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Approved Organisation, Leader of Approved Research Program	Approved Research Program	Estimated and Approved Expenditure ($)			Indicative Funding ($)			Total ($)	Partner Organisation(s)
		2021-22	2022-23	2023-24	2024-25*	2025-26*	2026-27*		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)	(Column 9)	(Column 10)	(Column 11)
Australian Capital Territory									
The Australian National University									
LE220100009	**Enhanced high-field nuclear magnetic resonance spectroscopy**	170,000.00	0.00	0.00	0.00	0.00	0.00	170,000.00	
Otting, Prof Gottfried	Nuclear magnetic resonance (NMR) spectroscopy is the most powerful analytical tool in chemistry, ranging from small molecules to 3D structure determinations of large biomolecules such as proteins and DNA. This application is for a probe that offers the highest possible sensitivity of detection, about 2.5 times higher than the current probe, which is a loaned item and partly defect. The new probe is essential to regain full operation of the 800 MHz NMR spectrometer at the Australian National University, which constitutes a $4M investment. By accelerating measurements 6-fold and being much less sensitive to salt, a greater range of protein systems can be studied, including important drug targets such as the CoV-2 main protease.								
	National Interest Test Statement								
	Australia has a particular strength in basic biomedical research, including the identification and development of small-molecule compounds to treat disease. Nuclear magnetic resonance (NMR) is a key technique to identify the binding mode of drug molecules on protein targets at atomic resolution. This knowledge is essential not only for drug approval, but also for optimisation and development of initial compounds for improved activity, thus underpinning the early stages of drug development. The new probe sought in this application delivers greatly enhanced sensitivity, thus significantly broadening the range of drug targets that can be investigated, as well as the range of challenging synthetic compounds, which require maximal sensitivity due to limited availability and solubility. It will recover and maintain international competitiveness of a leading NMR facility in Australia, opening unique opportunities for the development of improved and accelerated NMR techniques, which are important to advance the competitiveness of Australian research in biological, pharmaceutical and synthetic chemistry.								
LE220100083	**Integrated volatile-mineral-isotope micro-analysis of Earth environments**	191,734.00	153,130.00	0.00	0.00	0.00	0.00	344,864.00	GEOSCIENCE AUSTRALIA, COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION
King, Prof Penelope L	This project aims to build an innovative facility for small-scale spectral maps of volatiles (e.g., carbon, oxygen, hydrogen) and minerals that is linked to micro-isotopic analysis. The facility should significantly improve methods to trace the history of natural materials that have been exposed to different environments (e.g., liquids, gases, temperature, or biology). This capability underpins cross-disciplinary research in "hot" topics such as critical mineral and ore exploration, climate change, volcanic eruptions, biomineral formation, and cultural history. The project will likely benefit homegrown infrastructure in universities, CSIRO and Geoscience Australia, and leverage Australian expertise in geoscience and archaeology.								
	National Interest Test Statement								
	Infrastructure and expertise in characterising materials is an important component of growing an innovation economy in Australia. The proposed facility will ensure that Australia remains at the forefront in characterisation methods of some of the most complex and important materials: rocks, critical and ore minerals, biominerals (teeth, bone), and archaeological and environmental samples. University and government partners will build on unique Australian expertise to improve homegrown SHRIMP and HyLogger commercial technologies. The project will expand existing facilities to measure small-scale light stable isotopes linked to spectral maps of micron-scale materials. The infrastructure is likely to bring economic rewards to Australia and to fuel cross-disciplinary research in "hot" topics. We anticipate improving ways to: a) explore for critical minerals and ore metals; b) understand past processes and environments that formed materials in the deep Earth; and c) track environmental histories (e.g., at archaeology sites). Early career personnel will become highly trained and ready for interdisciplinary jobs.								

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LE220100126 Ireland, Prof Michael J	**The milli-arcsecond cosmos: astrophysical imaging with Heimdallr** This project aims to complete the Asgard near infrared instrument suite for the European Southern Observatory's Very Large Telescope Interferometer. With the core short and long wavelength parts of the instrument already funded by partners from Belgium and the United Kingdom, this final instrument component built as a France-Australia partnership using 1.5 to 2.4 micron wavelengths aims to greatly extend the instrument to be able to directly detect a significant sample of exoplanets, to resolve and measure the mass of Active Galactic Nuclei, and calibrate Galactic Archaeology through precision measurements of star systems.	460,000.00	310,000.00	0.00	0.00	0.00	0.00	770,000.00	CATHOLIC UNIVERSITY OF LEUVEN, BELGIUM, UNIVERSITY OF EXETER, OBSERVATOIRE DE LA CÔTE D'AZUR
	National Interest Test Statement Australia plays a leading international role in astronomical instrumentation, which both has social benefits as part of science education and playing a part to understand humanity's place in the Universe, as well as technological benefits to developing advanced manufacturing capability. Our national engagement in the partnership with the world's leading optical observatory, the European Southern Observatory mostly involves decade-long instruments. This relatively quick visitor instrument develops and showcases Australian photonic technology as part of this partnership, leading to the most competitive instrument in the world for directly detecting light from giant planets orbiting other stars, which is a particularly exciting class of result to communicate with the public. By utilising the Australian National Fabrication Facility in capabilities beyond what is publicly offered, their micro-optics and diamond turned mirror capabilities will be expanded, enabling future offerings for Australian industry.								
	The Australian National University	821,734.00	463,130.00	0.00	0.00	0.00	0.00	1,284,864.00	
University of Canberra									
LE220100028 Coffee, A/Prof Neil T	**A national eInfrastructure for high-resolution population spatial modelling** Research at a meaningful spatial scale is hampered by privacy requirements and the use of administrative spatial units which prevent analysis at the address level and forces the use of spatial units which aggregate the results, mask spatial patterning, hindering local understanding. This proposal will: • build a digital twin Australian Synthetic Population on the Geocoded National Address File (GNAF). • link built environmental features to the GNAF. • build spatially detailed ARIA indices for Health and Wellbeing. Open access to these data eInfrastructure will improve modelling, policy and decision making across all levels of government and open a new level of understanding in how the environment helps shape the Australian population.	164,235.00	150,789.00	0.00	0.00	0.00	0.00	315,024.00	AUSTRALIAN URBAN RESEARCH INFRASTRUCTURE NETWORK (UNIMELB), AUSTRALIAN BUREAU OF STATISTICS
	National Interest Test Statement This project will build a spatially detailed eInfrastructure for a more equitable nation – a digital twin for modelling the patterns and processes impacting the Australian population. By calculating geographic access to commonly used services and facilities, this foundation dataset will enable Australian researchers, policy stakeholders, and industry to plan targeted interventions, and cost effective and equitable services to the Australian population. Through the creation of a synthetic, detailed data for the whole population, it will preserve individual anonymity, while still providing detailed, geographically located data (to the scale of individual residential addresses) across Australia. This is a fundamental piece of data infrastructure that is long overdue in Australia. This infrastructure will be a readily accessible for all sectors of government, academia and industry and provide a powerful and ongoing resource for Australia.								
	University of Canberra	164,235.00	150,789.00	0.00	0.00	0.00	0.00	315,024.00	
	Australian Capital Territory	985,969.00	613,919.00	0.00	0.00	0.00	0.00	1,599,888.00	

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New South Wales									
Macquarie University									
LE220100037 McDermid, A/Prof Richard	**MAVIS: A Revolutionary New Instrument for the European Southern Observatory** This application aims to fund an innovative spectrograph for "MAVIS" - a ground-breaking Australian-led instrument for the European Southern Observatory (ESO), enabled by the current $120M 10-year Australia-ESO strategic partnership. MAVIS leverages ESO's $40M investment in its unique Adaptive Optics Facility, and $30M of European funding for MAVIS itself. MAVIS will give the sharpest, most sensitive optical view of the cosmos ever, exceeding the capabilities of any ground- or space-based telescope in existence, or planned for the coming decade. The capabilities enabled by this funding will make MAVIS an essential tool for discoveries across a broad range of science prioritised by the Australian astronomy community's 10-year strategic plan. **National Interest Test Statement** The Australian Government's investment in a strategic partnership with the European Southern Observatory (ESO) is enabling fundamental discoveries by Australian researchers in astronomy - one of the most publicly-accessible STEM fields. This partnership also presents opportunities for Australian institutions and companies to develop key technologies and engage in world-class, multi-million dollar instrumentation and technology projects for current and future facilities (such as the Square Kilometre Array and the Giant Magellan Telescope). Technology spin-offs from astronomy include new techniques in space situational awareness, improving the output of solar farms, and the application of advanced data analytics, including for COVID-19 clinical data processing. This proposal will fund an innovative capability for a new instrument Australia is leading for ESO that will give us the sharpest view of the Universe ever. This leverages $70M of external funding and investment from ESO and other European partners, and provides Australian researchers with new opportunities for leadership of globally-impactful research.	1,749,940.00	0.00	0.00	0.00	0.00	0.00	1,749,940.00	
LE220100084 Schwab, Dr Christian	**The MARVEL exoplanet facility** This project aims to deliver critical parts for the new $6M international MARVEL exoplanet facility, in exchange for full access of Australian researchers to the facility. MARVEL is a robotic telescope array and cutting edge spectrograph at one of the best sites in the world. MARVEL is dedicated to collecting critical data on rocky exoplanet candidates from the TESS and PLATO space missions. Outcomes include finding the nearest terrestrial exoplanets, gaining a detailed understanding of their stellar systems, and identifying targets suitable for future searches for life based on atmospheric biomarkers. This project ensures a leading role for Australia in exoplanet science, one of the most exciting endeavours in astronomy. **National Interest Test Statement** The search for life on other planets in our universe is one of the most exciting endeavours in science. Leveraging our world-leading expertise in astronomical spectroscopic instrumentation to deliver critical components to the MARVEL telescope, this project will place Australia at the forefront of the global pursuit of the question "How common is life in the Universe?" The technique we use to investigate the exoplanets is ultra-precise spectroscopy. Optical spectroscopy is a 5 Billion dollar / year market underpinning a broad range of industries, from food safety and the development of pharmaceuticals to mineral exploration and defense. Technology developed for this project can be applied to this wide range of industries, and in particular, the photonics sector, in which Australia is a global leader. This project will therefore have broad economic and educational benefits to the Australian community, as well as social benefits through public engagement, and will help Australian high-tech optics companies stay a step ahead.	296,339.00	0.00	0.00	0.00	0.00	0.00	296,339.00	RUPRECHT KARLS UNIVERSITY OF HEIDELBERG, CATHOLIC UNIVERSITY OF LEUVEN, BELGIUM
	Macquarie University	2,046,279.00	0.00	0.00	0.00	0.00	0.00	2,046,279.00	

