identify new pathways for optimising the practice of egg donation in Australia. This project has the potential for significant social and economic benefits: it will benefit people seeking to donate eggs or access them for their own reproduction, and will provide ethical and regulatory clarity to the assisted reproduction industry in managing reproduction through donor eggs. The industry partners will enable the adoption of project findings, which will also be communicated through reports, presentations and media engagement to prompt public discussion. The project outcomes can help to maintain Australia's position as a global leader in assisted reproduction and an example of a best practice industry internationally.					

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		2024-25	2025-26*	2026-27*		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
IE240100023 Barson, Dr Michael	**Quantum sensing for communication & navigation in challenging environments** This research aims to address outstanding navigation and communication difficulties in challenging undersea and underground environments by developing quantum magnetic sensing technology. Unlike conventional high-frequency electromagnetic signals (e.g. GPS), low-frequency magnetic signals can penetrate through conductive media such as sea-water and soil. This project will combine applied physics and manufacturing capability to translate research into compact, robust, high-performance, low-cost and deployable quantum technology. Resulting in enhanced capability and autonomy for underwater and underground vehicles. This will benefit our sovereign capability in industry-backed quantum technology and our defence and security capability. **National Interest Test Statement** Australia has a unique coastal defence challenge, as demonstrated by the significant Australia, United Kingdom, and United States (AUKUS) trilateral submarine program. Since electromagnetic signals (e.g. 5G, GPS, WiFi) do not penetrate well into water, there are communication challenges that limit our defence capabilities underwater, particularly with autonomous missions (e.g. drones), as vehicles are unable to accurately determine their location or receive commands without coming to the surface. The challenge is similar underground, limiting underground mining vehicle automation and tracking. This project will develop high-precision magnetic field sensor technology using quantum physics to meet these challenges. With this technology, we will be able to communicate underwater and underground using magnetic fields, giving vehicles the capability to navigate and perform missions without needing to come to the surface. Partnering with the high-tech domestic defence manufacturer Defendtex will enable the translation of this technology into practical and deployable hardware. This hardware will strengthen our defence capabilities and help keep all Australians safe.	140,000.00	130,000.00	130,000.00	400,000.00	DEFENDTEX RESEARCH LABS PTY LTD
IE240100162 Facer-Childs, Dr Elise R	**Innovative sleep and circadian technology to optimise athletic performance** Sleep is the greatest natural performance enhancer we have, and yet improving sleep remains a national priority. This project aims to develop, implement and validate a set of personalised sleep recommendations to optimise wellbeing and performance, and integrate it into a practical, scalable digital solution. With an initial focus on female athletes, this project will use innovative science and technology to develop new intellectual property that can improve sleep and performance, highlighted as a critical need in the Government's National Plan 'Sport 2030'. The expected outcomes will provide a direct benefit to elite, sub-elite and community sports organisations, as well as society at large through increasing productivity and performance. **National Interest Test Statement** Disrupted sleep has been identified as a major cause in reducing productivity and performance, costing economies billions of dollars annually. The CSIRO cited poor sleep as one of the global megatrends in their 'Our Future World 2042' report, aimed at guiding strategic and policy directions for long term investment. On top of this, the Australian Sports Commission have identified the need to: 1) invest in technologies to optimise performance, 2) partner with adjacent sectors and 3) prioritise female research. In collaboration with technology partner, Readiness, and a number of elite sports partners, the aim of this project is to develop technology driven solutions to deliver precision-based sleep recommendations for optimising performance. This aligns with the National Sports Plan (Sport 2030) and the Government priorities of changing the game with science and technology, which are estimated to have high impact on economic prosperity. The project outcomes will lead to valuable intellectual property for optimising performance through sleep which can be commercialised as a standalone product, or licenced to other organisations. As well as providing core capabilities in digital technology development, the partners will provide a pathway to market, ensuring that outcomes of this project can be translated to community sports, business, and education. This project addresses a gap in the human performance sector, where marginal gains make the difference between success and failure.	175,323.00	175,401.00	137,827.00	488,551.00	READINESS PTY LTD, SOUTHSIDE FLYERS, GREEN EDGE CYCLING PTY LTD, SWANWICK SLEEP
	Monash University	479,199.00	470,825.00	426,756.00	1,376,780.00	
RMIT University						
