Minister's Approval for ARC Future Fellowships for Funding Commencing in 2024 Schedule

Approved Organisation, Leader of Approved Research Program	Approved Research Program	Estimated and Approved Expenditure ($)	Indicative Funding ($)			Total ($)
(Columns 1 and 2)	(Column 3)	2024-25 (Column 4)	2025-26 (Column 5)	2026-27 (Column 6)	2027-28 (Column 7)	(Column 8)
Australian Capital Territory						
The Australian National University						
FT240100010	**Backbone Editing Strategies: Underutilised Tools for Peptide Drug Discovery**	302,663.00	300,163.00	302,663.00	302,663.00	1,208,152.00
Malins, A/Prof Lara R	The therapeutic capacity of peptides is reliant on the availability of synthetic chemistry tools to optimise their drug-like properties. This Fellowship program aims to develop strategies to modify the polypeptide backbone—a critical modulator of peptide bioactivity and biophysical properties for which there are remarkably few existing strategies for chemical modification. Expected outcomes encompass future health and economic benefits for the Australian community, including: the development of novel reagents and methods for peptide synthesis with a key focus on sustainable electrochemical approaches, the synthesis of bioactive peptide-drug conjugates, and a greater understanding of the role of backbone structure in peptide drug discovery.					
	National Interest Test Statement					
	Emerging diseases and growing resistance to current treatments highlight the need for new therapeutic molecules to sustain Australian health and economic well-being. Medicinal chemists develop and deploy effective medicines by applying chemical tools to alter the structure and function of promising candidate molecules. This project will explore new technologies to fine-tune underexplored classes of therapeutic molecules, enabling the evaluation of molecules which are inaccessible using existing techniques. Importantly, the proposed technologies will increase the efficiency of production and reduce the reliance on toxic reagents through the innovative application of electrochemistry—an environmentally-conscious method in which electricity, rather than a toxic chemical, is used to produce a chemical reaction. These technologies offer vast commercial potential for Australia's growing biotechnology and pharmaceutical sectors, including through the development of sustainable chemical manufacturing practices. Adoption of such practices by industry will serve to decrease the environmental impact of drug discovery processes and minimise cost of production for promising new therapies.					
FT240100071	**Why Monarchy Endures. Answers from the Ancient Mediterranean World.**	301,263.00	293,153.00	291,848.00	277,389.00	1,163,653.00
Davenport, A/Prof Caillan	The project aims to discover why monarchy endured in the ancient Mediterranean world (c. 1200 BCE-600 CE) despite the emergence of democracies and republics that gave citizens an important political voice. By comparing ancient governments across Europe, North Africa, and the Near East, it aims to generate new knowledge about the creation of monarchies, the strategies monarchs used to win popular support, and why sole rule poses serious challenges to democratic constitutions. Expected outcomes include new historical explanations for the rise and popularity of authoritarian figures in modern democracies. This should provide significant benefits such as better understanding of how to cope with political change in a time of global uncertainty.					
	National Interest Test Statement					
	Australians are living in a time of unprecedented global political instability. A chief concern is the rise of autocrats who seek to rule their countries alone. Although Australia is a constitutional monarchy, our democratic institutions operate largely independently, with the monarch adopting a mostly ceremonial role. This has not always been the case throughout history. As an increasing number of present-day global leaders seek autocratic rule, as monarchs in the past once did, there is the potential for significant negative impacts on democracies worldwide, including Australia. Using ancient historical texts to examine the challenges presented by monarchies to the world's first democracies, this project will reveal what factors lead to the emergence of would-be monarchs and the destabilisation of democratic governments. Through podcasts, Q&A panels, opinion pieces, and an online exhibition, the project's new findings of potential threats to the democratic process will be shared broadly with the Australian public. This will offer significant political and cultural benefits to Australians and our politicians, and contribute to greater public confidence in our constitution and electoral processes.					
FT240100198	**Stepping-Stones to Sahul**	299,925.00	302,270.00	302,270.00	302,410.00	1,206,875.00
Shipton, Dr Ceri	This project aims to determine if there were two human dispersals into Australia, and whether the second had an adaptive advantage. The project expects to generate new knowledge in the area of human dispersal, through excavation then combined technological and functional analysis of stone tools. Excepted outcomes of this project are to establish if stone tool miniaturisation reflects a significant threshold in human population density, technology, or social organisation. This should provide important benefits to Australian society such as addressing the complexity of deep time history of the country, and determining whether the later Palaeolithic represents a fundamental					

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	behavioural threshold for humanity in general. **National Interest Test Statement** This project aims to answer a key question about Indigenous Australian origins: Was there something unique about human behaviour in the last 50,000 years that explains why we are the only species of human alive today? The project will explore two potential human migrations to Australia around 65,000 and 50,000 years ago. Archaeological sites will be excavated on Indonesian and Timor-Leste islands, believed to be the route of the earliest human arrivals in Australia. Stone tools from these sites will be analysed to determine if the earlier migration used larger, long-lasting tools, and the later migration used smaller, disposable tools. New modes of stone tool use may have given the later migration an advantage, such as in making complex tools with multiple pieces of stone and in creating body markings to show tribal identity. The findings will be communicated to the public through press releases, newspaper articles, and online media increasing appreciation of Australian history. Outcomes will be shared with ACT primary schools through ‘show and tell’ demonstrations and with artefacts loaned to National Museum Australia exhibitions. This will foster greater public understanding of Indigenous Australian origins and the unique aspects of our species.					
FT240100210 Glanville, A/Prof Luke	**Humane Exclusion: How States Justify Excluding Refugees** This is a project about the idea of humanity and how this concept is deployed. Specifically, it aims to understand and critique the contemporary phenomenon of humane exclusion: humane-sounding justifications for the exclusion of refugees. The work will innovate via a unique framework for understanding today’s prevailing claims, involving analysis of how they echo historical justifications for controlling the movement of Indigenous peoples, minorities, slaves, and other vulnerable groups. It will be the first holistic examination of the ethics of humane-sounding claims and practices of refugee exclusion in the light of their histories, providing a means for Australia to consider, anew, how it might construct more ethical refugee policies. **National Interest Test Statement** The global count of forcibly displaced people has surpassed 100 million, with countries like Australia constructing policies to exclude refugees and asylum seekers. Australia provides compassionate reasons for such policies, citing the need to prevent sea drownings, for example. However, these justifications echo historical patterns of controlling vulnerable populations, such as Indigenous people, ethnic minorities, and slaves. These historical echoes suggest that Australia’s present policies may be ethically problematic. Through the retrieval and close study of this history, this project seeks to shed light on the justice of Australia’s justifications and policies toward refugees today. Featuring close collaboration with an existing network of representatives from NGOs and refugee advocacy groups, this Fellowship will produce a deeper understanding of the hazards of prevailing arguments for supposedly humane refugee exclusion. This project will help NGOs to advocate for, and political leaders to construct, refugee policies that foster justice with the effect of enhancing Australia’s reputation and, in turn, security and prosperity.	302,693.00	302,743.00	302,773.00	302,713.00	1,210,922.00
FT240100229 Hicks, Dr Jamie	**Breaking and Making Bonds with Aluminium** This project aims to explore the use of aluminyl anions, a recently developed class of aluminium compounds, as sustainable alternatives to the environmentally damaging noble transition metal complexes widely used in fine chemical manufacturing. The project expects to generate major fundamental and applied advances in chemistry, using an innovative synthetic approach aided by both computational investigations and an international research team. Expected outcomes of this project include improved techniques for sustainable chemical synthesis, advanced knowledge, an international research network, and a highly trained workforce. The development of this research should provide significant environmental benefits to the fine chemicals industries. **National Interest Test Statement** The chemical manufacturing industry plays a vital role in supplying Australians with many of the fine chemicals that are used in everyday life such as medicines, cosmetics, and food preservatives. However, many of these manufacturing processes are not sustainable due to their reliance on precious metals, which are expensive and environmentally damaging to acquire. This project aims to find more sustainable ways to manufacture chemicals by developing alternatives based on aluminium, which is one of the cheapest and most eco-friendly metals available. This would have significant environmental benefits, reducing Australia's dependence on environmentally harmful precious metals, and improving the sustainability of the chemical manufacturing industry, both locally and globally. Outcomes from this project will be posted on social media, highlighted in scientific magazines and promoted through University media, with ground-breaking results sent to the national media. Furthermore, it is envisioned that these sustainable aluminium reagents will feed into chemical manufacturing industry, directly replacing some of the currently used precious metals.	266,098.00	266,581.00	261,781.00	262,037.00	1,056,497.00
FT240100278 Catford, Prof Jane A	**Predicting biodiversity impacts of plant invasion in a changing environment** This project aims to develop an approach for predicting impacts of alien plant invasions on plant	302,780.00	302,754.00	302,770.00	302,782.00	1,211,086.00

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	community diversity under environmental change: such capacity is urgently needed. Through innovative grassland experiments and models that incorporate impacts of invasions, land use and climate change, this research promises to transform predictive understanding in ecology. Being able to identify when, where, why and how invasive plants can drive native species loss will benefit biodiversity conservation, biosecurity and vegetation management. Project outcomes will advance ecological theory and address a critical research need: how to conserve the biodiversity of plants – the dominant life form on earth – under global environmental change. **National Interest Test Statement** Invasive species cost the Australian economy over $9 billion each year and are the leading cause of biodiversity loss and species extinctions in the country. With over 20 new alien plant species being introduced into Australia each year and with climate change favouring invasive species over native ones, these impacts are expected to worsen. Despite this huge and growing problem, there are no reliable methods for identifying which species and ecosystems are most at risk, and which management actions can most effectively help. This project aims to fill this need by developing an approach for accurately predicting combined impacts of plant invasion, climate change and land use on native vegetation. The project will use experiments and build models to generate robust predictions, focusing on grasslands in southern Australia, which are particularly valuable and under threat. Through the creation of user-friendly tools, results of the research will directly influence the decisions of managers, policymakers and landholders when planning for the future. This will increase the effectiveness and cost-efficiency of Australia's already world-leading record in biosecurity and weed management. By helping to protect Australia's unique flora and fauna and the productivity of our landscapes, now and in the future, outputs of the project will provide long-term social, cultural, economic and environmental benefits for Australia.					
FT240100466 Walter, Dr Gregory M	**Understanding and using adaptive plasticity to increase plant resilience** This project aims to determine the potential for native plant populations to persist in the face of pervasive and increasingly rapid climate change. By applying innovative multidisciplinary approaches, it will test evolutionary theory about how plant populations from different ecosystems evolve to buffer variation in their environment. Expected outcomes include new understandings of how plants evolve to cope with rapid environmental change and how this could help them to persist under climate change. This should provide significant benefits by enhancing our ability to predict species and ecosystem responses to climate change, and to develop novel methods for increasing the resilience of crops and threatened species. **National Interest Test Statement** Climate change is creating more extreme and unpredictable environments that threaten the existence of biodiversity and crop systems. By the next century, biodiversity is expected to suffer catastrophic extinctions while losses in crops in Australia alone are expected to cost in excess of $211 billion by 2050. It is therefore critical to understand and predict how plants will respond to climate change. This project will use novel multidisciplinary approaches to identify how native plant populations from different ecosystems evolve to cope with variation in their environment. This information will identify the capacity for natural populations to adapt to the novel conditions being created by climate change. As well as generating breakthrough knowledge about how plants adapt to changes in their environment, this research will benefit Australia by helping to more accurately predict the response of native plants to climate change, and by developing novel techniques to increase plant resilience under climate change. These outcomes would help conservation by informing genetic improvement designs for threatened species and ecosystems, and improve food security by helping to develop more climate-resilient crops that will increase our food security. Through collaboration with conservation managers and crop breeders, this project will apply research outcomes to directly tackle plant resilience under climate change in Australian crops and threatened ecosystems.	186,112.00	195,222.00	196,612.00	197,202.00	775,148.00
FT240100498 Anderson, Dr Craig S	**Mapping the Gas that Drives Galaxy Evolution with Magnetic Dye Tracers** Galaxies evolve by drawing in gas from the broader universe, yet observing this gas directly is challenging. Using the Australian Square Kilometre Array Pathfinder (ASKAP) telescope, this project aims to use magnetic fields to trace pathways the gas takes into galaxies to form stars like our Sun. Expected outcomes include new techniques to detect the gas, detailed maps of the gas in key cosmic environments, and new insights into how galaxies like our Milky Way evolve. This should provide significant benefits, including advancing Australian leadership in radio astronomy to capitalise on investments in ASKAP and the Square Kilometre Array, stimulating science and technology education, and attracting global collaborations to our shores. **National Interest Test Statement** Over billions of years, our Milky Way and countless other galaxies have been shaped by unseen rivers of cosmic gas, flowing into them to form stars like our Sun. Our project seeks to unveil these hidden gas flows by measuring the magnetic fields inside them, much like doctors can trace the flow of blood in our bodies with medical dyes. Leveraging Australian telescopes, this project will enable Australian scientists to make significant	205,807.00	223,728.00	226,728.00	229,728.00	885,991.00

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	discoveries about galaxy formation and evolution, addressing major gaps identified in both Australian and international research strategies, enhancing our nation's standing in globally recognised research. Beyond scientific discovery, the project will attract international scientists to visit, work, and live in Australia, bolstering local businesses. It will also serve as a training ground for jobs in high-tech industries and the job market of the future, equipping Australian students with essential, transferable skills in coding, supercomputing, data analysis, visualization, and artificial intelligence. Our project will engage the Australian public and students through direct outreach initiatives, including collaborations with platforms like The Conversation and Australian Sky & Telescope, the Mt Stromlo outreach program, talks at local schools, and our robust online presence. These efforts aim to boost interest in science and technology, fostering an informed and inspired student body ready to lead future research and innovation.					
FT240100522	**Multicultural frontiers and human histories on the fringe of tropical Sahul**	266,356.00	265,541.00	264,413.00	264,813.00	1,061,123.00
Shaw, Dr Ben J	This project aims to transform our understanding of deep-time human histories on the fringe of eastern Papua New Guinea that contributed to the peopling of Oceania, the Australia-New Guinea continent of Sahul, and the region as a global diversity hotspot. It expects to generate new knowledge about the role of cross-cultural interaction in this process by linking interdisciplinary archaeological and traditional data in preserved coastal landscapes that were key corridors of mobility. Expected outcomes include reframing New Guinea in human history models and development of novel interpretive frameworks. Benefits include enhancing Australia's capacity to manage a shared multi-cultural heritage, and strengthening inclusive Pacific partnerships.					
	National Interest Test Statement					
	Australia has a 60,000-year human history that is critical to understanding global human migrations and past strategies of adaptation to environmental challenges. Although Australia and New Guinea were joined as a single continent for much of this time, we know very little about the rich human history of New Guinea – the world's most culturally diverse region. Past climate changes drastically altered how and where people lived, offering strategic insights into future climate-related social impacts. This project explores a preserved ancient coastline in eastern Papua New Guinea that was a hub for human settlement over millennia. Integrating traditional knowledge with innovative analytical approaches and cutting-edge technologies, such as high-resolution laser drone mapping, it will assess the past roles and effective limits of multicultural social networks in mitigating environmental impacts of climatic change and natural disasters. The findings, presented as research papers, plain language summaries, and policy briefs, will aid national and Pacific-wide climate resilience strategies, with results to be made publicly available through online, in-print and in-person outlets. The project will strengthen Australia's strategic partnership with Papua New Guinea as our closest neighbour by building capacity between both governments to manage a shared and globally unique cultural heritage and boost cultural relations in the Pacific region amid geopolitical uncertainties.					
FT240100607	**Water security in an era of global change, big data and computational power**	261,598.00	257,698.00	257,698.00	257,698.00	1,034,692.00
Razavi, Dr S. Saman	This fellowship aims to develop an entirely new, holistic modelling method to advance understanding, prediction and management capacity of water resources systems, such as watersheds, rivers, and reservoirs. Equipped with advanced analytics, the proposed method will synthesize emerging big data sources on a range of hydroclimatic variables to uncover important insights into complex dynamics and changing properties of water-human systems. The results are expected to catalyse a paradigm shift in modelling theories that will not only be much more scientifically advanced, but also critically inform decision-making to protect lives and assets locally and globally in the face of climate change and increasing flood and drought disasters.					
	National Interest Test Statement					
	By seamlessly integrating hydrological sciences with cutting-edge technology and diverse data sources, my fellowship aims to address the knowledge gaps and prediction challenges surrounding water systems – to help transform the management of Australia's precious water resources. The project is centred on the development of a novel method for modelling water systems, by creating an advanced mathematical representation that harnesses the capabilities of artificial intelligence, big data sources and state-of-the-art computing resources. The potential benefits of this innovation are profound, as it significantly enhances our capacity to predict and manage water-related disasters such as floods and drought. These events annually incur costs of tens of billions of dollars for Australia, underscoring their paramount significance for farmers, communities, and water-dependent industries. This advanced capability can have two distinct benefits: (1) substantial economic savings afforded by better predictions and (2) enhanced environmental protection by more informed resource management. The project, which aspires to set a new global standard for modelling and managing water resources, will share its findings widely through end-user and scientific workshops and publications. It will also foster new collaborations, promoting far-reaching impact for the knowledge and tools developed and contributing to securing Australia's water future in the face of challenges posed by climate change.					
FT240100820	**Towards reliable deployment of computer vision systems in the real world**	236,018.00	236,918.00	234,704.00	233,418.00	941,058.00
Zheng, Dr Liang	This project aims to enhance the reliability of computer vision models in real-world deployment by quantitatively assessing the environment, facilitating optimal model selection and enabling accurate expression of prediction uncertainty. Current literature falls shorts in extending model choices beyond the training domain or adjusting uncertainty to varied test conditions, posing safety risks. This project					

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	is significant for advancing the theoretical understanding of model performance in complex and changing environments and promote practical applicability. Anticipated outcomes include innovative techniques for improving and signaling model reliability, with substantial benefits to computer vision applications such as autonomous vehicles. **National Interest Test Statement** Vehicles with autonomous parking, lane detection and distance estimation are common in new cars and of great convenience and safety for drivers and passengers. However, autonomous systems in cars are usually 'trained' in common and static environments, so they can malfunction in unusual environmental conditions (e.g., extreme smoke or rain). Car manufacturers need a solution to this safety risk – and that solution lies in adaptive autonomous systems that can adapt to any road conditions. This project will design a novel, world-first simulator and algorithm that minimises the gap between real world conditions and those in the simulated environment and adaptively select the best systems to create a more reliable algorithm for the real world. The computer program we create can be retrofitted to existing cars and embedded in all new cars. Working with our long-standing industry partner, Seeing Machines, and through them, the world's largest car manufacturing firms, this cutting-edge computer vision research will contribute long-term to greater vehicle safety for all drivers and passengers worldwide.					
	The Australian National University	2,931,313.00	2,946,771.00	2,944,260.00	2,932,853.00	11,755,197.00
University of Canberra						
FT240100653 Curato, Prof Nicole P	**Global public deliberation beyond the Sustainable Development Goals** The aim of this project is to propose a process for global public deliberation beyond the Sustainable Development Goals (SDGs). It advances a timely and novel research program on how direct forms of deliberative citizen engagement can transform institutions of global governance to be more responsive to marginalised communities and open to alternative futures. Outcomes of this project include a global public engagement framework that the UN, its member states, international development agencies and civil society organisations can use to facilitate public deliberation on the successes and failures of SDGs and co-generate proposals on what comes after the UN's 2030 Agenda for Sustainable Development. **National Interest Test Statement** Developing a process for global public deliberation beyond the Sustainable Development Goals (SDGs) is aligned with Australia's agenda of promoting economic prosperity, regional security, and social cohesion. As of 2023, only 12% of SDGs are on track to be achieved by 2030. This signals the need to assess why SDGs have fallen short, what Australia can do to address them, especially in the context of Australia's National SDG Implementation plan, and begin a global conversation about what comes next after the UN's 2023 Agenda for Sustainable Development. This research will propose concrete ways the successes and failures of SDGs can be assessed from the perspective of marginalised communities and chart pathways for citizen engagement to determine what comes next after the SDGs. It will provide an innovative approach to public engagement grounded on the lived experiences of people most deeply affected by SDG's successes and failures. The global public engagement framework that will be developed from this project will offer direct benefits to policymakers and practitioners in Australia and in institutions of global governance that seek to enhance their public engagement strategy in line with the UN Secretary General's call to deepen public participation to achieve global goals to generate more effective outcomes.	291,540.00	302,303.00	302,303.00	301,923.00	1,198,069.00
	University of Canberra	291,540.00	302,303.00	302,303.00	301,923.00	1,198,069.00
	Australian Capital Territory	3,222,853.00	3,249,074.00	3,246,563.00	3,234,776.00	12,953,266.00