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The University of New South Wales									
LE220100007 Brough, Prof Sarah	**Australian Participation in the Legacy Survey of Space and Time** The Legacy Survey of Space and Time (LSST) is a 10-year US survey where the entire Southern Sky will be imaged every few days starting in 2023. The dataset will provide the highest resolution and sensitivity images ever recorded as well as 10 million alerts per day to transient objects, transforming many areas of astrophysics. The 8.4m telescope is under construction in Chile with over 1000 scientists from 25+ countries already involved. This proposal supports in-kind contributions to LSST, providing membership of LSST to 45 Australian astronomers and their students. Expected outcomes include training of young researchers in big data, strong international links and enhanced capacity for Australian leadership in astrophysics research.	662,295.00	306,500.00	306,500.00	0.00	0.00	0.00	1,275,295.00	COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION, ASTRONOMY AUSTRALIA LIMITED
	National Interest Test Statement This proposal supports Australian astronomers' access to the transformative Legacy Survey for Space and Time (LSST), worth over US$700M. LSST is a 10-year survey of the entire southern sky to be undertaken by an 8.4-metre telescope under construction in Chile. The new telescope will provide the highest resolution and sensitivity images ever recorded, with 20 Terabytes of images produced every night and 85 Petabytes by the end of the survey. The outcome of the project would be an International Data Access Centre for LSST in Australia and answers to key astrophysical questions like: What is the nature of dark matter and dark energy? How do galaxies form and evolve across cosmic time? How do stars and planets form? and What is the nature of matter and gravity at extreme densities? The project benefits include broad-ranging impact on active and influential research fields throughout astrophysics, providing new opportunities for existing and next-generation Australian radio and optical astronomy facilities, and training young researchers in big data skills.								
LE220100075 Dempster, Prof Andrew G	**Space Resources Environmental Analogue Facility** The Space Resources Environmental Analogue Facility aims to allow researchers to test equipment in realistic Moon/ Mars/ asteroid conditions. It will allow the development of space robotics and techniques to process space rocks. A dirty thermal vacuum chamber replicates temperatures and pressures on deep space objects, while not having the ultra-clean requirement of a more usual spacecraft facility. Moon/ Mars/ asteroid yards simulate the surfaces of those objects. Technologies proven in the new facilities will be qualified to operate on the moon, for example, enabling participation in the space agency's Moon to Mars program.	2,098,355.00	0.00	0.00	0.00	0.00	0.00	2,098,355.00	
	National Interest Test Statement The Space Resources Environmental Analogue Facility will provide essential support to the Australian Space Agency's commitment to the Moon to Mars initiative to join NASA's Artemis program. Building on traditional Australian strengths in mining and robotics, the facility will foster Australia's emerging strength in applying these disciplines in space. As a result, significant numbers of high-value jobs will be developed. In addition, terrestrial mining companies will benefit by applying new developments to terrestrial operations. By creating this space niche for Australia, the decades-long brain drain of top STEM graduates leaving to space careers in Europe and the US, can be halted. Similarly, by creating the opportunity for space careers in Australia, more young people will be attracted into STEM studies.								

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LE220100095 Michael, Dr Aron	**Facility for enabling low thermal budget Si/SiGe technologies** This project aims to enhance Australian micro/nano fabrication capability and strengthen research across a range of key technologies by establishing an advanced state-of-the art semiconductor facility that enables deposition of wide range of silicon-based films at low thermal budget. The facility is expected to provide unique capabilities that are not currently available in Australia. The expected outcomes include: (i) development of 3D integration approaches on CMOS Integrated Circuit that will be necessary for the rapidly growing applications in Artificial Intelligence, Internet-of-Things, and Wearables; (ii) thick electrically active silicon-based films for Biomedical, Telecommunication, Photonics, and Micro Electro Mechanical Systems. **National Interest Test Statement** The proposed facility will establish state-of-the-art facility with unique capabilities that are necessary to develop and deliver new silicon and silicon germanium based technologies in Australia for the first time. Such capabilities will support and enhance existing and emerging research across a wide range of key areas including consumer technologies, advanced scientific tools, information technology, defense, agriculture, telecommunication and biomedical by addressing the challenges of industry requirements and ultimately facilitating commercialization which will have economic benefit to Australia. The facility has also significant potential to enable cheaper alternative silicon substrate platform that will impact the semiconductor industries. The new substrate platform may lead to start-up companies which will further develop, manufacture and supply the new substrates to semiconductor companies or researchers all over the world or may be licensed to the third party and hence contribute to the Australian economy.	580,000.00	0.00	0.00	0.00	0.00	0.00	580,000.00	
LE220100108 Rogge, Prof Sven	**Atomic Scale Control over Quantum Materials** This project aims to establish a state-of-the-art microscope and materials growth facility in Australia to develop functional quantum materials. The unique aspect of the facility is the ability to create bespoke materials in an ultra-clean environment under working conditions for quantum materials, i.e. in large magnetic fields and sustained temperatures below 100mK. This capability has only recently been reliably available and Australia will be amongst the first countries to utilise such a tool for its world leading quantum technology community. This project will enable break through science and mature materials for this rapidly growing community with applications in silicon qubits, strongly correlated matter, and topological materials. **National Interest Test Statement** This project aims to establish a facility that will allow the Australian researchers and development community to probe and control functional quantum materials at the atomic scale in an application setting. This will support breakthrough science, whose outcomes will lead to the development of new electronic technologies and materials, ranging from long-term quantum processors, via materials and devices for low energy electronics, to really deployable sensors for medical diagnostics and navigation. This unique tool will fill a major gap in the current available facilities in Australia, supporting existing and emerging industries and enhancing Australia's global position as a leader in quantum technologies, innovative spintronics, optoelectronics, and low energy electronics. It will also contribute to the development of the highly skilled workforce required by such industries.	1,173,128.00	0.00	0.00	0.00	0.00	0.00	1,173,128.00	

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LE220100111	**Nano-IR Facility for the Search of New Multifunctional Materials**	738,750.00	0.00	0.00	0.00	0.00	0.00	738,750.00	
Seidel, Prof Jan	Investigations of 2D and van der Waals materials, biological samples, photovoltaic and energy materials, and quantum devices on the nano- and microscale are revolutionising medicine, communications, information technology, energy production and storage by virtue of new phenomena. The new time-resolved nano-IR facility will enable state-of-the-art capabilities in mapping chemical, morphological, mechanical, and spectral properties, providing cutting-edge tools that will enable breakthroughs in both existing and future multi-disciplinary projects in photonics, quantum devices, nanomaterials, nanoelectronics, and solar photovoltaic technology as key drivers of the new economy in Australia.								
	National Interest Test Statement								
	New developments in medicine, communications, quantum and information technology, energy production and storage require the study of advanced materials, including 2D and van der Waals materials, biological samples, photovoltaic and energy materials, and quantum devices on the nano- and microscale. Further progress requires imaging of material and device structure and properties with high spatial resolution and high time resolution. The new instrumentation will enable state-of-the-art capabilities in mapping chemical, morphological, mechanical, and spectral properties. The facility will provide cutting-edge tools that will enable breakthroughs in both existing and future multi-disciplinary projects in photonics, quantum devices, biosensing, nanomaterials, nanoelectronics, and solar photovoltaic technology. Micro- and nanoscience is a key driver of technology in new economies and this Facility will underpin broad research in the above areas, which will ultimately lead to new health and economic outcomes.								
LE220100125	**National groundwater recharge observing system**	158,845.00	0.00	0.00	0.00	0.00	0.00	158,845.00	
Baker, Prof Andrew	This project aims to improve our understanding of groundwater recharge through a sensor network deployed in underground spaces located between the soil and the aquifer. This recharge observing system will generate new knowledge which is fundamental for water resource management. Expected outcomes include quantified rainfall recharge thresholds; a better understanding of climate, vegetation and geological controls on rainfall recharge in a time of changing climate and fire regimes; and improved understanding of spatial and temporal variability of rainfall recharge across these diverse environments. This should provide significant benefits for sectors of the Australian economy which rely on the sustainable use of our groundwater resource.								
	National Interest Test Statement								
	The 2013 estimated worth of groundwater to the Australian economy was AU$6.8 billion GDP, in particular supporting extractive minerals and agricultural activities. Knowing when and why groundwater recharge occurs is of fundamental importance for groundwater management, yet difficult to observe and quantify. The 'National Groundwater Recharge Observing System' (NGROS) will comprise an integrated sensor network and database to directly observe groundwater recharge occurring, and to understand when, where and why recharge takes place across diverse geological and climatic environments. Currently, groundwater makes up around 17% of accessible water in Australia and accounts for more than 30% of total water consumption. An improved understanding of when groundwater recharge occurs, and why, will inform our sustainable use of our groundwater resource, with beneficiaries including local water users, state water manager responsible for groundwater allocations, and federal bodies responsible for integrated water management.								
	The University of New South Wales	5,411,373.00	306,500.00	306,500.00	0.00	0.00	0.00	6,024,373.00	

