RMIT UNIVERSITY Vice-Chancellor's Research Fellowships

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2025 Strategic Research Priority Areas & High-Priority Topics

We live in a world that is undergoing great change and uncertainty. Over the next decade, we will live and work through complex challenges in climate, security, inequality, health and wellbeing, technological revolutions, and emerging social movements. RMIT University is committed to work with our partners and communities to find new solutions and apply transdisciplinary approaches to help society, the environment, and the economy, navigate these challenges.

The RMIT Vice-Chancellor's Research Fellowship program aims to provide researchers from all backgrounds an opportunity to flourish whilst making a positive real-world impact. If you value building connections between different people and skills, seek to make a genuine difference to Australia and the world through your research, and can demonstrate creativity and imagination in your approaches, we encourage you to apply for an RMIT Vice-Chancellor's Research Fellowship.

There are three areas of research focus for this recruitment round: Regenerative Futures, Digital Innovation, and MedTech Innovation. Under each of these overarching research areas, specific high-priority topics are provided to focus your application on for this recruitment round.

Appointment of Vice-Chancellor's Research Fellows will be on merit, taking into account strong alignment with the areas of research focus and high-priority topics, and capability for impact linked to one or more of RMIT's Enabling Impact Platforms.

1. Regenerative Futures

Regenerative futures moves knowledges and practices beyond a sustainability framing to advance and accelerate societal efforts to restore, renew, reconstruct and revitalise human, ecological and material systems for inhabitable planetary futures. At RMIT researchers are building visionary inter-disciplinary approaches to regenerative futures across the fields of technology, design, enterprise and society.

The effort is oriented towards inclusion and justice, located in places on First Nations country, and centred on collaboration and partnerships with diverse stakeholders. Such collaborative approaches imply new approaches to local and planetary civics that can transform the structures and processes that shape how we govern our entangled planet.

(R1). Regenerative Fashion Systems

We are seeking a research leader to lead research that contributes to systemic change towards textiles and clothing regenerative futures. Able to work across disciplines from social science and policy, STEM and design/creative practice, and develop evidence-based solutions for the fashion and textile sector to transition toward sustainable, restorative, and resilient supply chains. This includes governance systems based on mutually beneficial relationships and reciprocity, alternatives to extractive economic models, and frameworks that recognise the interconnection between human and ecological systems.

(R2). Public Policy Modelling

We are seeking a dynamic and driven researcher with expertise in epidemiology, systems modelling, and policy scenario simulation to strengthen RMIT's capability across disciplines in

biomedical and health innovation and social change. This role will contribute to innovative projects at the intersection of public policy and social justice. With a strong foundation in quantitative and computational methods and experience applying systems thinking to complex health and social challenges, the Fellow will be responsible for designing policy models, analysing data, and translating findings into policy-relevant insights.

***(R3).* Regenerative Low-Cost Renewables**

This high-priority topic is focused on energy microgrid expertise for urban futures and sustainable technology and systems. We are seeking a researcher with experience of designing and managing microgrid application in low-income contexts and/or across the Pacific/global south. The expertise sought will be applicable to a wide range of electrification and grid decarbonisation needs, including across urban and regional contexts, working in interdisciplinary teams with electrical and civil engineers, social scientists, construction managers, and building scientists.

***(R4).* Regenerative Design and Urban Governance**

This high-priority topic is focused on research excellence in design leadership, including design for social innovation, entrepreneurialism and innovation management for regenerative futures. With a disciplinary base in design, thematic areas of focus will be design-led innovation, entrepreneurialism, the creative economy, public policy and governance for regenerative futures. This includes environmental, social and economic impacts of the creative economy, and could include relationships to Indigenous sovereignties and Treaty-making. Alternatively, applicants focused on research excellence in questions of climate justice and urban governance are welcome

***(R5).* Regenerative Food Technologies: Sustainable Production from Soil to System**

Based in RMIT's Food and Nutrition Innovation hub, the focus of this high-priority topic is on applying physical sciences and Engineering principles to revolutionise food production in a sustainable approach. Research includes the development of precision fermentation; precision farming enabled by advanced sensing technologies and robotics; food ingredient characterisation and recovery; use of AI systems in food product innovation; sustainable nutrient cycling systems and bioprocessing. With an emphasis on science, biophysics, and nutrition, projects could investigate how to design and deploy scalable food production technologies that reduce environmental degradation, promote biodiversity enhancement, improve consumer nutrition, increase resilience to climate stressors, or promote closed-loop systems for nutrient and energy flows. This includes perspectives on Australian, Vietnam and ASEAN food systems. The goal is to build regenerative food technology systems that are advanced, ecologically harmonious, restorative, and resilient in the face of global change.

***(R6).* Circular Engineering: Designing for a Regenerative Economy**

This high-priority topic aims to develop engineering solutions that support a circular economy, minimising waste, and promoting the continual use of resources. Research may involve designing products and systems for disassembly and reuse, developing sustainable materials, creating technologies that facilitate resource recovery and recycling, implementing green processes, and applying modular construction techniques for adaptable systems. The goal is to engineer systems that not only reduce environmental impact but also contribute to economic regeneration.

