Michael Zurel

Personal information

PhD student @ University of British Columbia (Physics) & Stewart Blusson Quantum Matter Institute

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- Github: github.com/mzurel

Education

- **PhD (in progress)** — University of British Columbia
  Physics (Quantum information and computation) — September, 2020 – Present
  - Supervisor: Dr. Robert Raussendorf
  - Expected graduation: 2025
- **MSc** — University of British Columbia
  Physics (Quantum information and computation) — September, 2019 – November, 2020
  - Supervisor: Dr. Robert Raussendorf
  - Thesis: Hidden variable models and classical simulation algorithms for quantum computation with magic states on qubits
- **BSc** — University of British Columbia
  Combined honours in Physics and Mathematics — September, 2014 – May, 2019
  - Honours thesis: Contextuality and Simulating Quantum Computation with Magic States

Publications & preprints

[1] **MZ**, Cihan Okay, Robert Raussendorf, and Arne Heimendahl. "Hidden Variable Model for Quantum Computation with Magic States on Any Number of Qudits of Any Dimension". 2021. arXiv: 2110.12318.

[2] Robert Raussendorf, Cihan Okay, **MZ**, and Polina Feldmann. "Clifford covariance of Wigner functions, positive representation of Pauli measurements, and cohomology". 2021. arXiv: 2110.11631.

[3] Cihan Okay, **MZ**, and Robert Raussendorf. "On the extremal points of the Λ-polytopes and classical simulation of quantum computation with magic states". In: *Quantum Information & Computation* 21.13&14 (2021). DOI: 10.26421/QIC21.13-14-2. arXiv: 2104.05822.

[4] **MZ**. "Hidden variable models and classical simulation algorithms for quantum computation with magic states on qubits". MSc thesis. University of British Columbia, 2020. DOI: 10.14288/1.0394790.

[5] **MZ**, Cihan Okay, and Robert Raussendorf. "Hidden Variable Model for Universal Quantum Computation with Magic States on Qubits". In: *Physical Review Letters* 125.26 (2020), p. 260404. DOI: 10.1103/PhysRevLett.125.260404. arXiv: 2004.01992.

[6] Robert Raussendorf, Juani Bermejo-Vega, Emily Tyhurst, Cihan Okay, and **MZ**. "Phase-space-simulation method for quantum computation with magic states on qubits". In: *Physical Review A* 101.1 (2020), p. 012350. DOI: 10.1103/PhysRevA.101.012350. arXiv: 1905.05374.

For citation data see Google Scholar.

Awards

- Alexander Graham Bell Canada Graduate Scholarship (NSERC CGS-D) — 2021–2024
- UBC Four Year Doctoral Fellowship (4YF) — 2021 – 2025
- President's Academic Excellence Initiative PhD Award — 2020 – 2022
- UBC Faculty of Science PhD Tuition Award — 2020 – 2022

Conference presentations and posters

- Theory of Quantum Computation, Communication, and Cryptography (upcoming) — University of Illinois
  August, 2022 — Urbana-Champaign, Illinois
  - Format: talk
  - Title: Hidden Variable Model for Quantum Computation with Magic States on Any Number of Qudits of Any Dimension
- Internal talk for QuEra Computing Inc. software/algorithms team — QuEra Computing Inc.
  April, 2022 — Online
  - Format: 45 minute talk
  - Title: Classical simulation of quantum computation with magic states
- Quantum Information Processing (QIP) — Caltech
  March, 2022 — Pasadena, California (online)
  - Format: poster
  - Title: Hidden Variable Model for Quantum Computation with Magic States on Any Number of Qudits of Any Dimension
- Theory of Quantum Computation, Communication, and Cryptography (TQC) — University of Latvia
  July, 2021 — Riga, Latvia (online)
  - Format: 30 minute talk
  - Title: Hidden variable model for universal quantum computation with magic states on qubits
  - Video: https://youtu.be/b1wYoOOLZCI
- Quantum Physics and Logic (QPL) — University of Gdańsk
  June, 2021 — Gdansk, Poland (online)
  - Format: 30 minute talk
  - Title: Hidden variable model for universal quantum computation with magic states on qubits
  - Video: https://youtu.be/ZJwLBAiV_Zc
- Quantum Information Processing (QIP) — Technical University of Munich
  March, 2021 — Munich, Germany
  - Format: poster
  - Title: Hidden variable model for universal quantum computation with magic states on qubits
- Algebraic Structures in Quantum Computation (ASQC4) — University of British Columbia
  June, 2020 — Vancouver, Canada
  - Format: 1 hour talk
  - Title: Hidden variable model for universal quantum computation with magic states on qubits
  - Video: https://youtu.be/Oo6HHSiiJzo
- Southwest Quantum Information and Technology (SQuInT) 2020 — University of Oregon
  February, 2020 — Eugene, Oregon
  - Format: poster
  - Title: Phase-space-simulation method for quantum computation with magic states on qubits
- Quantum Physics and Logic (QPL) 2019 — Chapman University
  June, 2019 — Orange, California
  - Format: 25 minute talk
  - Title: Phase-space-simulation method for quantum computation with magic states on qubits

Teaching experience

- Teaching assistant: Introduction to Quantum Mechanics — January, 2022 – April, 2022
- Teaching assistant: Electricity and Magnetism — September, 2021 – December, 2021
- Teaching assistant: Electricity and Magnetism — September, 2020 – December, 2020
- Teaching assistant: Enriched Physics I — September, 2020 – December, 2020
- Teaching assistant: Introductory Physics for Engineers II — January, 2020 – April, 2020
- Teaching assistant: Introductory Physics — September, 2019 – December, 2019