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The University of Newcastle									
LE220100168 Dastoor, Prof Paul C	**BioSHeM: A High-Resolution Imaging and Spectroscopic Helium Atom Microscope** This project will build the first scanning helium microscope (SHeM) instrument designed for imaging in the advanced materials, biological and medical sciences. The new technique of scanning helium microscopy (SHeM), which was developed at the University of Newcastle, images structures completely non-destructively by using an extremely low-energy beam of neutral helium atoms to probe sample surfaces. This new instrument will exploit the unique capabilities of the SHeM technique to probe the new science that can be obtained from non-destructive imaging of samples in-situ; including exploring the sub-surface contrast that can be obtained from inelastic scattering processes.	420,347.00	0.00	0.00	0.00	0.00	0.00	420,347.00	
	National Interest Test Statement Imaging is the key to scientific discovery and yet conventional microscopes damage delicate materials and devices; altering the very structures that they are trying to see. However, the scanning helium microscope (SHeM) opens a new window on science; providing completely non-damaging imaging using beams of neutral helium atoms. The development of the SHeM is cutting edge international science, with researchers from the University of Newcastle, Australia and the University of Cambridge, UK collaborating over many years to produce the world's first atom beam imaging instruments.The BioSHeM is the next generation of atom-beam microscope; delivering a new imaging tool tailored for the biological and material sciences that urgently need non-destructive imaging instruments. The BioSHeM will enable, for the first time, the imaging of delicate materials, structures and devices without the observation influencing their operation or function.								
	The University of Newcastle	420,347.00	0.00	0.00	0.00	0.00	0.00	420,347.00	
The University of Sydney									
LE220100060 Payne, Prof Richard J	**Australian Peptide Display Facility** The aim of this project is to develop a globally unique facility for the discovery of bioactive peptides for application in the chemical and biological sciences and industry. We expect to build an integrated technology platform for the identification, synthesis, purification and confirmatory testing of such molecules with unprecedented speed and efficiency. The intended outcome is the establishment of a national peptide display facility that will be accessible to all Australian researchers, leading to enhanced capacity to discover bioactive molecules for a range of applications. This should provide economic benefits through commercial development, including the discovery of new agricultural products.	772,676.00	0.00	0.00	0.00	0.00	0.00	772,676.00	CSL BEHRING (AUSTRALIA) PTY LTD
	National Interest Test Statement The discovery of bioactive molecules represents a crucial first step in the development of new medicines and agrichemicals that provide enormous benefit to humanity. Current discovery approaches, such as those used in the pharmaceutical and biotechnology industry, are relatively slow and inefficient. This project will integrate new specialised scientific equipment with existing infrastructure to establish an automated platform capable of identifying, synthesising and validating such molecules faster and more efficiently than any other approach currently available. The national peptide display platform that we will establish with this cutting-edge instrumentation will position Australia at the forefront of molecular discovery science, providing immediate commercial benefits with diverse, longer-term outcomes ranging across areas of economic, health, environmental and social importance.								

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LE220100114 Bilek, Prof Marcela	**Advanced materials synthesis and environmental characterisation facility** This facility combines advanced materials synthesis, in-situ characterisation, and a capability to study materials' structure and composition when exposed to a range of operating environments. The controlled environment characterisation system, unique and first-of-its-kind in Australia, is underpinned by a revolutionary differential pumping technology to enable X-ray photoelectron spectroscopy at pressures far above UHV. It will provide researchers the capability of performing measurements under conditions that simulate both expected operating and extreme environments to support the development of high-performance materials, ranging from biomaterials/sensors, catalysts, photonic, electronic and energy-storage materials, to pharmaceuticals.	1,040,375.00	0.00	0.00	0.00	0.00	0.00	1,040,375.00	
	National Interest Test Statement This state-of-the-art facility will support dozens of research programs ranging from biomaterials, sensors, catalysts, photonic, electronic and energy-storage materials. It will enhance and enable domestic and international research collaborations by implementing new cutting-edge materials development with great potential to solve global challenges and improve our lives. It will aid in understanding and modeling the growth and subsequent transformation processes under environmental conditions of a variety of thin film materials. The fundamental atomic-scale knowledge of surface physics will help to design next-generation, high-performance devices that are optimised for robustness in operation. This equipment enables the chemical analysis of interactions between gases/liquids and surfaces with crucially important implications in many fields ranging from biological and catalytic systems to construction materials. With the capability of operating in the near ambient pressure regimes, it also offers an entirely new opportunity to investigate biological materials and processes.								
LE220100130 Ho-Baillie, Prof Anita W	**Versatile laser processing system for multi-disciplinary research** This project aims to meet the growing needs for laser-assisted material processing and device fabrications supporting multi-disciplinary research at multiple institutions. The unique multi-wavelength pulsed and continuous wave laser system will provide additional capacity and capability expanding material systems processable especially organics and hybrid materials for laser-assisted surface cleaning, ablation, doping, and crystallization for optoelectronic, photonic, biomedical and carbon fibre reinforced plastics research. The system will support existing and future fundamental and applied research and industry projects benefitting Australia via research training and by boosting capacity for advanced manufacturing.	480,000.00	0.00	0.00	0.00	0.00	0.00	480,000.00	
	National Interest Test Statement The laser system will expand laser manufacturing capabilities in Australia meeting growing demands for new applications and new device designs that require small feature size, fast scanning, large substrates, use of different types of lasers for a multi-step-process and organic and hybrid materials. The latter is particular important as many existing systems only cater for inorganic materials. Its strategic placement within the Australian National Fabrication Facility (ANFF) will make the system highly accessible to research community at large and will accelerate process developments where existing up-stream and downstream processing equipment are also housed in the same Facility. The expected outcomes include i) novel low cost fabrications of various types of Si-based tandem solar cells, high efficiency perovskite solar modules, flexible LEDs, Si-based modulators for microwave photonics ; ii) advanced surface cleaning for composite materials; iii) pattern-on-demand quantum dot opto-electronic devices; iv) advanced brain-on-chip devices; and v) polymer-free glass bonding.								

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LE220100157	**Investigating biological processes in tissues by spatial profiling**	535,000.00	0.00	0.00	0.00	0.00	0.00	535,000.00	
Molloy, Prof Mark P	This project will establish a new system for spatial profiling of protein and gene activity in tissues to advance research in the life-sciences. Spatial profiling enables more refined understanding of biological processes in tissues by recognising patterns of gene expression and proteins at defined tissue locations. This addresses the limitations of conventional gene and protein profiling methods that produce averaged data which fails to consider the discrete spatial organisation that occurs within tissues. The project will support investigators from numerous disciplines of molecular biosciences, neuroscience, bioengineering, plant biology and bioinformatics and train the next generation of research students in this technology.								
	National Interest Test Statement								
	Life-science researchers investigate biology through large-scale analysis of the activity of genes and proteins. This project will deploy innovative new technology to understand what genes and proteins are driving biological processes in the context of spatial organisation within tissues. These studies will provide new fundamental understanding of cell biology processes occurring in tissues, knowledge that is relevant to Australia's scientific community. Outcomes of this knowledge are used by Australian academic and industrial researchers in broad discipline areas including biological research, medical research, bioengineering and agriculture. Applied research using knowledge of spatial biological processes has potential for commercial use and subsequent societal benefit. Examples include the design of new diagnostics and improved agricultural products with higher yields.								
LE220100182	**Metallurgical Facility for Solid-State Additive Manufacturing**	851,607.00	0.00	0.00	0.00	0.00	0.00	851,607.00	COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION, AUSTRALIAN NUCLEAR SCIENCE AND TECHNOLOGY ORGANISATION
Paradowska, Prof Anna M	This project aims to create a Metallurgical Facility for Solid-State Additive Facility, to radically enhance the Australian capability for Additive Manufacturing. The Facility will revolutionise manufacturing research in Australia, by creating access and opportunity to develop novel materials and procedures via this rapidly growing technology. This strategic facility will give researchers a significant advantage in the development and optimisation of advanced manufacturing and maintenance technologies by providing a state-of-the-art friction-stir 3D printing hybrid manufacturing capabilities with substantial downstream benefits to the civil, transport, automotive, aerospace, mining, oil and gas, defence, recycling and medical industries.								
	National Interest Test Statement								
	Solid-state metallurgical processes are a rapidly emerging form of additive manufacturing. They are time and cost effective and enable processing of alloy systems that are difficult to 3D print using other technologies. This project will create a national metallurgical facility for solid-state additive manufacturing that will significantly enhance Australia's additive manufacturing capability. Leveraging partner organisations' substantial investments in additive manufacturing, this purpose-built solid-state hybrid facility will be unique in the world, and will revolutionise manufacturing research in Australia. Access to comprehensive state-of-the-art capabilities and unique modern manufacturing tools will drive Australian innovations in solid-state additive manufacturing technologies, enabling researchers and industry to develop novel materials and procedures. The application of these technologies to create lightweight structures with exceptional properties will bring substantial downstream benefits across the civil, transport, automotive, aerospace, energy, defence, recycling and biomedical industries.								
	The University of Sydney	3,679,658.00	0.00	0.00	0.00	0.00	0.00	3,679,658.00	