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New South Wales						
Macquarie University						
FT240100181	**Transposons as a means for rapid evolution of a complex organ**	227,861.00	230,361.00	230,567.00	230,842.00	919,631.00
Griffith, Dr Oliver W	The project aims to assess the role of transposons in the complex changes required for the evolution of a placenta, a new organ that has evolved more than 100 times vertebrates including our own ancestors. The project will use new genomic resources, genomic techniques, and gene manipulation to provide a mechanistic understanding of how changes in the expression of genes can support the evolution of a placenta. Expected outcomes of this project include a new understanding of how complex organs originate and evolve in animals. This will benefit society because it provides a deep understanding of our own evolutionary history and provides a framework for future studies to investigate the origin and evolution of organs more broadly in animals.					
	National Interest Test Statement					
	This research will answer a core criticism of evolutionary thinking since its inception “How do complex biological structures originate and evolve?”. Specifically, the research proposes and tests a new mechanism that supported the evolution of a placenta as a new organ. Furthermore, we will learn about the reproductive biology of some of Australia’s unique wildlife, which may improve management of threatened reptiles. This fellowship will support the continued development of a theory driven research program that will grow Australia’s dominance of discovery-based research. This project is uniquely suited to Australia because it takes advantage of our unique wildlife. By demonstrating how our wildlife can answer fundamental questions about the origins life, this project will advance our global standing in the fields of evolutionary biology and genomics. The fellow supported by this program has a strong record of science communication and outreach, all research outcomes from this work will be communicated to the public through multiple streams of public communication. This will lead to improved literacy in the fields of evolution and genetics, allowing the public to better understand the world around us and our place in it. To summarise, this project will provide real social, cultural, and environmental benefits by promoting Australian research excellence, promoting scientific discussion in the wider community, and providing new understanding about Australia’s unique fauna.					
FT240100269	**Advancing Robust Autonomy in Cyber-Physical Systems**	246,698.00	246,698.00	246,698.00	220,318.00	960,412.00
Zheng, Dr Xi	This project enhances the safety of cyber-physical systems such as unmanned aerial vehicles, autonomous vehicles, and smart farming technologies in Australia. It will leverage large language models for generating realistic scenarios of potential hazards and extracting formal models for rigorous testing. This interdisciplinary approach aligns with Australia's goals for national safety and innovation in autonomous systems, addressing key challenges outlined in the national regulatory frameworks for autonomous vehicles and mining. The anticipated outcomes include improved methods for safe autonomous operations, fostering safer commercialisation pathways and bolstering Australia’s global market competitiveness in autonomous technology sectors.					
	National Interest Test Statement					
	This project addresses the critical need for enhanced safety and efficiency in autonomous systems like self-driving cars, drones, and automated medical devices in Australia. The research gap it fills is the lack of comprehensive testing methods for these advanced systems. Improved testing will not only boost technological reliability but also align with national safety and innovation objectives. The benefits for Australians are manifold. Economically, it could expedite the integration of autonomous systems across industries, fostering job growth and market competitiveness. Environmentally, more efficient autonomous technologies can contribute to pollution reduction and better resource management. Socially, it enhances public safety, from safer transportation to more accurate medical devices, positively impacting daily life. To maximize the impact of the research, I plan to collaborate closely with industry leaders and policymakers. This includes aligning our testing methods with Australia's 'National Policy Paper on Automated Vehicles' and Western Australia's autonomous mining safety codes. Through workshops, public talks, and active engagement with stakeholders, I aim to integrate the findings into practical applications rapidly. These efforts will ensure the research is not only academically robust but also practically relevant, cementing Australia’s status as a frontrunner in safe and advanced autonomous technology.					
FT240100338	**Functional Panel Data Analysis: Harnessing Big Data for Society**	279,803.00	279,803.00	302,783.00	291,293.00	1,153,682.00
Shang, Prof Hanlin	Panel data models measure cross-sections of complex data sets, such as subnational demographic and high-frequency financial data. They are critical for solving pressing societal and economic challenges, yet current methods fail to capitalise on opportunities afforded by unprecedented volumes and sources of data. This project aims to develop new theories, better methods and faster algorithms to analyse function-valued panel data to produce accurate forecasts. Expected outcomes					

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	involve advances in big data-analytic theory and easy-to-implement algorithms for forecasting demographic and financial data. Improved forecasts will bring significant benefits for financial markets, superannuation and insurance industries, governments and society.					
	National Interest Test Statement					
	Handling the unprecedented volume and complexity of data in today's society calls for new, sophisticated, yet practical theories, methodologies and algorithms. Harnessing big data for business and society - combining mathematical modelling, computation, econometrics and statistics, and finance - is an emerging capability for expanding scientific knowledge. By enabling a rich understanding of how longevity and financial risks may impact retirees, this fellowship aims to resolve what is a sustainable pension age. The new data-analytic methods are able to produce accurate demographic forecasts and optimise financial returns. These outputs are essential for developing accurate and affordable insurance or superannuation premiums, maintaining the solvency of the insurance and superannuation industries, improving government planning and policy for aged care, and minimising financial risks. Translated into purpose-built, open-source software and coupled with industry training, the new statistical advances will build the capacity of various industry and government sectors. Outcomes are more stable markets and industries, better directed public spending, and better retirement outcomes for over 16 million Australians.					
	Macquarie University	754,362.00	756,862.00	780,048.00	742,453.00	3,033,725.00
The University of New South Wales						
FT240100038	**Integration and Stability of Power Electronics Defined Low Inertia Grids**	266,578.00	266,578.00	266,578.00	266,578.00	1,066,312.00
Konstantinou, Dr Georgios	This project aims to improve how we model, analyse, understand and operate low-inertia electricity grids that rely heavily on power electronics converters. The project will advance understanding in the field by integrating theoretical frameworks, practical applications, simulations, experiments and digital twins. Expected outcomes include the development and full validation of analytical methods, open toolsets and introduction of new stability performance metrics tailored to a power electronics defined power systems. These outcomes will provide significant benefits towards enhancing grid resilience, drive sustainable integration and management of renewables and support decarbonisation and growth in the energy sector.					
	National Interest Test Statement					
	Decarbonisation of the electricity sector and electrification of other sectors are key steps for addressing climate and energy challenges in Australia and globally. As Australia transitions away from fossil fuels, the stable operation of its power systems characterised extended use of power electronics converters and of low inertia becomes a critical national concern. Such a transformation is not just an Australian challenge but a global imperative, necessitating rapid advancements in grid technology and management, yet Australia sits at the forefront of both challenges and implementation of solutions. The project aims to pioneer breakthroughs in the integrated analysis and modelling of power electronics-defined low inertia grids. By developing a systematic, holistic approach, the project will establish appropriate methods and metrics to evaluate the conditions of the power system and define necessary system services that ensure grid stability in this new paradigm. The anticipated outcomes will future-proof Australia's national electricity infrastructure and accelerate the transition and adoption of new technologies in Australia and across the world. This will position Australia at the forefront of integrating renewable energy and managing low-inertia grids dominated by inverter-based generation. As a result, Australia will enhance its technical, academic and commercial leadership in a field that is rapidly gaining international significance.					
FT240100200	**Visualising Intercultural Futures: the role of performance in soft power**	266,815.00	266,673.00	266,653.00	266,709.00	1,066,850.00
Swain, Dr Rachael A	This project aims to develop understandings of visual and cultural perception applied to the making of intercultural performance to investigate how performance contributes to cultural diplomacy between Australia and South East Asia. Forging research innovation to (re)imagine and visualise shared environmental and cultural futures in our region, the project will develop new skills for remote community artists, performance researchers and arts industry application. Working with Kimberley Indigenous and diasporic South East Asian communities, it will generate new intercultural performance as a public engagement platform to recalibrate Australia's position as a leading force in performing arts in the post-pandemic era.					
	National Interest Test Statement					
	This project is field-first analysis of the overlap and interplay between Australian intercultural performance practices, Indigenous cultural diplomacy and new approaches to artist mobility in the post-pandemic era. It address the gap in Australian society's capacity to imagine the benefits of Indigenous recognition by demonstrating the importance of recognition for cultural diplomacy. Forging new performance models to (re)imagine and visualize shared					

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(Columns 1 and 2)	(Column 3)	2024-25 (Column 4)	2025-26 (Column 5)	2026-27 (Column 6)	2027-28 (Column 7)	(Column 8)
	environmental and cultural futures between north west Australia and South East Asia, the project will contribute simultaneously to the Australia Government's 2022 strategy to Deepen Engagement in South East Asia. Through demonstrated performance research methodologies the project will investigate under explored modes of cultural and visual composition and performance in collaborations between Indigenous and South East Asian artists and community members. The project will simultaneously research, identify and share cultural and perceptual performance literacies, support First Nations performing arts workforce development and amplify cultural diplomacy in South East Asia. Results will be shared with a diversity of audiences, through performance outcomes, industry masterclasses across the region and multi-vocal publications in order to reinvigorate Australia's position as a leading force in the performing arts post the Covid 19 pandemic.					
FT240100203	**Three-Dimensional Micro Electromechanical Systems for Biological Sensing**	261,648.00	261,648.00	261,648.00	261,648.00	1,046,592.00
Phan, Dr Hoang Phuong	This project aims to create transparent, flexible, multimodal three-dimensional (3D) MicroelectroMechanical Systems that provides volumetric interfaces between electronics and 3D cell cultures. This out-of-plane platform, equipped with multiple sensing capabilities such as temperature, strain, impedance, and biopotential measurements, offers compelling opportunities to advance the fundamental understanding of biological processes in 3D organ-on-chips. Synchronising with existing made-in-Australia technologies for in vitro biological studies, the engineering solutions from this project will generate intellectual properties that will be patented and translated into practical applications, bringing significant economic benefit to our nation.					
	National Interest Test Statement					
	A lab-on-a-chip is a miniature device that utilises microfluidics integrated with electronics and Micro ElectroMechanical Systems (MEMS) to elucidate and manage chemical and biological processes. Australia has a growing market in lab-on-chip technology with broad applications in security, environmental monitoring, and fundamental biological research. However, our nation's capacity in this field still faces technological limitations due to the significant mismatch between existing two-dimensional (2D) platforms and real-world three-dimensional (3D) biological systems. To harness the potential of emerging 3D cell cultures as an alternative solution to traditional 2D configurations, this project aims to develop an innovative platform of flexible 3D MEMS devices that provide non-invasive, volumetric interfaces with 3D cell clusters. Built upon CI Phan's pioneering work in multimodal sensors using nanomembrane semiconductors, novel three-dimensional interfaces between electronics and biological systems will enable monitoring of vital signals such as temperature, impedance, contractions, and electrical potential from extracellular activities. Synchronised with the cutting-edge 3D organ-on-chip technology developed in Australia, the technological solutions in bioelectronics obtained from this project will support a deeper understanding of fundamental biological phenomena and strengthen Australia's profile in sovereign semiconductor manufacturing as well as advanced bioengineering.					
FT240100384	**Defending Constitutional Democracy: The Military & the Constitution in Asia**	302,020.00	300,458.00	301,565.00	301,192.00	1,205,235.00
Crouch, Prof Melissa A	Responding to the United Nations' calls to end military rule, this project aims to investigate the legal challenges that the military poses to constitutional democracy in Asia and beyond. The project expects to develop rigorous qualitative, comparative research to explain how the military rules through constitutions in authoritarian regimes. Anticipated outcomes include novel, empirically-informed insights into how constitutions empower the military, and also constitutional design strategies to subordinate the military to civilian control in Myanmar and Indonesia. Outcomes will benefit Australian policymakers, international organisations committed to advocacy for constitutional democracy, and international scholarship.					
	National Interest Test Statement					
	In 2023, the United Nations Secretary General issued urgent statements condemning military coups and calling for 'a restoration of the constitutional order'. Military influence and military rule through constitutions directly threatens constitutional democracy in several of Australia's neighbors across Asia, as well as in Sub-Saharan Africa, Latin America and the Middle East and North Africa. Yet there has been little focus on the role of the military in constitutional law. This project will produce the first comparative account of the military as constitution-makers, law-makers, and administrators. By explaining how the military uses constitutions in authoritarian regimes, this project will help Australian policymakers, civil society organisations, constitutional advisors and legal advocates develop empirically informed strategies that can respond to the legal challenges that military rule poses to constitutional democracy and offer new constitutional design strategies to subordinate the military to civilian rule. The research will include roundtables, workshops and sharing of insights with Australian policymakers and regional counterparts, and policy papers will draw upon comparative insights to develop constitutional design strategies to end military rule in Myanmar, and address military influence in governance in Indonesia, two of Australia's neighbours and important to regional stability.					
FT240100398	**Encoding 3D microstructural gradients via metal additive manufacturing**	297,283.00	302,783.00	302,783.00	302,783.00	1,205,632.00
Primig, Prof Sophie	This project aims to encode inbuilt 3D microstructural gradients into high-performance alloys by harnessing inherent heterogeneities of additive manufacturing. The new physical metallurgy knowledge concerns advancements in the understanding of the interrelationship between tuneable characteristics of powder bed fusion processes and phase transformation pathways. Expected					

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	outcomes are 3D printing routes to unlock new property—performance spaces for aerospace and defence applications. Commercial benefits are opportunities to domestically source and manufacture engineering parts with reduced dependency on international trade. Environmental and societal benefits include reduced emissions due to superior mechanical design and workforce training. **National Interest Test Statement** This project will develop new advanced manufacturing methods for metal 3D printing to make superior engineering parts for aerospace and defence in Australia, independent of international supply chains. Current engineering designs for such applications continue to rely on homogenous materials where properties (e.g., mechanical, corrosion) do not change with position. Such designs impede further advancements in material performance now required for applications in extreme conditions (e.g., space planes). This project will address this challenge by making gradient materials where the inner structure and properties are engineered to change with position, unlocking superior performance spaces. Expected outcomes are new methods to make gradient materials, harnessing metal 3D printing. These new materials will outperform homogeneous materials currently used in aerospace and defence. Economic and commercial benefits include new industrial capacity, export opportunities, and reduced dependency on international trade. Workforce training, employment, and national security are social, and fuel savings due to better mechanical design environmental benefits. I will promote and communicate the outcomes via professional organisations (e.g., Engineers Australia), social media (e.g., LinkedIn), and events (e.g., Science week). Aerospace and defence suppliers will adopt gradient materials for high-performance applications. I will license this new technology to current and new industry partners.					
FT240100584 Ho, Dr Junming	**Taking Quantum Chemistry from Vacuum to the Real World** This project aims to produce highly accurate methods to predict the effect of environment on chemical reactions using multi-scale approaches and machine learning. If successful, this outcome will be very significant as it will propel chemical modelling to become a key driver for the design and discovery of new chemicals, medicines and materials. These methods will find very broad use in the chemical and biosciences by allowing researchers to reliably include realistic reaction conditions such as solvents and enzymes in their models. It will have economic benefits for Australia's multi-billion-dollar chemicals and pharmaceuticals industries as time-consuming experimentation are replaced by computer screening in the future. **National Interest Test Statement** Quantum chemistry has the potential to transform how research and development is currently performed in the pharmaceutical and chemicals industries. Already certain tasks such as measurement of the heat produced by a chemical reaction that used to cost industry USD$100,000 are now replaced by quantum chemical calculations almost exclusively. Australia is strongly positioned to be part of this transformation with the most powerful supercomputer facilities in the Southern Hemisphere, but quantum chemistry has moved to a phase where its progress requires methods that can accurately describe reactions other than those in the vacuum. This project will help develop such methods that will increase the predictive power of quantum chemical simulations of real-world reactions. This breakthrough will have enormous potential economic and environmental benefits for Australia's multi-billion-dollar chemicals and pharmaceutical industries as time-consuming experimentation and costly consumables such as toxic solvents and reagents can be significantly reduced through computer screening in the future.	254,298.00	254,448.00	243,198.00	236,698.00	988,642.00
FT240100691 Fernandez Valverde, Dr Selene L	**Two to Tango: The synergistic power of RNA-protein interactions in plants** RNA is an excellent vehicle for administering animal therapies, including vaccines. RNA is also a crucial regulator of plant genetics and epigenetics. However, our understanding of how regulatory RNA aids motion-constrained plants in adapting to their environment remains limited. The function of RNA often relies on its interactions with protein partners, which remain largely unknown in plants. The main goal of this project is to survey plant RNA binding proteins and RNA structures, to understand the principles of their synergistic interactions, and their changes in closely related species over time. Such insights will inform the development of synthetic regulatory RNAs for market-friendly and pest- and extreme climate-resilient plants. **National Interest Test Statement** Australia's food security faces potential threats in a changing world. RNA is successfully being used to prevent and treat human and animal diseases and is also vital for plants. Plants cannot escape predators or harsh environmental conditions and often respond to their environment by regulating their genes, often using RNAs. This research project will study RNA, how it folds and the proteins that bind it in related plant species. By studying how RNA and their binding proteins have changed over time and how these changes affect gene expression, we can learn more about how plants use RNA to control their genes to adapt to their ever-changing environment. This knowledge can be used to develop new types of RNA that can be temporarily applied to crops to improve their growth without changing their genes. These RNAs could help enhance plants to produce higher crop yields and acquire resistance to pests, extreme weather conditions, and other environmental challenges without resorting to genetic modification, helping to ensure Australia's food self-sufficiency. These technological developments have the potential to boost Australian farmers' competitiveness in the global market and help to support Australia's growing RNA industry.	237,938.00	243,698.00	247,213.00	254,447.00	983,296.00

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FT240100731	**A unified approach to the design of economic institutions**	296,314.00	297,456.00	300,634.00	301,221.00	1,195,625.00
Kolotilin, Prof Anton	The project produces fundamental theoretical research on classical design problems in microeconomic theory, including the design of disclosure rules, regulatory policies, and decision processes. It uncovers a common underlying mathematical structure for these classic problems, previously studied by disparate methods. Building on the CI's contributions to information design, the project develops powerful tools – based on recent advances in optimal transport – to unify and generalize existing classic theorems, and to produce a wealth of new fundamental results. By taking these tools to various applications such as digital platforms, consumer privacy, and social networks, the project informs the design of fair and effective economic policies.					
	National Interest Test Statement					
	By substantially expanding our theoretical understanding of economic design problems, this project will directly speak to some of the key challenges that Australia faces today: in particular, to the problems of media regulation, market competition, and the design of public organisations. The project aims to incorporate realistic constraints into the design problems that Australian policymakers face, and will allow for the careful analysis of tradeoffs that are particularly relevant to Australia -- such as the need to balance national security interests with consumer rights in the regulation of media markets. In doing so, the project will produce specific guidelines and recommendations that can be taken on board and applied by policymakers, executives, and legislators in contexts that are specifically Australian.					
	The University of New South Wales	2,182,894.00	2,193,742.00	2,190,272.00	2,191,276.00	8,758,184.00
The University of Sydney						
FT240100089	**The Future of the Middle Class**	301,751.00	302,783.00	302,783.00	302,783.00	1,210,100.00
Konings, Prof Martijn	This research program will shed new light on the declining accessibility of the middle class, especially for younger generations, and it will propose solutions to counter a growing problem of social integration. The research program aims to 1) determine how property ownership came to function as the core pillar of social integration 2) show how the high cost of property interacts with other factors to shape the financial constraints and strategies of Australian households and 3) identify new policy pathways and work with stakeholders to reshape the public debate. The program will result in enhanced research capacity and an improved ability to address socio-economic problems in an area of vital importance to Australian society.					
	National Interest Test Statement					
	The growing difficulty that younger generations experience in accessing the middle class represents a major challenge to Australian social cohesion. The problem receives considerable attention, but suitable and viable solutions have yet to be identified. Often, proposed solutions are localised or temporary, solving the problems of one group at the expense of another's. Social scientists have analysed some of the causes of affordability problems, but they have not been able to develop a framework commensurate with the complexity and depth of the problem. This research program aims to provide a new framework of analysis and to work closely with relevant stakeholders to reshape the terms of public debate. It will elucidate the foundations of existing policies by examining how property ownership came to be a central pillar of social integration and what problems arose from this role over time. It will analyse how the high cost of property has affected household strategies, and show how this dynamic has taken shape in the current cost-of-living crisis. Through close collaboration with key societal and policy stakeholders, the program will design new policy solutions and map sustainable pathways to broaden the integrative capacity of the Australian middle class. In this way, the program will enhance Australia's capacity to secure social integration, broad-based economic prosperity and political stability.					
FT240100162	**Strong light-matter coupling: a new direction in optical computing**	302,663.00	302,663.00	302,663.00	302,663.00	1,210,652.00
Lakhwani, A/Prof Girish	Light can strongly couple with organic semiconductor molecules and materials to form polaritons at room temperature that can immensely modify excited energy states and exhibit nonlinear optical properties. This project aims to leverage the strong interparticle interactions between polaritons, which are significantly higher than weakly interacting photons used in conventional photonics, to deliver a new capability for multidimensional optical computing. This project has a distinctive approach to harnessing photon degrees of freedom via strong light-matter coupling enabling novel avenues for enhancing the capacity of optical computing, benefiting various applications that require pattern recognition, such as artificial intelligence.					

