ROBERT GERSTNER

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Personal Website ◇ LinkedIn ◇ Google Scholar ◇ arXiv ◇ GitHub

EDUCATION

Master of Science, Physics (Thesis-Based) — 2024 - 2026
McGill University — 4.0/4.0 — *Montréal, QC*

Bachelor of Science, Honours Specialization in Integrated Science with Physics — 2020 - 2024
University of Western Ontario — 3.98/4.0 — *London, ON*

RESEARCH EXPERIENCE

Graduate Researcher, **Prof. Bill Coish's Group** — Sep. 2024 - Present
McGill University — *Montréal, QC*

- Using neural networks to improve the simulation of spin qubit systems and study quantum integrability.
- Included a brief research visit with the group of **Prof. Guido Burkard**, University of Konstanz.

Undergraduate Thesis Student, **Prof. Mahi Singh's Group** — Sep. 2023 - May 2024
University of Western Ontario — *London, ON*

- Contributed to a theory of harmonic generation in plasmonic nanohybrid materials.

Undergraduate Research Assistant, **Prof. Jesko Sirker's Group** — May 2023 - Jan. 2024 / May - Aug. 2024
University of Manitoba — *Winnipeg, MB*

- Used operator growth to provide evidence for an absence of many-body localization in spin models.

PUBLICATIONS

[1] A. Weisse, **R. Gerstner**, and J. Sirker. Operator growth in disordered spin chains: Indications for the absence of many-body localization. Phys. Rev. Research **7**, 033018 (2025).

[2] Q. Meng, **R. Gerstner**, Y. Yan, J. E. MacDonald, R. F. Haglund, and M. Singh. Study of Nonlinear Plasmonic Properties of Metallic Nanohybrids. Phys. Scr. **100**, 075550 (2025).

SCHOLARSHIPS & AWARDS

Lorne Trottier Science Accelerator Fellowship, McGill University — Jul. 2025
FRQNT Master's Research Scholarship, Fonds de recherche du Québec (rank 3/29) — Apr. 2025
NSERC CGS-M, University of Manitoba (Declined), McGill University (Accepted) — Apr. 2024
NSERC USRA, University of Manitoba — Feb. 2024
S.R. Valluri Scholarship in Mathematical or Theoretical Physics, Western University — Nov. 2023
Kyle Brandon Traves Memorial Scholarship in Science, Western University — Nov. 2023
Dr. Gérard Hébert Scholarship in Physics, Western University — Nov. 2023
Faculty of Science USRA, University of Manitoba — Mar. 2023
Andrew and Sarah Hamilton Scholarship, Western University — Nov. 2022
Class of '49 Prize, Western University — Nov. 2022
Faculty Association Award, Western University — Nov. 2021
Chancellors' Scholarship, University of Manitoba (Declined) — Aug. 2020
Governor General's Medal, St. Paul's High School — Jun. 2020
President's Entrance Scholarship, Western University — Apr. 2020

SELECTED TALKS AND POSTERS

Spin Qubits Workshop at QTech 2025, Budapest, Hungary — Sep. 22-24, 2025
Poster: *Neural-Network Solutions to Integrable Central-Spin Models*

Quant25 Summer School at Max Planck Institute (PKS), Dresden, Germany — Sep. 8-12, 2025
Poster: *Neural-Network Solutions to Integrable Central-Spin Models*

APS Global Physics Summit, Anaheim, CA — Mar. 17-21, 2025
Oral presentation: *Operator Growth and the Absence of Many-Body Localization*

CAP Congress, London, ON — May 27-31, 2024
Oral presentation: *Second and Third Harmonic Generation in CuS/Au/Al Nanohybrids* (3rd prize in AMO)

Canadian Undergraduate Physics Conference, Waterloo, ON — Oct. 28, 2023
Poster: *Operator Growth and Many-Body Localization via Graphs and Nested Commutators*

SUMMER SCHOOLS

School for Master Students: From Quantum Matter to Quantum Computers — Sep. 8-12, 2025
Max Planck Institute for the Physics of Complex Systems — *Dresden, Germany*

RQEMP & AMA Summer School on Advanced Materials Science and Engineering — Aug. 6-8, 2025
Bishop's University — *Sherbrooke, QC*

SIDE PROJECTS

Band Structures with Graph Theory — Nov. - Dec. 2024
Paper | GitHub Repository

- Devised and analyzed a graph theory method for computing band structures of arbitrary 1D periodic materials.

WORK EXPERIENCE

Teaching Assistant — Sep. - Dec. 2024
McGill University — *Montréal, QC*

Membership, Sales, and Experience Associate — Jun. - Aug. 2021 / May - Aug. 2022
YMCA-YWCA of Winnipeg — *Winnipeg, MB*

General Store Employee — Jul. - Aug. 2020
Hnausa General Store — *Hnausa, MB*

Mathematics and Chemistry Tutor — Jun. 2017 - Jun. 2020
St. Paul's High School — *Winnipeg, MB*

SERVICE

Conference Volunteer. Volunteered at the 2025 Conference on Strongly Correlated Electron Systems in Montréal, managing the audio and timing systems for speakers.
Mentorship. Mentored four younger undergraduate students over two years.
Event Lead. Organized and led an information session about undergraduate summer research in science.
EnviroUSC Collaboration. As part of a group of students in Western's Integrated Science program, collaborated with campus environmental organization EnviroUSC to create an extensive study on Western's environmental policies and performance in comparison to other schools.

CERTIFICATIONS

Deep Learning Specialization, DeepLearning.AI — Jan. 2025
Advanced Badge, IBM Quantum Challenge Fall 2022 — Nov. 2022

SKILLS

- Technical skills: Python, C++, Julia, Mathematica, Maple, JAX, TensorFlow, PyTorch, Qiskit, Git/GitHub, LaTex, SLURM
- Soft skills: scientific writing, public speaking, problem solving, critical thinking, communication
- **National silver medalist** in **long jump**: time management in balancing training with academics