IE240100031 Balanzategui, Dr Jessica K	**Enhancing Discoverability of Australian Children's TV in the Streaming Era** This project aims to enhance and protect the threatened Australian children's TV sector by developing an understanding of how Australian children use video streaming platforms to access local and age-appropriate content. It expects to generate new evidence to inform regulation, investment, and strategy around children's TV, improving how children's content is distributed on streaming platforms. Expected outcomes include streaming media education programs for	166,908.00	154,284.00	157,714.00	478,906.00	THE AUSTRALIAN CHILDREN'S TELEVISION FOUNDATION, AUSTRALIAN CENTRE FOR THE MOVING IMAGE

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
	children and parents, guidelines for policymakers and the screen industry, and a prototype children's streaming platform. Benefits include improved public access to Australian-produced screen content and screen policy aligned with the needs of Australian children in the streaming era. **National Interest Test Statement** Most children now access screen content via on-demand video streaming, but there is very little knowledge about how children use streaming platforms to find and select content. This poses challenges for the Australian children's television sector, which saw an 84% reduction in the amount of local children's content broadcast between 2019 and 2022. An understanding of children's streaming habits is required to strengthen the sector's decision-making on the distribution and promotion of content on streaming platforms and to support effective, sustainable investment in the streaming era. This project will benefit Australians by generating this evidence-base of how children use streaming platforms, which will inform new policy and industry strategies aligned with children's needs. New approaches to content distribution will improve public access to Australian-produced screen content, which children currently struggle to find and identify on streaming platforms. Working with the Australian Children's Television Foundation, the Australian Centre of the Moving Image and an advisory board involving national screen and regulatory bodies to support strong uptake, it will develop new industry and policy guidelines to make local, age-appropriate content easier for children to find, a streaming platform prototype to showcase child-accessible design principles to local and global industry, and education programs for parents and children to improve family knowledge about streaming media.					
IE240100048 Dhanabalan, Dr Shanmuga Sundar	**Innovative materials and manufacturing for flexible pressure sensing system** This project aims to develop a flexible pressure sensing system using soft electronics technology with high sensitivity, fast response time, and high stability through advanced design and materials technology. This project expects to generate new knowledge in soft electronics and sensors using innovative materials and an efficient manufacturing approach. The outcome of this project includes a flexible integrated pressure sensing system with high manufacturing efficiency. The design, technology and outputs of this project are expected to be adopted by a wide range of industries including the industry partners. Project benefits include advances in microscale Australian research towards next-generation soft electronics and sensor technologies. **National Interest Test Statement** Soft electronics and sensors, with their flexibility and conformability, are revolutionising fields including artificial intelligence, wearable electronics, and tactile sensing. While they have gained popularity, they are not used for mass production due to complex fabrication techniques and material selection, which cannot be employed for mass production. This project addresses these shortcomings by carefully selecting materials and employing advanced manufacturing techniques that facilitate the mass production of soft electronics and sensors. Through collaboration with industry partners, this project will facilitate the widespread adoption of soft electronics and sensors in small and medium-scale electronic manufacturing. The design, materials, and manufacturing technology developed in this project can be immediately utilised by Australian small and medium electronic manufacturing enterprises to enhance their competitiveness in the global soft electronics and sensor industry. This project will increase the potential to establish a national manufacturing capability, especially in regional areas, due to a simple and efficient manufacturing process. With a predicted market of USD $74 billion by 2033, the project is also expected to deliver benefits to the flexible and stretchable electronics industry by creating a competitive advantage over international companies, generating high-tech manufacturing capability, and creating hundreds of highly skilled jobs in Australia.	168,938.00	154,738.00	156,515.00	480,191.00	SLEEPTITE IP PTY LTD, NTHALMIC PTY LTD
IE240100083 Jiang, Dr Shuaiyu	**Direct Sunlight Catalysis Floating Device for Green H2 Production** This project aims to develop direct sunlight utilising floating devices based on catalytic membranes that combine photocatalysis with solar heat for cost-effective green hydrogen production in open waters. This project expects to generate new knowledge in generating green hydrogen using an innovative approach. Expected outcomes include the development of composite catalysts and membranes incorporated into floating devices suitable for real-world application and knowledge around temperature-dependence and in-built charge generation in photocatalytic reactions. This should provide significant benefits to Australia's capacity in clean energy generation and hydrogen supply chains. **National Interest Test Statement** The aim of this project is to develop floating devices that allow