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	National Interest Test Statement In this era of big data, the need for content creation has grown significantly as our requirements expand and technologies evolve with the emergence of artificial intelligence (AI). This poses a major challenge that is clearly outlined in the 20-year R&D NSW roadmap. Even though electronic computers continue to become more powerful and can solve complex computational problems, they are inept at pattern recognition, a vital component of AI systems. Optical computing and neural networks offer a paradigm shift due to their intrinsic ability to perform pattern recognition problems and handle large datasets but suffer from weak interactions between light signals to carry out computations efficiently. This project will deliver an innovative method to enhance these interactions, demonstrating resourceful information encoding and processing operations. Research findings will be published or protected by patents, as appropriate, and will pave the way for new partnerships in information technology across materials chemistry, nanophotonics, and computing science. The proposed project is a significant step towards the advancement of emerging technologies, and discoveries made and capabilities developed will enable Australia to maintain its position at the forefront of innovation in advanced computing.					
FT240100376 Li, Dr Fengwang	**Electrocatalytic green ammonia synthesis using reactive dinitrogen** This project aims to advance electrochemical nitrogen reduction reaction for green ammonia production using renewable electricity, water, and reactive dinitrogen feedstock. The project expects to generate new knowledge in catalysis using advanced in-situ spectroscopies and real-time electrochemical analysis, high-throughput catalyst screening, in-situ imaging, and multiphysics modelling. Expected outcomes include new structure-activity relationships and novel catalyst and reactor designs with breakthrough in energy efficiency for green ammonia production. This will enable a transformative way for green hydrogen storage and transport, providing significant benefits for Australia's net zero targets, sustainable manufacturing, and exports.	230,774.00	230,818.00	230,728.00	230,728.00	923,048.00
	National Interest Test Statement Ammonia lays the foundation of present-day agriculture as a fertiliser, and it has recently also been identified as a safe and efficient approach to store and distribute hydrogen, a clean fuel underpinning net-zero future. Current route for ammonia production is not sustainable, accounting for 1-2% world energy consumption and nearly 2% carbon dioxide emission. This project will address this challenge by developing a sustainable ammonia production approach that is fully powered by electricity—which can come from renewable sources such as solar and wind—and operates under environmentally friendly conditions, emitting zero carbon dioxide. The project draws on successful proof-of-concept studies and breakthrough in energy efficiency is expected with the aim to make this new route economically competitive. Further outcomes will be shared with leading Australian ammonia manufacturers in agriculture and energy sectors to identify opportunities for industries to adopt this new, sustainable manufacturing technology. This way, Australia will be able to phase out the currently unsustainable ammonia production industry and establish new green chemical sectors. This project will therefore contribute to Australia's transition be a global leader in sustainable agriculture and renewable energy production and export in the net-zero future.					
FT240100418 Fulcher, Dr Ben D	**Unravelling a rainbow: Complex systems methods to transform sleep research** This project aims to develop practical new analytic tools based on complex systems theory and time-series analysis to better characterize and track sleep from large time-series recordings. The project expects to establish the analytical foundation of representing sleep as a quantifiable dynamical process and use it to better understand how sleep varies across individuals and aging, and how it underpins learning and memory consolidation. Expected outcomes include methods and software to detect new types of interpretable structure from complex time-series datasets, and new understanding of sleep function. This should provide significant benefits for diverse data-intensive time-series applications and for how we measure and understand sleep.	266,698.00	266,698.00	266,698.00	266,698.00	1,066,792.00
	National Interest Test Statement This project will develop innovative new methods for analysing complex time-varying data and use them to pioneer a new dynamical representation of human sleep data that overcomes major limitations of the time-consuming, subjective, and imprecise current methods. The powerful new methods for analysing large, complex time-series datasets are generally applicable to the growing number of data-intensive Australian industries, from ecological monitoring to financial data analysis, making them well placed to deliver broad benefits to Australia's economic competitiveness in our rapidly advancing information age. And the new methods to detect and quantify patterns in sleep recordings are likely to shape diverse applications in science and industry where sleep recordings are measured and analysed. The project expects to deliver new understanding of the inter-individual distinctiveness of human sleep architecture and the mechanisms during sleep that underpin effective learning and memory consolidation, with potential to guide improvements to sleep that would have major societal and economic impacts for people across the globe. The research outcomes are of great interest to the public and will be communicated broadly as videos, podcasts, and public talks, and all technological advances will be shared with practitioners as a suite of open software tools to accelerate advances to a broad range of data-intensive problems.					
FT240100491 Rahim, Dr Md. Arifur	**Dynamic Single-Atom Liquid Metal Nanozymes** This project aims to initiate a paradigm shift in biocatalytic technology. It proposes a new class of	220,928.00	220,928.00	220,928.00	220,928.00	883,712.00

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	nanoscale artificial enzymes (nanozymes), harnessing the extraordinary properties of liquid gallium-based alloys. The developed liquid nanozymes are expected to surpass the limitations of traditional solid-state nanozymes in terms of catalytic activity and selectivity. The proposed research integrates a blend of theoretical and experimental methods, aiming to advance our understanding of artificial enzymes. The strategic objectives of this project focus on synthesizing liquid metal nanoalloys, investigating the structure–function relationship for model enzymatic reactions, and expanding their applications in biocatalysis and biosensing. **National Interest Test Statement** Nanozymes, a growing class of artificial enzymes, represent nanomaterials that can replicate the activity of natural enzymes. This project aims to pioneer a new type of nanozymes, leveraging the unique properties of liquid gallium-based alloys. The anticipated outcomes include nanozymes with liquid-like properties that can offer enhanced catalytic efficiency compared to solid-state nanozymes. As such, this project can potentially revolutionise industrial processes, from manufacturing to waste treatment, bolstering Australia's position in sustainable technology. The project's focus on developing platforms for biocatalysts and biosensors aligns with national health priorities by aiming to improve diagnostic methods, potentially reducing the healthcare burden. Additionally, environmental applications, such as pollutant degradation, directly contribute to protecting Australia's unique ecosystems. Investment in this research will foster collaboration between Australian universities and high-tech industries, nurturing a knowledge-based economy and creating new opportunities in academic research. By leading the way in this innovative field, Australia can become a hub for artificial enzyme technology, attracting international partnerships and investment. In summary, the project stands to deliver on multiple fronts of national interest: advancing research excellence, economic gains through technological innovation, environmental preservation and enhancing public health outcomes.					
FT240100578 Colagiuri, Prof Ben	**Expecting the worst: uncovering the psychology of nocebo effects** Nocebo effects – when negative expectancies trigger adverse outcomes – cause enormous personal and societal harm. We have made great progress identifying the basic psychological processes giving rise to nocebo effects. Yet, we currently know very little about how nocebo effects spread, how they interact with decision-making, and whether they can genuinely occur nonconsciously. The current project uses novel experimental methods to uncover the role of generalisation, decision-making, and nonsconsious learning in nocebo effects as well as how to inhibit them. The results will significantly advance scientific understanding of nocebo effects and pave the way for much needed translational research to reduce the substantial harm they cause. **National Interest Test Statement** 'Nocebo effects' occur when negative information triggers expectations that cause harmful outcomes. For example, the very act of warning people about side effects can cause them to expect and therefore experience worse side effects. Nocebo effects create an enormous social and economic burden - they cause over 40% of all medication side effects, can lead to poorer decisions (such as people avoiding cheaper but equally effective generic medicines), and spur resistance to lifesaving vaccinations (e.g. COVID-19 vaccinations) and new technologies (e.g. wind turbines). This project will significantly advance global scientific knowledge on how nocebo effects spread, how they influence decision-making, whether they can occur nonconsciously, and how to inhibit them. Expected outcomes include a new evidenced-based model of the psychology of nocebo effects and identification of novel behavioural strategies to combat them. The knowledge gained from this project will pave the way for much needed translational research to reduce the enormous burden nocebo effects cause, leading to more efficient healthcare systems in Australia and beyond. In doing so, the project will also build Australia's capacity and international collaborations in this vital area. Project findings will be disseminated in leading international journals, presented at major conferences, and communicated directly to relevant professionals, politicians, and the general public to maximise benefits to Australia.	302,774.00	302,683.00	301,691.00	301,691.00	1,208,839.00
FT240100614 Norris, Dr Barnaby R	**A new paradigm in astrophotonic technologies for exoplanet direct imaging** Understanding our place in the universe, the diversity of distant planets and even the possibility of life are some of the biggest questions in science. While countless planets exist around distant stars, many like our Earth, we have never been able to see them in detail. This project will develop and deploy innovative new astrophotonic technologies at four major observatories. It will allow Earth-bound telescopes to image distant planets and other astronomical objects with unprecedented clarity, and measure the composition of their atmospheres and surface. The project will produce the first images of solar-system scale planets, and the developed technology will greatly benefit other fields such as space communications and remote sensing. **National Interest Test Statement** This project will see national benefit in both scientific and technological domains. It centres on developing a revolutionary new photonic technology to crack one of the biggest problems in astronomy: how to take clear images of distant objects despite having to peer through the Earth's blurry, turbulent atmosphere, which scrambles the image and corrupts the signal. By addressing this the project will secure Australia's position as a global leader in	223,928.00	227,698.00	230,563.00	230,368.00	912,557.00

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	astronomy and also photonic technology and machine learning. The scientific outcomes in the domains of exoplanet science will be of extremely high international profile, and answering fundamental questions about the Earth's place in the universe and the diversity of distant planets has profound societal impact. Moreover, the technological innovation developed to achieve the project's ambitious science goals will directly transfer to and revolutionise commercial and industrial sectors such as remote-sensing, life-science imaging and, in particular, space communications. Australian astronomy – and our research group in particular – has a strong track record of technology transfer, which will be strongly manifested here. Both astronomical and technical outcomes will be strongly promoted through global networks and high profile international scientific forums.					
FT240100665	**Women Philosophers on Nature & the Human: Toward a New Environmental Ethics**	280,471.00	302,458.00	300,358.00	273,434.00	1,156,721.00
Nassar, A/Prof Dalia	This project aims to investigate the neglected history of women's contributions to the debates concerning nature, the human, and their relation. By exploring how women–who were identified with nature–theorised these crucial categories, the project expects to generate new knowledge of a distinctive strand of ethical and environmental thought and demonstrate its continuing relevance. Intended outcomes include a new understanding of women's contributions to philosophy, greater access to their works, and increased public awareness and appreciation of women's role in European thought and culture. This should provide significant social benefits including the promotion of gender equality through the recognition of women's intellectual history.					
	National Interest Test Statement					
	The categories of "nature" and the "human" have shaped thinking about the world and the human place within it. The same is the case for the category "woman," which has often been identified with nature. While scholars have critically investigated these categories and their consequences, none has considered how women themselves theorised nature and their distinctive status as both natural and human. This project will produce the first systematic study of women's contributions to the debates concerning nature and the human and thereby tap into unique resources for thinking carefully and critically about the human place in and responsibility toward nature. In so doing, it will advance Australia's collective resilience by helping to develop ways to live ethically in challenging times. Through translation, a critical edition, and the development of a digital platform, the project will increase public access to women's writings and contribute to training a new generation of researchers in Australia. Recent reports (e.g., 2022 SDG Gender Equity Index) have shown that Australia is falling behind other countries in terms of gender equality. Through a museum exhibition and public-focused discussions and articles, the project will increase awareness of women's contributions to European thought and culture and thereby advance Australia's effort to achieve equality and inclusivity in society and professional life.					
FT240100693	**A systems approach to maximising crop pollination using companion flowers**	242,943.00	242,783.00	242,783.00	275,655.00	1,004,164.00
Latty, A/Prof Tanya M	Planting pollinator-attractive 'companion' plants alongside less-attractive crops has been proposed as a biodiversity friendly way to increase yields in pollinator-dependent crops. However, companion flowers can also have negative impacts on the pollination success of their neighbours. This project aims to determine how flower traits and pollinator behaviours interact to determine whether a companion flower helps or hinders its co-flowering neighbours. Expected outcomes include new techniques for improving pollination success in pollinator-dependent crops. This project will yield significant benefits to food production and food security by developing techniques for safeguarding pollination amidst ongoing pollinator declines.					
	National Interest Test Statement					
	Planting 'companion flowers' alongside crops has been proposed as a biodiversity-friendly way to attract pollinators into crops. However, companion flowers can also 'steal' pollinators, resulting in lower pollination success for neighbouring plants. At present, the factors that determine whether a companion flower will be a 'good neighbour' are unclear, and, as a consequence, there are no protocols for selecting effective companion plants for target crops. This project aims to close this research gap using a 'systems thinking' approach to understand how the behaviour of pollinators and the traits of flowers impact whether a companion flowers will help or hinder the pollination success of neighbouring crops. This research will yield significant benefits to the $14 billion per annum horticultural industry and will safeguard pollination in the 1/3 of crops which are insect pollinated. Finding ways to maximise pollination by insects is especially important in light of the recent Varroa mite outbreak in NSW, which is expected to kill 95% of wild honeybees (our most abundant crop pollinator) within the next three years in affected areas. The imminent collapse of wild honeybee populations highlights the tremendous risk of following an agricultural pollination strategy based on a single insect species; this project, which focuses on four pollinator species, will help create resilient flower planting strategies that maximise the pollination efficiency of multiple pollinators.					
	The University of Sydney	2,372,930.00	2,399,512.00	2,399,195.00	2,404,948.00	9,576,585.00
University of Technology Sydney						
FT240100011	**Reimagining AI answer systems for critical AI literacy in Australia**	298,103.00	301,569.00	295,413.00	286,084.00	1,181,169.00

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(Columns 1 and 2)	(Column 3)	2024-25 (Column 4)	2025-26 (Column 5)	2026-27 (Column 6)	2027-28 (Column 7)	(Column 8)
Ford, A/Prof Heather	Australians use AI answer systems embedded in virtual assistants, smart speakers and chatbots that offer "fast facts" in many quotidien contexts. But Siri, Alexa and ChatGPT provide information that is often biased, sometimes inaccurate, and almost always stripped of its human origins. Citizens display misplaced trust in systems which seem to rise above human biases to offer an apparently omniscient, neutral perspective. This project aims to "reclaim the human" in AI answer systems by mapping how knowledges are coproduced by people at multiple levels of the AI model lifecycle, collaboratively reimagining how AI answer systems might be designed differently, and using the redesigned products to catalyse critical AI literacy. **National Interest Test Statement** Asking a general question about the world is one of the most popular use cases for the more than a quarter of Australians who own a smart speaker and the many more who access a voice assistant via their mobile phone. This project will investigate how local users, intermediaries and data producers encounter and build such "AI answer systems" through their individual feedback, commercial application development and public volunteerism. It will map the local, human-built infrastructures on which AI answer systems depend and apply this knowledge to the development of smart speaker prototypes that will be displayed in a national exhibition and made available to libraries throughout the country to catalyse critical AI literacy. This project advances knowledge about how Australians are encountering and participating in the coproduction of knowledge in everyday AI systems and provides the Australian public with access to high-quality opportunities to improve their critical AI literacy.					
FT240100194 Fang, Dr Jianguang	**Topology optimisation of damage-tolerant cellular structures with disorder** This project aims to develop a new approach to designing new lightweight, damage-tolerant, and crashworthy cellular structures by taking advantage of the latest technologies in computational mechanics and topology optimisation. The project intends to develop a new multiscale topology optimisation framework to seek new disordered cellular structures, in the context of highly nonlinear mechanics considering plasticity and fracture. The expected outcome of this project is a new methodology for generating eco-friendly structures with exceptional mechanical properties in crashing applications. This should potentially provide significant benefits to transport industries by providing safe and energy-saving vehicles. **National Interest Test Statement** Occupant safety and energy use reduction are undeniably two of the most critical aspects of vehicle design. Our research will provide direct benefits to Australian transportation and aerospace industries through our new approach to designing lightweight, damage-tolerant, and crashworthy cellular structures. The outcomes of this project have many potential applications, but most notably in vehicles and for the aerospace industry. While road safety has significantly improved over the last 40 years, road crashes remain a huge financial burden to Australians (at over $30 billion per year), alongside the extensive social impacts. This project takes advantage of the latest technologies to address and improve vehicle crashworthiness, contributing to Vision Zero (zero traffic deaths and severe injuries) . Our research also focuses on optimising the weight of the cellular structures, as each 10% change in weight reduction leads to approximately 6-8% fuel saving in the automotive industry. This is vital research with significant environmental impact and any opportunity to save on fuel reduces our use of finite resources and ultimately supports our mission to meet Net Zero targets.	257,948.00	255,248.00	245,473.00	246,473.00	1,005,142.00
FT240100222 Li, Dr Jun	**Eco-friendly ultra-high performance concrete in protective structures** Modern buildings and infrastructure are facing challenges from natural and man-made disasters, and structural safety is jeopardized by hazardous blasts and fire scenarios. This project aims to understand concrete material and structural behavior under the combined blast and fire loads and develop structural protective measures. Expected outcomes include an in-depth understanding of structural dynamic response and failure mechanisms under coupled blast and temperature effects and a protective measure based on ultra-high-performance concrete with multi-hazard resistance and low embodied carbon. Successful delivery of this project will benefit the construction sector in Australia and the international community. **National Interest Test Statement** Conventional concrete is one of the world’s most widely used construction materials. It is widely acknowledged that the abnormal loads created by explosions and fire can be catastrophic to concrete structures. However, there is a lack of understanding of structural response of concrete to the combined effects of blasts and fire when they commonly take place at the same time. This project aims to develop a solution based on eco-friendly ultra-high-performance concrete. In addition to superior mechanical strength and material durability, this novel construction material is further optimised with the aid of industrial by-products to enhance its fire resistance. The outcomes will help safeguard critical buildings and infrastructures, and the consumption of industrial by-products in the process will greatly reduce carbon emissions.	256,698.00	266,698.00	262,698.00	264,698.00	1,050,792.00

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		2024-25	2025-26	2026-27	2027-28	
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
FT240100307	**Monitoring vital signs using mmWave signals and cross-modality supervision**	302,663.00	302,663.00	302,663.00	302,663.00	1,210,652.00
Xu, A/Prof Min	This project aims to develop key enabling technologies for millimeter-wave radar-based monitoring of vital signs, including respiration, heartbeat, and blood pressure, for multiple users. Through mmWave imaging in a near field and cross-modality learning, computer vision knowledge is integrated into mmWave radar sensing to overcome major challenges that hinder practical applications. Person re-identification, tracking, and beamforming techniques will be developed to enable simultaneous multiple-user monitoring. The intended outcomes are novel techniques capable of monitoring vital signs for multiple people. The technology can enable a vast array of new applications, such as safety and security, healthcare and entertainment.					
	National Interest Test Statement					
	This project will develop critical enabling technologies for millimetre wave (mmWave) radar-based contact-free monitoring of vital signs, including respiration, heartbeat and blood pressure. Traditional measurement of vital signs requires the wearing electrodes or chest bands, which can be uncomfortable and inconvenient. MmWave radar can detect chest movement and tiny displacement of the skin in the order of millimeters induced by vital signs over a long physical distance. However, the technology faces obstacles to its application from its susceptibility to body movement and interference from moving persons. Moreover, no existing solutions can monitor multiple individuals simultaneously. This project will develop innovative signal processing, pattern recognition and machine learning techniques to overcome the challenges and enable vital sign monitoring for multiple people in motion. This research will benefit many sectors relying on human sensing, such as health, safety, security, rescue, and entertainment, and reduce their costs by avoiding unnecessary human involvement. The project team will also promote the project outcome via its extensive research and business networks to create new business opportunities and global competitiveness in human sensing for Australian companies.					
	University of Technology Sydney	1,115,412.00	1,126,178.00	1,106,247.00	1,099,918.00	4,447,755.00
University of Wollongong						
FT240100511	**Intergenerational Play: A right for all generations**	267,401.00	300,716.00	300,038.00	300,129.00	1,168,284.00
Kervin, Prof Lisa K	Disconnection is an increasing phenomenon across all generations. Intergenerational play is a connecting force to exchange values, knowledge, skills, traditions and ideas. While intergenerational programs exist, missing is understanding of what intergenerational play actually is, how it can be encouraged and identified benefits for all participants. This project will: 1) engage with leading researchers to understand intergenerational play globally; 2) develop an online repository of examples; 3) develop guiding principles for intergenerational play to focus on outcomes for all participants; 4) implement, document and test principles in intergenerational play programs in Australia; and 5) inform future programs and policies.					
	National Interest Test Statement					
	Disconnection is an increasing phenomenon across all generations, presenting deeply social, economic and urgent challenges. We must ensure that our ageing population lives well, that all children experience the best start to life, and that all generations feel connected to one another. Intergenerational programs are often conducted in isolation from one another and evidence-based examination of benefits for all participants are often overlooked. At a time when social isolation and loneliness are among the most potent determinants of mortality, this research looks to Intergenerational Play as a connecting force where participants exchange knowledge, skills, information, ideas and values while simultaneously boosting the wellbeing of all people. The scope, constructs and possibilities for Intergenerational Play across cultures and in the context of divergent knowledges and value systems are not yet realised. This project will develop internationally-informed principles for Intergenerational Play, that will be implemented and tested within Australia to inform future programs and policy.					
FT240100596	**Next-generation battery designs for mild and extreme conditions**	221,587.00	226,672.00	226,587.00	226,587.00	901,433.00
Wang, Dr Nana	This project aims to develop high-performance sodium ion batteries for use in smart grids, even in extreme conditions, by designing functional electrolytes, fabricating innovative electrodes, and establishing robust electrode/electrolyte interfaces. This groundbreaking research program will provide new insights into battery performance and promote innovation in electrolytes and electrodes, which is vital for practical battery development. The program is expected to generate new knowledge in the battery field. These outcomes would position Australia as a global leader in battery technology and renewable energy utilization, contributing to Australia's and the world's sustainability.					
	National Interest Test Statement					

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	Transitioning to net zero and low-emissions technologies presents a significant opportunity and challenge for Australia and the world, necessitating the development of novel low and zero-emissions technologies. Renewable energy sources are essential for a sustainable future and to reduce greenhouse gas emissions compared with burning fossil fuels. Creating reliable energy storage systems is crucial for maximizing renewable energy utilization. Sodium-ion batteries are considered the most promising candidate for next-generation large-scale energy systems, supporting the path to net zero. This project will conduct cutting-edge research to enable large-scale, cost-effective, high-performance sodium-ion batteries that can function even in extreme conditions. Expected outcomes include constructing innovative electrodes, designing stable electrolyte/electrode interfaces, and acquiring new knowledge in materials science, chemistry, and engineering. This project will assist Australia in harnessing emerging technologies at scale, attracting more investment in emerging battery technologies, driving job creation, and promoting the adoption of clean energy for a net-zero future.					
	University of Wollongong	488,988.00	527,388.00	526,625.00	526,716.00	2,069,717.00
Western Sydney University						
FT240100427 Plett, A/Prof Jonathan M	**Unlocking mycorrhizal signals to shape mycobiomes from roots to restoration** This project aims to address significant challenges in seedling establishment during reforestation by advancing our fundamental understanding of plant-fungal symbioses, which support plant health. The project expects to produce new insights into fungal competition, promoting elite symbionts using interdisciplinary approaches. Expected outcomes include refined methods for microbial inoculant development, improved techniques to boost symbiotic microbial activity, and enhanced capacity to improve seedling establishment in disturbed soils. This should provide significant benefits for foresters, land managers, and the broader public by fostering healthier forests, streamlining plantation forest production, and safeguarding ecosystems.	301,978.00	300,078.00	301,813.00	301,083.00	1,204,952.00
	National Interest Test Statement Australia is the sole developed nation labelled a 'deforestation hotspot.' This crisis has economic ramifications, elevating living costs due to supply chain disruption, loss of jobs in rural areas, and increased reliance on >$3.5B in imports. Ecologically, forest loss endangers >700 plant and animal species, releases billions of tonnes of greenhouse gases, and jeopardises world heritage areas. To address this urgent challenge, we must develop innovative approaches to establish forests faster, and more sustainably, than ever before. By harnessing Australian symbiotic mycorrhizal fungi, this project will develop strategies that aid reforestation in the short-term by accelerating seedling establishment and, in the long-term, by boosting soil fertility through improved microbe biodiversity and the services they provide to support plant health. The knowledge gained will support development of green technologies with global applicability, advancing ecosystem function and resilience. These outcomes contribute to three targets within the UN Sustainable Development Goals 'Life on Land' and ‘Responsible Consumption and Production’. Project discoveries will be shared with foresters and bush regeneration groups, encouraging their adoption to bolster forest establishment and health, secure the wood products pipeline, reduce emissions, and protect Australia's iconic landscapes and species.					
	Western Sydney University	301,978.00	300,078.00	301,813.00	301,083.00	1,204,952.00
	New South Wales	7,216,564.00	7,303,760.00	7,304,200.00	7,266,394.00	29,090,918.00