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Approved Organisation, Leader of Approved Research Program	Approved Research Program	Estimated and Approved Expenditure ($)			Indicative Funding ($)			Total ($)	Partner Organisation(s)
(Columns 1 and 2)	(Column 3)	2021-22 (Column 4)	2022-23 (Column 5)	2023-24 (Column 6)	2024-25* (Column 7)	2025-26* (Column 8)	2026-27* (Column 9)	(Column 10)	(Column 11)
University of Technology Sydney									
LE220100035 Yang, Dr Yang	**Australian 3D Beam Measurement Platform from Radio Waves to Terahertz Waves** The project aims to establish a unique set of terahertz experimental equipment to support Australia's significant growing interests in terahertz research on functional materials, devices, metamaterials, security scanning, biosensing and imaging. The proposed infrastructure is the only in Australia probing the frequency band ~500 GHz using a software-defined automation platform for planar, cylindrical or spherical scans of terahertz beams. The proposed facility will lay the foundation for future large-scale cooperative initiatives by the seven-university alliance and their collaborators in the national terahertz community. The project should boost terahertz applications in security screening, biomedical imaging, high-speed data transmission. **National Interest Test Statement** The seven universities and their broader networks demonstrate the impact of the proposed facility and the associated benefits to a substantial research community in Australia. Terahertz radiation is an under-utilised region of the electromagnetic spectrum. There is a global surge of interest in this sort of radiation, with developments in terahertz science and technology now regularly reported from around the world. The open-access automation facility will be the first in Australia for cutting-edge terahertz measurement for next-generation imaging and sensing. The facility will drive richer collaborations in areas such as new materials characterisation, biomedical imaging, sensing and communications, affecting new users who are yet to tap into the benefits of terahertz. The requested facilities will provide Australian researchers with easy access to a state-of-the-art facility. The establishment of the infrastructure will increase the capability and visibility of Australian strength in terahertz research by benefiting from global collaborations for joint publications and research funding opportunities.	520,000.00	0.00	0.00	0.00	0.00	0.00	520,000.00	
LE220100078 Xu, Prof Guandong	**A Secure Smart Sensing and Industry Analytics Facility for Industry 4.0** This project aims at establishing a world-first large-scale experimental facility to enable research in the area of Edge computing, Smart Sensing and Industry Analytics. It will reproduce typical elements encountered in edge computing and Industry 4.0 in a controlled secure environment, enabling research that otherwise is difficult to conduct and reproduce. The facility is expected to be an essential instrument to achieve Australia's leadership on key technologies for Industry 4.0, and to provide Australian research community with a unique platform for large-scale experimentation and evaluation of Industry Analytics. It also serves as a perfect vehicle for the education and training of Australia's next generation of scholars and engineers. **National Interest Test Statement** The rise of new digitalisation technologies, known as Industry 4.0, has called in the research demand in smart sensing and industry analytics, to gather and analyse data across industry processes, enabling more flexible, efficient and optimal processes at reduced costs. There is an urgent need to create a unique research facility to stimulate advanced experimental research and realistic assessment on the involved technologies of the Internet of Things, Distributed Computing, Cybersecurity, AI and Data Analytics. The proposed research facility will fill the gap of a full suite of experimental infrastructure and offer direct supports to many current and emerging research projects, as well as wider Australian research institutions and industries. It will fall in the national science and research priority of Advanced Manufacturing, create a major and timely addition to the national research capacity in Industry 4.0, and put Australia at the forefront of this frontier technology, especially for post-covid economic recovery.	538,350.00	0.00	0.00	0.00	0.00	0.00	538,350.00	
	University of Technology Sydney	1,058,350.00	0.00	0.00	0.00	0.00	0.00	1,058,350.00	

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University of Wollongong									
LE220100085	**Scoping the world of ultra-thin film and ultra-high pressure environments**	521,816.00	0.00	0.00	0.00	0.00	0.00	521,816.00	
Wang, Prof Xiaolin	This proposal will establish a unique Australian research facility, a combination of high efficiency Thin Film Thermophysical Property Analyser and a complete package of tools for materials and devices fabrication and characterisation at ultra-high pressures Almax DiaCell. This exceptionally comprehensive and versatile set of tools will foster collaborative activities between participating research organisations supporting breakthrough research conducted by more than 30 researchers across more than 20 ARC and other projects to discover novel unconventional phenomena in topological insulators, superconductors, spintronic materials, low energy devices, one- and two-dimensional micro- and nano-materials, battery, and bio-magnetic materials.								
	National Interest Test Statement								
	Australia has been at the forefront of international multidisciplinary research for many years. Newest technological advances, in quantum computing and renewable energy sectors, have prompted researchers across the globe to concentrate their efforts in finding and understanding key fundamental operating principles of materials and devices in unique environments. The proposed research infrastructure will see the establishment of Australia's first platform for fabrication/characterisation of novel functional materials and devices in ultra-thin film and ultra high-pressure environments. This capacity would enable a large number of Australian researchers to be at the forefront critically important and strategic research, that would allow Australia to be intellectually and technologically competitive in the near future. The development of novel low energy functional materials and devices is presently among key developments that are perceived to bring about enormous economic benefits, such as high power computing and low energy transmission.								
	University of Wollongong	521,816.00	0.00	0.00	0.00	0.00	0.00	521,816.00	
Western Sydney University									
LE220100030	**National Facility for Physical Fire Simulation**	1,213,351.00	0.00	0.00	0.00	0.00	0.00	1,213,351.00	
Tao, Prof Zhong	This LIEF proposal aims to establish a ground breaking national facility for physical fire simulation (NFPFS) that will extend and upgrade existing research capacity in Australia to become world leading. The facility will open new research possibilities and collaborations on the fire resistance of structures and infrastructure, from individual components (e.g. columns, beams) to structural assemblies (e.g. joints, frames). The NFPFS will unite researchers in their endeavours to conduct high-quality research in fire-related disciplines from all Australian mainland states; enhance collaboration with industries and government agencies; and provide research, training and education for this critically important area to the country.								
	National Interest Test Statement								
	Fire disasters (e.g., bushfires) have widespread economic, social and environmental impacts, including life or property losses, and damage or destruction of critical infrastructure and services. The proposed NFPFS facility will play a significant role in developing new fire-resistant construction materials and structural systems, as well as contributing to education and technology transfer. A better understanding of the fundamental behaviour of materials and structures exposed to fire will foster innovations in design and construction that can be incorporated into future performance-based standards. This will safeguard Australian communities from various fire hazards and infrastructure failures. The research by using this facility is also likely to generate innovative technologies for developing cost-effective, environmentally-friendly, and fire-resistant new construction materials and building products, which will greatly benefit the Australian construction and manufacturing industries, promoting local innovation and industrial competitiveness.								

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	Western Sydney University	1,213,351.00	0.00	0.00	0.00	0.00	0.00	1,213,351.00	
	New South Wales	14,351,174.00	306,500.00	306,500.00	0.00	0.00	0.00	14,964,174.00	