for the creation of hydrogen as an alternative fuel source to fossil fuels through water splitting in open waters such as rivers, lakes, and the ocean without external energy input, using only energy from sunlight. This process has been forecast to reduce the cost of generating renewable hydrogen by $3-5/kg by 2050, making it a viable energy source with zero emissions. The project has the potential to bring huge environmental, economic, and commercial benefits to Australia and the world. The dependence in Australia, particularly industry, on traditional fossil energy sources will be largely removed, along with associated challenges such as supply exhaustion and environmental impacts due to fossil fuel combustion. The significantly increased cost-effectiveness will accelerate Australia's entry into the global hydrogen market by allowing early access to the $11 billion hydrogen economy and access to up to 7,600 jobs forecast to be created by 2050. The floating devices for hydrogen production will likely be implemented by	157,738.00	157,188.00	155,788.00	470,714.00	ADVANCED CARBON ENGINEERING PTY LTD, SOUTH EAST WATER CORPORATION

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	industry through partnerships and collaborations with renewable energy companies and energy-intensive sectors such as manufacturing and transportation. These devices can be deployed in open waters, and the produced hydrogen can be integrated into existing energy infrastructure or used for fuel cell applications, contributing to the reduction of fossil fuel dependence in various industries.					
IE240100085 van Eeden, Dr Lily M	**Behaviour change science for nature conservation** This project aims to harness human behaviours to improve nature conservation outcomes. This project expects to improve understanding of human-nature interactions through application of interdisciplinary sciences including behaviour change science. Expected outcomes include behaviour change methods and frameworks that can be integrated into policies and programs seeking protect native plants, animals, and ecosystems. This should provide significant benefits including reversing biodiversity loss, particularly in urban areas, and improving societal resilience through healthier human-nature interactions.	150,122.00	136,624.00	144,086.00	430,832.00	DEPARTMENT OF ENERGY ENVIRONMENT AND CLIMATE ACTION, ROYAL BOTANIC GARDENS AND NATIONAL HERBARIUM OF VICTORIA
	National Interest Test Statement Healthy natural environments are essential for human wellbeing and a strong economy, but actions by people are damaging the natural systems that we depend on. Australia has some of the highest rates of species extinction in the world and a third of our threatened plant and animal species live in urban centres, meaning that human behaviours in cities are important for preventing extinctions. So far, nature conservation has largely relied on natural sciences, inadequately embracing social sciences to better understand people and their actions. This project will use behaviour change science to study how people interact with nature in and around cities and develop effective ways to encourage behaviours that help native animals, plants, and ecosystems rather than harm them. The project will create programs that help people connect with and protect nature. This will benefit both the environment and human livelihoods. It will provide tools for other government agencies and non-government organisations to take human-centred approaches to conservation across Australia and beyond our borders, which will be shared via publications and development of a free online training tool.					
IE240100086 Rahman, Dr Md Ataur	**Cyber secure, battery-free, and wireless wearable patch technology** The project aims to investigate the technological and manufacturing challenges in wearables to integrate prominent high-frequency electrical, optical, and chemical signals on a single tiny patch. The integration expects to generate new multidisciplinary knowledge in wearables for real-time on-site and remote multisensory monitoring systems by using wireless, battery-free, and on-chip data encryption operation. It will develop cutting-edge technology for the highest performance with the least amount of power and space in a challenging environment. The project is expected to provide benefits to national security and defence, agriculture, manufacturing, and human and animal health sectors with remote area accessibility.	184,438.00	152,138.00	152,115.00	488,691.00	VLEPIS SOLUTIONS PTY LTD
	National Interest Test Statement The project will use a multidisciplinary approach drawing on materials, electronics, firmware engineering, and cyber security to address the manufacturing challenges of industry-scale fabrication and real-life adoption of the wearable device. Wearable devices depend on cutting-edge electronic technology for optimal performance using the least amount of space and power. As these devices are wireless, they transmit data over the air to a cloud-connected interface. Hence, this device also needs to overcome cybersecurity challenges. Complex electronics such as these devices are usually fabricated using soft materials to ensure they are lightweight for wearability and conformal to a curved surface. However, manufacturing this technology is extremely complex for large-scale fabrication. To address this challenge, this project will investigate how to integrate micrometer-sized hard components into soft materials to produce battery-free, wireless, and cyber-secured operations with applications in national security for detecting chemical threats, biological threats, and highly explosive materials; agriculture for monitoring plant health, and biosignals monitoring for human health.					