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Queensland						
Central Queensland University						
FT240100831	**Transforming incident investigation in safety-critical industries**	302,783.00	302,783.00	302,783.00	302,783.00	1,211,132.00
Naweed, Prof Anjum	Psychosocial risks are ever-present in safety-critical industries, impacting physical and psychological safety and inhibiting organisational learning. This novel project will characterise investigation trauma as a new and insidious class of hazard, and identify ways to tackle investigations in safety-critical industries that would lead to improved safety and less traumatisation. Outcomes of this interdisciplinary project will provide government and decision-makers with evidence to support uptake of strategies that promote both physical and psychosocial safety. It will provide significant benefits for the many working Australians who start their day fearful of incidents and end it fearful of investigation if something goes wrong.					
	National Interest Test Statement In Australia's safety-critical industries, people go to work with the real risk of not coming home. Intolerance towards mistakes and blame-focused investigation methods mean that people begin their day fearful of incidents, and if something goes wrong, end it fearful of investigation. This creates a culture of fear where workers are afraid to speak up and report near misses for fear they will be investigated and blamed, even if they are not at fault. Low job control, exposure to traumatic events, and poor organisational justice are just some of the serious psychosocial risks plaguing work in Australia's safety-critical industries. However, being investigated is also traumatising. While investigations are done to reduce catastrophic risk, the unintended consequence is psychosocial harm, and as mental health affects concentration, alertness and reaction time, a fear culture then becomes a problem of physical safety. This interdisciplinary 'T.H.R.I.V.E. in Investigations' project will identify how investigation processes and models may be transformed to reduce psychosocial harm and promote open disclosure. The outcomes will provide government and decision-makers with the evidence needed to support uptake of strategies that promote physical and psychosocial safety across diverse safety-critical industries with maximum economic, environmental, and social benefit.					
	Central Queensland University	302,783.00	302,783.00	302,783.00	302,783.00	1,211,132.00
Griffith University						
FT240100020	**Stretchable microfluidics for improved fluid and particle handling**	230,425.00	230,582.00	230,690.00	230,762.00	922,459.00
Zhang, Dr Jun	This project aims to develop an unprecedented microfluidic platform technology that enables real-time and onsite control of microchannel geometry and dimension. The project expects to create a stretchable microfluidic platform for adaptable and versatile manipulation of fluids and particles, underpinning the development of next-generation miniaturised fluidic devices with applications in real-time health monitoring. Expected outcomes include the generation of new knowledge in advanced manufacturing of flexible devices and a proof-of-concept prototype for biomedicine and fisheries. This will significantly benefit Australia's biomedical, pharmaceutical and fishing industries with cutting-edge diagnostic and therapeutic technologies.					
	National Interest Test Statement Microfluidic technologies are used in a broad range of applications, including medical diagnostics and therapeutic development. Their size, efficiency and cost-effectiveness overcome issues of the traditional manual lab processes; however, a lack of flexibility to accommodate a range of particle sizes has limited their development. Recent advances in soft material manufacturing and novel testing methods have provided necessary breakthroughs to develop a flexible technology platform with real-time shape-morphing microchannels. This project exploits elasticity to enable transport, manipulation, and characterisation of heterogeneous bioparticles from body fluids and environmental extracts. The versatile cell handling technique developed in this project will facilitate the development of more efficient disease diagnosis and production of therapeutic agents. The platform technology has applications in industries other than health, such as environmental monitoring of water quality; It can rapidly detect pollution risk and microbiota population changes, enabling faster response and intervention for improved environmental sustainability. Commercialisation of the technology in collaboration with national and international universities and industries, including pharmaceutical manufacturers and environmental agencies, will deliver cutting-edge technologies for many biomedical and environmental applications, providing significant health, environmental and economic benefits to Australia.					
FT240100236	**Understanding the Collateral Consequences of Sex Offender Legislation**	266,250.00	265,731.00	266,811.00	265,631.00	1,064,423.00

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Harris, Dr Danielle A	The fellowship aims to address a critical gap in our effort to prevent sexual reoffending. It investigates the unintended consequences of sex offender legislation on perpetrators as well as the harmful collateral impacts on their non-offending family members. It will analyse narratives of recidivism and desistance in Australian sex offenders and compare them to those from Norway and North America. The anticipated outcomes of this project will inform more effective responses to sexual offending by engaging those who have successfully desisted. This pioneering study of how sex offender legislation affects men, and their families will yield significant benefits for Australian society by preventing sexual recidivism and reducing harm. **National Interest Test Statement** Sex offender legislation often has unintended consequences, affecting not only the offenders but also their non-offending family members. With little evidence to support current legislation's efficacy in reducing reoffending or improving community safety, a significant gap remains in our efforts to prevent sexual offending. This fellowship aims to uncover the nature and extent of the far-reaching impact of these laws on both perpetrators and their families. The potential benefits are substantial, including reducing the economic burden on the justice system and mitigating the psycho-social impact on non-offending family members. Furthermore, its learnings will facilitate the social and cultural reintegration of offenders, fostering a more supportive environment for their rehabilitation. To maximise the impact of the research, the findings will be disseminated widely to policymakers, practitioners, and the public. By ensuring access to findings beyond academia, the project will inform effective strategies for enhancing community safety, contributing to a safer and more compassionate society for all Australians. This project aligns with key Commonwealth initiatives and contributes to the advancement of the National Office of Child Safety goals, ultimately striving to reduce the social, cultural, and economic burden of sexual offending in Australia.					
FT240100262 Stafford, Dr Lisa M	**Transport Equity For All** Over 4.4 million Australians with disabilities are subject to active and public transport discrimination. This project aims to co-develop with people with disability and transport planners, a practice framework and tools to better guide decision making and application of equity in transport planning. By doing so, this project's co-created knowledge and practice methods would advance transport equity for people with disability in Australia. Creating fit-for-purpose transport systems founded on equity and justice that are inclusive, ecologically sound, and affordable, will lead to multiple benefits including improved social and economic participation and more sustainable safe resilient communities, cities, and regions. **National Interest Test Statement** Better ways of planning transport to ensure it's fair and accessible for all Australians is a significant need. Transport is essential to everyday life yet remains the most reported form of discrimination experienced by Australian with disabilities. Every Australian will have an experience of disability in their lifetime, and transport equity is a way of ensuring access needs are met for the most disadvantaged to ensure same level of services for everyone. Problems persist due to little knowledge and practice know how, and gaps in existing national standards. Without fit-for-purpose knowledge to guide planners, applying equity in transport will remain inadequate. This research will work directly with Australian transport planners and people with disabilities to co-create new knowledge and practice tools, that will be freely available on public websites, public information hubs, professional bodies magazines, and through free professional seminars. Applying the new knowledge will inform better planning of transport for everyone, removal of barriers to social-economic participation, and creating fairer access and increased opportunities to work, education, health, recreation, and family/friends critical to everyday life. Inclusive fit-for-purpose transport systems will reduce spending on expensive disability transport support for some due to improved access to public and active transport, as well as lowering carbon emissions with mode shift and increase usage.	264,432.00	263,242.00	262,824.00	262,324.00	1,052,822.00
FT240100280 Ta, A/Prof Hang T	**Materials to cross gastrointestinal barrier and escape liver metabolism** This project aims to engineer advanced hybrid materials to cross the gut barrier and escape liver metabolism by utilising a novel multifunctional polymeric microcapsule to encapsulate and protect nanoparticles with tailored mechanical properties and bio-coating. It expects to generate significant new knowledge on the role of nanomaterial's properties and bio-coating in its capability to go across intestinal wall and evade liver clearance, eventually leading to the development of advanced materials for targeted delivery via oral administration. Expected outcomes include patented technologies and next-generation oral delivery systems that are likely to benefit veterinary, food and pharmaceutical sectors where delivery technology is applied. **National Interest Test Statement** Innovative value-added materials are crucial for enhancing manufacturing efficiency and product quality. Australia possesses substantial expertise in value-added materials, including nanomaterials, and the application of	287,783.00	302,776.00	302,776.00	302,776.00	1,196,111.00

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	nanotechnology in materials offers fresh prospects for these industries. Currently there are many bottlenecks to efficient oral delivery of bioactive materials. This project aims to generate fundamental understanding on how mechanical properties and bio-coating of nanoparticles affect their capability to cross the intestinal barrier and interact with liver metabolism, and develop next-generation micro-nano hybrid material systems for efficient oral targeted delivery applications. New knowledge and technology created will drive the advancement of oral delivery materials, bolstering Australia's competitiveness in value-added materials. This effort will open doors for Australian material industries, offering innovative technologies for various sectors like veterinary, food, and pharmaceuticals, where delivery technology is applied. The resulting education and skills development will empower these industries, enhancing national capabilities, global competitiveness, and generating new businesses and job opportunities					
FT240100352	**Pioneering Quantum Advantage for Distributed Precision Metrology**	266,818.00	266,818.00	266,818.00	266,818.00	1,067,272.00
Slussarenko, Dr Sergei	This project aims to enhance our ability to perform ultra-precise measurements. By using the methods of quantum physics, this project will develop the science behind implementing an interconnected ultra-sensitive measurement network. The research will focus on overcoming the challenges of sending quantum data across distances and using it to simultaneously process measurement information in various locations. Expected outcomes of this project include new quantum measurement techniques for distributed metrology applications. This project will ultimately lead to benefits such as improved environmental and infrastructure safety monitoring capabilities and contributions to Australia's technological advancement initiatives.					
	National Interest Test Statement					
	Quantum physics studies the fundamental structure of our world. New technologies based on principles of quantum physics are shaping our information-based society. We are now entering an era where quantum methods are better at some tasks than any specialized classical tool. Performing accurate and precise measurements is essential for our daily lives. Quantum sensors provide unprecedented advantages in measurement precision compared to classical devices. The major technological ambition of this project is to link these quantum sensors into a single, ultra-sensitive, interconnected system. This type of information network will have wide-reaching applications, such as in environmental monitoring and searching for minerals using gravity surveys. This project focuses on developing the science and techniques for efficiently operating and transmitting quantum data – a cornerstone of this interconnected quantum system. The challenge lies in progressing from basic quantum measurements in controlled settings to implementing intricate, deep quantum techniques applicable in real-world scenarios. The benefits of this project are vast. It will lead to technological advancement, boosting Australia's national prestige. It also aligns with Australia's strategic goals in quantum technology, ensuring we remain at the forefront of this global race and progress towards technologies with tangible benefits for our environment, infrastructure, and economy.					
FT240100370	**Resilient elections: How to Strengthen Our Democracies**	241,349.00	257,192.00	266,480.00	266,225.00	1,031,246.00
Martinez Coma, Dr Fernando	Elections are at the heart of democracy. Yet the question of their resilience -the ability to overcome threats while effectively preserving and improving the integrity of the electoral process- is little understood. The project aims to evaluate electoral resilience by investigating how threats affect the three main election dimensions: participation, contestation, and organisation. Undertaking in-depth case studies in Australia, India, Indonesia, and the United States, and large-scale global quantitative analysis, expected outcomes include new theoretical insights into electoral resilience. Working with election stakeholders will enhance benefits, developing feasible measures and strategies to strengthen elections, and therefore democracy.					
	National Interest Test Statement					
	Democratic elections cannot be taken for granted, as they face multiple increasing threats. Technological threats, utilising social media, have exacerbated the spread of disinformation. As Vladimir Putin’s ally Yevgeny Prigozhin (from the Wagner group) stated regarding the 2016 U.S. presidential election: ‘Gentlemen, we interfered, we are interfering, and we will interfere’. Societal threats can come from large-scale disruptive events, like the COVID-19 pandemic hindering the organisation of the election (eg. Queensland, 2020) and/or postponing it (eg. New Zealand, 2020). Environmental threats also impact elections, discouraging voter turnout (eg. Germany, 2013) or complicating it (eg. Lismore in NSW, 2022). Despite these threats increasing and intensifying across the world, we lack an understanding of how they interrelate and impact elections. The proposed project will address this by providing multi-country quantitative and qualitative data analysis on the features and effects of threats to electoral resilience. By working with stakeholders involved in elections, such as electoral commissions, political parties, and civil society, the project will offer specific strategies to mitigate and manage threats. Research outcomes will be disseminated via policy reports and briefs, case studies and media. By building the resilience of elections, and strengthening democracies, the research outcomes can provide social and economic benefit for Australia and internationally.					
FT240100514	**Porous Electrode Design for Electrochemical Conversion of Captured CO2**	297,713.00	298,483.00	298,483.00	300,813.00	1,195,492.00
Liu, A/Prof Porun	Direct conversion of the captured CO2 in solution into valuable chemicals and fuels using an electrolyzer powered by renewable energy presents a promising advantage over the conventional energy-intensive CO2 capture and utilization approach. However, the electrolyzer is inefficient due to the low activity of the key electrode component. This project aims to improve the CO2 conversion					

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	efficiency by creating novel porous electrodes and optimized operation parameters. This improvement in electrolysis efficiency can revolutionize the disruptive CO2 capture and conversion technology, helping reduce greenhouse gas emissions, and contributing to Australia's net-zero emission target. **National Interest Test Statement** Australia's pursuit of net-zero emissions and the need to meet rising energy demands necessitate the adoption of more CO2 capture and conversion systems. One innovative approach for meeting these objectives involves utilizing electricity generated from renewable sources to convert captured CO2 into valuable chemicals and fuels. Although this approach holds great promise, it faces specific technological challenges. The first challenge pertains to the efficiency of chemical production, characterized by substantial energy losses at the reaction surface, specifically the electrode. The second challenge relates to the selectivity and durability of the electrode. This project has a primary goal of conceiving and deploying new electrodes that are efficient, dependable, and cost-effective. Successful completion of this project will result in a proof-of-concept for groundbreaking porous electrodes capable of achieving high-rate and stable electrochemical conversion of CO2 capture solution. These electrodes will be prepared for prototyping in collaboration with Australian partners. By achieving this, the project will significantly contribute to the advancement of cost-effective and environmentally friendly chemical fuel production, thus fostering both ecological and economic advantages. The outcomes can reduce greenhouse gas emissions, supporting the Australian Government to achieve its net-zero emission targets and its extensive investment in renewable energy.					
FT240100621 Adame, Dr Maria Fernanda	**Carbon negative freshwater wetlands: novel pathways of carbon sequestration** Freshwater wetlands are a substantial source of methane emissions, contributing significantly to climate change. Under my leadership, it was discovered that contrary to expectations, freshwater wetlands dominated by “paperbark” trees (Melaleuca spp.) act as methane sinks rather than emissions sources. This study will explore the hydrology, ecology and microbial communities that drive this unusual carbon pathway. The implications of these investigations are immense; the results will inform new Blue Carbon methodologies that could include low-emission freshwater wetlands. Additionally, it will support the discovery of methane-consuming microbes with the potential to create biotechnological solutions to reduce global methane emissions. **National Interest Test Statement** Australia is committed to reducing greenhouse gas emissions by 43% by 2030. Reductions will partially be achieved through nature-based solutions such as restoring “Blue Carbon” ecosystems, which include mangroves, saltmarsh, and seagrass. Nonetheless, wetlands dominated by Melaleuca spp., or paperbark swamps, have similar characteristics to established Blue Carbon ecosystems; they have high carbon sequestration rates and low or negative greenhouse gas emissions. This project will investigate the processes behind the unusual methane consumption in these wetlands. The implications of this discovery are immense as the area of paperbark wetlands in Australia is larger than that of mangroves and saltmarsh combined. The information from this project could support the development of new Blue Carbon methodologies, such as the restoration or protection of paperbark wetlands. New methodologies will fast-forward the Australian government’s pursuit to gain international recognition for high-quality and verifiable Blue Carbon. Moreover, finding new methane-consuming microbes could aid in creating biotechnological solutions. For instance, methane could be transformed into valuable chemicals through gas fermentation. Unravelling the mechanisms and microbial communities behind this surprising methane sink has the potential to transform Blue Carbon strategies and greatly enhance Australia’s pursuit to achieve its ambitious emission reduction goals by 2030.	264,506.00	264,506.00	264,506.00	264,506.00	1,058,024.00
	Griffith University	2,119,276.00	2,149,330.00	2,159,388.00	2,159,855.00	8,587,849.00
James Cook University						
FT240100685 Watson, Dr Sue-Ann	**Global responses of marine species and ecosystems to environmental change** This project will determine and predict the effects of environmental change on biodiversity and ecosystem functioning worldwide. Current understanding of the combined effects of environmental change across biodiverse species in wild ecosystems is limited. To solve this problem, this project uses untapped data from global species collections to analyse responses of 300+ species to drivers of change over the last 100-300 years. Outcomes will highlight and forecast multiple species and ecosystem trajectories to environmental change through time and space, and provide significant environmental, economic and social benefits through improved predictive capacity for vulnerable and resilient groups to inform management, fisheries and conservation. **National Interest Test Statement**	247,836.00	257,138.00	252,471.00	261,818.00	1,019,263.00

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		2024-25	2025-26	2026-27	2027-28	
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
	Billions of people depend on marine resources for food security and livelihoods. Yet environmental change is altering marine ecosystems globally at unprecedented rates. This innovative project will used the untapped resource of museum collections to determine how marine species and ecosystems have already responded in the face of escalating drivers of change, allowing a critically enhanced understanding of the past, present, and projected future responses of hundreds of species. Using global collections in a novel way, this project will focus on animals without backbones (invertebrates), which represent 92% of marine animal species, including important fisheries and environmental indicator species. Determining species and ecosystems across the planet that are adapting or declining will deliver practical management and conservation advice for ecosystem managers, fisheries, conservation practitioners and tourism end-users within Australia and globally. Research outcomes will be adopted into policies and programmes implemented by government environment and fisheries departments, and data will feed directly into conservation assessments of marine invertebrates, the majority of which have never been assessed at the Australian or international level. Research outcomes will be promoted through traditional and social media, exhibitions, lifelong learning and school programmes, and talks to maximise public and end-user understanding to ensure better management of marine resources.					
	James Cook University	247,836.00	257,138.00	252,471.00	261,818.00	1,019,263.00
The University of Queensland						
FT240100022	**PBIAS: A Principled Approach to Data Bias Management in Data Pipelines**	302,543.00	302,543.00	302,543.00	302,543.00	1,210,172.00
Demartini, A/Prof Gianluca	This project aims to tackle fundamental problems of bias in data and Artificial Intelligence (AI), proposing the new concept of bias management. Being trained with massive amounts of human generated content, AI may reflect and reinforce human bias and stereotypes and may be used for malicious purposes. Urgent action is needed to support the average person in better understanding if the output of AI systems can be trusted or not. This project builds and evaluates novel methods to track, quantify, and deal with bias rather than to mitigate or remove it. This will empower end-users making informed data-driven decisions and will benefit Australia by accelerating investment in responsible AI and fostering greater social acceptance in AI.					
	National Interest Test Statement					
	Next-generation AI comes with great societal risks of it being used for malicious purposes and to support adversarial intents. There is still a major misunderstanding and difficulty in differentiating between factual and creative content as provided by these AI systems. This project will address this issue through providing better mechanisms to increase transparency in data pipelines by surfacing potential bias information to the end users of the system (e.g., in the top 100 results there are only 20 women). This will empower them to make sound, informed decisions rather than relying on the AI to make decisions for them (e.g., hiring). The project aligns with the current prioritisation of AI efforts in Australia. This project will advance knowledge in data annotation (i.e., the fuel of AI) methods, as well as develop novel methods to collect better data annotations at scale. Such advances are applicable to a number of different data-driven decision-making scenarios where automation is quickly being deployed. Gen AI could automate or augment up to 44 per cent of the tasks being undertaken by workers across the economy. The focus on bias in data pipelines, besides the scientific advantages, also ensures Australia being a leader in responsible AI. This is important given the fact that most of the research data currently used for AI research (that is, testbeds and benchmarks) has been done outside Australia, (e.g., ImageNet in US), where responsible AI may not be a priority.					
FT240100030	**Why do we lose bone mass? Social and temporal dynamics of a silent disease.**	266,188.00	262,698.00	265,093.00	266,818.00	1,060,797.00
Miszkiewicz, Dr Justyna J	This project aims to address why modern human bones are weak and lose mass easily. By applying a first-ever social and evolutionary framework alongside classic microscopy and state-of-the-art particle accelerator methods to ancient and modern skeletons from England and Australia, this project aims to assess how fundamental cell mechanisms that build and destroy bone have responded to social changes over the last millennium. Expected outcomes include identifying interdisciplinary theories about how social hierarchies influence bone quality. Future benefits include aiding in the assessment of how social disadvantage and evolution affect the incidence of bone diseases, critical for developing wellbeing strategies in Australia and beyond.					
	National Interest Test Statement					
	Despite scientific efforts explaining and preventing porous bone disease, ~40% of older Australians still develop this condition, costing the Australian Government $4 billion annually, of which $2.6 billion is spent on bone injury management. This project seeks to create new knowledge about why this condition is so persistent today by identifying how ancient and present social structures determine bone porosity and weakness. By applying a first-ever combined social, evolutionary, biological, and technically advanced framework including state-of-the-art particle accelerator methods, this project aims to explain how fundamental cell processes that lead to loss of bone mass have responded to social hierarchies over the last millennium. Expected social benefits include guiding Australians about how socio-economic disadvantage and evolutionary history shape our chances of experiencing bone loss through outreach posters distributed within Australian schools, museums, libraries, sports and community wellbeing centres. Long-term benefits include aiding in the national assessment of incidence of bone diseases and contribution to holistic wellbeing plans for Australia's future.					