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

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(Columns 1 and 2)	(Column 3)	2021-22 (Column 4)	2022-23 (Column 5)	2023-24 (Column 6)	2024-25* (Column 7)	2025-26* (Column 8)	2026-27* (Column 9)	(Column 10)	(Column 11)
Queensland									
Queensland University of Technology									
LE220100025 Glaser, Prof Sebastien	**DynaMix-FM, dynamic mixed reality environment for future mobility** This project aims to establish a new future mobility research facility, named DynaMix-FM, at the Royal Automobile Club of Queensland (RACQ) Mobility Centre of Excellence in Mt Cotton, Queensland. The proposed facility includes an automated vehicle, remote control and supervision equipment. It will support research on new generations of connected and automated transport systems to anticipate the challenges of future transport systems. This future mobility proving ground will provide an innovative framework that integrates the physical testing environment with a digital testing environment, allowing them to be used together to enable the best attributes of each to be applied to solve important issues identified by the transport community.	548,940.00	0.00	0.00	0.00	0.00	0.00	548,940.00	ROYAL AUTOMOBILE CLUB OF QUEENSLAND (RACQ), LICENSYS PTY LTD, TELSTRA CORPORATION LIMITED
	National Interest Test Statement Automated vehicles are key to the future of Australia's transport. This project will establish an innovative future mobility research facility that will accelerate prototyping and testing of automated vehicles for urban applications and remote operation. The facility integrates an advanced mixed-reality and digital twin framework to simulate complex city environments. It enables sophisticated testing within the variability and unpredictability of these environments, including interactions with pedestrians and cyclists. This facility will benefit researchers, regulators and industry by creating a state-of-the-art testbed where future mobility challenges can be identified and resolved safely and efficiently. It will enable end-users across government and logistics, insurance and supply chain sectors to boost their knowledge and competitiveness, enhancing the mobility innovation capabilities of Australian industry and positioning Australia at the forefront of transport research and development internationally.								
LE220100031 Blanksby, Prof Stephen J	**A cyclic ion-mobility mass spectrometer for resolving molecular isomers** Both our fundamental understanding of the natural world and our ability to shape new functional materials depends on our ability to assign molecular structure. Rapid assignment of molecular structures within complex biological or synthetic mixtures and, particularly, the differentiation between closely related structures (i.e., isomers) is a frontier challenge for chemists and biologists alike. The requested infrastructure directly addresses this challenge by making next-generation (cyclic) ion-mobility mass spectrometry available to Australian researchers for the first time. This new capability will drive biomolecular discovery across both plant and animal kingdoms, and accelerate advances in materials science.	630,880.00	0.00	0.00	0.00	0.00	0.00	630,880.00	
	National Interest Test Statement The requested infrastructure represents a fundamentally new capability for Australian researchers to accelerate the discovery of new biomolecules and functional materials. Research to be supported by this infrastructure seeks to uncover the complex interactions between lipids, proteins and glycans (sugars) that underpin cellular biology. Fundamental discoveries will translate to future applications in human and animal health (including diagnosis and treatment of disease) and plant biology that will advance Australia's biotechnology and agricultural sectors. The accelerated discovery of new, functional materials will have benefits for the environment, through minimising waste and the introduction of smart materials with programmed degradation, and the economy through value adding to Australia's traditional strengths in raw materials production. The instrumentation requested in this proposal will provide unique opportunities for advanced training of the next generation of scientists to power the emerging knowledge economy.								

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(Columns 1 and 2)	(Column 3)	2021-22 (Column 4)	2022-23 (Column 5)	2023-24 (Column 6)	2024-25* (Column 7)	2025-26* (Column 8)	2026-27* (Column 9)	(Column 10)	(Column 11)
LE220100034	**A platform for upscaled demonstration of emerging photovoltaic materials**	817,476.00	0.00	0.00	0.00	0.00	0.00	817,476.00	
Wang, Prof Hongxia	This project aims to establish a platform composed of a suite of essential facilities including a slot-die coater, integrated electroluminescence/photoluminescence/Infrared imaging system, module level solar simulator, climate chamber and an outdoor solar cell test bed, enabling upscaled fabrication and assessment of the commercial feasibility of promising materials for photovoltaics (PV) and other applications. The proposed research infrastructure bridges the critical gap between laboratory research and commercialisation. The expected outcomes of commercially viable high value-add materials will enhance manufacturing capability of Australia in the area of advanced materials and clean energy technologies, generating economic benefits.								
	National Interest Test Statement								
	Making solar electricity more efficient, affordable and reliable is one of the grand challenges in 21st century to address the global issue of climate changes and the increasing demand for energy in society. The proposed research infrastructure offers unique capabilities for demonstration of upscaled fabrication and performance assessment of emerging high value materials for photovoltaics and other applications that promise to deliver cost-effective clean energy in the future. The research infrastructure are urgently needed in the Australian material science communities to push these new materials toward commercialisation, generating direct economic benefits. This project aligns with two of the national Science and Technology Priority Area including “Advanced Manufacturing” and “Energy”, through addressing Practical Research Challenge of “Cutting-edge technologies that will de-risk, scale up and add value to Australian manufacture products” and “New Clean sources and storage technologies that are efficient, cost-effective and reliable” respectively.								
	Queensland University of Technology	1,997,296.00	0.00	0.00	0.00	0.00	0.00	1,997,296.00	
The University of Queensland									
LE220100022	**Solar Photovoltaics forecasting for efficient power management**	475,000.00	0.00	0.00	0.00	0.00	0.00	475,000.00	
Saha, Prof Tapan K	This ARC LIEF aims to establish a Light Detection and Ranging (LiDAR) facility to support leading-edge Australian research in solar power generation management and atmospheric monitoring, bringing together three key topics of the century: renewable power generation, big data and climate change. Real-time monitoring, control and supply/demand forecast for solar power management require not only extensive sensor data from solar plant devices but also accurate and location specific cloud data, with accurate solar forecasts being absolutely critical to securely manage large-scale solar plants. The proposed LiDAR provides powerful, real-time information for short-term and long-term solar forecasting and investigating clear air dynamics.								
	National Interest Test Statement								
	Improved forecasts of solar power generation will assist in the greater uptake of renewable energy into the Australian electricity market grid, hence promoting ways to alleviate the effects of climate change by moving to a less polluting energy supply. This LIEF facility will improve national solar forecasting abilities by using a Light Detection and Ranging (LiDAR) facility to model aerosols, the motion of clouds and to explore how they affect solar radiation and hence enhance the operation of solar technologies. This will be further assisted by string level monitoring of a solar plant to gain insight into the effect of rapid cloud movement on the condition of individual Photovoltaic panels, where LiDAR data will be extremely useful in advanced research efforts.								

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(Columns 1 and 2)	(Column 3)	2021-22 (Column 4)	2022-23 (Column 5)	2023-24 (Column 6)	2024-25* (Column 7)	2025-26* (Column 8)	2026-27* (Column 9)	(Column 10)	(Column 11)
LE220100068 Schulz, A/Prof Benjamin L	**An integrated analytical network for protein characterisation** This proposal aims to provide researchers with complementary tools for in-depth characterisation of proteins and proteomes, including their post-translational modifications. It aims to deliver unparalleled technology to south east Queensland for characterisation and research into proteomics, biomolecular complexes, glycans and glycobiology. The project aims to further strengthen the collaborative cluster of expertise in the region, and provide rapid and targeted response for future emerging research needs. This infrastructure will enhance the collaborative arrangements in protein biology, and provide significant benefits in both fundamental and applied aspects of research in this field. **National Interest Test Statement** The requested infrastructure will support and substantially strengthen existing strengths in south east Queensland in proteomics and systems biology. These research fields are critical for modern fundamental protein and biomolecular research, as well as in quality control in modern industrial agriculture and biotechnology. The application therefore provides substantial economic benefits to the Australian community. The combined expertise at The University of Queensland, Griffith University, Queensland University of Technology and University of the Sunshine Coast make south east Queensland an outstanding location for research and development into fundamental and applied protein and biomolecular biology. The instruments will extend capabilities in south east Queensland for quantitative proteomics and protein characterisation.	727,596.00	0.00	0.00	0.00	0.00	0.00	727,596.00	INTEGRIA HEALTHCARE (AUSTRALIA) PTY LTD
LE220100177 Jak, Prof Evgueni	**Microanalytical Facility Supporting Resources Development and Manufacturing** The project aims to establish a state-of-the-art electron probe microanalysis facility enabling accurate chemical analysis to be undertaken at the micro-scale. It is expected to provide new knowledge and support applied research on a range of natural, synthetic and processed materials that will deeply impact advancements in the fields of metals processing and recycling, Earth and environmental science, and the development of materials for a healthier society. It will support ARC funded and industry engaged research enhancing the minerals exploration, mining and metallurgical industries and inform sustainable practice. It will also provide the key research infrastructure to enhance Australia's research leadership in these fields. **National Interest Test Statement** The proposed research infrastructure will enable the non-destructive chemical analysis of minerals, metallurgical and manufactured samples, which are critical aspects of the Australian economy, providing vital information about how and where they formed and under what conditions. In turn, this will benefit minerals exploration, mining and metallurgical industries through identification of potential new mineral resources, enabling increased efficiency and productivity of these industries. The minerals and metals production sector accounted for over 30% of Australia's export income in 2018, with their supply critical to new technology in sectors as diverse as energy storage and conversion, transportation, the e-economy, and health and medicine. In addition, the research will potentially impact in the design of better performing materials and devices for healthier and cleaner/efficient energy production. The outcomes of the project will support the communities reliant on the aforesaid industries.	1,650,000.00	0.00	0.00	0.00	0.00	0.00	1,650,000.00	BHP BILLITON OLYMPIC DAM CORPORATION PTY LTD, BHP INNOVATION PTY LTD, UMICORE NV
	The University of Queensland	2,852,596.00	0.00	0.00	0.00	0.00	0.00	2,852,596.00	
	Queensland	4,849,892.00	0.00	0.00	0.00	0.00	0.00	4,849,892.00	