IE240100180 Zhang, Dr Huihui	**Smart graphene supercapacitors for self-sustained and zero-emission gyms** This project aims to develop a smart and robust graphene supercapacitor system (GraFit) that harnesses the green electricity generated by gym-users to power the self-sustained and zero-emission gyms. This project expects to generate new knowledge in translating graphene supercapacitors into real-life applications. Expected outcomes include a practical GraFit system ideally compatible with the intermittent and fluctuating electricity generated from gym workouts. The establishment of the world's first self-sustained and zero-emission gym innovatively collects and uses the massive kinetic energy previously dumped through gym. It promotes deep decarbonisation in Australian fitness industry and green and healthy lifestyles in Australian society.	150,000.00	150,000.00	150,000.00	450,000.00	GRAPHENEX PTY LTD

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
	National Interest Test Statement In line with Australia's national interest to achieve net-zero emissions by 2050, this groundbreaking initiative aims to revolutionise the domestic fitness industry through the indigenous development and implementation of advanced graphene supercapacitors, surpassing the current energy storage solutions in sustainability, stability and durability. The project is designed to pioneer the transformation of Australia's fitness sector into a self-sustaining, zero-emission industry by ingeniously capturing and storing renewable energy generated by gym-goers during their exercise routines. Leveraging our recent advances in the green, facile and scalable fabrication of graphene supercapacitors, we are collaborating with an Australian industry partner to fine-tune and scale these devices, enhancing their adaptability to the intermittent green electricity from gym equipment. This initiative advances the commercial viability of our cutting-edge technology and fosters industrial partnerships crucial for large-scale deployment, establishing a novel technology platform tailored to the deep decarbonisation of Australia’s fitness sector. It also holds transformative potential by alleviating the nation's energy constraints, redirecting excess stored energy back into the grid. This initiative promises to deliver immediate and far-reaching impacts on Australia’s transition to a green and sustainable economy, aligns squarely with Australia’s national objectives and promotes a healthy lifestyle.					
IE240100221 Nazir, Dr Tariq	**Flame Retardant Coating: Preventing Pole Top Fires in Electricity Networks** This project aims to develop a flame-retardant coating to avoid pole top fires in electricity networks via a ceramic barrier against electrical discharges and flame. This project expects to generate a fire safety product using multidisciplinary approaches to tackle the issue of power outages stemming from the deposition of airborne soot and pollutants on vital electricity infrastructure. Expected outcomes include a commercial-grade flame-resistant yet electrically insulated coating, designed for application on electricity assets. This should provide benefits, such as a more robust electric network, a reduction in unplanned blackouts, prevention of fire ignition risks, and substantial cost savings for network operators and consumers alike.	141,897.00	142,897.00	140,897.00	425,691.00	FLAME SECURITY INTERNATIONAL PTY LTD
	National Interest Test Statement Pole top fires stemming from insulator failures of electricity assets are catastrophic events that can result in real damage to assets, cause power outages, harm to vegetation, trigger bushfires and endanger lives. The global silicone coating market for the electrical industry was valued at USD $3.5 billion in 2022, is forecasted to reach USD $5.9 billion by 2032. Australia, with its advanced manufacturing capabilities in fire safety, is well-positioned to develop vital coating technology for the electricity sector. This project will develop a silicone coating product with flame-retardant properties to be used by Australian and global electricity operators to avoid pole-top fires and unplanned power outages in the electricity network. This project is expected to yield significant economic benefits for Australia by substantially reducing maintenance costs associated with electricity lines. This, in turn, will alleviate the considerable economic burden currently shouldered by both operators and consumers. Flame Security International Pty Ltd (FSI), a leading Australian coating manufacturer that has recently garnered the highest global accolade for fire retardant performance ever conferred upon a paint product; will manufacture, commercialise, and supply this cutting-edge technology. This collaborative effort will not only enhance Australia's industrial growth but also contribute to advancements in electricity infrastructure resiliency, high-performance composites, and polymers.					