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
FT240100230	**Understanding the neurophysiology of executive function**	230,801.00	230,620.00	230,739.00	230,730.00	922,890.00
Filmer, Dr Hannah L	This project explores the causal neural basis of executive functions (EF) —multi-tasking, decision-making, and cognitive control — which are among the most vital psychological operations for adaptive behaviour in everyday life. Currently, little is known about the role of neurochemicals in EF and how they interact with manipulations of brain activity. This project expects to elucidate the causal interplay between EF and neurochemicals using a unique combination of cutting-edge approaches including brain stimulation and ultra-high field brain imaging. Anticipated outcomes are a greater understanding of brain function which should pave the way for fundamental research into the ability to enhance human performance in applied settings.					
	National Interest Test Statement					
	Adaptive everyday functioning is highly reliant on psychological executive functions. These include memory, decision-making, multitasking, and task switching. Performance on tasks measuring such operations can predict education attainment and are related to mobility in older adults. Despite the importance of these processes, it is currently unknown how these arise in the brain. There is some preliminary evidence that concentrations of key chemicals in the brain may be important for optimal executive function, but their role is not fully understood. This project would utilise a cutting-edge combination of neuroscientific approaches including techniques to modulate neurochemical concentrations, e.g., drug manipulations, and non-invasive brain stimulation, a technique which is low cost and easy to administer. The project allows for fundamental knowledge gains, will build capacity in advanced cognitive neuroscience techniques, and represents important foundational knowledge required for future optimisation of executive performance. This has potential economic gains via boosting performance in industry (e.g., Defence). The key findings would be communicated via scientific outlets (e.g., publications and conferences), to the public (e.g., articles, events, social media), and materials produced would be made freely available. Further, the findings would be distributed to relevant future beneficiaries, for example industry settings such as Defence.					
FT240100361	**Symmetry in geometric differential equations**	227,479.00	233,782.00	249,761.00	219,098.00	930,120.00
Lafuente, Dr Ramiro A	This project aims to address major open questions about the geometry of solutions to Einstein's equations from the theory of General Relativity, and other related equations. These questions centre around the notion of symmetry, which is natural both from the physical and geometric viewpoints, and of utmost importance in our current understanding of the universe. The outcomes are expected to fill clear gaps in knowledge in Pure Mathematics, and to unveil new connections between this subject and other areas of Mathematics and Physics. Anticipated benefits include putting Australian at the forefront of current research in geometry, and enhanced domestic and international collaboration in the field.					
	National Interest Test Statement					
	Basic research in Pure Mathematics is vital to the development of a wide range of disciplines, including Computer Science, Economics, Medicine and Physics. For example, the two pillars of our modern understanding of the universe —Einstein's theory of general relativity and the Standard model of particle physics— are impossible to describe without reference to Differential Geometry, a mathematical theory that studies the geometry of higher-dimensional shapes. This project intends to settle fundamental open questions in Differential Geometry, by studying solutions to Einstein's equations from General Relativity and other related equations, with a focus on their interplay with symmetries: symmetries lie at the core of our understanding of the universe, but their role in solving these equations is still not fully understood. The outcomes of the project are expected to advance our understanding of geometry by filling critical knowledge gaps. This in turn is expected to help lay the groundwork for long-term applications to Physics and Data Science, and potential technological developments. The calibre and international significance of the challenges to be addressed have the potential to add to the internationalisation of Australian research networks, and to attract the best students to Australian universities, thus contributing to the country's economy and intellectual capacity.					
FT240100378	**Electron Crystallography Methods for Multidisciplinary Applications**	255,318.00	255,118.00	255,218.00	255,318.00	1,020,972.00
Xu, Dr Hongyi	The project aims to establish the first dedicated research group in Australia to develop new methods based on electron crystallography, namely micro-crystal electron diffraction (MicroED) and serial electron diffraction (SerialED). These methods enable the determination of 3D atomic structures of materials, small molecules, and macromolecules from nano- and micron-sized crystals, too small or too complex to be studied by existing techniques. This multidisciplinary research project expects to generate new knowledge in crystallography and electron microscopy. This should provide significant benefits in stimulating research in materials science, structural biology, structural chemistry, green catalysis, sustainable energy, and drug discovery.					
	National Interest Test Statement					

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	Knowing the 3D atomic structures is crucial for designing novel materials with extraordinary properties, discovering new drugs to treat disease, studying chemical and biological molecules, and understanding fundamental chemical and biological processes. While traditional crystallography methods have been instrumental in deciphering crystal structures, they face limitations when dealing with tiny crystals. With the development of sophisticated electron crystallography methods, scientists can explore previously inaccessible realms, solve complex structures and answer questions that were once deemed unapproachable. However, these methods are currently unavailable in Australia. In this project, cutting-edge electron crystallography methods will be developed to study the atomic structures of scientifically interesting specimens, from materials, pharmaceutics to macromolecules. It is expected to provide unprecedented opportunities to Australian scientists to engineer advanced materials, study complex chemical processes and explore fundamental processes of life. Furthermore, electrons probe the materials differently, yielding greater information about the sample than is currently available using existing techniques, at a fractional of the cost of large-scale facilities. Additional future benefits of this research include training a new generation of multidisciplinary researchers and fostering new research in green chemistry, renewable and sustainable energy, and healthcare.					
FT240100383 Franks, Prof Daniel M	**Assessing the mineral security dimensions of multi-dimensional poverty** This project aims to address a major gap in our understanding of global poverty by assessing for the first time the mineral security dimensions. Minerals are the only natural resource absent from the United Nations Sustainable Development Goals, despite their importance in providing shelter, mobility, energy, communication and sustenance. The project seeks to explore how the availability, access, stability and utilisation of minerals impact the prevalence and intensity of multi-dimensional poverty. Expected outcomes are improved measurement tools, policies and programs, which will benefit the 1.1 billion people living in poverty, and a schema for the potential inclusion of mineral security within the revised Sustainable Development Goals.	302,783.00	302,783.00	302,783.00	302,783.00	1,211,132.00
	National Interest Test Statement Australia has an important role to play in shaping the world for the better. In 2023, Australia announced an updated international development policy (A Peaceful, Stable and Prosperous Indo-Pacific) and will invest 4.77 billion dollars this year (2023-24) in international development aid in line with a global commitment to halve the proportion of people living in poverty by 2030. More than 1.1 billion people experience multi-dimensional poverty (UNDP and OPHI, 2023) and progress toward reducing extreme poverty has essentially stalled. New approaches are desperately needed to inspire effective action. This research project investigates a previously neglected dimension of poverty, the sufficient and affordable access to the minerals necessary for human development. The project is expected to generate novel insights into the relationships between mineral security and multi-dimensional poverty and tools to measure mineral security at multiple scales. This should inspire new directions in aid programming, for example by enabling better infrastructure provision in the Pacific, where major shortages of local construction materials are creating challenges for Australia's infrastructure investments. More effective development programming will also benefit Australia by strengthening our international relationships, and ultimately contribute to Australia's own security through the promotion of a peaceful, stable and prosperous Indo-Pacific.					
FT240100405 Baker, Dr Christopher	**Superfluid helium: a probe into the Universe.** This project aims to develop advanced photonic circuits and microscopy techniques to probe superfluid helium—the only quantum liquid, characterised by flow without dissipation and quantized vortices. Leveraging these unique characteristics, the devices developed in this project will provide access within a compact laboratory setting to extreme regimes of nonlinear flow, inaccessible even in the world’s largest wavetanks, and be applied to tackle some of the biggest problems in physics, such as the nature of turbulence and the search for dark matter. This project’s outcomes will advance Australia’s leadership in quantum science and precision measurement, fields expected to drive significant economic growth in the coming decades.	219,178.00	215,378.00	217,908.00	209,708.00	862,172.00
	National Interest Test Statement This project aims to provide answers to deep scientific questions, from fluid dynamics and turbulence to dark matter search, through the development of state-of-the-art superfluid sensor technologies. The project addresses major research gaps. Fluid dynamics and the nature of turbulence are of great scientific and engineering interest, as these describe the physics of systems ranging from global weather patterns to aircraft aerodynamics. Despite their wide practical use, these topics remain incompletely understood. Similarly, dark matter is estimated to constitute 85% of the mass in the universe but has yet to be directly detected despite considerable efforts. This project aims to develop novel dark matter sensors and deploy these in Australia’s first deep underground laboratory. This project is expected to strengthen Australia’s international research standing and raise Australian Universities’ attractiveness through collaboration with leading academic institutions and Industry and Defence partners, as well as the production of high-quality scientific outputs. This project is well aligned with Australia’s National Quantum Strategy. It will train workers with valuable skills in advanced nanofabrication, photonics and quantum technologies, furthering Australia’s know-how and leadership in these fields and supporting the creation of high-value jobs in Australia’s growing quantum ecosystem—predicted to contribute $6 billion yearly to the economy and 19,000 jobs by 2045.					
FT240100520 Ballard, Dr Timothy	**Understanding the hidden costs of working long hours** This project aims to map the harmful impact of working hours on life satisfaction over time,	230,125.00	230,754.00	230,245.00	230,527.00	921,651.00

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	answering the questions of when harmful effects emerge, the severity of the effects, and who is most vulnerable. It will develop and test a novel computational model, integrating recent advances in computational psychology, to deliver new knowledge from the largest to-date examination of the relationship between working hours and life satisfaction. Expected outcomes are a new theory of how working hours affect well-being over time with widespread implications for industrial and organisational psychology. The benefits include actionable insights from new software to help policymakers ensure work practices promote sustainable global economic growth. **National Interest Test Statement** Over 1/3 of the global workforce, and 1 in 6 Australian workers, works more than 48 hours per week. Australians spend more time at work than engaged in leisure or personal care and over 30% of Australian full-time workers would prefer to work fewer hours, even at a reduced income. Working more than desired reduces life satisfaction, which has consequences that ripple across society ranging from reduced economic productivity, parenting quality, and trust in national institutions, to increased healthcare costs and criminal activity. Yet, surprisingly little is known about how working hours and life satisfaction interact and evolve over time and when and for whom harmful effects emerge. This project applies mathematical modelling and machine learning techniques to comprehensive international survey data to gain deeper insights into how long harmful effects take to emerge, the severity of the effects, and who is most vulnerable. The research outcomes should provide policy makers with an improved way of forecasting the hidden costs of working long hours, which is expected to benefit Australia by helping to facilitate better policy, managerial practices, and career decisions that support sustainable economic growth. The outcomes will be communicated to industry via reports and a practitioner conference. The results will be translated via a software package that can enable key decision makers to use the new model to simulate the impact of potential policies.					
FT240100592 Gonzalez Tokman, A/Prof Cecilia I	**New mathematics to unravel dynamical systems in changing environments** Randomness and predictability are ubiquitous in daily life. This project aims to resolve crucial gaps in understanding how environment changes affect the transient and long-term behaviour of chaotic systems influenced by noisy inputs and external forces. Using modern ergodic theory, this project expects to generate novel mathematical tools to analyse complex dynamical systems, including models of natural and human systems, and refined limit laws explaining fluctuations in random dynamical systems. Project benefits include the development of breakthrough mathematics with potentially broad impact in science and technology, high-quality training of Australian scientists and enhanced international collaboration in the mathematical sciences. **National Interest Test Statement** Randomness and predictability are complementary features in many facets of daily life. The weather, financial markets, transport networks and even artificial intelligence are affected by a combination of unpredictable and deterministic effects. Random dynamical systems are a flexible mathematical tool to analyse trends and fluctuations in chaotic systems influenced by noisy inputs and external forces. Understanding these phenomena is essential to address major open questions about the mid- and long-term behaviour and control of the underlying systems, modelling natural and human systems and their interactions. Project outcomes are expected to resolve crucial knowledge gaps by providing novel mathematical insights into the effect of environment changes on the systems' dominating components, and refined limit laws explaining system fluctuations. This project is expected to yield significant benefits, including breakthrough mathematical research with potentially broad impact in science and technology, high-quality training of Australian scientists and enhanced international collaboration in the mathematical sciences.	302,653.00	302,783.00	302,074.00	283,533.00	1,191,043.00
FT240100725 Cortesi, Dr Fabio	**Coral reef fish visual plasticity in the Anthropocene** Global climate change alters the complexity of our oceans' visual scenes, colour, and light availability. This project aims to investigate how fishes adapt their vision to mitigate increases in reef degradation and light pollution to improve survival. This project expects to generate new knowledge on the mechanisms underlying brain restructuring and its impact on animal behaviours such as feeding and navigation. Desired outcomes include molecular, morphological, and cognitive datasets of sensory adaptation in coral reef fishes to inform climate-niche models ultimately. Project benefits include a better understanding of fish neurobiology and the projected climate change impacts on economically, ecologically, and culturally important species. **National Interest Test Statement** Coral reefs are under threat from global climate change. As ocean waters are warming, the underwater visual habitats change due to reef degradation and increases in turbidity, algal blooms, and light pollution. These changes disrupt visually guided behaviours such as hunting and mating in fish, resulting in altered species distributions and decreased survival. There is an urgent need to understand if and how fish adapt their vision to mitigate human-induced environmental threats. This project will address this knowledge gap by providing fundamental insights into the visual adaptation of commercially, ecologically, and culturally important reef fish. It will	230,816.00	230,806.00	230,806.00	230,848.00	923,276.00

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	generate open-access high-resolution 3D brain reconstructions and large molecular and cognitive datasets using advanced imaging, genetic, and behavioural approaches. These outcomes will benefit Australia and the global community by increasing understanding of how environmental disruption affects marine ecosystems. The newly generated knowledge of fish sensory adaptation generated here can then be used to advise management, for example, to improve the forecasting of species movement and distribution patterns. This will increase the effectiveness of climate change mitigation strategies, aligning with the National Climate Resilience and Adaptation Strategy 2021-2025. The project will also create public awareness of an Australian iconic yet endangered ecosystem, the Great Barrier Reef, worth over $6bn annually.					
FT240100740 Hobson-Peters, Dr Jody M	**Yada Yada: a new chimeric system to combat alphaviral disease of livestock** Outbreaks of mosquito-borne viral diseases persist globally and threaten the livestock industries of Australia and nearby neighbours. No veterinary vaccines against alphavirus pathogens such as Ross River virus and the exotic viruses of Getah and equine encephalitis viruses exist in Australia, placing our industries at risk. This proposal aims to advance a novel platform for creating vaccines and diagnostics against veterinary alphavirus pathogens by conducting pre-clinical animal studies, optimising industry-ready manufacturing and developing pen-side and high throughput diagnostic assays. This will provide new platform pipelines and blueprints to enhance sovereign capability to safeguard our livestock industries against viral disease.	266,818.00	266,818.00	266,818.00	266,818.00	1,067,272.00
	National Interest Test Statement The emergence of new or lesser-known mosquito-borne viruses as major pathogens, as well as the spread of existing ones into new areas, poses a proven threat to Australia's livestock industries. The development of new vaccine and diagnostic platforms, with sovereign manufacturing capability is urgently needed to rapidly produce interventions and safeguard Australia's livestock industries against emerging viral disease. This project will define a blueprint for the rapid development of veterinary vaccines and diagnostics against alphaviruses such as Getah, equine encephalitis and Ross River viruses - each a significant livestock pathogen. The innovative platform uses an Australian mosquito-specific virus to rapidly produce vaccine and diagnostic proteins safely. This project will generate pre-clinical data on the safety, efficacy, and immunological responses for lead candidate vaccines targeting alphavirus pathogens of risk to Australian industry. These data will lay the groundwork for future trials in pigs and horses and commercialisation as veterinary vaccines. The proposal will also refine the bioprocessing pipeline to meet industry-standards and develop high throughput and pen-side diagnostics for the Australasian context.					
FT240100816 Labzin, Dr Larisa	**How innate immune signalling dictates avian susceptibility to viruses.** This project aims to understand how innate immune signalling dictates whether different bird species will tolerate or succumb to viral infection. Highly pathogenic avian influenza virus (HPAIV) threatens Australian livestock industries and wild animal populations. Innate immune responses need to restrict viral replication without causing tissue damage. This project will reveal how innate immune signalling differs between HPAIV-susceptible (chicken) and tolerant (duck) species. Expected outcomes include novel insights into avian immunology, new approaches to mitigate HPAIV emergence and new strategies to predict species susceptibility to HPAIV for significant agricultural and conservation benefits.	230,000.00	230,000.00	230,000.00	230,000.00	920,000.00
	National Interest Test Statement Emerging viruses, like highly pathogenic avian influenza (HPAIV), cause severe disease and death in poultry and livestock and threaten wild bird populations. Preventing the emergence and spread of avian influenza is a major priority for the World Health Organisation. Some birds (e.g., ducks) can control influenza infection, while other birds (e.g., chickens) cannot. Understanding why this occurs could prevent the emergence of new HPAIV strains and allow accurate prediction of which wild birds are susceptible to HPAIV to inform protection efforts. This project aims to uncover key differences in the immune response between chickens and ducks to determine why chickens are susceptible to HPAIV while ducks are protected. With this knowledge, new approaches for boosting avian immunity to prevent HPAIV emergence can be identified, thereby protecting both domestic and wild animals. Additionally, new ways to predict the risk of HPAIV decimating our wild bird populations can be developed so that future HPAIV outbreaks are managed more effectively. The proposed research will provide agricultural, conservation and economic benefits for Australia and increase fundamental immunology knowledge. This proposal will also provide world-class immunology and molecular biology training to the next generation of scientists. Through ongoing science communication and outreach, research findings will be translated into practice by sharing our results with industry, collaborators, and the public.					
FT240100825 Suarez, Dr Rodrigo	**Symmetry making and breaking in the developing neocortex** Brain halves become wired during development following molecular and neural activity-dependent rules of symmetry. This project aims to unravel the mechanisms by which spatio-temporal symmetries between cortical hemispheres instruct the precise formation of functional connections. Using advanced methods in high-throughput gene expression analyses, live imaging of neural activity, and connectivity mapping in a marsupial model of early brain patterning, this Fellowship aims to unravel new generative principles of mammalian brain circuit formation. Expected outcomes	266,214.00	266,214.00	266,214.00	266,214.00	1,064,856.00

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	include innovative ways to manipulate brain wiring, and to functionally link mechanistic knowledge of complex trait formation across levels of biological organisation. **National Interest Test Statement** Understanding the rules that govern formation of brain circuits in mammals can provide benefits to ensure a healthy start of life in young Australians. This Fellowship Project exploits the natural advantages of a native marsupial species, the fat-tailed dunnart, to provide unique insights about early brain formation. Accordingly, these findings will also have potential benefits for conservation of native fauna in that they will outline the requirements for healthy brain development in marsupials. Finally, by advancing innovative methods of cellular and molecular biology, stem cell technologies, big-data bioinformatic pipelines of gene and RNA expression, and computational analyses and modelling (including machine learning and artificial intelligence) applied to systems neuroscience, this project will help cement the establishment of a world-class critical mass of advanced capabilities to further expand the biotechnology and educational sectors, further positioning Australia at the forefront of these fields.					
FT240100832 Bao, Prof Zhifeng	**Automating Target-Oriented Data Orchestration at Scale** This project involves developing an automated, scalable data orchestration system, i.e., a system that discovers, enriches, and filters high-quality data to meet diverse targets in designing data-driven solutions. The system drastically reduces the amount of data required to adequately train a model. Functionality, efficiency, effectiveness, and scalability are the project's priorities. New knowledge will be generated to automate the entire process of preparing training data, including generating a data pool, assembling datasets, and selecting specific data points to meet performance goals. Eliminating the costs of manually preparing training data will have significant benefits – most of all by fostering a modern and resilient data economy. **National Interest Test Statement** By now, it is well known that training a machine learning model requires inordinate amounts of data, consumes an enormous amount of time, money, and energy, and leaves a carbon footprint big enough to rival the annual emissions of 50 people. To address this situation, this project outlines a data orchestration system that automatically discovers, enriches, and reduces the amount of training data required to train a large machine learning model down from massive volumes of questionably useful data to a much smaller amount of highly relevant, task-specific data. Beyond the clear environmental benefits, the result will be a drastic decrease in the amount of time, money, and energy required to train a high-performing machine learning model. The system, which will be accessible to governments, both federal and local, and to businesses including small and medium-sized enterprises, will make machine learning far more accessible than it has been up to now. Additionally, proper data orchestration will result in far more accurate and reliable decision support, the benefits of which can be felt in almost every aspect of today's society, from urban planning to finance to healthcare to the myriad of service businesses that are the lifeblood of Australia's economy. Just as importantly, this project involves a range of programs designed to instil the next generation of researchers with the necessary skills to successfully navigate the data management requirements of tomorrow.	285,633.00	285,633.00	285,633.00	285,633.00	1,142,532.00
FT240100854 Huang, Dr Xiaodan	**Enabling Rechargeable Aluminium-Organic Batteries** This project aims to advance aluminium battery technology by exploring high-capacity organic cathodes and engineering stable aluminium anodes. Battery technology is critical for the clean energy transformation in Australia. Aluminium batteries are promising candidates to compete with problematic lithium-ion batteries but suffer from low capacity and poor cycling stability. This project plans to solve these problems by understanding the battery interfaces and controlling the optimum chemistry of organic cathodes and aluminium anode activation protocols. Completion of this project expects to generate advanced battery technologies that can enhance Australia's global battery market presence and optimise renewable energy resource utilisation. **National Interest Test Statement** Australia's renewable energy sector has significantly expanded, contributing 35.9% to total electricity generation in 2022. As renewable energy gains momentum, battery storage is crucial for utilising renewable energy in electricity grids and households. While lithium-ion batteries dominate Australia's battery market, they are predominantly produced in Asian countries. Australia's battery industry captures only ~0.53% of the value in global battery production, primarily focused on mining. Prioritising advanced battery technologies beyond lithium-ion batteries can foster the development of Australia's battery manufacturing industries to meet soaring global demand for batteries. This project aims to develop high-capacity and stable rechargeable aluminium batteries with improved safety and low cost. Successful completion of this project expects to deliver a new generation of aluminium battery technology that can compete with lithium-ion batteries and position Australia to seize opportunities in the rapidly expanding battery market, projected to exceed USD 300 billion by 2030. The technical outcomes of this project will extend beyond battery development and establish Australia's innovative material engineering expertise. By leveraging world-class mineral resources, this project will transform them into high-profit battery materials. This transformation will bolster the country's economic prospects and reinforce its position as a trailblazer in advanced manufacturing.	220,828.00	220,528.00	220,628.00	220,828.00	882,812.00
	The University of Queensland	3,837,377.00	3,836,458.00	3,856,463.00	3,801,399.00	15,331,697.00

