

C2 — Administering Organisation Letter of Support

DRAFT - Dr Yuefeng Yin - FT26 baseline for FT27 review

30 October 2025

Professor Ute Roessner
Chief Executive Officer
Australian Research Council
GPO Box 2702
CANBERRA ACT 2601

Dear Professor Roessner,

Monash University strongly supports the Future Fellowship application of Dr Yuefeng Yin in the Department of Materials Science and Engineering (DMSE). Dr Yin is an outstanding mid-career computational materials scientist whose research expands materials science, condensed matter physics, and data-driven modelling. Dr Yin has established strong expertise and a reputation for innovation in theoretical and computational design of quantum materials, with his research published in leading international journals such as ACS Nano, Materials Today Physics, Nano Letters, Matter, and npj Quantum Materials. He has developed unique proficiency in multiscale modelling and automated simulation workflows, supported by major computational grants from the National Computational Infrastructure (NCI) and the Pawsey Supercomputing Centre. As a core member of the ARC Centre of Excellence in Future Low-Energy Electronics Technologies (FLEET), Dr Yin plays a central role in bridging theory and experiment for quantum and topological materials. His interdisciplinary collaborations with physicists, materials engineers, and industry partners have positioned him as an emerging leader in computational quantum materials research in Australia. He has also played pivotal roles in research translation and commercialisation through his recent collaboration with the Australian start-up TQ Transistors, developing next-generation transistor architectures, which attracts significant investment interests from domestic and international sources.

Dr Yin's Future Fellowship proposal aims to transform *disorder*—traditionally viewed as a limitation—into a functional design element for next-generation semiconductor and quantum technologies. The project will establish a predictive, data-driven computational framework to identify low-energy, fabrication-ready materials that outperform current technology, contributing directly to the global search for alternatives to the limit-reaching silicon chip. The expected outcomes will generate new fundamental knowledge of disordered materials, deliver advanced modelling tools for materials discovery, and strengthen Australia's strategic priorities in advanced manufacturing, critical materials, quantum technology, and the net-zero transition. The Fellowship will consolidate Dr Yin's leadership in computational design and accelerate the nation's capability in developing sustainable, low-energy electronics while expanding Australia's skilled research workforce in quantum technologies.

Alignment with Monash University Research Strengths

Monash University is internationally recognised for research excellence and impact. The University's performance in the latest Excellence in Research for Australia (ERA) evaluation confirmed Materials Engineering as a top-ranked discipline (ERA 5 – well above world standard). The Materials Science research at Monash is consistently ranked among the world's leading institutions—29th globally (QS, 2025)—and is home to several eminent researchers, including Professor Michael Fuhrer, a world-renowned expert in semiconductor materials and a long-term collaborator of Dr Yin. Dr Yin also works closely with Professor Nikhil Medhekar, a leading figure in the Australian computational modelling community, and Associate Professor Julie Karel, an emerging leader in experimental condensed matter.

Monash provides a unique research ecosystem for the success of this Fellowship. The ARC Centre of Excellence in Future Low-Energy Electronics Technologies (FLEET), hosted at Monash, has left a strong foundation for both fundamental and applied research into next-generation quantum and low-energy devices within the Department of Materials Science and Engineering. This environment provides Dr Yin with unrivalled access, among Australian universities, to high-impact internal collaborations across theory and experiment. In addition, Monash's strategic alliance with NCI and the newly built, Australia-first AI supercomputer MAVERIC ensures that Dr Yin will have exceptional computational capability and technical support to deliver on the project's objectives.

The aims of Dr Yin's project align closely with the Faculty of Engineering's strategic plans to conduct mission-oriented, interdisciplinary research that addresses critical global challenges and fosters

partnerships for impactful research outcomes. The Fellowship also complements the Department's initiative to strengthen a Quantum Materials and Technology research and teaching stream, responding to growing international interest in quantum technologies. In return, Dr Yin's expertise in semiconductor materials and multiscale modelling will broaden Monash's research portfolio, strengthening interdisciplinary links between materials science, physics, and data science. This mutually reinforcing partnership will consolidate Monash's position at the forefront of computational materials discovery while advancing Dr Yin's development as a world-class researcher in semiconductor innovation and a leading advocate for Australia's transition to a net-zero future.

Research Environment

Monash University provides a rich and collaborative research environment that will strongly support Dr Yin's Future Fellowship and career development. He will draw on the expertise and infrastructure of the Monash eResearch and the Monash Data Futures Institute, which offer world-class high-performance computing, data management, and AI capabilities essential for his computational and data-driven materials design. The DMSE provides advanced facilities and technical expertise for characterisation and validation of complex materials systems proposed in Dr Yin's project. Research development support through Monash Innovation and the Faculty Research Office will assist in grant preparation, interdisciplinary collaborations, and industry engagement, including partnerships with end-users. In addition, Monash's researcher development programs—covering mentoring, leadership, and networking—will further enhance Dr Yin's professional growth. Dr Yin will make invaluable contribution to the Monash research ecosystem by mentoring students, leading interdisciplinary collaborations, and advancing Australia's capabilities in computational materials discovery and critical technologies.

Direct Support for the Research Proposal

The Future Fellowship program at Monash University offers individually tailored professional development in research leadership, impact planning, and interdisciplinary engagement to strengthen the capabilities of our emerging research leaders. The Faculty of Engineering will ensure that Dr Yin has access to all key facilities required to successfully carry out the proposed research, including high-performance computing and data analysis infrastructure. Additionally, the Faculty will provide an HDR stipend to support the project's PhD student. The DMSE will cover the salary/stipend gap for Dr Yin and the PhD student. An academic mentoring committee, comprising a research mentor, a university mentor, and an industry mentor, will provide continuous guidance to support Dr Yin's professional growth and research leadership. These commitments will ensure that Dr Yin's Fellowship achieves its goals and contributes to the long-term advancement of computational and quantum materials research at Monash and in Australia.

Integration into Monash Research Activities

At the end of the Fellowship program, it is expected that Dr Yin will build strong international reputation as an expert in computational and quantum materials design. He will continue to play a key role within DMSE at Monash University, fostering interdisciplinary collaborations and contributing to competitive research initiatives in quantum technologies and advanced manufacturing. Monash University strongly supports Dr Yin's Future Fellowship application and is confident that, upon its completion, he will be well positioned to continue his career as a leading researcher at Monash, driving internationally recognised programs in computational materials discovery and strengthening Australia's capability in low-energy electronic technologies.