

Educational Background

Fall 2024 **M.Sc. Physics**, *University of Victoria*, Victoria, Canada

- Thesis on quantum virtual cooling via quantum many-body holographic systems.
- Scholarships: [NSERC CREATE Quantum Computing Program](#), [BCGS](#), [UVic FGS](#) (\$31,500)

2019 - 2023 **B.Sc. Honours Physics**, *McGill University*, Montréal, Canada (GPA: 3.84/4.0)

- Thesis on de Sitter space compactifications in type II string theory and M-theory. [↗](#)
- Scholarships: 2 [NSERC USRAs](#) with [FRQNT](#), [SURA](#), [SURE](#), [BSA](#) (\$41,600)

Ongoing Experience

Present **Head of Quantum Software**, *BTQ*, Vancouver, Canada

- Using persistent homology and topological data analysis techniques **to make consensus protocols more robust in post-quantum cryptographic applications**.
- We **characterize the autonomous evolution** and interaction of consensus networks by studying their topology at different grained length scales.

Collaborators: [Prof. Gavin Brennen](#), [Dr. Peter Rohde](#)

Present **Quantum Information Theorist**, *University of Victoria*, Victoria, Canada

- Studying strongly correlated phases in quantum many-body systems for **accessing lower temperature regimes in quantum measurements**.
- Using the holographic framework of AdS/CFT to understand and **perform quantum tasks more efficiently through quantum algorithms** with a path integral formulation.

Supervisor: [Prof. Kristan Jensen](#)

Selected Experience

2023 - 2024 **Quantum Neural Network Theorist**, *Fudan University*, Shanghai, China

- Used topological quantum neural networks to **address the issue of generalization in deep neural networks and make quantum algorithms more efficient**.
- Characterized the networks with the use of topological quantum field theory, a framework which more **efficiently transcribes the information required for quantum tasks in quantum computers**.

Supervisors: [Prof. Antonino Marcianò](#), [Prof. Emanuele Zappala](#)

Summer 2022 **String Cosmology Theorist**, *McGill University*, Montréal, Canada

- **Increased efficiency of extracting cosmic string signals by 1.7x** within non-linear noise, allowing for sampling much larger areas with **wavelet/match filter statistics**.
- Created the cosmic string signal and **developed numerical algorithms in Python** to recognise its profile with **45% more accuracy than previous statistics** with correlation functions. [🐱](#)
- Classified the stability of the cosmic strings to **constrain the signal distribution in the expanding spacetime**. [↗](#)

Supervisor: [Prof. Robert Brandenberger](#)

Fall 2021 **Quantum Cosmology Data Scientist**, *McGill University*, Montréal, Canada

- **Developed computational methods in Python** for decoupling the fast radio burst signals from noise for describing black-white wormhole tunneling events. [🐱](#)
- **Coordinated with 10+ physicists at Compute Canada Cedar** to optimize the calculation of scintillation and decorrelation bandwidths of the burst via **bash scripts**.
- **Established a method for finding the position of the bursts** using spatial correlation functional defined in the our universe's spacetime.

Supervisor: [Prof. Victoria Kaspi](#)

2019 - 2020 **Quantum Theorist**, *Vanier College*, Montréal, Canada

- **Developed a novel approach to solve non-linear PDE** Hamilton-Jacobi equations of motion and generated quantum trajectories in pilot-wave theory. [↗](#)
- Developed efficient **real-time simulations of quantum trajectories with recurrent neural networks in Python** for arbitrary potentials. [🐱](#)

Supervisor: [Prof. Ivan Ivanov](#)