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University of Southern Queensland						
FT240100016	**Probing the formation and migration pathways of Jovian planets**	200,823.00	220,102.00	220,102.00	230,560.00	871,587.00
Huang, Dr Xu	This project will explore the key physical mechanisms governing the formation and evolution of Jupiter-like planets around other stars, by making use of time awarded on flagship international facilities, including NASA's James Webb Space Telescope, and the Very Large Telescope at the European Southern Observatory. This project will address fundamental questions identified by the Decadal plan for Australian astronomy to reveal the nature of interactions between Jupiter-like planets and small terrestrial planets that shape entire planetary systems. The project will directly benefit Australia’s international astronomical research profile and train the next generation of Australian astronomers using world-leading facilities.					
	National Interest Test Statement Leveraging Australia's only exoplanet program that was awarded time on NASA's flagship James Webb Space Telescope (JWST), this project will explore the interplay of Jovian planets (Jupiter-like planets) and their terrestrial counterparts. Understanding how Jovian planets form in other planetary systems, and how they drive the evolution of their sibling planets, is the major research gap driving the global exoplanet community and the gap this project aims to close. This research leverages world-class Australian astronomical infrastructure for exoplanet science, including the Minerva-Australis telescope array, and key observing programs that were awarded time on major international facilities, specifically the European Southern Observatory and JWST. This project also places the next generation of Australian astronomers at the forefront of international efforts to find other Earths and study their birth, evolution, and dynamical interplays. Discoveries with JWST are already having significant international impact, and this Australian-led exoplanet research places us at the centre stage for this generational revolution in astronomy.					
	University of Southern Queensland	200,823.00	220,102.00	220,102.00	230,560.00	871,587.00
	Queensland	6,708,095.00	6,765,811.00	6,791,207.00	6,756,415.00	27,021,528.00

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		2024-25	2025-26	2026-27	2027-28	
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
South Australia						
Flinders University						
FT240100067	**Gallium Liquid Metal Nanoparticles For Targeted Delivery of Antimicrobials**	229,808.00	230,808.00	230,808.00	230,808.00	922,232.00
Truong, Dr Vi Khanh	Antimicrobial resistance has become an urgent societal problem. This project aims to employ advanced strategies to rationally design the next generation of antimicrobial functional materials using gallium liquid metal nanoparticles. These materials will efficiently target microbial pathogens while remaining safe for mammalian cells. By utilising interdisciplinary approaches and advanced analytical tools, this project will generate advanced knowledge and a mechanistic understanding of bio-nano interactions between liquid metals and biological cells. On the applied side, the project will deliver novel solutions to current challenges posed by antimicrobial resistance in various fields, including healthcare, food, environment, and agriculture.					
	National Interest Test Statement Microbial growth and contamination have long been significant issues in Australia's manufacturing, food safety, and healthcare industries. Microbial resistance to antimicrobial compounds is a major and ongoing threat to humankind, with the continual emergence of microbial species that survive all currently known antimicrobial agents. This project aims to develop an innovative technology platform for producing metal-based, nanoscale-sized antimicrobial compounds that are less susceptible to microbial resistance than currently available antimicrobials. Such compounds will have significant applications as coatings for medical devices, textiles, and various household and food-related uses, benefitting Australians by reducing microbial growth and antimicrobial resistance. Australian industry will also have the opportunity to lead the commercialisation of such compounds to enhance Australia’s economy and position Australia to lead the implementation of next-generation antimicrobial technologies. Outcomes of this project support Australia’s National Research Priorities of Advanced Manufacturing, Food, and Health. Outcomes will be published through traditional peer-reviewed publications but also as media releases, public presentations and direct engagement with relevant professional biotechnology groups and companies.					
FT240100330	**Supramolecular host-in-host adsorbents that trap perfluorinated pollutants**	230,728.00	230,728.00	230,728.00	230,728.00	922,912.00
Bloch, Dr Witold M	This project aims to enhance the pore chemistry of metal-organic frameworks by integrating nanocages within their pores. These advanced composites will be applied to trap the types of perfluoroalkyl pollutants that current water treatment approaches fail to address. This research expects to generate significant new knowledge in the areas of host-guest chemistry, materials design, and water remediation. The expected outcomes include the generation of advanced methodologies and techniques to enhance the performance of porous adsorbents. Significant benefits are expected, such as access to high-performance adsorbents that remove toxic pollutants from water and reduce adverse health effects associated with exposure to these harmful pollutants.					
	National Interest Test Statement Per- and Polyfluoroalkyl Substances (PFAS) represent a significant category of harmful synthetic pollutants, linked to several serious chronic diseases such as kidney disease and testicular cancer. PFAS are frequently employed in firefighting, stain protection, and in non-stick cookware and as a result have become prevalent in our waterways and drinking water. Current water purification technologies are unable to remove certain types of PFAS from water to a satisfactory level, which increases the chance of serious health risks to the Australian population. This project will address this problem by developing absorption materials with enhanced attraction to PFAS, aiding filtration of the PFAS from our waterways. This project will benefit Australians by providing cleaner drinking water and reducing human exposure to these harmful pollutants. Expected follow-on economic benefits include a reduced burden on publicly-funded healthcare and the creation of an adsorbent product with commercial value. Research outcomes will be promoted through publication in academic journals and presentations at international conferences and focused environmental and chemical workshops. Outputs from this project will lead to new collaborations with Australian organisations that deal with PFAS remediation and commercialisation opportunities for companies that design adsorbent products.					
FT240100422	**Quantifying the long-term resilience of Australian mammal communities**	291,771.00	296,917.00	302,637.00	302,779.00	1,194,104.00
Beck, A/Prof Robin M	This project aims to use the fossil record of mammals and new methods to study how mammal communities in Australia have changed over the last 25 million years. This project expects to provide major new data showing how biodiversity is assembled, maintained, and lost over time. Expected outcomes include new knowledge regarding the resilience of Australian mammal communities to extinction and environmental changes, and identifying when there have been major shifts in the way					

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	in which they have functioned. It will help predict how the modern Australian mammal fauna will respond to the current extinction crisis and to projected climate change. This information can be used to develop more effective conservation strategies. **National Interest Test Statement** The mammal fauna of Australia is of great national and global significance, both for its unique and iconic species, and for the economically valuable ecosystem services it performs. Climate and vegetation forecasts indicate that many regions of Australia will experience major environmental change in the short- to medium-term, including increases in temperature, and changes in rainfall pattern and vegetation, factors that will enhance the current extinction crisis. Effective conservation and management strategies require an understanding of how the Australian mammal fauna is likely to respond to these changes. This project will examine ecosystems associated with fossil and modern Australian mammal faunas. Outcomes will identify: 1) whether an ecosystem continues to function in the same way if its species change; 2) major changes in ecosystem function over time, and 3) possible causes(s) of these changes. This will help predict how the modern Australian mammal fauna will respond to projected climate and vegetation change. More generally, the project will provide profound new insights into the past, present and likely future fate of Australian ecosystems. It will provide new data and tools that can be used to guide conservation legislation, planning and management to maximise the effectiveness of future conservation strategies. It will benefit all Australians by directly improving efforts to conserve Australia's precious and irreplaceable ecosystems.					
FT240100558 Thomas, Prof Emma F	**Unravelling the psychological foundations of reactionary social movements** Research into how and why people mobilise in favour of progressive social change is flourishing; but research on why people act collectively to oppose equality and inclusion is rare. Using new conceptual and methodological approaches, this project aims to understand when, how, and why people organise collectively to oppose the inclusion of migrants and transgender people; what prompts some people to escalate to political or physical violence; and how online platforms enable engagement. Expected outcomes defining the social psychology of actors, and trajectories of engagement and extremism, will support a growing collaboration with end-users in the national intelligence community to bolster social cohesion and inform de-escalation tactics. **National Interest Test Statement** Diversity is a part of any flourishing society, but groups opposed to social change threaten progress towards a more inclusive world for people with particular cultural or gender identities, while adoption of extremist views by members of these groups constitutes a serious security threat. Some extremists no longer fit traditional types of extremism (left- vs right-wing, religious vs secular), perhaps because social media provides unprecedented opportunities for promoting grievance and hate. Government intelligence and security bodies are struggling to understand this new diversity and what prompts certain individuals to progress to radical, and even terrorist, activities. This gap in our understanding is the subject of the Fellowship. I seek to define the steps through which people adopt illegal or violent means of expressing their opposition to people, such as immigrants or transgender people, with identities different to their own. I will explore the radicalisation process and test the role of online social media platforms in the development of extremist views. The understanding created by this research will identify new approaches to combating extremism, benefiting Australians by creating a safer, more cohesive, domestic and international security environment. Outcomes of the research will be shared by direct engagement with an International non-government and government reference group and national intelligence community end-users.	302,783.00	302,783.00	302,783.00	302,783.00	1,211,132.00
FT240100815 Phillips, A/Prof Andrew J	**A new paradigm for tracking the circadian clock** The circadian clock controls biological processes in every tissue. There are large differences between people in circadian timing, yet we lack accurate and simple methods for measuring circadian timing. This project aims to (i) create a novel physiologically based model of the human circadian system and (ii) create and evaluate methods that enable rapid individualisation of the model. Expected outcomes for this project include accurate estimation of a person's circadian timing from easily collected wearable data. This will generate significant benefits, including individually tailored countermeasures for mistimed circadian rhythms to improve sleep, workplace performance, and to treat diseases that involve mistimed circadian rhythms. **National Interest Test Statement** The circadian (24-hour) clock, commonly referred to as the body clock, organises daily rhythms in all tissues of our body, including when we feel sleepy and when we feel alert. There are large differences in circadian timing between people, but there are currently no simple or practical ways to measure body clock timing in individuals. Existing methods are expensive and require people to stay in dim conditions for several hours in a fixed posture, providing a saliva or blood sample every hour. This makes it difficult to carry out research that increases our understanding of the body clock and limits translation of the research into commercial and social benefits, such as interventions that reduce fatigue, improve sleep, and align body clock timing in disorders where mistimed body clocks contribute to poor health outcomes. This project will address this problem by developing a new method that allows a person's body clock to be accurately estimated from light data that is easily collected using a wearable device. This simple, less than 30 minute long, new test will enable highly accurate assessment of the body clock of individuals, allowing rapid analysis and improved approaches to reducing fatigue and improving sleep in the large number of Australians who suffer from the debilitating effects of disrupted sleep patterns.	302,775.00	302,783.00	302,771.00	302,772.00	1,211,101.00

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FT240100856	**Resilience and Relocation: Unravelling the end of Angkor**	302,783.00	302,783.00	302,783.00	302,783.00	1,211,132.00
Polkinghorne, Dr Martin	This project addresses the unresolved issue of Angkor's decline, among the largest pre-industrial cities on Earth, by examining human settlement, landscape management, and resilience to climatic and demographic changes. Employing novel methods in archaeology, geoscience, and history, and building upon twenty-five years of Australian-led research in Cambodia, I will lead a team to interpret Angkor's decline as a distinct socio-cultural event, rather than a simple 'collapse.' The focus is on Srei Santhor, a pivotal site where Angkor's elites sought to ensure food security and maintain political authority amidst an agricultural crisis. Our findings will reveal key insights into societal evolution, modelling long-term socioeconomic trends.					
	National Interest Test Statement Angkor is a globally and culturally significant World Heritage site in Cambodia. Similar to Australia's challenges in heritage site preservation amidst development, Cambodian sites face threats from the rapid expansion of nearby Phnom Penh. There is an urgent need for archaeological research on precious heritage locations. This Fellowship addresses this need, focusing on the relationship between past agricultural practices, environmental changes and societal responses at Angkor. The research explores the susceptibility of urban areas to water fluctuations, an issue pertinent to Australia and Southeast Asia. It also offers insights into community resilience and adaptive strategies in the face of climate change The work is aligned with Australia's 'Environmental Change' and 'Soil and Water' Science & Research Priorities and supports the Association of Southeast Asian Nations-Australia Comprehensive Strategic Partnership, focusing on shared interests in sustainable development and climate action. Australians will benefit from the promotion of cultural and educational exchange, the strengthening of diplomatic relations, contributions to the capacity for sustained economic progress, stability and security in our region through a better understanding of past community responses to climate change. Results will be communicated beyond academia through public lectures, media engagements, and social media, to both Australian and Southeast Asian communities.					
	Flinders University	1,660,648.00	1,666,802.00	1,672,510.00	1,672,653.00	6,672,613.00
The University of Adelaide						
FT240100291	**A new wave for growing viable oocytes in vitro**	266,035.00	262,366.00	266,366.00	266,754.00	1,061,521.00
Dunning, Dr Kylie R	This project aims to transform how ovarian follicles are grown in the laboratory using an innovative method: suspension using sound. The project expects to generate new knowledge on crucial steps in mammalian development and how to provide optimal conditions for follicle culture using newly developed acoustic technology. Expected outcomes include the development of new platforms to monitor and optimise growth of the developing follicle, ultimately increasing how many viable eggs can be grown from stored ovarian tissue. This should provide significant benefits across disciplines with potential application to threatened species protection and economic benefit through development of novel, next-generation reproductive biotechnologies.					
	National Interest Test Statement The ovarian follicle is vital for the growth of healthy eggs, and thus important in the cycle of life. Current methods for growing follicles in the lab have a low success rate for producing eggs that can lead to a live birth. This project will address this issue with a novel approach: using sound to suspend follicles within liquid. This removes the weaknesses of current methods by maintaining the natural structure of the follicle and permitting free exchange of nutrients and waste. Optimising follicle culture conditions is expected to lead to an increased number of healthy eggs. The storage of ovarian tissue and subsequent growth of follicles in the laboratory can be used to produce healthy eggs for transfer to recipients. Improving this process is expected to have many benefits: for endangered species it may increase numbers and improve genetic diversity. This method may also be used to produce more offspring with desirable traits in livestock, presenting opportunities to enhance economic growth in Australia. New scientific knowledge from this project will be commercialised, creating new jobs. Awareness of this research will be raised through articles in national and international newspapers, on various social media outlets and by TV/radio interviews. These will showcase the work and emphasise the importance of reproductive technologies to enhance agricultural output and protect endangered species.					
FT240100420	**New approaches to define protein function during malaria host cell entry**	260,723.00	266,748.00	266,748.00	266,796.00	1,061,015.00
Wilson, Dr Danny W	Apicomplexan parasites of humans and livestock, including malaria, survive by infecting and reproducing in host-cells. To enable host-cell entry, these parasites evolved sets of unique and shared proteins whose functions remain unknown. Using a multi-disciplinary approach, this project will define cross-species protein function of malaria proteins required for early and late stages of host-cell entry. Leveraging a substantial international network of research partners, outcomes of					

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	benefit to Australia include establishing a lead role in understanding the protein network driving different stages of malaria host-cell entry, characterisation of potential therapeutic targets and advancing imaging techniques applicable to other cellular systems. **National Interest Test Statement** Apicomplexans are parasites that infect humans, livestock, and wildlife. These parasites, which include malaria parasites, cost >$16B in control measures and lost production, and cause >800,000 human deaths annually. To trigger disease, apicomplexans must enter and infect a host-cell. To do this they have developed unique solutions reliant on specialised proteins. Using the malaria parasite as a robust model, this project will apply world-leading imaging, gene-editing, and protein analytical methods to reveal the roles of key proteins needed for dynamic host-cell entry. These discoveries may underpin development of new control measures targeting parasite specific 'Achilles heals' for pathogens of significant economic and health importance to Australia, our neighbours and major trading partners. Outcomes will advance imaging technology and applications, initiate multiple avenues of biological discovery, and train emerging leaders that build national research capability. Research outcomes will be disseminated to the wider public and stakeholders through media releases, social media and presentations to both the public and Industry (e.g. School outreach, South Australian Museum, Malaria researchers, Livestock Producer Forums). This will facilitate community wide education of these parasites widespread impact and controls, lead to uptake of best-in-class experimental approaches and inform on conserved biology that could be targeted for control across diverse parasites.					
FT240100855 Legrand, A/Prof Timothy	**New approaches to combat the misuse of blacklists as tools of repression** This project aims to define the extent of malicious blacklisting used by authoritarian states and their alliances to justify persecution of dissenters/minorities. The problem is growing, as full democracies become less prevalent and as global non-government organisations are increasingly targeted. Using innovative machine learning tools to decipher hidden blacklisting regimes, this research will deliver the first comprehensive, publicly available and searchable dataset of global blacklists; strong political analysis of norms for current blacklisting modalities; and, critically, policies to challenge or avoid malicious blacklisting. Outputs are likely to benefit international governance and support Australia's commitments to human rights. **National Interest Test Statement** Blacklisting is the mechanism endorsed by the United Nations (UN) to designate 'enemies of the state' and legitimise subsequent punishment. However, blacklisting is being increasingly misused by authoritarian regimes to constrain civil freedoms and commit human rights abuses against dissenters/minority groups, not just within their borders but globally. Increasingly, non-government organisations (NGOs) that operate within these states are also being targeted, compromising their continued operation and the personal safety of their members. This project tackles this issue by analysing and laying bare the full extent of blacklisting abuses. It will develop new policies and norms to combat or avoid malicious blacklisting by authoritarian states and their allies. A new international network of NGOs and academic scholars will be convened to test the resulting policy recommendations, prior to their publication in a Handbook to be launched at the UN along with a searchable database of global blacklists. These outputs will be paired with user-guides to maximise uptake and utility, ensuring this research can be effectively integrated into global policy. Social and traditional media will be used to share key research findings with the public. This project thus contributes towards Australia's commitments to the UN to promote good governance and stronger democratic institutions as well as to protect freedom of expression and advance the human rights of indigenous peoples and human rights	281,243.00	292,609.00	293,897.00	262,588.00	1,130,337.00
	The University of Adelaide	808,001.00	821,723.00	827,011.00	796,138.00	3,252,873.00
University of South Australia						
FT240100641 Melchels, Prof Ferry	**Autonomously expanding biomaterials for engineering growing tissues** Natural tissue and organs develop gradually and slowly, but we've failed to replicate this to date in artificial tissue growth. This project aims to engineer biomaterials pre-programmed to expand gradually and organically. This project expects to generate significant knowledge in achieving controlled, predictable expansion of the new biomaterials. Expected outcomes include 3d print structures, containing stem cells, to investigate how gradual expansion can aid stem cells to make tissue. Expected benefits include improved regeneration of damaged tissues, without using donor tissues or permanent implants. The new biomaterials should also be beneficial for wound healing and surgical applications, as well as pharmaceutical and cancer research. **National Interest Test Statement** Only 2% of Australians who die in hospital each year can be considered for organ or tissue donation and 1,800 people are waiting for a transplant due to donor shortages. Thus, there is an urgent need for alternative sources	292,463.00	302,763.00	302,513.00	292,163.00	1,189,902.00

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	of tissues and organs. Stem cell technology has raised the potential of growing tissues to address this crisis. However, getting stem cells to grow organised tissues is still a major hurdle. This project aims to develop biomaterials to aid tissue growth and development. These biomaterials will differ from existing ones as they will be engineered to grow gradually and spontaneously. This is how tissues grow naturally but has not been reproduced yet. Overcoming these hurdles would eventually lead to the benefits of reduced waiting lists for donor tissues. On the shorter term, these biomaterials could be used to improve current clinical procedures, such as the growing of skin through gradual stretching (similar to that seen in pregnancy) in preparation for reconstruction surgery. This is currently done by balloons that are inflated step-wise on a weekly basis. Here, the new self-expanding materials could reduce discomfort and require fewer hospital visits. The outcomes will be shared with Australian medical companies to aid their efforts in developing new therapies, improving Australia's competitiveness in one of the world's fastest growing sectors.					
	University of South Australia	292,463.00	302,763.00	302,513.00	292,163.00	1,189,902.00
	South Australia	2,761,112.00	2,791,288.00	2,802,034.00	2,760,954.00	11,115,388.00

