Monash University
Department of Materials Science and Engineering

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Professor Matthew Hill
Head, Department of Materials Science and Engineering
Department of Materials Science and Engineering
Monash University

Re: Application for Lecturer / Senior Lecturer in Materials Science and Engineering

Dear Professor Hill,

I am writing to apply for the position of Lecturer / Senior Lecturer in Materials Science and Engineering within the Department. As a current Research Fellow and AEA Ignite Project Lead, I have developed an independent research program spanning computational materials science, quantum materials, and semiconductor technologies, while contributing to undergraduate and postgraduate teaching, student supervision, and industry engagement. I am now seeking to contribute to the Department in a continuing academic role, where I can combine research excellence with innovative teaching and research translation to help shape the future of materials science at Monash.

My research seeks to understand and engineer the electronic properties of thin-film and quantum materials through computational modeling. By combining density functional theory, tight-binding methods, and transport modeling, I develop new materials concepts that connect fundamental condensed matter physics with low-energy electronic and spintronic technologies. This work has resulted in more than 40 refereed publications, including 14 since 2024 and six in journals with an impact factor above 10. It has also attracted more than A$3.4 million in competitive research funding since 2024, including the Australia's Economic Accelerator (AEA) Ignite grant (A$650K) as Lead CI and an ARC Linkage Project (A$1.7M) as Key Participant. Beyond scholarly publications, I have pursued the translation of computational discoveries into practical technologies through a U.S. patent application developed with the Australian start-up TQ Transistors. Together, these experiences have reinforced my belief that computational materials science should not only explain materials behavior, but also accelerate the discovery and deployment of future technologies.

Teaching and mentoring are equally important components of my academic career. I enjoy helping students develop a deep understanding of physical principles while equipping them with modern computational tools to solve real research problems. Through the Monash–CSU "2+2" program, I designed and taught Computational Materials Science, introducing undergraduate students to density functional theory, high-performance computing, and computational modeling. At Monash, I regularly deliver DFT training workshops for Master's and PhD students, and I have mentored or co-supervised nine PhD candidates and three Bachelor's/Master's students. It has been particularly rewarding to see several of these students progress to first-author publications in journals including ACS Nano, Nano Letters, and Advanced Science. Looking ahead, I see artificial intelligence becoming an integral part of computational materials education, and I hope to develop teaching approaches that combine AI-enabled learning with a strong emphasis on physical intuition, critical thinking, and scientific rigor.

Equally important to me is working within a collaborative research environment. My research has benefited enormously from partnerships across the Department, the School of Physics and Astronomy, national collaborators through FLEET, and industry partners. These collaborations have strengthened my conviction that many of the most exciting opportunities in materials science arise at the interfaces between disciplines. Whether helping establish the Monash–Jiangxi Copper partnership, leading collaborative research with TQ Transistors, or working alongside experimental physicists, I have consistently sought to connect computational modeling with experimental validation, device engineering, and industrial innovation.

Looking ahead, I believe computational materials science is entering a transformative era. Artificial intelligence, automation, and high-performance computing are changing not only how we perform simulations, but also how we formulate scientific questions, discover materials, and translate research into engineering solutions. Rather than viewing

AI as a replacement for scientific understanding, I see it as a powerful partner that enables researchers to explore larger design spaces, develop more sophisticated computational workflows, and accelerate the journey from fundamental discovery to technological innovation. I believe the Department is well positioned to lead this transformation. My ambition is to complement its existing strengths by building a research program that integrates first-principles modeling, AI-assisted materials discovery, high-throughput computational workflows, and semiconductor device design, while strengthening the Department's connections with physics, industry, and emerging digital technologies. At the same time, I hope to prepare students for this new era by equipping them with both the computational skills and the scientific judgment needed to use these technologies creatively and responsibly.

I would be honored to continue contributing to the Department as a continuing academic through internationally recognized research, innovative teaching, and meaningful engagement with industry and the broader scientific community. Thank you for considering my application. I have enclosed my curriculum vitae and response to the selection criteria, and I would welcome the opportunity to discuss how my experience and future research vision can contribute to the continued success of the Department of Materials Science and Engineering.

Yours sincerely,

Dr Yuefeng Yin
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Department of Materials Science and Engineering
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