Yuefeng Yin

Senior Research Fellow · Computational Quantum & Materials Physics

Dept. of Materials Science & Engineering / School of Physics & Astronomy, Monash University

Monash University
Clayton VIC 3800, Australia
yyfforce@gmail.com
yyfforce.github.io

43	1,123	19	10	A$850K+
REFEREED PAPERS	CITATIONS	H-INDEX	PHDS MENTORED	FUNDING 2026–27

Computational condensed-matter physicist who **uses and develops advanced methods—density functional theory, tight-binding modelling, and many-body transport**—to discover and design topological quantum materials, 2D systems, and spintronic platforms for ultralow-energy, high-speed electronics. Track record of pairing first-principles theory with experiment and industry to move discovery **from lab to fab**.

APPOINTMENTS

2024 – now **Senior Research Fellow**, Monash University — Dept. of Materials Science & Engineering / School of Physics & Astronomy. Leading research in 2D materials and computational methodology development.

2017 – 2024 **Research Fellow**, Monash University — ARC Centre of Excellence in Future Low-Energy Electronic Technologies (FLEET). Topological materials theory; mentors: N. V. Medhekar & M. S. Fuhrer.

2010 – 2011 **Research Associate**, CSIRO Mineral Processing — thermal properties of molten salts for concentrated solar power.

EDUCATION

2012 – 2016 **Ph.D., Materials Science & Engineering**, Monash University. Thesis: *Tailoring the electronic structure of graphene via molecular adsorption.* Advisors: N. V. Medhekar, J. Cervenka.

2007 – 2011 **B.Eng., Materials Science & Engineering** (2+2 program), Monash University / Central South University.

SELECTED GRANTS & FUNDING

2026 – 2027 **A$650K** — Australia's Economic Accelerator (AEA) Ignite, Round 2, *"From Lab to Fab: Advancing a New Low-Energy Transistor Towards Large-scale Manufacturing."* CI with M. S. Fuhrer & N. V. Medhekar (A$500K AEA + A$150K partners).

2026 **A$200K** — Industrial funding, "Select 2D Topological Materials on Substrates" (industry partners).

2023 – now **3M+ CPU-hours (~A$200K)** — NCI Adapter / NCI–Monash Computational Scheme.

2025 – now **500K CPU-hours (~A$30K)** — Pawsey Fast-Track Scheme (semiconductor–metal contact interfaces).

2020 – 2023 **A$10.75K** — FLEET–MacDiarmid Collaborative Grant (with S. Granville, VUW, New Zealand).

SELECTED PUBLICATIONS (author list abbreviated; full list at yyfforce.github.io/cv)

1. L. Chen, **Y. Yin**, T. Lu, *et al.* Uncovering complex phonon interactions in $Mg_3Bi_{2-x}Sb_x$: topology and avoided crossings. *Nature Communications* (2026).
2. K. Xing, Z. Yang, W. Zhao, **Y. Yin**, *et al.* Efficient and robust p-type transistor based on an ultrawide-bandgap semiconductor. *ACS Nano* 20, 7343 (2026).
3. W. Zhao, K. Xing, Y. Zhao, L. Chen, M. Hong, **Y. Yin**, *et al.* Room-temperature quantum metric effect in $TbMn_6Sn_6$. *Nature Communications* 16, 6837 (2025).
4. J. Wang, Y. Zhang, *et al.*, **Y. Yin**, *et al.* Band-structure engineering to optimize spin-wave propagation in the Weyl ferromagnet $Co_2MnGa_{1-x}Ge_x$. *Advanced Materials* 37, 2505704 (2025).
5. W. Zhao, Y. Zhang, **Y. Yin**, *et al.* Giant Berry curvature in the amorphous ferromagnet Co_2MnGa. *Matter* 8, 101988 (2025).
6. K. Xing, D. McEwen, **Y. Yin**, *et al.* Pick-and-place transfer of arbitrary-metal electrodes for van der Waals device fabrication. *ACS Nano* 19, 3579 (2025).
7. C. Wang, **Y. Yin**, T. T. Huynh, M. S. Fuhrer, N. V. Medhekar. Edge-state stabilization and control in 2D topological crystalline insulators. *Materials Today Physics* 59, 101897 (2025).
8. 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* 24, 11295 (2024).
9. **Y. Yin**, 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* 36, 101168 (2023). REP
10. M. Aoki, **Y. Yin**, S. Granville, *et al.* Gigantic anisotropy of self-induced spin–orbit torque in the Weyl ferromagnet Co_2MnGa. *Nano Letters* 23, 6951 (2023). REP
11. Q. Li, J. S. Smith, **Y. Yin**, *et al.* Localized Wannier-function-based tight-binding models for 2D allotropes of bismuth. *New Journal of Physics* 23, 063403 (2021). REP

2. **Y. Yin**, M. S. Fuhrer, N. V. Medhekar. Selective control of surface spin current in topological pyrite-type OsX_2 (X = Se, Te). *npj Quantum Materials* 4, 47 (2019). **REP · FIRST OF ITS KIND**
3. **Y. Yin**, J. Cervenka, N. V. Medhekar. Molecular dipole-driven electronic structure modifications of DNA/RNA nucleobases on graphene. *J. Phys. Chem. Letters* 8, 3087 (2017). **REP**

Further lead/co-author work in *Nature Communications*, *ACS Nano*, *Advanced Functional Materials*, *Physical Review Applied/B/Materials*, *Chemistry of Materials*, and *InfoMat*. **REP** = self-nominated representative publication.

MENTORING & TEACHING

- **10 PhD researchers** mentored / co-supervised (4 current: H. Wang, M. T. Le, R. Awale, T. Huynh).
- Mentees first-authored in *Nat. Commun.*, *ACS Nano*, *Nano Lett.*
- Alumni incl. C. Wang, A. Varghese, B. Field, E. Haque, Z. Zhao, Q. Li.
- **Lecturer** (2017–now), Computational Materials Science, Monash & Central South Univ.; open lecture notes.
- Graduate Teaching Assistant (2012–2016): Modelling & Characterization of Materials.
- Open, citable computational notebooks for newcomers to the field.

ESTEEM, TRANSLATION & SERVICE

- Chief investigator translating low-energy topological-transistor research toward manufacturing (AEA Ignite + industry).
- Research featured by the **Australian Research Council** newsletter, *Materials Australia*, and the FLEET Centre.
- Developer of universal DFT–tight-binding workflows and open reproducible research pipelines.
- Cross-institution collaborations: Monash, ANSTO, VUW, IIT Bombay, Shandong Univ., Tongji Univ., USQ.
- Invited / keynote conference presentations (APS March Meeting; FLEET Annual Workshop; ICON-2DMAT).
- Peer reviewer for international condensed-matter and materials journals.

REFEREES

Prof. Nikhil V. Medhekar — Professor, Materials Science & Engineering, Monash University. users.monash.edu/~nikhilm

Prof. Michael S. Fuhrer FAA — Professor, School of Physics & Astronomy, Monash University.

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