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

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		2021-22	2022-23	2023-24	2024-25*	2025-26*	2026-27*		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)	(Column 9)	(Column 10)	(Column 11)
South Australia									
Flinders University									
LE220100179	**SA Spectromicroscopy Facility: From Band Mapping to Atomic Scale Imaging**	405,049.00	0.00	0.00	0.00	0.00	0.00	405,049.00	
Harmer, Prof Sarah L	This proposal aims to establish Australia's first advanced spectromicroscopy facility capable of energy filtered momentum space imaging of advanced materials in real time. The facility will enable the direct correlation between electron band-structure of advanced materials with device function. This is essential for understanding the electron transport in materials including topological insulators and transistors for quantum computers; nanomaterials for energy storage devices and catalysis, and geoscience. The investment will ensure innovation in Nanotechnology, Characterisation, and Advanced Manufacturing that is crucial for Australian to remain competitive in the global market.								
	National Interest Test Statement The Specromicroscopy Facility will provide Australia with a unique world class facility capable of mapping the electronic properties of advanced materials with unprecedented spatial, energy and momentum resolution. This facility is critical for understanding the intrinsic properties of advanced materials and their link with device performance. The facility will build capacity to address key global challenges in Advanced Manufacturing, Energy and Resources. It will enable a highly skilled workforce by training HDR students, post doctoral fellows in world class instrumentation and materials characterisation. The facility will ensure that Australia is at the forefront of advanced materials research for years to come, supporting local companies competitiveness in international markets.								
	Flinders University	405,049.00	0.00	0.00	0.00	0.00	0.00	405,049.00	
The University of Adelaide									
LE220100040	**The Australian Rental Monitor: A Data Infrastructure**	180,000.00	190,000.00	190,000.00	0.00	0.00	0.00	560,000.00	
Baker, Prof Emma	Rental is Australia's emerging tenure. Each year the proportion of Australians who rent increases, many of us will rent for life, and for the first time in generations there are now more renters than home owners. The project will provide researchers and policy stakeholders with the essential data infrastructure on Australia's rental housing conditions that they urgently require - a publicly accessible multi year data resource to monitor housing quality, conditions, and population in the Australian rental sector. Researchers and policy-makers know very little about the rapidly changing conditions in Australia's rental market, and COVID-19 has made the need for this infrastructure all the more important.								
	National Interest Test Statement The project will help to create a more responsive rental sector that is better able to balance the interests of tenants and landlords, enable the expansion of affordable housing, and the development of a more efficient housing market. The rental sector is home to 7 million Australians. It is a tenure of diverse quality, spread across our cities and regions. It is also a tenure that has been dramatically affected by the COVID-19 pandemic. We know, however, comparatively little about this large sector of the Australian housing stock. There is currently no large-scale, ongoing research infrastructure that can be used by policy makers, planners and researchers. This LIEF project responds to this important gap, enriching a previously funded, and highly impactful, ARC LIEF that created a publicly accessible and nationally representative 'snapshot' infrastructure in 2020. This project extends that data infrastructure, establishing an ongoing monitor of our rental sector. It will be available to the Australian research and policy community - across disciplines, states, and universities.								

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LE220100050 Sanders, A/Prof Kate L	**Enhancing the SA Regional Facility for Molecular Ecology & Evolution** This project seeks to enhance and upgrade the equipment of the South Australian Regional Facility for Molecular Ecology & Evolution. SARFMEE has a vital role in South Australia's science community, providing >80 researchers from 6 institutions with state-of the-art genotyping technologies for evolutionary and environmental studies. This project will enable researchers to utilise DNA samples at femtogram levels, resulting in significant outcomes, including fundamental and applied projects to detect, mitigate and manage changes in the environment. This enhanced capacity will also provide significant benefits for students, by providing cutting-edge training that keeps them at the forefront of technological advances in genome sequencing.	361,354.00	0.00	0.00	0.00	0.00	0.00	361,354.00	SOUTH AUSTRALIAN MUSEUM, BOARD OF THE BOTANIC GARDENS AND STATE HERBARIUM, DEPARTMENT OF AGRICULTURE, WATER AND THE ENVIRONMENT
	National Interest Test Statement The new equipment will enhance opportunities for innovative research in basic biology, archaeological, agricultural, biomedical, forensic and environmental sciences, including species delineation and the diagnostics of pest, invasive and illegally trafficked species. SARFMEE has operated successfully for 18 years and is the major hub for researchers from across SA and nationally, providing training for students in cutting edge genomic and genotyping analyses, ensuring they keep at the forefront of the rapid technological advances in genome sequencing. Our research is critical for monitoring the nature and extent of environmental change and developing strategies to promote adaptation by species to future climate change, as well as providing the foundation for improving the speed and rigour of environmental impact assessment in the agricultural and mining sectors.								
LE220100144 Spandler, A/Prof Carl	**Mass spectrometry for mass geochronology** This project aims to establish a new facility for developing and applying novel geochronological and geo/biochemical techniques to a diverse range of rock and mineral samples. The new facility consists of a laser ablation micro-sampling unit coupled with the latest generation reaction-cell quadruple ICP mass spectrometer that will allow for rapid and cost-effective collection of elemental and isotopic data. Expected outcomes of the project are an enhanced understanding of Earth evolution over geological time, improved tracing of marine ecosystems, and increased knowledge of the formation and localisation of metal-rich ore bodies needed for modern society.	389,526.00	0.00	0.00	0.00	0.00	0.00	389,526.00	UNIVERSITY OF GOTHENBURG, SWEDEN, BHP MINERALS PTY LTD
	National Interest Test Statement This analytical facility will provide cost-effective and rapid measurement of elements and isotopes in a variety of samples down to the sub-millimetre size. The facility will allow Australian scientists to develop new methodologies and applications for resolving the age and evolution of the Australian continent, and for tracing the origins of metal-rich ore deposits and marine organisms using chemical records of minerals. These innovations represent a once-in-a-generation opportunity to become world leaders in this emerging research field. Economic and social benefits include enhanced success in the discovery of new orebodies needed to supply metals for modern society, and better understanding and management of terrestrial and marine ecosystems.								
	The University of Adelaide	930,880.00	190,000.00	190,000.00	0.00	0.00	0.00	1,310,880.00	
	South Australia	1,335,929.00	190,000.00	190,000.00	0.00	0.00	0.00	1,715,929.00	

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

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Tasmania									
University of Tasmania									
LE220100089 Chase, Prof Zanna	**HydroBox: A containerised hydrochemistry lab for Australian oceanography** This project aims to deliver a portable, sea-going laboratory for the analysis of ocean salinity, dissolved oxygen and dissolved nutrients to high analytical standards. The expected outcomes include a vast increase in the capacity to accurately measure these Essential Ocean Variables in the waters around Australia, in particular around Antarctica and the Southern Ocean, new opportunities for international collaboration and improved training of Australian students in sea-going oceanography. Significant benefits include the ability to detect early impacts of climate change on physical, chemical and biological ocean processes, and solidification of Australia's world leading status in the field of hydrochemistry.	552,086.00	0.00	0.00	0.00	0.00	0.00	552,086.00	COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION, AUSTRALIAN ANTARCTIC DIVISION
	National Interest Test Statement This project aims to produce a portable, sea-going laboratory for the measurement of some of the most important chemical constituents of the ocean, namely salinity, dissolved oxygen and dissolved nutrients. These measurements are essential for tracking the impact of climate change on the physical and biological processes in the ocean around Australia, including the Southern Ocean. there is no portable hydrochemistry laboratory available to Australian researchers. Potential economic impacts include early warning of significant ecosystem shifts with the potential to alter fisheries and sea-level. The project will build the sea-going technical workforce in Australia, minimising reliance on international recruitment. A Tasmanian Aboriginal artist will be commissioned to develop the exterior design of the container to maximise the potential for public engagement with marine and Antarctic science and aboriginal culture and communities.								
	University of Tasmania	552,086.00	0.00	0.00	0.00	0.00	0.00	552,086.00	
	Tasmania	552,086.00	0.00	0.00	0.00	0.00	0.00	552,086.00	

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

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Victoria									
La Trobe University									
LE220100185	**A flow cytometry suite for multiscale biosorting**	675,000.00	0.00	0.00	0.00	0.00	0.00	675,000.00	
Humbert, Prof Patrick O	The proposal aims to establish a state-of-the-art flow cytometry suite that will allow for the first time in Australia at one site, the separation of the broadest range of sizes of biological samples from viruses, to plant seeds and animal embryos. The flow cytometry suite will include three cutting edge flow cytometers (i) a 2 laser Union Biometrica BioSorter large particle flow cytometer for large objects (eg embryos); (ii) a 5 laser BD Biosciences FACSAria Fusion cell sorter with FSC PMT for small to mid-size objects (eg cells), (iii) a 2 laser NanoFCM flow nanoanalyzer for the smallest biological objects (eg viruses, vesicles). These new broad capabilities will support research in agricultural, veterinary and microbiological sciences.								
	National Interest Test Statement Flow cytometry is an essential tool for biological research that allows the identification and separation of mixed complex biological populations through rapid laser-based detection and fluid flow sorting of biological entities. The recent development of new instrumentation has dramatically expanded the range of size and nature of organisms that can be analysed by flow cytometry from extremely small (eg virus and bacteria) to comparatively large (eg plant seeds and animal embryos). The biosorting flow cytometry suite of instrumentation will provide Australian researchers with a competitive edge in a broad range of basic and strategic research disciplines including in the agri-biosciences (e.g. enhanced nutritional quality of grains), marine biology (e.g. biodiversity and animal physiology), microbiology (e.g. antibiotic resistance and parasitology) and biomedicine (e.g. biomarker identification for cancer and neurodegeneration, in vitro blood production).								
	La Trobe University	675,000.00	0.00	0.00	0.00	0.00	0.00	675,000.00	
Monash University									
LE220100138	**Advanced lattice light sheet microscope optimised for biological imaging**	800,000.00	0.00	0.00	0.00	0.00	0.00	800,000.00	
Lieschke, Prof Graham J	This project provides a lattice light sheet microscope optimised for biological applications and user utility. Lattice light sheet microscopy combines optical, physical and technical attributes that achieve high spatio-temporal resolution imaging of biological specimens for long periods with minimal phototoxicity, making practical for the first time high-resolution longitudinal volumetric analyses of living specimens. It is suitable for imaging cultured cells, organoids, small embryos, and small model organisms such as zebrafish larvae at cellular and subcellular resolution. Expected outcomes are high impact discoveries, training opportunities, international collaborations and publications addressing fundamental questions in biology.								

