Hrishikesh Patel

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(Updated: October 24, 2025)

Education

From Sep 2023 — **MSc Physics, University of British Columbia:** Focusing on Condensed Matter Physics and Quantum Information (theory).

Sep 2018 – May 2023 — **BSc, University of British Columbia:** Combined Honours in Physics & Mathematics. Coursework tailored for Physics and Applied Mathematics.

Research Schools

Aug 2024 — **Topological Matter School, Donostia-San Sebastian:** Theory summer school in topological matter. Topics include: Moire physics in pentalayer graphene, quantum geometry, kagome materials.

Apr 2024 — **CIFAR Quantum Materials Summer School, Toronto:** Introduction to quantum materials. Topics include: Polarons, Non-Fermi liquid theories and experimental methods for 2D materials.

Jan 2024 — **Frontiers in Superconductivity, National High Magnetic Field Lab, Tallahasse:** Experimental and theoretical landscape of superconductivity with focus on moire materials.

Jun 2023 — C^2QA **QIS Summer School, Brookhaven National Lab:** Quantum Information Science summer school on a Practical Guide to Superconducting Qubits Experiments.

May 2021 — **USEQIP, University of Waterloo:** Intensive summer program in Quantum Information and Quantum Computing.

Research Positions

May 2023 – *Present* — **Graduate Research Assistant**, SBQMI-UBC.

- I am broadly looking at 2D materials and its application towards quantum hardware. I have studied interaction driven physics in twisted bilayer graphene through Hartree-Fock approximations and I have also worked on application-based projects involving design of d/s superconducting qubits.
- Thesis Advisor: Dr. Marcel Franz

Nov 2018 – Dec 2022 — **Research Collaboration**, UBC Okanagan.

- Investigated experimental tests of quantum gravity in the low-energy regime. In particular, we were interested in corrections to gravity at short distances through brane world models and generalized uncertainty principles (GUP).
- Advisor: Dr. Mir Faizal

May 2022 – Aug 2022 — **Research Intern,** Laboratory of Photonics & Quantum Measurements, EPFL.

- Designed parts of an experiment on efficient microwave to optical conversion using high overtone bulk acoustic resonance (HBAR). slides
- Advisors: Dr. Tobias J. Kippenberg & Anat Siddharth

Jan 2021 – Aug 2021 — **Junior Researcher,** TRIUMF.

- Implemented variational algorithm for Dirac and Hyperfine calculations. slides
- Advisor: Dr. Jason D. Holt

May 2020 – Aug 2020 — **Undergraduate Research Assistant,** Department of Mathematics, UBC.

- Studied kappa distributions arising in space science by solution of associated Fokker-Planck and Schrödinger equation using quadrature discretization schemes. slides
- Advisor: Dr. Bernie D. Shizgal

Skills

Computational	Proficient in Python, MATLAB, Pennylane, Qiskit, Kwant, LaTeX, Git, Docker. Some experience in multi-threading, optimization and machine learning. Basic experience with simulation softwares like COMSOL and Lumerical.
Interpersonal	Excellent written and verbal Communication skills. Punctual and Dedicated.

Publications & Presentations

Selected Publications

1. **Patel**, **H.**, Pathak, V., Can, O., Potter, A. C., & Franz, M. (2024). D-Mon: A Transmon with Strong Anharmonicity Based on Planar c-Axis Tunneling Junction between d-Wave and s-Wave Superconductors. *Physical Review Letters*, *132*(1), 017002. doi:10.1103/PhysRevLett.132.017002
2. **Patel**, **H.** (2023). Exploring atomic systems using a relativistic imsrg scheme (*honours thesis*). doi:http://dx.doi.org/10.14288/1.0435586
3. Tenkila, G., Chand, V., Miyagi, T., **Patel**, **H.**, Stroberg, S. R., Ruiz, R. F. G., & Holt, J. D. (2022). Ab initio in-medium similarity renormalization group for open-shell atomic systems. doi:10.48550/ARXIV.2212.08188
4. Faizal, M., & **Patel**, **H.** (2021). Probing short distance gravity using temporal lensing. *International Journal of Modern Physics A*, *36*(17), 2150115. doi:10.1142/S0217751X21501153
5. Mann, R. B., Husin, I., **Patel**, **H.**, Faizal, M., Sulaksono, A., & Suroso, A. (2021). Testing short distance anisotropy in space. *Scientific reports*, *11*(1), 1–8. doi:https://doi.org/10.1038/s41598-021-86355-3
6. **Patel**, **H.**, & Shizgal, B. D. (2021). Pseudospectral solutions of the fokker-planck equation for pearson diffusion that yields a kappa distribution; the associated susy schrödinger equation. *Computational and Theoretical Chemistry*, *1194*, 113059. doi:https://doi.org/10.1016/j.comptc.2020.113059

Recent Presentations

1. **So What is Quantum Anyway?**. Resident Member Series at Green College, UBC. *Nov 25, 2024*. slides
2. **d-mon: Transmon with Strong Anharmonicity**. Poster Presentation at CIFAR Summer School. *Apr 29, 2024* and Topological Matter School. *Aug 19, 2024*. poster

Selected Awards

Jul 2024	**BPOC Graduate Excellence Award**, Awarded by the Faculty of Graduate and Postdoctoral Studies, UBC.
Feb 2022	**Richard E. Azuma Fellowship**, Offered by TRIUMF. *declined*
	Scholarship of Excellence, Awarded by École polytechnique fédérale de Lausanne (EPFL) for summer internship.
Mar 2021	**Undergraduate Research Scholarship**, Awarded by the Canadian Institute of Nuclear Physcics (CINP).
Jan 2021	**Reginald Palliser-Wilson Scholarship**, Awarded by the Faculty of Science, UBC. Based on recommendations from the Department of Mathematics.
Nov 2020,22	**Faculty of Science International Student Scholarship**, Awarded by the Faculty of Science, UBC **x2**.
Nov 2020	**Trek Excellence Scholarship**, Awarded by the Faculty of Science, UBC. *Awarded to Top 10 % students in the faculty.*