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Tasmania						
University of Tasmania						
FT240100092	**Be prepared: rapid diagnostics and field-ready vaccines for wildlife**	266,198.00	266,798.00	266,374.00	266,374.00	1,065,744.00
Flies, Dr Andrew S	Disease is increasingly a driver of wildlife population declines and extinctions. Two independent Tasmanian devil facial tumours (DFT1, DFT2) are transmissible cancers that have driven >80% declines in regional devil populations. Vaccines are among the most effective public health tools for human and domestic animal health but are largely unexplored for wildlife. A DFT1/2 vaccine that can be distributed in the field via edible baits has been developed. This project will develop rapid diagnostic tests for monitoring disease in multiple species, develop broadly applicable marsupial vaccine vectors, and execute a series of DFT1/2 vaccine trials. This innovative project will make us better able to protect our iconic Australian wildlife.					
	National Interest Test Statement					
	Disease and human-induced threats are causing alarming declines in Australia's iconic wildlife populations, exemplified by the devastating impact of two independent devil facial tumours (DFT1, DFT2) on the wild Tasmanian devil population. Vaccines are among the most effective tools in the history of human and veterinary medicine. Unfortunately, vaccines have received scant attention for wildlife. There is strong evidence showing that delivering vaccines to wildlife in edible baits can control wildlife disease on vast scales. Modelling studies have shown that an oral bait vaccine to protect devils from DFT1 and/or DFT2 would be the most potent management option for rebuilding the devil population and healthy Tasmanian ecosystems. This project will develop field-ready vaccines to protect Australia's marsupials from disease. By working directly with wildlife rescue centres, it has become clear that better diagnostic tests are needed for wildlife disease. This project will develop rapid diagnostic tests and address the urgent need to understand how immune suppression potentially caused by one disease can facilitate the emergence of new diseases. This pioneering model for wildlife disease management emphasises community integration and global collaboration. The outcomes will have far-reaching implications for the preservation of marsupial biodiversity and serve as a testament to Australia's commitment to the conservation of its unique and irreplaceable ecosystems.					
FT240100473	**What lies beneath: how the deep mantle influences the Antarctic surface**	302,583.00	302,583.00	302,583.00	302,163.00	1,209,912.00
Whittaker, A/Prof Joanne M	This project will investigate how processes deep beneath Earth's surface have led to elevation change in the land below the Antarctic ice sheets. Current and future climate change have the potential to melt large portions of the East Antarctic ice sheet, which will contribute strongly to sea level rise. The height of the land below the ice sheets plays a big role in controlling how vulnerable the ice is to melting. A key way to test climate models is to train them on past warm periods. This project will reconstruct ancient elevations caused by changes in deep Earth to model past ice sheet behaviour. The expected benefit of this project is to improve the precision of models that predict future changes to ice sheets and sea level.					
	National Interest Test Statement					
	The future behaviour of the East Antarctic Icesheet is a major source of uncertainty in future projections of sea-level rise. Despite this significance, there is no consensus on why it initially formed 34 Myr ago and what has since caused it to advance and retreat. This project will use data and samples from around East Antarctica to understand how the deep Earth has influenced the size and shape of the East Antarctic Icesheet through geological time. It will help to cement Australia's international leadership in Antarctic Earth Science, train a new generation of computationally proficient geoscientists, and has significant societal implications. Since accurate models of ice sheet behaviour are critically important to modelling sea-level change, addressing this knowledge gap will reduce uncertainty in future forecasts of sea-level rise. It is therefore of environmental and economic significance to people and businesses, particularly in coastal regions, and aligns with the Science and Research Priority on environmental change. Deliverables will include models of the Antarctic deep Earth through time, reconstructions of East Antarctic basement and heat flow below the ice, and modelled East Antarctic icesheet responses. Through existing partnerships with government agencies and the Australian Centre of Excellence for Antarctic Science, we will integrate results into national and international Antarctic models and make results available through public portals, such as Zenodo.					
FT240100519	**Decoding risks and unlocking rewards of oceanic volcanism**	302,308.00	299,000.00	297,000.00	276,000.00	1,174,308.00
Carey, A/Prof Rebecca J	Submarine volcanoes pose a destructive natural hazard but also host copper and critical metals required for renewable energy infrastructure to mitigate against climate change. This project aims to identify shallow and deep explosion mechanisms in submarine volcanoes that drive powerful eruption, or the sub-surface mineralisation of copper and critical metals. The outcomes are new knowledge of the hazards of submarine volcanoes, and refined models for metal ore exploration in Australia's ancient submarine volcanoes. The benefits are increased disaster resilience for Pacific Island neighbour nations vulnerable to					

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	volcanic hazards, and enhanced potential of metal ore discoveries to ensure a secure and sustainable energy future. **National Interest Test Statement** Submarine volcanoes present a challenge but also opportunity. While they pose destructive natural hazards, they also host copper and critical metals crucial for renewable energy infrastructure, essential in mitigating climate change. The Tonga volcanic eruption in 2022 was immensely powerful, defies current understanding, and requires new deep-seated explosive mechanisms around the magma plumbing system where copper and critical metal ores are produced. This project aims to elucidate interactions between the deep and shallow volcanic systems to reveal new mechanisms for submarine eruptions and sub-surface mineralisation of copper and critical metals. Anticipated outcomes include improved exploration targeting and first-of-its-kind understanding of the hazards posed by submarine volcanoes around the South Pacific. This research benefits Australia as it enhances the discovery potential of economic ore deposits in the continent's metal-rich volcanic corridors, supporting Australia’s pivotal role and global responsibility to lead the energy transition. It will benefit our Pacific Island neighbours who face substantial risks from volcanic eruption and tsunami especially in the face of rising sea-levels. The project will be carried out in close collaboration with industry partners and geological surveys across the South Pacific, ensuring that the research outcomes are tailored to meet practical needs and suitably integrated into exploration models or hazard assessments.					
University of Tasmania		871,089.00	868,381.00	865,957.00	844,537.00	3,449,964.00
Tasmania		871,089.00	868,381.00	865,957.00	844,537.00	3,449,964.00

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Victoria						
Federation University Australia						
FT240100673	**Novel Hybrid Droop and Model Predictive Control for Community Microgrids**	296,448.00	288,109.00	284,885.00	300,141.00	1,169,583.00
Hu, A/Prof Jiefeng	This project aims to increase energy resilience and efficiency by utilising next-generation community microgrids, in which power shortfall in one household can be compensated by the excess power available from its neighbours. It expects to generate significant new knowledge in grid integration of power electronics interfaced distributed energy resources. Expected outcomes include new network architectures and innovative power converter control methods to utilise local energy sources. This project will unlock the full potential of community energy to generate reliable electricity independently during bushfires and extreme weather events. It will also help in meeting emission reduction targets by facilitating renewable energy uptakes.					
	National Interest Test Statement Australia has abundant energy resources, but we need to improve user efficiency, reduce greenhouse emissions and integrate multiple, new energy sources into the electricity grid. This timely and significant project aims to develop next generation community microgrids integrating renewable energy resources and sharing power among households across neighborhoods. It addresses “An Environmentally Sustainable Australia” and “Responding to Climate Change and Variability” through developing new circuitry architectures and power control techniques that can enhance renewables uptake with cheaper, efficient and reliable power supply. The proposed research is well aligned with National Reconstruction Fund National Science priorities – Renewables and Low Emissions Technologies. It will help with reaching Australia’s Net Zero target by 2050 while having a positive impact on the economy by maintaining sustainable power supply development. The outcomes will deliver prototype designs as well as control algorithms, which can be applied by local industry and distributed network supply providers.					
	Federation University Australia	296,448.00	288,109.00	284,885.00	300,141.00	1,169,583.00
La Trobe University						
FT240100256	**A Political History of Colonial Australian Poetry**	211,898.00	232,056.00	227,121.00	214,413.00	885,488.00
Ford, Dr Thomas H	This project aims to provide the first comprehensive study of colonial Australian poetry and to demonstrate that poetry's political claims and impacts. It expects to generate new knowledge of the ways in which poetry served as a powerful medium for the advancement and contestation of colonial regimes of political, cultural and legal settlement. Based on archival research covering poetry's circulation in the long nineteenth century, the project's outcomes will show how poetry formed an indispensable element in the constitution of Australian political and cultural formations that endure today. Expected benefits include better public understanding of Australia's literary heritage and its critical contributions to culture and nationhood.					
	National Interest Test Statement Colonial poems are today the most widely known and loved of Australian poems: think, for instance, of 'Waltzing Matilda' (1895) or 'Advance Australia Fair' (1878). This project examines the significance and legacy of the poetry written in colonial Australia. It also investigates the cultures of reading, publication, performance, criticism and appreciation in which that poetry circulated. In the colonial period, when poetry was seen as central to the making of nations, its influence was much more extensive than today. The project will recover poetry’s public voice and political agency to critical attention, demonstrating poetry’s impacts on colonial projects of settlement and nation-making. Even the name 'Australia' first appeared in lines of verse. This project will provide a better understanding of the political engagements and effects of nineteenth-century poetry. It will develop a more critical sense of the enduring significance of Australian literature and its contributions to Australian politics and culture. By showing how poetry helped to fashion a common national consciousness and shared cultural identity, the project will open up these foundational elements of national belonging to revision by policy-makers and other stakeholders today. The project’s cultural and social benefits will be secured through research translation activities including radio, podcasts, engagement with high schools, and newspaper and mainstream periodical publications.					
FT240100767	**The History of Human Rights and Technological Change**	221,763.00	206,818.00	217,988.00	206,818.00	853,387.00
Burke, Dr Roland G	This project aims to investigate the history of the relationship between human rights and technological change. After 1945, technological advancement was recognised as a source of both					

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
	peril and promise for freedom, peace, and welfare. The nature of that balance is presently a source of fierce community controversy. This project's anticipated outcomes will include a detailed historical account of preceding dislocations between rights and technology suitable for policymakers, as well as more public interest focused interventions in policy debates. By placing present-day digital disruptions in this longer perspective, it seeks to provide another framework for considering risks and benefits to the community.					
	National Interest Test Statement					
	This project investigates the ways in which human rights activism has responded to technological disruptions of the past century – from nuclear weapons to social media. It will show how these technological changes have affected principles of individual freedom and community welfare. The project will provide a better understanding of how previous technological shifts have been managed by community, government, and law, both successfully and unsuccessfully. In doing so, it will give Australian policy makers and wider society the capacity to negotiate technological change informed by past experience, as opposed to confronting each technological advance anew. The project will contribute interim findings through the media on emerging public debates. As part of its research method, the project also draws on archived electronic media from the early digital age. It will disseminate, via workshops and publications, relevant skills and strategies for their preservation and transfer to modern platforms. Given the abundance of aging digital media across the community, greater literacy in this area will assist Australians in the retention of their own family and community history, which is increasingly registered in these fragile technological formats.					
	La Trobe University	433,661.00	438,874.00	445,109.00	421,231.00	1,738,875.00
Monash University						
FT240100043	**Understanding and Defeating Leakage Attacks Against Encrypted Databases**	266,698.00	266,698.00	266,698.00	266,698.00	1,066,792.00
Yuan, Dr Xingliang	This project aims to conduct a systematic investigation on leakage exploitation and corresponding mitigations for encrypted databases. Encrypted databases allow users to make confidential queries over encrypted data. Despite fruitful progress on improved efficiency and functionality, they face obstacles in leakage exploitation during deployment. This project expects to formally understand those obstacles and lay a foundation for designing mitigations. Expected outcomes will push forward the widespread adoption of encrypted databases in the real world, and will bring significant benefits for Australia, such as promoting data analytics in a privacy-preserving fashion and delivering new initiatives for cybersecurity-centric IT infrastructures.					
	National Interest Test Statement					
	Encrypted databases are considered as a primary line of defence against ever-growing data breaches. They allow users to make confidential queries over encrypted data, reducing information disclosure to controlled leakage. Despite fruitful progress on enriched query types and improved efficiency, encrypted databases have not achieved widespread adoption. The legitimately admitted leakage can be exploited to recover queries and eventually devastate the system's privacy guarantee. This project will identify obstacles of deploying encrypted databases in practice, and propose mitigations with rigorous security guarantees accordingly. The proposed technologies are capable of mitigating the threats of cybercriminals and providing encrypted and searchable data database solutions for enterprises, governments to secure end-users data. It enables Australia to strengthen cybersecurity sectors and further promote disruptive technologies such as cloud computing and data management services in a secure and privacy-preserving fashion. Apart from economic benefits, the outcome will enhance Australian cybersecurity capability, deliver new initiatives for cybersecurity-centric IT infrastructures, ease the privacy concern of the common society, and lay the cornerstone of building a privacy-preserving data-sharing economy in Australia. The research outcomes will be promoted to broad sectors such as CSIRO's Data61, OCSC, and BigTech like MongoDB for real-world deployment of encrypted databases.					
FT240100146	**Next-generation synthetic tissues and their effects on cell function**	302,663.00	302,663.00	302,663.00	302,663.00	1,210,652.00
Frith, A/Prof Jessica E	This project aims to develop and 3D-print cell-friendly materials at the microscale to create artificial body tissues, and use these to understand how cells build and maintain our bodies. It expects to develop new tools that will allow us to understand how tissue composition, stiffness and structure influence biological processes. Expected outcomes include new bio-friendly materials for microscale 3D printing, new knowledge of how tissue structure influences cells, cross-disciplinary international collaboration and research training. Significant benefits should include increased understanding of cell mechanics and new technologies that will underpin future alternatives to live animal testing and create engineered tissues.					
	National Interest Test Statement					

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	The ability to build synthetic body tissues “in a dish” that properly mimic the biological processes in our bodies would have many applications in biological research and pharmaceutical testing, or even to create implants that can restore our bodies following disease or injury. Inside our bodies, cells receive information from the surrounding tissue matrix. This guides their function and only the correct combination of cues will ensure that the biological response is accurate. To develop synthetic body tissues, we therefore need to understand how cells respond to the biochemistry, mechanical properties and shape of the tissue matrix that they reside in. This project will develop a new technology that can build synthetic tissue structures, with control of the tissue biochemistry, mechanical properties and architecture, all at the scale of an individual cell. These will then be used to test cell responses. The knowledge created will be shared with researchers and industry through publications, presentations and workshops to inform the future development of more accurate tissue models. The findings will benefit Australia by creating knowledge and technologies that will give Australian biomedical and pharmaceutical companies a competitive advantage and create highly skilled jobs.					
FT240100502 Greening, Prof Chris	**Microbial gas metabolism in the mammalian gut: from enzymes to ecosystems** Hydrogen gas is one of the most central, but least understood, metabolites cycled in the gut. This fellowship will provide the first system-wide understanding of hydrogen production and consumption in the guts of both humans and ruminants. By uniquely synergising studies at the enzyme, cellular, and gut ecosystem scales, we will resolve the microbial and enzymatic mediators of hydrogen cycling, determine how they function at a molecular level, and demonstrate how they interact to shape gut processes. The project will provide wide-reaching benefits by increasing fundamental understanding of gut function, ecology, and biogeochemistry, and will guide efforts and develop partnerships to mitigate methane emissions from the livestock sector. **National Interest Test Statement** Hydrogen gas occurs at high levels in the guts of humans and animals. Gut microbes produce this gas in large amounts during digestion of foods. Other microbes then convert this gas either into nutrients that we absorb or the wasteful greenhouse gas methane. This project will determine how hydrogen cycling works in both humans and livestock. We will resolve at fine detail how different enzymes and cells either make or use hydrogen. These insights will then be used to determine what controls the balance of nutrient versus methane production in the gut. In partnership with agritech giant DSM, this knowledge will be harnessed to develop strategies to increase nutrient production and reduce methane emissions from livestock. By doing this, we may be able to simultaneously increase the productivity and sustainability of the livestock sector, a $24 billion dollar industry that accounts for 11% of Australia’s emissions. This work will also contribute to Australia’s developing hydrogen industry and therefore has significant economic potential.	296,783.00	283,783.00	299,183.00	296,783.00	1,176,532.00
FT240100555 Bennett, Dr Daniel	**Using cognitive and affective science to dissect in-play gambling decisions** This project aims to investigate decision making in the context of 'in-play' gambling, a novel and widespread class of online gambling products. Using innovative methods rooted in computational cognitive science, this project will shed light on the cognitive and affective processes that underlie choice behaviour in in-play gambling, and will reveal how users' decision making is altered by the presence of in-play features within online gambling platforms. The expected project outcome is a quantitative psychological framework that describes how in-play gambling decisions are made. Project benefits include a behavioural evidence base that will inform future regulation in the gambling sector, thereby paving the way for community harm reduction. **National Interest Test Statement** The rise of app-based and online gambling platforms has fundamentally changed the ways that Australians engage with betting products. Online gambling platforms offer users a raft of new and under-regulated ‘in-play’ betting features that are not available at traditional brick-and-mortar bookmakers, such as rapidly placing bets during live events and ‘cashing out’ of bets before events have ended. Though popular with users, in-play betting has the potential to increase gambling-related harm by reinforcing constant engagement with gambling apps and encouraging more impulsive and risky betting behaviour. To effectively regulate in-play betting, however, policy-makers need to understand exactly how users engage with in-play betting products, and how these products contribute to gambling-related harm. This project will address this empirical gap by using the methods and tools of computational cognitive psychology to gather data on how people make in-play gambling decisions in a controlled and low-risk setting. This research will benefit Australians by building a knowledge base that informs future regulation and policy in the gambling sector, as well as by shedding light on the psychological processes that underlie risky decision making more broadly. Project outcomes will be translated to policymakers and regulators in the form of policy briefs and position statements, and will be used to build awareness and understanding of contemporary gambling products in the general public.	230,832.00	230,832.00	230,832.00	230,832.00	923,328.00
FT240100795 Do, A/Prof Norman N	**Partition functions through the lens of topological recursion** This project aims to resolve deep mathematical mysteries concerning structures known as partition functions, which arise in theoretical models of the universe. Novel insights and approaches will come from the developing yet powerful theory of topological recursion, which provides a clarifying and unifying lens. Expected outcomes include the resolution of outstanding conjectures concerning	285,443.00	286,173.00	287,053.00	280,413.00	1,139,082.00

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	topological string theory and quantum invariants, as well as new connections between these concepts. The project will lead to significant benefits, such as the formation of international collaborations, the training of researchers in an area of fundamental importance, and the enhancement of Australia's reputation as a powerhouse in mathematical physics. **National Interest Test Statement** Humanity has been involved in a century-long quest for a theory that describes the universe at the small and large scales. A variety of mathematical mysteries have arisen from this progression of ideas, involving knots in three-dimensional space, surfaces in six-dimensional space, and more. Novel insights will be combined with recently discovered concepts to resolve these deep mathematical mysteries and unlock new avenues for exploration. The activity and interest generated by these discoveries will forge new interactions and cement existing collaborations with international research networks, thus enhancing Australia's reputation as a powerhouse in mathematical physics. Additional benefits include the training of the next generation of thinkers, equipping them with the expertise to pursue further cutting edge research or to create critical impact in industry, thereby ensuring Australia's future prosperity. Results will be disseminated in distilled form to the broader public via lectures and articles, and to various cognate research communities via seminars and publications. The project will make important contributions to pure mathematics, a body of knowledge that invariably leads to myriad downstream applications. In particular, the proposed research draws together various mathematical strands, whose development has the long-term potential to enable advancements in data science, wireless communication, cybersecurity, quantum computing, and artificial intelligence.					
FT240100798 Li, Dr Chen	**Understanding cytokine-modulated antigen processing and presentation** This project aims to investigate the molecular basis of cytokine-modulated antigen processing and presentation using both cutting-edge experimental and computational approaches, thereby providing novel knowledge in cytokine-modulated cellular biology and immunology. This project leverages transcriptomics, functional proteomics, immunopeptidomics, and computational biology techniques to investigate multiomic level molecular mechanisms and their contributions to remoulding antigen processing and presentation upon cytokine stimulation. This project is also expected to construct innovative experimental and computational pipelines for multiomic data generation and analysis, to push forward Australia’s innovative life science research. **National Interest Test Statement** Cytokines are ancient signalling molecules that form a part of the immune system in animals and humans, providing molecular cues to different cell types to help them grow, develop, and promote immune responses to fight infection and cancer. Due to their important role in health and disease, these signalling molecules are important targets for the pharmaceutical industry. However, there is a lack of understanding of how the machinery within cells is changed by cytokine signalling, and how these changes contribute to cell growth, development, and the initiation of immune responses. This project will address this knowledge gap by exploring alterations to cell machinery in response to cytokine signalling and, in particular, how these alterations lead to superior activation of immune responses. The findings of this research will uncover molecular targets that can be harnessed by the biotechnology and pharmaceutical industries for future development of cytokine-based treatments against cancers, infections, and autoimmune diseases in humans. This research will therefore provide important fundamental knowledge on a critical component of the immune system, and promote applications to reduce the chronic burden of disease in Australia, benefiting our health, environment, and economy.	230,000.00	230,000.00	230,000.00	230,000.00	920,000.00
FT240100821 Davidovich, A/Prof Chen	**RNA at facultative heterochromatin: why is it there and how can we use it?** This project aims to determine how the product of all genes, termed RNA, affects gene packaging once genes are turned off and how gene packaging can be modulated for applications in biotechnology. The project will determine how RNA participates in the packaging of genes and how it alters the function and activity of proteins that work to package genes into a compact structure. The project also aims to develop methods to loosen the compact structure of chromatin to facilitate the modification of genes and effectively introduce new genes into cells. The benefit will be new knowledge and new methods for the biotechnology industry, to enable the development of cell lines and future crops for food technology, synthetic biology and agriculture. **National Interest Test Statement** This project aims to determine how the immediate product of all genes, termed RNA, affects the packaging of genes. The project also intends to develop methods to reduce the amount of RNA around certain groups of genes for applications of biotechnology. The outcome will be twofold: (i) The project will lead to fundamental knowledge of the structure of genes, how RNA shapes their structure and how RNA affect the activity of proteins that are tasked in the packaging of genes in the cells of all multicellular organisms. (ii) The project is also aimed to develop methods that will enable efficient genome modification of genes even if they are packed in a tight structure that otherwise may interfere with their modification. Additionally, the project will enable stable expression of new genes that were artificially introduced into the cells, called transgenes. The benefit will be in the form of new methods to overcome challenging problems with genome modification and transgene expression. The project intends to enable the development of tools that will benefit the Australian society and economy through impact on food technology, synthetic biology and agriculture. Specifically, the new knowledge and methods for genome modification and stable transgene expression would enable faster and more affordable development of robust artificial	276,342.00	285,859.00	290,779.00	302,107.00	1,155,087.00

