

Dr Yuefeng Yin

Research Fellow · Computational Materials Science — Research, Teaching & Curriculum Development

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43 ORIGINAL RESEARCH ARTICLES	1,143 CITATIONS	19 H-INDEX	9 PHDS MENTORED	A\$3.4M FUNDING LED, CO-LED AND PARTICIPATED
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Computational materials scientist with a PhD in Materials Science and Engineering from Monash University, pairing internationally competitive research in thin-film and quantum materials with a sustained record of **undergraduate and postgraduate teaching, curriculum design, and PhD supervision**. Nine years developing and applying density functional theory, tight-binding and transport methods, with a demonstrated ability to **translate this research strength into curriculum, mentorship, and industry outcomes**.

EDUCATION

- 2012 – 2016 **PhD, Materials Science and Engineering**, Monash University. Thesis: *Tailoring the electronic structure of graphene via molecular adsorption*.
- 2007 – 2011 **B.Eng., Materials Science and Engineering** (2+2 program), Monash University / Central South University.

APPOINTMENTS

- 2024 – now **Research Fellow (Level B) / Lead Entrepreneur, AEA Ignite Project**, Department of Materials Science and Engineering / School of Physics and Astronomy, Monash University. Developing and prototyping a new low-energy transistor technology.
- 2017 – 2024 **Research Fellow**, Monash University, ARC Centre of Excellence in Future Low-Energy Electronic Technologies (FLEET). Theoretical modeling of topological materials, semiconductor interfaces, and spintronic systems for low-energy electronics.

TEACHING & OUTREACH

- Lecturer, Computational Materials Science** (2017–2019, 2023–2024), Central South University — delivered on behalf of Monash under the Monash–CSU "2+2" program.
- Designed the course's intensive **3-week curriculum** from first principles — foundations through DFT, HPC and AI, finished in a group mini-assignment — expandable into a full 12-week program; materials openly available on GitHub.
- Training HDR students in research skills** — DFT training workshops and tutorials for Master's and PhD students, Monash University.
- Examiner** for 2 PhD candidates, Department of Materials Science and Engineering, Monash University.
- 9 PhD candidates** mentored/co-supervised (4 current, 5 graduated): Hanqi Wang, Minh Tien Le, Rahul Awale, Tung Huynh, Ziyuan Zhao, Enamul Haque, Bernard Field, Abin Varghese, Chutian Wang.
- 3 Bachelor's/Master's students** supervised, including Qile Li.
- Mentees first-authored papers in *Advanced Materials*, *ACS Nano* and *Nano Letters*; one graduate now holds a joint postdoctoral position at the University of Cambridge and King's College London.
- Public engagement: Melbourne Knowledge Week (FLEET quantum-science outreach), annual Gordon Godfrey Workshop (UNSW), and ongoing science communication via X, GitHub and Wikipedia.

GRANTS (FUNDING & COMPUTATIONAL RESOURCES)

- 2026 – Current **A\$650K**: Lead CI, Australia's Economic Accelerator (AEA) Ignite, Round 2, "*From Lab to Fab: Advancing a New Low-Energy Transistor Towards Large-scale Manufacturing*.", Other CIs: Michael S. Fuhrer & Nikhil V. Medhekar, with industry partner TQ Transistors.
- 2026 – Current **A\$1.7M**: Key Participant, ARC Linkage Project, 2025R2, "*Prototyping a Breakthrough Low-Energy Topological Transistor for Future Electronics*.", Led by Prof. Michael S. Fuhrer. Other CI: Prof. Nikhil V. Medhekar, with industry partner TQ Transistors.
- 2024 – Current **A\$1.04M**: Co-CI, Industrial funding (TQ Transistors Pty Ltd), "*Materials Design for Novel Negative Capacitance Field Effect Transistors*", Led by Prof. Nikhil V. Medhekar. Other CI: Prof. Michael S. Fuhrer.
- 2024 – Current **4M SU**: Lead CI, NCI Adapter Scheme / NCI-Monash Computational Scheme, "*Exploring new approaches of modeling defects in Materials*."

SELECTED PUBLICATIONS SINCE 2019 (lead-author papers first; full publication list on Google Scholar)