***(R7).* Clean Energy Materials and Devices: Engineering the Transition to Net-Zero**

This high-priority topic is focused on research in next generation energy materials and device architectures for renewable generation, storage, and conversion. Projects may focus on thin-film photovoltaics, solid-state batteries, hydrogen production via electrolysis, or thermoelectric systems, power electronics for renewable energy systems (including offshore renewable energy systems like wind platforms and floating solar arrays), intelligent control for smart grids and resilient microgrids, and materials/strategies for the electrification of transport and industry. With foundations in

materials engineering, nanotechnology, and applied physics, the goal is to accelerate the energy transition through scalable, efficient, and circular energy solutions that regenerate rather than deplete planetary systems.

(R8). Next-Generation Materials and Infrastructure for Climate Resilience and Resource Recovery

This high-priority topic focuses on engineering future-ready infrastructure and materials systems that are both climate-adaptive and resource-efficient. Research may involve the development of infrastructure capable of withstanding extreme weather events - such as flood-resistant buildings, fire-resistant buildings, thermally adaptive materials, carbon-sequestering materials, and resilient transport systems, alongside technologies that convert industrial byproducts like construction waste, electronic waste, and agricultural residues into high-performance materials. Projects may span advanced manufacturing, chemical processing, and materials engineering to enhance durability, reduce environmental impact, and build robust systems that support sustainable development in the face of climate disruption.

(R9). Resilience and Security in the South Pacific

This high-priority topic is focused on the Melanesia region and specifically on regional security issues through the lens of sustainable/regenerative development, climate resilience, indigenous sovereignty, and/or social security. This is part of a new initiative, and the successful Fellow will work directly with leading researchers in the field, across disciplines of climate science, political science, and social science.

2. MedTech Innovation

Medical technologies are revolutionising health outcomes and health expectations. RMIT leads, and is investing in, areas including better disease diagnosis via advances in imaging, biosensors and biomarkers, as well as harnessing state-of-the-art smart materials such as optoelectronics, new bioinformatics and digital health AI-enabled tools. We are also engaging nanotechnology for health in areas ranging from nutrition to cancer, supporting community health across the lifespan.

In all these areas, RMIT has a deep commitment to ensuring medical technologies are designed to make a practical contribution to clinical outcomes and health providers, supported by our range of partnerships and co-location initiatives with major hospitals, health providers, and community organisations. RMIT also has its own supporting infrastructure including the Micro Nano Research Facility (MNRF), Advanced Manufacturing Precinct (including digital manufacturing), and The Victorian Medical Device Prototyping and Scale-Up Facility – Discovery to Device, and the Accelerator for Translational Research in Clinical Trials (ATRACT) Centre, central to human clinical trials in cancer, ageing and infectious diseases with collaborators Australia-wide.

Across these diverse areas we need committed and innovative researchers to drive forward our research strategy for impact, and that build on collaborative initiatives with strategic research partners such as the Aikenhead Centre for Medical Discovery (ACMD), and Northern Health. As well as specialised expertise, this theme further encourages applicants with effective biological data analysis and integration capabilities including bioinformatics, multi-omics and, where relevant, AI and biostatistics.

RMIT is seeking to build and enhance our research and innovation capability in MedTech in the following areas:

(M1). Medical Discovery through Medical Technology Innovation

We are seeking researchers who are focused on Medical technology Innovation and support RMIT's strategic participation as a member of the Aikenhead Centre for Medical Discovery

(ACMD). Fellows will preferably have networks with key ACMD partners spanning St Vincent's Hospital, the University of Melbourne, Swinburne University of Technology, Centre for Eye Research, and/or the Bionics Institute. Fellows should have a history of medical technology research outputs that align to gaps in RMIT in capability and the strategic agenda of ACMD. Fellows will have strong engineering design, systems integration, bioinformatics or computational modelling, or medical device development expertise to address ACMD's strategic agenda.

(M2). Cancer and Ageing

This high-priority topic aligns with RMIT's biomedical innovation capabilities and focuses on leading edge fundamental science able to be translated into medical technology discoveries, and clinical practice for people with, or at risk of, developing malignant disease. It also includes the applications of technology for longevity, healthy aging, remote monitoring, and independent living. This theme further encourages applicants with effective biological data analysis and integration capabilities including bioinformatics, multi-omics and, where relevant, AI or biostatistics.

(M3). Infection Detection and Immune Monitoring

This high-priority topic focuses on bioengineering and innovative biomarker platforms for rapid, point-of-care detection of infectious agents and immune system changes. It includes microfluidic systems, optical or electrochemical biosensors, biomarker discovery and deployable diagnostics for use in clinical, remote, or emergency settings. Emphasis on novel transduction mechanisms, advanced signal processing for enhanced sensitivity/specificity, systems integration of sensor arrays, and big-data bioinformatics and AI-driven diagnostic algorithms from sensor data.