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	genetic circuits, cell lines and crops for applications ranging from more nutritious food to drought-tolerant crops.					
	Monash University	1,888,761.00	1,886,008.00	1,907,208.00	1,909,496.00	7,591,473.00
RMIT University						
FT240100301 Lin, Dr Xiaoshan	**New-generation prefabricated element design and eco-friendly construction** This project aims to investigate and enhance the performance of prefabricated concrete structures and mitigate environmental impact through innovative concrete element design and manufacturing. The project expects to pioneer an inventive design approach and establish an advanced computational framework for producing diverse and efficient designs. It also plans to realise the optimised designs through environmentally conscious fabrication. Expected outcomes include a groundbreaking design tool and a novel minimum-waste manufacturing technology for complex concrete elements. It will yield substantial benefits, including remarkably reduced construction and repair costs, improved production efficiency and minimised greenhouse gas emissions. **National Interest Test Statement** This project will significantly contribute to creating a high-quality and sustainable built environment by unleashing advanced design techniques and materials to create innovative prefabricated concrete elements with superior performance. It will also develop a cost-effective and eco-friendly manufacturing process to realise the designs with intricate geometries. The innovative design and analysis tool will address longstanding challenges in structural safety, functionality, and durability, particularly in complex engineering projects like tunnels, bridges, and transportation pipelines, minimising maintenance and repair costs. The adoption of the cutting-edge manufacturing process will yield sustainable construction with minimal waste and greenhouse gas emissions. The pioneering technology will advance structural design philosophy and construction practices. As Australia continues to invest in infrastructure, this advancement will catalyse long-term economic growth and competitiveness, boosting productivity, creating new job opportunities, stimulating prosperity, and enhancing social well-being. Disseminating research outcomes through public lectures, media engagement, and online platforms will ensure broader benefits and establish Australian researchers, design firms, and manufacturers as global leaders in the design and construction of next-generation prefabricated structures. The highly trained personnel from the project will produce a profound and lasting impact.	266,578.00	266,578.00	266,578.00	266,578.00	1,066,312.00
FT240100348 Nguyen, A/Prof Thuy (Kate) Q	**Novel oriented timber composites for fire-safe net-zero construction** This project aims to investigate the delamination and fire dynamics of engineered timber compartments using machine learning-based structural fire simulation and multi-scale experiments. The project expects to generate new knowledge on the fire safety and manufacturing of engineered timber in buildings by deploying advanced composite materials technologies. Expected outcomes include a new fire-safe oriented timber composite and an assessment framework including a multi-scale method for timber's fire safety. Expected benefits include an increase of 80% for sustainable and affordable dwellings with a potential reduction of more than 30% in buildings' carbon emissions. This will provide a viable pathway for Net Zero emissions in construction. **National Interest Test Statement** Engineered timber is a key component of green construction, however, it has intrinsic fire safety concerns due to its combustible nature. Timber elements can burn, resulting in loss of strength and can potentially double the heat in a burning apartment, possibly leading to catastrophic building collapse. Another key problem for the sector is that current fire assessment methods are not accurate for timber as they were developed for non-burning concrete and steel over 50 years ago. This project aims to provide solutions to increase the use and safety of engineered timber in apartment buildings while providing a pipeline for 25 researchers to be practically trained in innovative construction. The outcomes of the project will be 1) a new engineered-oriented timber composite solution with optimised fire safety performance, 2) a new method to accurately assess the fire performance of timber buildings, and 3) an assessment framework to assist engineers in designing green construction from engineered timber composites. The economic and environmental benefits will include an expansion of up to 80% for the $11.7B Australian timber construction industry and a reduction of over 30% in greenhouse gas emissions from construction, a high-polluting sector. The outcomes are expected to be translated into a proposal of change in the National Construction Code and lead the way towards Net Zero emissions in construction, an otherwise unreachable goal.	266,818.00	266,818.00	266,818.00	266,818.00	1,067,272.00
	RMIT University	533,396.00	533,396.00	533,396.00	533,396.00	2,133,584.00
The University of Melbourne						

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FT240100170	**Empowering Spatial Data Accessibility with Next-Generation Database Systems**	266,457.00	266,818.00	266,818.00	266,598.00	1,066,691.00
Qi, Dr Jianzhong	Spatial data - data with location information - is being generated at an unprecedented rate as sensors become more ubiquitous. It is critical for location-based services, transportation, urban planning, and emergency management. However, using this data is constrained by outdated methods currently used, which are difficult to adapt with the emerging querying needs of non-expert users. By investigating querying methods that self-optimise for emerging query types, this project aims to develop next-generation spatial database systems with enhanced query capability and accessibility. Project outcomes will prepare Australia for emerging applications such as mixed reality and establish our leadership in the global geospatial analytics market.					
	National Interest Test Statement					
	The Information Technology sector contributed $167 billion to the Australian economy in 2021. Databases are critical to this sector. New technologies, such as Internet of Things and 5G networks, generate enormous amounts of spatial data, with location information, creating new opportunities for location-based services. New services include finding a scenic route from Sydney to Melbourne with fast-charging facilities for electric vehicles, for example. Yet, such complex queries are currently beyond the capabilities of existing database technologies that have been built for a predefined set of criteria and have a specialised user interface. This project will address the urgent need for spatial database systems with significantly enhanced querying capabilities and easy-to-access interfaces. It will develop a next-generation spatial database system powered by novel algorithms that can automatically analyse and process emerging complex queries. Findings will be conveyed to government and organisations through workshops and the media. An Australian next-generation spatial database system has commercial, economic, environmental, and social benefits. It will provide easy access to spatial data for better decision-making in daily living and novel location-based services. It could optimise decision-making nationally for urban design and evacuation planning, for example, by using spatial data for advanced analyses of plans, and hence protect properties, livelihoods, and lives.					
FT240100306	**Understanding climate change beyond net-zero**	255,693.00	263,598.00	262,458.00	252,853.00	1,034,602.00
King, Dr Andrew D	We have a broad understanding of how the climate will evolve under continued greenhouse gas emissions, but we know surprisingly little about how the climate will behave if we achieve our policy goals and reach net-zero or net-negative emissions. This project aims to fill a major knowledge gap through using new earth system model simulations to investigate the evolution of regional climates, variability in the climate system and the likelihood of damaging extreme events under different net-zero and net-negative emissions scenarios. The goals of this work are to help prepare Australia for the climate changes we can expect from decarbonisation and to illustrate the climate impacts of humanity's choices in our path to a low-carbon future.					
	National Interest Test Statement					
	The international community, including Australia, is aiming to achieve net-zero greenhouse gas emissions later this century. To date, climate science has been focussed on the implications of continued global warming, but net-zero or net-negative emissions would lead to global cooling. We currently have limited understanding of how the climate may evolve at the regional or local level under net-zero or net-negative emissions. This project will add crucial detail by examining how Australia's climate and our extreme events will change in a post net-zero future. This new knowledge will help us understand the consequences of taking different emissions pathways to achieve the policy goal of net-zero emissions and halting further global warming. This information will be beneficial to government and private industry in helping to understand the range of climates that Australia may face under net-zero and net-negative emissions pathways. The projections produced from this project will be of particular use to weather- and climate-sensitive businesses in understanding risks associated with different climate futures. Collaboration with CSIRO and federal and state agencies will ensure that the projections are utilised and that post-net-zero climate changes are understood by decision-makers.					
FT240100322	**Intergenerational Stories of Statelessness: An Oral History Project**	266,687.00	266,500.00	266,079.00	254,195.00	1,053,461.00
Silverstein, Dr Jordana	Statelessness – the status of having no citizenship – is a distinctive political condition that can have long-term, intergenerational effects; but these are currently understudied and largely unknown. This fellowship will investigate and assess the repercussions within the Australian population for descendants of formerly stateless people. Using oral history methodologies and archival research, the project aims to foreground these stories from marginalised and minority communities, thereby offering new knowledge about what citizenship and belonging can mean. Key benefits include empowerment of these communities by providing new opportunities to be heard, and rich information about what citizenship means to diverse groups of Australians.					
	National Interest Test Statement					

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	Many stateless people (i.e. people with the unique and significant status of being without citizenship) migrated to Australia in the 20th and 21st centuries, and their descendants and family members now live here. These descendants, their histories and their narratives, have barely been recognised as part of the national story of diverse communities who make up the population of this country. Nor have they or their stories been adequately documented or researched. My fellowship would rectify this significant research gap, thus positioning Australia at the forefront of the study of the long histories of statelessness. The project will reach beyond academia to the general public and to policy makers by producing a publicly-accessible archive of oral histories as well as new understandings of the complexities of life in Australia for diverse groups of people from migrant families. Highlighting personal, familial and collective stories, this project will provide social and cultural benefits through improved knowledge of migration, settlement processes, and patterns of community creation within the settler-colony of Australia. It will result in a book, articles for academic and general audiences, briefing documents for policy makers, and training materials for schools and universities. This novel work will be enabled by collaborating in part with the National Library of Australia and National Archives of Australia.					
FT240100396 Muirhead, Dr Stephen	**Percolation models with strong and oscillatory correlations** Percolation theory studies how global connectivity in a complex system arises out of local properties of that system, for example how the connectivity of an electric car charging network depends on the spread and density of the charging stations. This project aims to deepen our understanding of percolation models with strong and oscillatory correlations, and resolve longstanding questions on the existence and nature of their phase transitions. The techniques developed will be applicable to a broad range of mathematical disciplines, such as Gaussian analysis, point process analysis, and spatial modelling, and insights arising from the project will benefit researchers in applied disciplines such as transport and telecommunication modelling.	221,008.00	221,008.00	221,008.00	221,008.00	884,032.00
	National Interest Test Statement Consider a map of the public electric car charging stations in Australia. By drawing a circle centred at each station, one could work out the connectivity of the network for a car with a given range. How sensitive are the properties of this network to the range of the car, and how does this depend on the distribution of the charging stations? This project aims to answer questions like this by addressing gaps in the mathematical theory of percolation, which studies the connectivity of complex systems. Strengthening this theory will have strong commercial and economic benefits for Australian researchers and industries that use percolation models, such as transport modelling, telecommunications, oceanography and astrophysics. The impact of the project will be maximised by publishing its insights through industry organisations such as the IEEE, and in public-facing outlets such as the Conversation.					
FT240100506 Adair, A/Prof Tim	**Advancing research to support improved life expectancy in Australia** The project aims to advance knowledge about life expectancy in Australia by strengthening the policy utility of mortality statistics. This aim is significant because of concerns about the accuracy of mortality statistics to identify threats to continued life expectancy growth. The project will develop innovative methods using linked data to quantify under-reporting of cause-specific mortality and to measure mortality from co-morbidities and leading risk factors. Intended outcomes are improved evidence of levels, trends and inequalities of co-morbidities and leading risk factors of mortality. This is expected to provide essential evidence to inform programs to accelerate improvements and reduce inequalities in Australia's life expectancy.	294,660.00	296,302.00	295,606.00	295,501.00	1,182,069.00
	National Interest Test Statement Continued improvements in Australia's life expectancy are threatened by faltering premature chronic disease mortality decline and high obesity prevalence. However, there are concerns about the quality and policy utility of available mortality statistics in Australia to inform health programs to address these adverse trends. This project aims to improve the accuracy of the measurement of mortality in Australia by using innovative methods to analyse large linked datasets. The project's outcomes will provide improved evidence of levels, trends and socioeconomic inequalities of mortality from co-morbidities and leading risk factors in Australia. The project will address the Government's Science and Research Priority in health and benefit Australia by ensuring that the opportunities afforded by government investment in linked administrative datasets are fully exploited to advance knowledge and evidence of contemporary population health trends. The results will provide detailed mortality statistics that will be invaluable for health planners to develop health interventions and allocate resources. The project's collaboration with the Australian Institute of Health and Welfare (AIHW) will provide the opportunity for results to be utilised in the Australian Burden of Disease Study. Stakeholder workshops will be conducted to present findings for AIHW's extensive networks of policy makers who use burden of disease data as evidence to inform decision-making.					
	The University of Melbourne	1,304,505.00	1,314,226.00	1,311,969.00	1,290,155.00	5,220,855.00
	Victoria	4,456,771.00	4,460,613.00	4,482,567.00	4,454,419.00	17,854,370.00

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Western Australia						
Curtin University						
FT240100041	**Critical Minerals: Novel Nanoscale Insights of Mineralisation to Extraction**	229,048.00	230,548.00	229,648.00	229,648.00	918,892.00
Fougerouse, Dr Denis	Critical minerals are essential to the green energy transition. Australia is well endowed in critical minerals resources, however they are inefficiently recovered in mining operations. This project aims to develop fundamentally new knowledge on the distribution of critical minerals such as indium, germanium, gallium, and cobalt in their host minerals and in residues of extractive metallurgy. This project will use atomic scale analyses to provide the first detailed study of the mineralogical processes responsible for critical minerals mineralisation and provide essential data necessary to optimise extraction of critical minerals. The project will have significant economic benefits for supporting mineral exploration and metallurgy operations.					
	National Interest Test Statement					
	The world's transition to sustainable energy source is dependent on the supply of critical minerals that need to be extracted from the Earth's crust. However, there are inherent supply risks for these minerals. Australia is richly endowed with critical minerals as by-products of main commodities, but these are not commonly recovered and accumulate in waste piles. This is due to limited knowledge of the incorporation of critical minerals in ore deposits and efficient industrial processes to recover them. By-product critical minerals are of lesser economic significance than primary commodities, but they can represent significant added value to mining operations. This project will use atomic scale characterisation methods to determine the mineralisation of critical minerals in the natural environment and their behaviour during extractive metallurgy processes. It will enable the mining and extractive metallurgy industry to better predict by-product critical minerals endowment and improve recovery of critical minerals. The improvement of the recovery of by-products during extractive metallurgy has direct tax-revenue benefits for Australia. Through Curtin University's leading edge in critical minerals research and collaboration networks, the results of this project will be communicated to minerals industry consortia and to policy makers.					
FT240100140	**Electrochemical Deactivation of Enveloped Viruses**	236,698.00	236,698.00	236,698.00	236,698.00	946,792.00
Darwish, Dr Nadim	The project aims to develop electrochemical methods and surface-science strategies to prevent the spread of enveloped viruses. A multidisciplinary approach involving surface electrochemistry, single-protein electrochemical measurements, and electro-active nanomaterials will be used. The expected outcomes are electrochemical devices to gain new fundamental knowledge of the electrochemistry involved in viral infectivity mechanisms and the development of new virucidal materials. The materials will be the active elements of new generation of anti-transmission products such as facemasks, wipe cloths, surface coatings and air filters.					
	National Interest Test Statement					
	Due to high population densities and urbanisation, global travel and trade, and climate change that affects the distribution of wildlife, it is only a matter of time before a new viral threat emerges. COVID19 has cost Australia severe economic losses in lockdowns to contain and treat the COVID19 pandemic and we need to be better prepared for outbreaks of similar viruses. The aim of this project is to understand the electrochemistry involved in the infectivity mechanism of enveloped viruses and to create a paradigm change in how we fight the spread of these viruses – particularly those that share similar properties to coronaviruses. New electrochemical methods and electroactive materials will contribute to countering future pandemics. The proposed electrochemical techniques and virus-capturing materials can potentially be applied to all coronaviruses and other related viruses such as human immunodeficiency virus (HIV), Ebola, Marburg and Influenza. The project will generate new fundamental knowledge that will be put in use for the development of spin-offs related to the manufacturing of new anti-transmission products. The products include innovative and powerful types of facemasks, air filters, wipe cloths and surface coatings.					
	Curtin University	465,746.00	467,246.00	466,346.00	466,346.00	1,865,684.00
The University of Western Australia						
FT240100224	**Tracing cultural continuities in West Australia's ancient coastal wetlands**	266,720.00	266,778.00	266,758.00	244,803.00	1,045,059.00
Ward, Dr Ingrid A	The project explores the impact of Post-glacial sea-level rise on ancestral coastal wetlands along Western Australia's southern coast. Through comprehensive surveying, coring, and immersive 3D					

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Approved Organisation, Leader of Approved Research Program	Approved Research Program	Estimated and Approved Expenditure ($)	Indicative Funding ($)			Total ($)
(Columns 1 and 2)	(Column 3)	2024-25 (Column 4)	2025-26 (Column 5)	2026-27 (Column 6)	2027-28 (Column 7)	(Column 8)
	visualizations, the project aims to map changing coastal palaeogeography and historical biodiversity, providing valuable insights into cultural narratives and songlines. Long-term records of wetland ecology and fire history will be obtained through high-resolution analyses, including ancient environmental DNA, polycyclic aromatic hydrocarbons and plant biomarker analyses. Findings will guide adaptive management strategies to safeguard the ecological and cultural significance of coastal and marine landscapes in the face of future environmental change.					
	National Interest Test Statement					
	The Recherche Archipelago and its surrounding coastline represents an ecologically distinct and culturally significant, yet largely overlooked region in Australia. Through the integration of indigenous knowledge and scientific research, the project will uncover the historical progression of these cultural landscapes, shedding light on their evolution and enabling improved environmental management and conservation efforts. The project's examination of the effects of post-glacial sea-level rise, alongside its focus on cultural awareness and wetland biodiversity, underscores its alignment with national priorities for environmental stewardship, cultural heritage protection, and the promotion of sustainable practices within Australia's Blue Economy. By amalgamating diverse knowledge, the project contributes to a more equitable and knowledge-driven approach to the sustainable management of natural resources, advocating for co-designed research and collaboration as the future research paradigm. Furthermore, it serves as an informational resource for Australian policymakers who play a pivotal role in shaping our strategies for handling upcoming coastal changes. This project sets a precedent for the sustainable preservation and management of the Recherche Archipelago within the newly established South Coast Marine Park and the adjoining coastline, while also enhancing our understanding of Australia's abundant cultural and ecological diversity.					
FT240100475	**Transforming clean hydrogen production by photothermal catalysis**	302,783.00	302,783.00	302,783.00	297,783.00	1,206,132.00
Sun, Prof Hongqi	Hydrogen as an energy source is considered a key tool for cutting carbon emissions and combating climate change, but current production methods are costly and/or energy-intensive. This project aims to facilitate large-scale “green” hydrogen production based on solar power. It expects to generate new knowledge in this innovative field, with anticipated outcomes to include development of the technological means to produce green hydrogen at a cost and on a scale that allow it to become an integral part of the sustainable energy mix. The project should deliver significant benefits, including an important new strategy for helping to achieve decarbonisation, both in Australia and overseas, and a major boost to Australia's future hydrogen economy.					
	National Interest Test Statement					
	This project will tackle research gaps relating to the knowledge and technology required to cost-effectively produce clean hydrogen, on an industrial scale. Addressing those gaps will help Australia to profit from a future hydrogen economy, and will also provide a powerful tool to help the country meet its carbon emission reduction commitments and slow climate change, the impacts of which are already being felt in many economic and environmental sectors nationally. Nanotechnology-driven solar energy conversion to clean hydrogen will be invented to underpin new commercial, industrial opportunities. This project expects to deliver a revolutionary strategy for solar-to-hydrogen conversion, including new catalyst materials, clean hydrogen production technology, and new and advanced knowledge in photothermal catalysis. This will be achieved by addressing the research gaps of low efficiencies in photochemical hydrogen evolution and critical operation conditions in thermochemical hydrogen evolution. This research will benefit Australia by better utilising our natural gas and abundant solar energy, which is of critical importance to Australia’s next-generation energy and environment sustainability. The outcomes will contribute to the Climate Change Act 2022 and National Hydrogen Strategy 2019, thereby directly contributing to the economic advancement and a greener environment for the nation and the world.					
FT240100587	**An Aboriginal History of Western Australia**	296,903.00	297,304.00	299,741.00	299,139.00	1,193,087.00
Konishi, A/Prof Shino A	The project will undertake ground-breaking research on innovative approaches to Aboriginal history, combining truth-telling imperatives with restorying techniques in order to produce an Indigenous-centred, future-oriented, new general Aboriginal history of Western Australia in time for the state Bicentenary. This project will create a scholastically rigorous, systematic and culturally appropriate historical resource for communities, students, researchers, and the general public. It will be able to serve as a model for future general histories of Aboriginal people seeking to truly embrace Indigenous perspectives.					
	National Interest Test Statement					
	Western Australia has the third largest Indigenous population in Australia and Aboriginal culture and history informs many aspects of its identity: from countless placenames, heritage trails and memorials, the inclusion of language, art and performance into civic life, recognition of native title, and local histories. Yet without a broad understanding of WA's past these aspects can appear piecemeal, confusing or overlooked. Unlike some other states, WA lacks a dedicated, coherent, and accessible account that can help its citizens to understand and value its unique Aboriginal past. This is an urgent problem, as recent calls for truth-telling attest. The upcoming WA					

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		2024-25	2025-26	2026-27	2027-28	
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)
	bicentenary in 2029 provides an opportunity to reckon with the West’s distinctive Aboriginal history. This project will produce valuable, innovative and unparalleled historical resources, including an authoritative book and curriculum materials, that can be used by students, researchers, the public, government agencies and private industries: it will benefit readers - citizens and visitors - who desire a deeper understanding of WA's Aboriginal past and how the histories revealed have shaped the present and can inform our futures. The project will be a model for historical truth-telling, which is not limited to acknowledging dark histories but also entails uncovering histories which inspire, by restoring dignity to ancestors, honouring our singular and shared heritages, and deepening our knowledge and understanding.					
	The University of Western Australia	866,406.00	866,865.00	869,282.00	841,725.00	3,444,278.00
	Western Australia	1,332,152.00	1,334,111.00	1,335,628.00	1,308,071.00	5,309,962.00
		26,568,636.00	**26,773,038.00**	**26,828,156.00**	**26,625,566.00**	**106,795,396.00**