	RMIT University	1,120,041.00	1,047,869.00	1,057,115.00	3,225,025.00	
The University of Melbourne						
IE240100007 Skinner, Dr Anthea S	**Accessible Instrumental Music Education for People with Disability** This project aims to address low participation rates of people with disability in instrumental music education by developing replicable pedagogies and resources that can be implemented by music teachers and therapists. This project expects to generate new knowledge in the area of inclusive music education using innovative, interdisciplinary methods focussing on a strengths-based approach. Expected outcomes of this project include improved inclusive music teaching pedagogies and training to support students with disability. This should provide significant benefits such as increased access to music education and participation for people with disability, more inclusive school and community music settings and improved teacher training.	144,467.00	176,771.00	167,117.00	488,355.00	MELBOURNE YOUTH ORCHESTRAS, DOTTED BEATS PTY LTD, CREATIVE SCHOOL SUPPORT PTY LTD
	National Interest Test Statement The social, cognitive, and physical benefits of playing a musical instrument are well-documented. Despite this, many people with disability struggle to access music education for a variety of reasons, including a lack of appropriate teacher training and available adaptive technologies. Drawing on findings and methodologies developed in previous pilot-studies, this project will create world-first, transferrable teaching techniques to support people with disability to learn musical instruments in school and community settings. These findings will be translated into guidelines and professional development material for music teachers and therapists to allow wide-spread dissemination of techniques and pedagogies to up-skill music educators to better support music students with disability. In creating easily transferrable teaching techniques and pedagogies, this project will improve access to music education around the nation and make Australia a world-leader in inclusive instrumental music.					

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
IE240100151	**Assessing climatic constraints on a biological control agent with genomics**	140,864.00	140,676.00	139,341.00	420,881.00	AGRICULTURE VICTORIA
Thia, Dr Joshua A	This project aims to investigate the capacity of a native subtropical parasitoid wasp, Diachasmimorpha kraussii, to act as a biological control agent of Queensland fruit fly in different climatic areas. This project is expected to generate new knowledge on climatic adaptation in D. kraussii from genomic data, informing the use of this agent for managing Queensland fruit fly in temperate regions of Australia. This project aims to use D. krausii as a model to develop a transformative genomics framework for sourcing, releasing, and monitoring biological control agents. This project will contribute to safeguarding Australia's horticulture industry by supporting sustainable and eco-friendly pest management.					
	National Interest Test Statement This project addresses the critical need for biological control of Queensland fruit fly, a major threat to Australia's $15 billion horticultural sector through the damage they inflict on fruit yields. In partnership with Agriculture Victoria Research (AgVic) this project will investigate the capacity of a native parasitic wasp to control Queensland fruit fly in different climatic areas across Australia. This work will develop a framework for biological control that integrates genomics, predictive modelling, and experimental data. This framework will directly inform strategies on Queensland fruit fly management and will be translatable to other biological control programs. This research aligns with national interests by generating fundamental data to plan and execute more efficient biological control of a devastating pest, using genomics. Economic and commercial benefits include potential reduction in Queensland fruit fly damage in Australia. Greater research into biological control of Queensland fruit fly will benefit the environment by reducing chemical use in agriculture. Socially, this project will help contribute to safeguarding Australia's fruit production, which affects food supply chains and farmers' livelihoods. I will work with AgVic to disseminate the outcomes of this work at industry events and grower meetings. We will also share our findings with commercial biological control companies to assist the development of commercial strains for use in agriculture.					