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	National Interest Test Statement Lattice Light Sheet Microscopy is a cutting edge imaging technology that for the first time permits researchers to undertake longitudinal volumetric imaging of biological specimens with minimal phototoxicity. This will allow Australian cell and developmental biologists to make fundamental discoveries about cellular processes, mechanisms, and biomechanics. This transformative imaging technology will generate national training opportunities in biology, and encourage new collaborations in computational image analysis and data management of large imaging datasets. There will be a direct impact on the development of new potentially patentable Australian-made intellectual property encompassing basic biological processes, the cellular responses to drugs and genetic lesions, developmental processes involved in embryogenesis, tissue repair, inflammation, stem cell biology and organ regeneration. In summary, this project will help to drive a diverse portfolio of Australian innovation in basic biological research.								
LE220100140 Egan, Prof Gary F	**Near Infrared Fluorescence and Photoacoustic Imaging Facility** This grant will establish a multi-institutional near infrared fluorescence and ultrasound photoacoustic imaging facility. The Facility will accelerate the development, characterisation and evaluation of new and emerging nanomaterials for a diverse range of applications, utilising fluorescent and photoacoustic imaging systems. Nanotechnologies including optical nanosensors, novel nanomaterials with tuneable quantum yields, and multi- modal imaging agents will enable discovery investigations of bio-nano interactions and bio-distribution interactions of nanomaterials in rodent models. The Facility will provide significant community benefits through the development of highly innovative bioimaging, biosensing and drug delivery tools.	699,691.00	0.00	0.00	0.00	0.00	0.00	699,691.00	
	National Interest Test Statement The Near Infrared Fluorescence and Photoacoustic Imaging Facility will be Australia’s first research facility dedicated to photoacoustic and near infrared imaging and spectroscopy of nanomaterials, devices and biological specimens. The Facility will provide equipment for ultrasound, photoacoustic and NIR characterisation of nanomaterials in discovery research using phantoms, cell culture specimens, and animal models. The equipment will lead to the development of optical nanosensors and multi-modal imaging agents, the discovery of novel nanomaterials with tuneable quantum yields, and for investigations of bio-nano interactions and bio-distribution interactions in nanobiotechnology research. The research that will be supported by the Facility will achieve a deeper understanding of the extracellular and intracellular behaviour of nanoparticles to increase drug efficacy and lead to the development of new multi-modal nanoparticle imaging agents. Research using two dimensional materials with unique optical properties, such as phosphorene will provide unique to develop and test new multimodal imaging agents.								
LE220100165 Preuss, Prof Michael	**An in-situ and multiscale scanning electron microscopy suite** This project aims to establish a purpose-build in-situ scanning electron microscope for imaging during testing macroscopic samples together with a second microscope for correlative high magnification analysis. This unique facility is expected to create new knowledge and understanding of evolution of materials and devices during processing and performance. Expected outcomes are the development and better utilisation of materials for a range of applications. This should benefit research in many disciplines such as physics, chemistry, geology, materials, mechanical, civil and chemical engineering and provide societal impact for the environmental, transport and energy sector.	2,020,000.00	0.00	0.00	0.00	0.00	0.00	2,020,000.00	
	National Interest Test Statement In order to evaluate and improve materials we test and characterise them. The separation of these two things has hampered our ability to truly understand how materials perform in the environments they have been designed for. We will overcome this challenge by establishing a laboratory inside a scanning electron microscope, which will allow us to stress bulky samples, expose them to high temperatures and/or gases while we image and watch changes that take place as a result of the testing. We will also use the set up to watch how structures of materials develop during processing, which is related to manufacturing. At the same time, we will also be able to drill deeper into understanding the physical mechanisms that are responsible for our in-situ observation and with this we will develop new knowledge that can help us to use material better or develop new materials. This will ultimately help us in tackling some of the grand challenges we are facing as many of those require better and longer lasting material solutions.								

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	Monash University	3,519,691.00	0.00	0.00	0.00	0.00	0.00	3,519,691.00	
Swinburne University of Technology									
LE220100057 Swalwell, Prof Melanie L	**The Australian Emulation Network: Born Digital Cultural Collections Access** This project aims to conserve and render born digital artefacts widely accessible by establishing an Australian Emulation Network. High value cultural collections from university archives and the GLAM sector requiring legacy computer environments will be targeted. The project expects to generate new knowledge across media arts, design, and architecture. Expected outcomes include stabilising and providing researchers with emulated access to born digital cultural artefacts, sharing legacy computer environments across the network, and establishing an Australian software preservation community of practice, building skills in preserving and emulating digital cultural artefacts with substantial future applications also in scientific preservation.	576,754.00	174,969.00	0.00	0.00	0.00	0.00	751,723.00	LIBRARY BOARD OF VICTORIA, AUSTRALIAN CENTRE FOR THE MOVING IMAGE, ART GALLERY OF NSW, MUSEUM OF APPLIED ARTS AND SCIENCES
	National Interest Test Statement The Australian Emulation Network will deliver cultural benefits to researchers, galleries, libraries, archives and museums (GLAM) organisations, and the community at large. A national, cross-sector consortium will assemble 'end-to-end' software preservation infrastructure in Australian university and cultural institutions. The project leverages collective effort and investment to build nationally significant digital infrastructure, rendering digital cultural heritage accessible. Through a combination of technical infrastructure, collaboration and human knowledge transfer, the project will deliver software preservation and emulation capabilities across 6 of the 8 states and territories, with potential for expansion. The project will help to ensure that Australia's cultural heritage that resides in digital records across arts, cultural and indigenous organisations is not lost.								
LE220100150 Juodkazis, Prof Saulius	**Transportable high-power blue laser for processing of reflective materials** This project aims to setup Australia's first experimental platform based on new high-power blue laser technology. It is expected to generate new knowledge in precision processing of reflective materials which are difficult to treat with current infrared lasers. Expected outcomes include improved techniques not only in additive manufacturing (AM) by wire arc or direct energy deposition, but also non-AM areas such as recycling, surface modification, joining, hybrid laser assisted technologies. Expected benefits include savings in energy and materials usage via innovations in applications of strategic metals (e.g. nickel for high temperature and corrosion resistance; copper for electrification, anti-fouling; or aluminium for light weighting).	320,000.00	0.00	0.00	0.00	0.00	0.00	320,000.00	COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION
	National Interest Test Statement The proposed blue laser facility is the first of its kind in the southern hemisphere. It will be capable of processing materials with drastically greater energy efficiency than high-power infra-red lasers that are commonly used today in the fabrication of many industrial metal products. The facility will allow us to study current and future advanced alloys and processing routes, especially metals of strategic importance to Australia, such as aluminium, titanium, copper, nickel and magnesium. With the blue laser, one of the major innovations for these metals is to overcome their high reflectivity for minimal thermal, chemical and/or mechanical processing to achieve novel properties, savings in energy and materials usage, and short lead times. The outcomes of this research will support the development of existing and new modern metal manufacturing industries in Australia.								
	Swinburne University of Technology	896,754.00	174,969.00	0.00	0.00	0.00	0.00	1,071,723.00	

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The University of Melbourne									
LE220100010 Thieberger, A/Prof Nicholas	**Modularised cultural heritage archives – future-proofing PARADISEC** This project will build an innovative modularised infrastructure to implement standards of data governance for cultural heritage records. This new infrastructure aims to build on the award-winning Pacific and Regional Archive for Digital Sources in Endangered Cultures collection and to capitalise on new technologies for metadata harvesting, temporal mapping, crowdsourced metadata, and automated transcription. The project expects to promote national and international research collaboration with Australian archiving communities and to build capacity in Pacific cultural institutions. The project will benefit research data communities across the sector as well as community custodians of cultural heritage collections.	400,000.00	220,000.00	0.00	0.00	0.00	0.00	620,000.00	
	National Interest Test Statement The material held in PARADISEC is uniquely Australian, either because it is a record of Australian cultural performance, or because it is made by Australian researchers. A large part of the collection (of 120 terabytes) is audio recordings from the Pacific region and enhances Australia's standing by looking after and making available recordings made in the past. We have safeguarded this cultural heritage for 18 years and developed relationships of trust with agencies in the Pacific. The current infrastructure is at the end of its life so there is an urgent need to update this internationally recognised project and to ensure it continues to ingest new material, and to make that material accessible. This will allow better access for both research purposes and community interest in their heritage languages. We are leading an international effort to create a modern set of metadata terms for collections like ours in the Open Language Archives Community (OLAC) , and to build a harvester to aggregate that metadata into a single service, showing that we are world leaders and partners in international initiatives.								
LE220100073 Cassidy, Prof Mark J	**A geotechnical centrifuge to underpin Australia's energy and construction** This proposal aims to establish a geotechnical centrifuge capable of spinning soils and scale-models at up to 130 times Earth’s gravitational acceleration to recreate in-situ stress conditions. The 4 m diameter centrifuge will allow modelling of large geotechnical infrastructure in challenging environments, such as offshore wind foundations and tunnels, where full scale tests are prohibitive. The facility will afford Australia’s leading geotechnical engineering groups with essential physical modelling capability. This will facilitate safe, innovative and economic engineering solutions to unlock new energy resources and construct the $250 billion of planned infrastructure to support Australia's fast-growing cities in the coming decade.	386,000.00	546,000.00	0.00	0.00	0.00	0.00	932,000.00	
	National Interest Test Statement Australia is expected to spend over $250 billion in civil engineering infrastructure in the coming decade, the vast majority located on challenging ground conditions. Full scale tests of these infrastructures are prohibitive, and the proposed geotechnical centrifuge facility is required to test scaled models under realistic loading conditions. This will be achieved by spinning intricately prepared soil samples and scaled models at accelerations up to 130 times that of Earth’s gravity. The new centrifuge will provide innovative engineering solutions to meet Australia’s geotechnical construction challenges, including offshore energy foundations built in extreme environment and rails and roads on ultra-soft soils. This will provide essential reliable and economic design for the energy and construction industries to build critical infrastructure for fast growing cities in Australia. The project will produce high quality engineers trained on next generation equipment, and keep Australia at the forefront of geotechnical engineering research and construction.								

