










## Educational Background

- 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. 
  - All research awards: 2 NSERC USRAs with FRQNT, SURA, SURE, BSA (Total Amount: \$41,600)

## Selected Experience

- Summer 2023 **Quantum Computing Theorist**, *University of Alberta*, Edmonton, Canada
- Demonstrated a novel relationship between topological wormholes and quantum tunnelling** for systems of entangled qubits in potential-well lattices. 
  - Characterized the general entanglement structure of confined qubits which enabled **quantum algorithms to run 2x more efficiently**.
  - Computed non-perturbative, non-local corrections to the qubit path integral, allowing for **measuring quantum observables with more accuracy**.
- Supervisor: [Prof. Igor Boettcher](#)
- 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. 
  - Numerically solved the time-dependent Schrödinger equation** with the **Crank-Nicolson method** to train the neural networks.
- Supervisor: [Prof. Ivan Ivanov](#)
- ## Ongoing Experience
- Present **Post-Quantum Cryptography Intern**, *BTQ*, Vancouver, Canada
- Using topological quantum error correction and fault-tolerant codes, we look at **optimizing blockchain consensus computations in post-quantum cryptography**.
  - We apply this framework to quantum sampling events done in clusters of scalable quantum computers.
- Collaborator: [Dr. Peter Rohde](#)
- Present **Quantum Neural Network Theorist**, *Fudan University*, Shanghai, China
- Using topological quantum neural networks we look at renormalization group flow in quantum gravity.
  - We use this to describe topological wormhole networks connecting entangled qubits for **more efficient measurements in quantum computers**.
- Supervisor: [Prof. Antonino Marcianò](#)