

## Educational Background

- Fall 2024 **M.Sc. Physics**, *University of Victoria*, Victoria, Canada
- Eigenstate thermalization hypothesis verification across quantum many-body systems and circuits.
  - Scholarships: **NSERC CREATE Quantum Computing Program, BCGS, UVic FGS** (\$31,500)

2019 - 2023 **B.Sc. Honours Physics**, *McGill University*, Montréal, Canada

- Thesis on de Sitter space cosmology compactifications in quantum gravity. 
- Scholarships: 2 **NSERC USRAs + FRQNT, SURA, SURE, BSA** (\$41,600)

## Ongoing Experience

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

- Leveraged topological data analysis **to strengthen post-quantum consensus protocols** and characterize autonomous network evolution in quantum key distribution systems, enhancing scalability and security in cryptographic frameworks.
- Creator of **Leonne**: **modular consensus networks for cryptographic proof** in blockchain, and **QRiNG**: **quantum random number generation** for consensus protocols.  

Collaborators: Prof. Gavin Brennen

Present **Quantum Computing Research Scientist**, *University of Victoria*, Victoria, Canada

- Systematic verification of the eigenstate thermalization hypothesis **across multiple quantum many-body models**, investigating thermalization behavior through exact diagonalization and level spacing statistics.
- Applied scaling analysis of thermalization times with Hilbert space dimension **to characterize quantum chaos and integrability**, improving understanding of thermalization mechanisms in quantum systems.

Supervisor: Prof. Thomas Baker

## Selected Experience

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

- Developed topological quantum neural networks **to improve generalization in deep learning**, boosting the efficiency of advanced quantum algorithms.
- Employed topological quantum field theory **to better encode quantum information**, supporting scalable and high-fidelity operations in quantum computing.

Supervisors: Prof. Antonino Marcianò, Prof. Emanuele Zappala

Summer 2022 **String Cosmology Research Scientist**, *McGill University*, Montréal, Canada

- **Increased cosmic string signal extraction efficiency by 1.7x** in noisy environments, enabling broader data sampling via wavelet/match-filter techniques.
- Created custom Python algorithms **to identify string profiles with 45% greater accuracy**, refining correlation-based analytics for astrophysical data. 
- Classified string stability **to constrain signal distributions in evolving spacetime**, improving predictive models for early-universe structures. 

Supervisor: Prof. Robert Brandenberger

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

- Developed Python-based methods **to isolate fast radio burst signals from noise**, facilitating clearer analyses of black-white hole tunneling. 
- Coordinated with 10+ physicists **to optimize bandwidth calculations using HPC and bash scripts**, accelerating signal refinement and processing.
- Established spatial correlation approaches **to pinpoint burst locations in evolving spacetime**, enhancing positional accuracy in cosmological studies.

Supervisor: Prof. Victoria Kaspi

2019 - 2020 **Quantum Simulation Research Scientist**, *Vanier College*, Montréal, Canada

- Created innovative solutions **for non-linear PDE Hamilton-Jacobi equations**, generating predictive quantum trajectories in pilot-wave frameworks. 
- Implemented RNN-driven simulations **to model quantum trajectories in real-time**, adapting efficiently to arbitrary potential landscapes in Python. 

Supervisor: Prof. Ivan Ivanov