Curriculum Vitae for Ryohei (Rio) Weil

Personal Information

Citizenship: Canadian
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Education

University of Chicago (2024-)
PhD Physics

- Supervisor: Dr. Ruben Veressen

University of Chicago (2024-2025)
MSc Physics

University of British Columbia (2022-2024)
MSc Physics

- Supervisor: Dr. Robert Raussendorf
- MSc thesis: Quantifying resource states and efficient regimes of measurement-based quantum computation on a superconducting processor

University of British Columbia (2018-2022)
BSc Combined Honours Physics and Mathematics (with distinction)

- Honours thesis: A Simulation of a Simulation: Algorithms for Symmetry-Protected Measurement-Based Quantum Computing Experiments

Publications

Aghaee Rad, H., Ainsworth, T., Alexander, R.N. et al. Scaling and networking a modular photonic quantum computer. *Nature* 638, 912-919 (2025). 10.1038/s41586-024-08406-9.

Walshe, B.W., Baragiola, B.Q., Ferretti, H. et al. Linear-Optical Quantum Computation with Arbitrary Error-Correcting Codes. *Phys. Rev. Lett.* 134, 100602 (2025). 10.1103/PhysRevLett.134.100602.

Kootte, B., Reiter, M.P., Andreoiu, C. et al. Convergence on the proton dripline in thulium. *Phys. Rev. C* 112, 024318 (2025). 10.1103/s8h6-f6kc.

Porter, W.S., Dunling, E., Leistenschneider, E. et al. Investigating nuclear structure near $N = 32$ and $N = 34$: Precision mass measurements of neutron-rich Ca, Ti, and V isotopes. *Phys. Rev. C* 106, 024312 (2022). 10.1103/PhysRevC.106.024312.

Research Positions (Other)

Xanadu (4 months - Full-time) (2023)
Research Resident, Architecture Team

- Developed quantum error correction simulations for benchmarking photonic quantum computing architectures.

University of British Columbia (4 months - Full-time) (2021)
Theory Research Student, Quantum Information Group

- Used condensed matter techniques to analyze resource states for measurement-based quantum computation.

University of British Columbia (4 months - Full-time) (2020)
Computational NMR Research Student, Solid-State NMR Group

- Used SIMPSON NMR simulations to investigate the viability of maximum-length binary sequences in inhomogenous magnetization transfer for application in Myelin imaging.

TRIUMF (4 months - Full-time) (2019)
Experimental Nuclear Physics Research Student, TITAN Group

- Assisted with the commissioning of a cryogenic Penning trap (CryoMPET) for precision mass measurement of ions.
- Developed SIMION simulations for optimization of ion extractions.

Schools & Presentations (materials here)

EQUIPTNT Workshop [Technical University of Munich] (2025)
Talk Title: Characterizing resource states and efficient regimes of MBQC on NISQ devices

Quantum Resources Workshop [Nanyang Technological University] (2023)
Poster Title: Characterizing resource states and efficient regimes of MBQC on NISQ devices

Xanadu Research Resident Symposium [Xanadu] (2023)
Talk Title: MBQC efforts in the war on loss

Quantum Matter Workshop [Perimeter Institute] (2022)
Poster Title: Investigating computational phases of matter on NISQ devices

Algebraic Structures in Quantum Computation V [UBC] (2022)
Talk Title: A Simulation of a Simulation: Algorithms for Measurement-Based Quantum Computing

Physics Circle [UBC] (2022)
Talk Title: The Physics of Snowmageddon

Physics Circle [UBC] (2021)
Talk Title: Symmetry in Electrostatics

TRIUMF Summer Student Symposium [TRIUMF] (2019)
Talk Title: Extracting CryoMPET

Teaching & Outreach

UChicago Department of Physics (2024-current)
Teaching Assistant

- PHYS 141: Honours Mechanics (1 quarter)
- PHYS 142: Honours Electricity and Magnetism (1 quarter)
- PHYS 143: Honours Waves, Optics, and Heat (1 quarter)

UBC Department of Physics and Astronomy (2019-2024)
Teaching Assistant and Lab Development Assistant

- PHYS 500: Graduate Quantum Mechanics (1 term)
- PHYS 402: Applications of Quantum Mechanics (2 terms)
- PHYS 200: Relativity and Quanta (2 terms)
- PHYS 129: Introductory Experimental Physics II (1 term)
  - Helped to develop simulations for the 2021-2022 iteration of the course.
- PHYS 119: Introductory Experimental Physics I (3 terms)
  - Developed materials for 2022 iteration of course involving Python.
  - Developed curriculum and simulations for 2020-2021 online course.
- SCIE 001: First-year Honours Physics/Mathematics (6 terms)

UBC Department of Physics and Astronomy (2018-2022)
Physics Circle Coordinator/Outreach Volunteer

- Organized sessions, recruited faculty speakers, and developed discussion materials for UBC Physics circle, an outreach program for secondary school students.
- Helped with event planning, activity development, and organization for annual UBC Physics Olympics events.

Selected Honours and Awards

UChicago (2025)
Robert G. Sachs Fellowship - *$14250*

NSERC (2022-2023)
Canada Graduate Research Scholarship - Master's - *$17500*

UBC Department of Physics and Astronomy (2022)
Rudi Haering Medal in Physics - *Most outstanding graduating student in Physics*

Canadian Association of Physicists (2022)
1st Place Nationwide - University Prize Examination

NSERC (2020-21)
Undergraduate Student Research Award (USRA) (x2) - *$12000 total*

UBC (2019-21)
Trek Excellence Award (x3) - *Top 5% of year and faculty - $4500 total*