(M4). Digital Design and Additive Manufacturing for the Next-generation Biomedical Implants

This high-priority topic focuses on the application of advanced digital design, modelling, and additive manufacturing (3D printing) technologies to develop next-generation biomedical implants. Research may involve the use of bioinspired design principles, the integration and engineering application of smart or responsive materials within implantable systems, and patient-specific modelling to create customisable, high-performance implants for orthopaedic, dental, cardiovascular, or reconstructive applications.

3. Digital Innovation

Digital innovation is pivotal to our shared digital futures. Emerging digital technologies have created new businesses, pushed automation deep into economic administration and operations, and disrupted industries and ways of working. RMIT is deeply involved in shaping this digital future. We have national leadership in digital technologies for artificial intelligence, information retrieval, digital design, and digital manufacturing, coupled with a focus on human behaviour, digital harms reduction, digital care technologies, enhancing security and resilience with digital technologies, and digital technologies in education. In a future where businesses, governments, and citizens interact in previously unimagined ways, RMIT's commitment is to advance world-leading and multidisciplinary digital innovation research for a prosperous and secure digital future.

As part of our research strategy for impact, RMIT is building on our existing world class research capability in digital innovation by identifying established and emerging research leaders with the capability to enhance Digital Innovation in the following high-priority topics:

(D1). EdTech

This high-priority topic is focused on digital applications, distributed learning platforms, AI, gamification, interactive learning, virtual classrooms, learning analytics, virtual and augmented

reality, and digital resources. Fellows will lead research that intersects EdTech and best practices in learning and teaching, and on digital literacy in early childhood and/or school-based settings, including cybersecurity awareness and digital empowerment.

(D2). Digital Harms Reduction

This high-priority topic is focused on critical issues in digital harms (e.g., abuse, disinformation, technology-facilitated violence, doxxing, scams, etc.) in relation to platform governance/policy, user wellbeing, digital literacy education and/or digital cultures. Fellows will have strong track records in this topic and will be working with experts on digital and mobile culture, policy and user experience based in the Digital Ethnography Research Centre. Humanities and social science-based approaches to how information and communication technologies shape public perception is encouraged.

(D3). Regenerative Digital Design

This high-priority topic is focused on research that advances regenerative topics with simulation, virtual environments, digital twins, AI, and digital design. We are seeking researchers who are eager to collaborate with teams of designers and developers working on dynamic modelling systems in the Centre of Digital Ecosystems to test the effectiveness of intervention strategies within ecosystems shaped by complex social, technical, governmental, and environmental challenges.

(D4). AI-Driven Solutions for Advanced Manufacturing and Industry 5.0

This high-priority topic focuses on AI-enabled innovation in digital and advanced manufacturing, including automation, robotics, process optimisation, additive manufacturing, and the development of bespoke polymers and composites with superior performance and durability, application of Machine Learning (ML) for manufacturing, and the development of datasets for materials and industrial informatics. Research may also explore the integration of AI and IoT systems to enable intelligent, adaptive production environments - enhancing productivity, quality assurance, and predictive maintenance across sectors such as automotive, mining, sustainable energy, agriculture, aviation, and space.

(D5). Electrical and Electronic Engineering for Breakthrough Research

Electrical and Electronic Engineering plays a pivotal role in reliable intelligent energy systems and advancing core digital innovation and breakthrough research by developing cutting-edge technologies such as integrated circuits, sensors, and communication systems that enable faster, more efficient data processing and transmission. These fields drive progress in smart grids, renewable energy integration, power systems, intelligent control and microgrid technologies fostering new discoveries and technological solutions that propel industries and society toward a more connected, sustainable, and innovative future. Furthermore, electronic and photonic engineering underpin emerging fields like AI for engineering, quantum engineering, 6G and space communication engineering, edge and embedded engineering, sensors and sensing technologies, electronic surveillance, fostering transformative solutions across industries including power, telecommunications, AI and defence systems. Continuous research and development in this domain drive the creation of smarter, more sustainable and breakthrough technological ecosystems, pushing the boundaries of what is practically achievable and accelerating the digital transformation landscape.

(D6). Digital Twins for Disaster Management and National Security

Aligning with the security and resilience innovation hub, this high-priority topic focuses on the development of advanced digital twin technologies to simulate, monitor, and respond to critical events in real time. Engineering research may include AI-enabled sensing systems, multi-modal sensor fusion (e.g. RF, optical, acoustic, hyperspectral), and cyber-physical integration for robust

environment modelling. Key capabilities include edge-triggered sensing, secure distributed architectures, and radio-based localisation for real-time infrastructure and asset tracking. Applications span emergency response, infrastructure resilience, environmental monitoring, and national security planning, including satellite-enabled visibility for remote or at-risk regions and the modelling of advanced aerial transportation systems.

(D7). AI for Health Equity and Digital Care Innovation

Research into applied AI and digital technologies that improve healthcare delivery, equity, and patient engagement. This includes clinical natural language processing (NLP), predictive analytics for population health, AI in digital triage and telehealth, and responsible automation in health settings. Emphasis on privacy-preserving methods, fairness across diverse populations, and interdisciplinary collaboration with public health, social work, and design.