	The University of Melbourne	285,331.00	317,447.00	306,458.00	909,236.00	
	Victoria	2,377,352.00	2,278,072.00	2,243,800.00	6,899,224.00	

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

Minister's Approval for Early Career Industry Fellowships for Funding Commencing in 2024 Schedule

Approved Organisation, Leader of Approved Research Program	Approved Research Program	Estimated and Approved Expenditure ($)	Indicative Funding ($)		Total ($)	Industry Partner(s)
		2024-25	2025-26*	2026-27*		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
Western Australia						
Curtin University						
IE240100207 Peng, Dr Zhen	**Transforming Smart Bridge Monitoring by Computer Vision and Edge Computing** Many Australian high-value bridges are approaching their service life, posing risks to community and sustainable growth. Given a high number of assets but a limited budget, this project aims to leveraging emerging computer vision and edge computing technologies to develop a cost-effective, easy-to-deploy monitoring system to assist in real-time bridge monitoring and optimized maintenance. Collaborating with Main Roads WA, the expected outcome is the development and application of a market-ready edge computing sensing system deployable to a population of existing bridges. This project will enhance bridge safety, reduce lifecycle maintenance costs and uplift the service life of transport infrastructure for smart city and remote operations.	127,397.00	124,797.00	129,097.00	381,291.00	MAIN ROADS WESTERN AUSTRALIA
	National Interest Test Statement In Australia, there is an estimated AU$17.6 billion shortfall in transport infrastructure maintenance spending from 2010 to 2024. The current bridge inspection practices are expensive and infrequent, especially for the bridges in remote areas. This project aims to address this industry-identified challenge by developing a cost-effective and easy-deployable monitoring system to effectively manage a growing population of aging bridges. By working with Main Roads Western Australia, one of the WA's largest transport agencies, this project will develop a market-ready smart bridge health monitoring system underlined by the emerging camera-based sensing technique and edge computing technology. The project is significant because it provides quantitative data-informed solutions for optimized structural maintenance, contributing to enhanced structural safety, reduced lifecycle maintenance costs, and prolonged structural service life. The proposed monitoring system is well-aligned with industry partner's demands and has high potential for commercialisation. In short-term, Main Roads WA is committed to implementing the research outcomes of this project to assess a number of flood-damaged bridges on the Great Northern Highway in WA. In the medium and long-term, the developed system has the potential to be widely adopted by the bridge owners in WA and beyond, leading to safer and more resilient transport infrastructures.					
	Curtin University	127,397.00	124,797.00	129,097.00	381,291.00	
Murdoch University						
IE240100217 Du, Dr Xin	**Break insect narcosis to enhance actual intake lethality of pesticide** This project aims to sustain phosphine as a cost-effective fumigant, even for phosphine-resistant stored grain insects. It does so by introducing pulse fumigation technology, which hinges on an in-depth understanding of insect respiration patterns and narcotic states during phosphine exposure. This newfound insight into individual insect behaviour and physiology will drive the development and optimisation of the novel pulse fumigation technology. The project contributes to the evolution theory of chemical resistance, offers input for techno-economic models, and supports licensing applications. Ultimately, it provides a more potent pest control tool for chemical-resistant insects, safeguarding the Australian grain industry's reputation.	157,208.00	165,979.00	160,133.00	483,320.00	CYTEC AUSTRALIA HOLDINGS PTY. LIMITED, ACADEMY OF STATE ADMINISTRATION OF GRAIN
	National Interest Test Statement This project aligns with Australia's National Science & Research Priorities, specifically in the domains of "Food," "Environmental Change," and "Health," with a particular emphasis on "enhanced biosecurity for safeguarding food sources." Australia has a federally mandated 'nil tolerance' policy for live insects in exports, which has solidified its preeminent standing in the global grain market. To uphold this commitment, the Australian export grain industry, valued at over 20 billion dollars, relies on phosphine for pest control. Nevertheless, the emergence of phosphine resistance among stored grain insects is a global concern. The project's primary objective is to fortify the Australian grain industry against this threat, by developing a better understanding of stored grain insect repiration patterns and their defence mechanism, narcosis, under varying environmental conditions. The development of phosphine resistance was mainly due to narcosis. Collaborating with global phosphine supplier CYTEC and the prominent Chinese importer ANFSRA, this project is primed to spearhead a revolutionary pulse phosphine fumigation technology. Promising economic, environmental, and societal advantages encompass the decreased use of harmful fumigants, alleviation of the economic burden of phosphine alternatives, and the reduction of toxic phosphine residue, ultimately contributing to the overall welfare of communities. Thereby securing phosphine's long-term sustainability.					