1. **MAGNETIC THIN FILMS** W. Zhao, Y. Zhang, **Y. Yin** **CO-FIRST**, et al. Giant Berry curvature in the amorphous ferromagnet Co_2MnGa . *Matter* 2025, 8, 101988.
2. **MAGNETIC THIN FILMS** Y. Zhang, **Y. Yin** **CO-FIRST**, G. Dubuis, T. Butler, N. V. Medhekar, S. Granville. Berry curvature origin of the thickness-dependent anomalous Hall effect in a ferromagnetic Weyl semimetal. *npj Quantum Materials* 2021, 6, 17.
3. **QUANTUM MATERIALS** L. Chen, **Y. Yin** **CO-FIRST**, T. Lu, et al. Uncovering complex phonon interactions in $\text{Mg}_3\text{Bi}_{2-x}\text{Sb}_x$: topology and avoided crossings. *Nature Communications* 2026, doi: 10.1038/s41467-026-71754-9.
4. **QUANTUM MATERIALS** C. Wang, **Y. Yin** **CORR**, T. T. Huynh, M. S. Fuhrer, N. V. Medhekar. Edge-state stabilization and control in 2D topological crystalline insulators. *Materials Today Physics* 2025, 59, 101897.
5. **QUANTUM MATERIALS** **Y. Yin** **FIRST**, C. Wang, M. S. Fuhrer, N. V. Medhekar. Extracting unconventional spin texture in the 2D topological crystalline insulator bismuthene via tuning bulk–edge interactions. *Materials Today Physics* 2023, 36, 101168.
6. **QUANTUM MATERIALS** Q. Li, J. S. Smith, **Y. Yin** **CORR**, C. Wang, M. V. Klymenko, J. H. Cole, N. V. Medhekar. Localized Wannier-function-based tight-binding models for 2D allotropes of bismuth. *New Journal of Physics* 2021, 23, 063403.
Entries 4–6 form the “Bismuth trilogy” — five years leading 2D bismuth allotrope theory, from foundational tight-binding models to device-relevant edge-state control.
7. **QUANTUM MATERIALS** C. X. Trang, Q. Li, **Y. Yin** **CO-FIRST**, et al. Crossover from 2D ferromagnetic insulator to wide-band-gap quantum anomalous Hall insulator in ultrathin MnBi_2Te_4 . *ACS Nano* 2021, 15, 13444.
8. **QUANTUM MATERIALS** **Y. Yin** **FIRST**, M. S. Fuhrer, N. V. Medhekar. Selective control of surface spin current in topological pyrite-type OsX_2 ($X = \text{Se}, \text{Te}$) crystals. *npj Quantum Materials* 2019, 4, 47.
9. **MAGNETIC THIN FILMS** J. Wang, Y. Zhang, J. Hu, ... **Y. Yin**, et al. Band-structure engineering to optimize spin-wave propagation in the Weyl ferromagnet $\text{Co}_2\text{MnGa}_{1-x}\text{Ge}_x$. *Advanced Materials* 2025, 37, 2505704.
10. **MAGNETIC THIN FILMS** Y. Zhang, J. Sung, **Y. Yin**, et al. Giant temperature-independent ultraviolet circular dichroism in Co_2MnX ($X = \text{Ga}, \text{Ge}$) Heusler magnetic thin films. *Physical Review Applied* 2025, 24, 034052.
11. **MAGNETIC THIN FILMS** W. Zhao, K. Xing, Y. Zhao, L. Chen, M. Hong, **Y. Yin**, et al. Room-temperature quantum metric effect in the kagome magnet TbMn_6Sn_6 . *Nature Communications* 2025, 16, 6837.
12. **MAGNETIC THIN FILMS** Z. Liu, B. Liu, **Y. Yin**, N. V. Medhekar. Generic approach to intrinsic magnetic second-order topological insulators via inverted p–d orbitals. *Nano Letters* 2024, 24, 11295.
13. **MAGNETIC THIN FILMS** M. Aoki, **Y. Yin**, S. Granville, et al. Gigantic anisotropy of self-induced spin–orbit torque in the Weyl ferromagnet Co_2MnGa . *Nano Letters* 2023, 23, 6951.
14. **MAGNETIC THIN FILMS** B. Mallett, Y. Zhang, C. Pot, ... **Y. Yin**, N. V. Medhekar, S. Granville. Using optical spectroscopy to probe the impact of atomic disorder on the Heusler alloy Co_2MnGa . *Physical Review Materials* 2023, 7, 094203.

FIRST = first author; **CO-FIRST** = equal contribution; **CORR** = corresponding author.

OTHER SERVICE, TRANSLATION & COLLEGIALITY

- **Lead inventor** on a **U.S. patent application** for a novel transistor material architecture (2025, US63/848,509) with start-up TQ Transistors, and contributed to its subsequent U.S. funding application (2025–current).
- **Liaison** for a strategic **R&D partnership** between Monash University and Jiangxi Copper (Fortune 500), taken from first contact to a **formal MoU signed in August 2024**; also hosted delegations from Central South University, Wuhan University of Technology, and Shanghai University.
- **Peer reviewer** for high-impact journals including *Nature Communications* and *Communications Physics*.
- **Collegiate working style** across Departments and Faculties — regular project-meeting collaboration with the School of Physics and Astronomy, prioritizing open communication and mutual respect.

REFEREES

Prof. Nikhil V. Medhekar — Professor, Materials Science and Engineering, Monash University.

Prof. Michael S. Fuhrer, FAA — Inaugural Vice-Chancellor's Distinguished Professor, School of Physics and Astronomy, Monash University.

Dr Simon Granville — Senior Scientist, Robinson Research Institute, Victoria University of Wellington, New Zealand.