

Dr Yuefeng Yin

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Selection Committee — Strategic Research Cluster Initiative

c/- PJ Sullivan

Faculty of Science

UNSW Sydney

Re: Application for Lecturer (Level B) / Senior Lecturer (Level C), Strategic Research Cluster Initiative (Job no. 542135)

Dear Members of the Selection Committee,

I am writing to apply for a continuing academic appointment under the Faculty of Science's Strategic Research Cluster Initiative. I nominate **Cluster 1 — Digital-led Discovery and Design of New Materials**, with the **School of Materials Science & Engineering** as my host School. I am applying at **Senior Lecturer (Level C)** and would equally welcome consideration at Level B. I am currently a Research Fellow and AEA Ignite Project Lead at Monash University, where I use first-principles modelling, tight-binding theory and large-scale high-performance computing to design functional thin-film and quantum materials — and where almost all of that work happens jointly with people outside my own department.

That last point is why this particular advertisement, rather than a conventional lectureship, is what I want. My most significant results exist because a disciplinary boundary was crossed. "Giant Berry curvature in the amorphous ferromagnet Co_2MnGa " (*Matter*, 2025) came out of a materials scientist's question — will this property survive the disorder that real manufacturing introduces? — colliding with an experimental physics group's measurements; I built the theory showing why it does. The same pattern produced the spin-wave engineering work in *Advanced Materials* (2025) and the five-year bismuth-allotrope program I led from foundational theory through to device-relevant edge-state control. Across 43 refereed papers, 1,180 citations and an h-index of 19 — fourteen papers since 2024, six in journals with an impact factor above 10 — my role is consistently the quantitative core of an interdisciplinary team.

I also know what it costs to take computation seriously as an engineering activity rather than an academic one. Since 2024 I have attracted more than A\$3.4 million in research funding: A\$650K from Australia's Economic Accelerator (AEA) Ignite as **Lead CI** on a project I conceived and wrote, A\$1.7M as Key Participant on an ARC Linkage Project, and A\$1.04M in direct industry investment from the start-up TQ Transistors — with whom I am **lead inventor** on a U.S. patent application. I hold roughly two million service units of national computing per year as Lead CI through competitive NCI and Pawsey schemes. Working to a funder that assesses commercial viability, and to a company spending its own money, has taught me to be precise about what a calculation is actually worth to someone who has to build something.

What I would build in the Cluster has three strands, set out in full in my response to the selection criteria: disorder-tolerant magnetic thin films, developed with experimental physicists; topological materials for low-energy devices, carried through to translation; and — the strand I care most about for the Cluster itself — a **shared digital discovery platform**. My existing high-throughput calculations already generate exactly the data that machine-learning surrogate models need, but turning that into something a colleague can actually use requires statistical expertise I do not have alone. I would like to build it with the School of Mathematics & Statistics, validate it with Chemistry, and open it to any member School — so that a researcher designing bio-inspired or functional materials can screen candidates without ever writing a DFT input file. Clusters cohere around shared infrastructure more reliably than around shared seminars, and I would rather contribute a tool the Cluster uses weekly than a talk it hears once.

Teaching and supervision are not a secondary obligation for me. I designed the *Computational Materials Science* elective delivered under the Monash–Central South University "2+2" program from first principles — structure, materials and assessment — and released it openly on GitHub; it runs as an intensive three-week course and expands cleanly to twelve weeks. I have mentored or co-supervised nine PhD candidates, supervised three Bachelor's and Master's students, and examined two PhD theses; mentees have first-authored papers in *Advanced Science*, *ACS Nano* and *Nano Letters*, and

one now holds a joint postdoctoral appointment at Cambridge and King's College London. My teaching conviction is simple and increasingly contested: in the age of AI, the derivation and the physical reasoning matter more than the software, because the graduate the field needs is the one who can tell when a plausible-looking answer is wrong.

UNSW is not unfamiliar ground. UNSW was a node of the ARC Centre of Excellence FLEET, where I spent seven years as a Research Fellow, and I attend the annual Gordon Godfrey Workshop and have made research visits to the University. I should also be straightforward about where I stand: my profile is established nationally and still developing internationally, and I do not yet hold a personal fellowship or an ARC Discovery Project as lead investigator — a continuing appointment is precisely what makes me eligible to pursue both, and my application sets out the pipeline I would submit rather than a general intention. I have enclosed my curriculum vitae and a full response to the selection criteria, and I would welcome the opportunity to discuss how this program could contribute to the Cluster and to UNSW Science.

Yours sincerely,

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