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

Minister's Approval for Early Career Industry Fellowships for Funding Commencing in 2024 Schedule

Approved Organisation, Leader of Approved Research Program	Approved Research Program	Estimated and Approved Expenditure ($)	Indicative Funding ($)		Total ($)	Industry Partner(s)
(Columns 1 and 2)	(Column 3)	2024-25 (Column 4)	2025-26* (Column 5)	2026-27* (Column 6)	(Column 7)	(Column 8)
	Murdoch University	157,208.00	165,979.00	160,133.00	483,320.00	
The University of Western Australia						
IE240100163 Manero, Dr Ana	**Valuing Australia's surfing resources for sustainable coastal management** Surf breaks provide key ecosystem services, but climate and human impacts threaten their integrity and the environmental and socio-economic benefits they support. This project aims to develop a holistic understanding and practical tools to effectively manage Australia's surf breaks, as valuable resources. The project will combine qualitative research with economic valuation to understand benefits and threats associated with surf breaks and their surrounding areas (i.e. surfing resources). Expected outcomes include Australia's first comprehensive surf management guidelines, setting a global blueprint for coastal sustainability benefiting industries and local communities, where surfing resources underpin livelihoods, culture and wellbeing.	153,897.00	169,897.00	157,897.00	481,691.00	SURFING WESTERN AUSTRALIA INC
	National Interest Test Statement Surfing is Australia's second most practiced water-based sport, contributing $4.6 billion to the national economy and the wellbeing of nearly one million participants. Globally, Australia is renowned as a top surf destination, with over 1,230 surf breaks and world-class waves. However, growing pressures from coastal erosion and infrastructure developments are impacting the complex processes needed for wave formation. Despite their significance, most coastal management mechanisms fail to consider surf breaks as valuable natural resources, with few safeguards to preserve their integrity and the economic and cultural benefits they provide. This research will be the first to comprehensively quantify the benefits derived from Australia's surf breaks, including contributions to local economies and social wellbeing. Additionally, this project will develop Australia's first comprehensive guidelines for the sustainable management of surf breaks and their surrounding areas. These key outcomes will assist governments in making effective decisions, considering a set of critical coastal values that had previously been overlooked. This project will serve as a blueprint for translation across Australia and surf-rich regions like Aotearoa New Zealand and Hawai'i. As the 2021-2030 United Nations Oceans Decade unfolds, this research takes place at a pivotal movement when governments, industry and community come together towards a common goal of greater coastal resilience and sustainability.					
IE240100281 Giraud, Dr Jeremie E	**Integrative geophysics Under cover: getting images of the Unknown Unknowns** The goal of the project is the collaborative development of an integrated multidisciplinary geophysical modelling algorithm to improve our capability to image rocks under cover in Australia. The project will generalise a new gravity anomaly modelling code with the integration of other datasets through the integration of physics, statistical analyses, deep learning and geological modelling. Expected outcomes include the capability to model 'unknown unknowns' such as the number of rock units under cover or their relationships together with the associated uncertainty. This will reduce mineral exploration risks and support the identification of prospects for targeted exploration, all while answering scientific challenges.	158,605.00	162,620.00	163,585.00	484,810.00	GEOLOGICAL SURVEY OF WESTERN AUSTRALIA , COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION
	National Interest Test Statement Approximately 80% of Australia's territory is covered by a layer of weathered rocks, concealing the geology of interest to the welfare and development of human societies, such as water and minerals. Imaging the subsurface under this cover remains challenging due to the lack of direct observations of the rock formations of interest. In this context, geophysical data serves as one of the primary sources of information about the subsurface and rigorous modelling is difficult when limited prior information is available. To address this, this project aims to develop specifically designed new geophysical modelling techniques for a deeper understanding of the subsurface that includes the estimation of unknown unknowns. These techniques will integrate various types of geophysical data (e.g., gravity, magnetics, electromagnetics) while incorporating geological principles to generate collections of subsurface models representing both the available data and the range of plausible subsurface scenarios it allows. The analysis of these models will provide valuable insights into potential exploration outcomes, reduce the risks, leading to better-informed decision-making. The project's outcomes will include freely available algorithms to be used by practitioners in Australia, the imaging of multiple areas of interest for mineral exploration in Western Australia, local capacity building and the training of PhD students at the University of Western Australia.					
	The University of Western Australia	312,502.00	332,517.00	321,482.00	966,501.00	
	Western Australia	597,107.00	623,293.00	610,712.00	1,831,112.00	
		7,782,549.00	**7,679,315.00**	**7,054,177.00**	**22,516,041.00**	

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