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LE220100103 Toffoli, A/Prof Alessandro	**An autonomous sea state monitoring system for Australia's research fleet** The project will deliver an innovative shipborne multi-camera infrastructure for autonomous monitoring of physical, thermodynamical and biogeochemical properties of the ocean surface. The infrastructure will empower systematic measurements of the remote and under-sampled Southern Ocean, including properties that are currently not monitored or rely on visual observations only. Unprecedented databases of ocean waves, surface currents, surface temperature, sea ice characteristics and biological properties are expected, which will support development of superior model capabilities to represent interactive processes, advancements of climate models and domestic and international responses to climate change.	328,389.00	0.00	0.00	0.00	0.00	0.00	328,389.00	AUSTRALIAN ANTARCTIC DIVISION, COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION, PIVOT MARITIME INTERNATIONAL PTY LTD
	National Interest Test Statement Australia’s climate is vulnerable to changes in the Southern Ocean. Earth System models are our sole means of predicting the future climate and informing mitigation and adaption policies. Advances in understanding the complex Southern Ocean system, including the key physics coupling the atmosphere, sea ice and ocean, are critical for more accurate model predictions. The project will be a multi-institutional collaboration to fill key technological gaps in observing the atmosphere–sea ice–ocean interface, delivering innovative measuring equipment for the flagships of Australia's research fleet. The infrastructure comprises a cluster of imaging sensors that scan the ocean surface from the visible to the infrared range of the light spectrum to acquire unprecedented data of physical, thermal and biological processes. It will be foundational for the next generation of climate models.								
LE220100104 Sheehy, Dr Suzie	**X-LAB beamline: accelerating applied research with tunable electron beams** This project aims to realise the first ultra-compact particle accelerator in Australia by adding a beamline and user end-station to the X-LAB. The aim is to transform technology which originated for particle physics into a facility producing tailored electron beams for both proof-of-principle high-tech applications and research. Applications range from physics to biology and from industrial processing to cultural heritage. This cutting-edge technology is 5-8 times smaller than existing systems, so the project aims to catalyse research which could transform societal applications, leading long-term to smaller, lighter accelerators for use in high-tech factories, hospitals, ports and mining sites, comprising a market worth $6.4B per year.	391,000.00	0.00	0.00	0.00	0.00	0.00	391,000.00	ANSTO
	National Interest Test Statement Australians benefit every day from particle accelerators: from security scanning systems at ports, materials modification in factories, radiotherapy systems in hospitals to analysis of artworks for cultural heritage. Innovative breakthroughs in particle accelerators and their end-use applications are essential to Australia's advancement as a knowledge economy, its future health and industrial competitiveness. Accelerators comprise a market estimated at ~$6.5 Billion/year and growing at ~4% per year. Until now, Australia has lacked the capacity to develop novel accelerators for end-user research to deliver innovative breakthroughs for societal benefit, because this research required travel abroad to relevant infrastructure. With this project we aim to establish a unique electron beamline to transform Australia’s innovation potential in the design and use of next-generation particle accelerator technology, enabling breakthroughs in biology, medical technology and other industries. This infrastructure underpins research programmes at leading Australian universities as well as existing industry partners.								

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

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LE220100107 DeGier, Prof Jan	**MATRIX: enhancing access to global research in the mathematical sciences** This project aims to improve access to MATRIX, a comprehensive national residential research facility that enables access to world leading researchers in the mathematical sciences. MATRIX advances knowledge by facilitating exceptionally creative and impactful research through immersive residential research programs, which are selected on international excellence and impact criteria. This application requests new technology to enhance remote collaboration opportunities, and a subscription co-contribution to improve coordinated access for Australian based researchers. This project will contribute to the transformation of international and economic impact of Australian based research in the mathematical sciences.	347,000.00	0.00	0.00	0.00	0.00	0.00	347,000.00	
	National Interest Test Statement Modern economic activity is strongly underpinned by mathematics and statistics. Calculus has provided tools to measure and understand change, enabling humans to predict weather, drive cars and launch spaceships. Hyperbolic geometry was considered ivory-tower and abstract, but is now used to enable space travel and correct for relativistic effects in GPS tracking. More recently, linear algebra allowed Google's PageRank algorithm to outperform all other search engines. Today, cyber-security is enabled through highly advanced number theory, partial differential equations are used to enhance decision-making in health care, and statistics underpins all advances in AI and machine learning. Enhanced access to research performed at the MATRIX infrastructure is vital to benefit from new global developments in the mathematical sciences and ensure adequate domestic STEM capability and preparedness for the future economy. Through its global reach, MATRIX has a unique window of opportunity to firmly establish Australia as a leader in the mathematical sciences and STEM more generally in the Asia-Pacific region.								
LE220100132 Klewicki, Prof Joseph C	**A facility to produce and quantify accelerated flow mixing at high fidelity** The Rayleigh-Taylor Mixing Facility will produce data needed to advance technologies allied to the instabilities and mixing that occur when a lighter fluid is accelerated into a heavier fluid. Its design integrates a host of existing high-resolution measurement technologies, allowing for the acquisition of globally unique data sets. Expected outcomes include the missing capacity to study problems having relevance to applications in geophysics, atmospheric dynamics, thin film deposition, combustion and inertial confinement fusion. Benefit derives from preemptively capturing a world-leading capacity for technology development via theory guided generation of unique data sets that advance design and prediction in the noted applications.	466,000.00	194,000.00	0.00	0.00	0.00	0.00	660,000.00	NEW YORK UNIVERSITY
	National Interest Test Statement A number of important scientific questions and existing and emergent technologies are associated with the acceleration of a lighter fluid into a heavier fluid. In this regard, the proposed Rayleigh-Taylor Mixing Facility (RTMF) will provide the unprecedented precision control and measurement capabilities needed to advance the associated technologies beyond their current state. Rayleigh-Taylor instability and mixing are phenomena intrinsic to a host of geophysical, environmental and industrial processes, as well as a number of defense-related technologies -- either existing or currently under development. Because of its unique capabilities the RTMF seizes upon an unmet technological need, and by doing so provides the opportunity to elevate Australia to an international leadership role in this important area of fluid dynamics, and thus in the associated scientific issues and technologies as well.								
	The University of Melbourne	2,318,389.00	960,000.00	0.00	0.00	0.00	0.00	3,278,389.00	
	Victoria	7,409,834.00	1,134,969.00	0.00	0.00	0.00	0.00	8,544,803.00	

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Western Australia

The University of Western Australia

LE220100153	**Equipment for research on future gravitational wave detectors**	385,000.00	0.00	0.00	0.00	0.00	0.00	385,000.00	
Zhao, Dr Chunnong	Five years ago Australia played a key role in the first detection of gravitational waves, that opened a brand new form of astronomy and detected the most powerful energy outbursts ever observed in the universe. The 70 gravitational wave signals now detected tell us there is a huge population of black holes to be discovered if sensitivity can be increased. This project builds on Australia's investments in measurement science by providing special lasers and cryocoolers that will allow development of revolutionary new techniques for amplifying gravitational wave signals and reducing noise by manipulating the ways that sound and light interacts.								

National Interest Test Statement

Gravitational waves have allowed us to hear the dark universe, and make unexpected discoveries. Cryogenic techniques promises dramatic sensitivity improvement which will result in more surprising discoveries. This facility will provide a testbed for technology required for this leap in sensitivity. White light signal enhancement and high power cryogenic silicon optics will be demonstrated using these facilities. Our frontier research will generate high impact results and global interest from scientists and industry. To succeed, challenging components will be custom-built using advanced manufacturing in local industries, industry partners and universities. Quantum opto-mechanical devices, cryogenic and nanolayer coatings and characterisation of high purity cryogenic silicon will generate commercially interesting results. Gravitational-wave research has a long enduring history of producing spin-off technology that provides benefit to the economy. The facilities will provide training opportunities with world-class instruments, and prepare young researchers in Australia to compete on the world stage.

The University of Western Australia	385,000.00	0.00	0.00	0.00	0.00	0.00	385,000.00
Western Australia	385,000.00	0.00	0.00	0.00	0.00	0.00	385,000.00
	29,869,884.00	**2,245,388.00**	**496,500.00**	**0.00**	**0.00**	**0.00**	**32,611,772.00**

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