

CHRISTOPHER GRANADE CURRICULA VITAE

Research Interests in Quantum Computation and Information

- Statistical inference for quantum information applications.
- Control and simulation of noisy quantum systems.
- Algorithms for using quantum resources to characterize and control.
- Applications of error correction and prevention.

Academic History

- PhD, Physics (quantum information). University of Waterloo. 2015.
- Master of Science, Physics. Perimeter Scholars International. 2010.
- Bachelor of Science (Honors cum laude), Physics. University of Alaska Fairbanks. 2009.
- Bachelor of Science (Honors cum laude), Mathematics and Computer Science. University of Alaska Fairbanks. 2009.

Recent Work History

- Research Associate, University of Sydney. March 2015 to present.
- Research Assistant, Institute for Quantum Computing. May 2010 to February 2015.
- Teaching Assistant, Physics Department, University of Alaska Fairbanks. September 2008 to May 2009.
- Research Assistant, Computer Science and Artificial Intelligence Laboratory, Massachusetts Institute of Technology. June 2008 to August 2008.
- Student Researcher, Infrasound Group, University of Alaska Fairbanks. September 2006 to June 2008.

Academic Contributions

Invited Talks

- *Rejection and Particle Filtering for Hamiltonian Learning*. Presented as an invited talk at the [Quantum Machine Learning](#) conference, Perimeter Institute, September 2016.

Papers, Essays and Publications

2016

- *Explaining quantum correlations through evolution of causal models*, Robin Harper, Robert J. Chapman, Christopher Ferrie, **Christopher E. Granade**, Richard Kueng, Daniel Naoumenko, Steven T. Flammia and Alberto Peruzzo. > [arXiv:1608.03281](#)
- *Practical adaptive quantum tomography*, **Christopher E. Granade**, Christopher Ferrie and Steven T. Flammia. > [arXiv:1605.05039](#) | supplemental material [doi:10/bhfk](#)
- *Efficient Bayesian Phase Estimation*, Nathan Wiebe, **Christopher E. Granade**. Physical Review Letters **117** 010503. > [doi:10.1103/PhysRevLett.117.010503](#) | [arXiv:1508.00869](#)
- *Practical Bayesian Tomography*, **Christopher E. Granade**, Joshua Combes and D. G. Cory. New Journal of Physics **18** 033024. > [doi:10.1088/1367-2630/18/3/033024](#) | [literate source code](#) | [arXiv:1509.03770](#)

2015

- *Can small quantum systems learn?*, Nathan Wiebe, **Christopher E. Granade**. > [arXiv:1512.03145](#)
- *Bayesian inference via rejection filtering*, Nathan Wiebe, **Christopher E. Granade**, Ashish Kapoor, Krysta M Svore. > [arXiv:1511.06458](#)
- *Accounting for Classical Hardware in the Control of Quantum Devices*, Ian N. Hincks, **Christopher E. Granade**, Troy W. Borneman, D. G. Cory. Physical Review Applied 4 024012. > [doi:10.1103/PhysRevApplied.4.024012](#) | [arXiv:1409.8178](#)
- *Quantum Inspired Training for Boltzmann Machines*, Nathan Wiebe, Ashish Kapoor, **Christopher E. Granade**, Krysta M Svore. > [arXiv:1507.02642](#)
- *Characterization, Verification and Control for Large Quantum Systems*, **Christopher E. Granade**. PhD Thesis. > [UWSpace](#)
- *Estimating the Coherence of Noise*, Joel Wallman, **Christopher E. Granade**, Robin Harper, Steven T. Flammia. > [arXiv:1503.07865](#)
- *Quantum Bootstrapping via Compressed Quantum Hamiltonian Learning*, Nathan Wiebe, **Christopher E. Granade**, David G. Cory. New Journal of Physics (Fast Track Communications) 17 022005. > [doi:10.1088/1367-2630/17/2/022005](#) | [arXiv:1409.1524](#)

2014

- *Accelerated Randomized Benchmarking*, **Christopher E. Granade**, Christopher Ferrie, D. G. Cory. New Journal of Physics 17 013042. > [doi:10.1088/1367-2630/17/1/013042](#) | [arXiv:1404.5275](#)
- *Quantum Hamiltonian Learning Using Imperfect Quantum Resources*, Nathan Wiebe, **Christopher E. Granade**, Christopher Ferrie, D. G. Cory. Physical Review A 89 042314. > [arXiv:1311.5269](#) | [doi:10.1103/PhysRevA.89.042314](#)
- *Likelihood-Free Methods for Quantum Parameter Estimation*, Christopher Ferrie, **Christopher E. Granade**. Physical Review Letters 112 130402. > [arXiv:1304.5828](#) | [doi:10.1103/PhysRevLett.112.130402](#)
- *Tractable Simulation of Quantum Error Correction with Honest Approximations to Realistic Fault Models*, Daniel Puzzuoli, **Christopher E. Granade**, Holger Haas, Ben Criger, Easwar Magesan, D. G. Cory. Physical Review A 89 022306. > [arXiv:1309.4717](#) | [doi:10.1103/PhysRevA.89.022306](#)
- *Hamiltonian Learning and Certification Using Quantum Resources*, Nathan Wiebe, **Christopher E. Granade**, Christopher Ferrie, D. G. Cory. Physical Review A 89 042314. > [arXiv:1309.0876](#) | [doi:10.1103/PhysRevA.89.042314](#)

2012

- *Robust Online Hamiltonian Learning*, **Christopher E. Granade**, Christopher Ferrie, Nathan Wiebe, David G. Cory. New Journal of Physics 14 103013. > [doi:10.1088/1367-2630/14/10/103013](#) | [arXiv:1207.1655](#)
- *Modeling quantum noise for efficient testing of fault-tolerant circuits*, Easwar Magesan, Daniel Puzzuoli, **Christopher E. Granade**, David G. Cory. Physical Review A 87 012324. > [doi:10.1103/PhysRevA.87.012324](#) | [arXiv:1206.5407](#)

2011

- *Adaptive Hamiltonian Estimation Using Bayesian Experimental Design*, Christopher Ferrie, **Christopher E. Granade**, David G. Cory. Bayesian Inference And Maximum Entropy Methods In Science And Engineering: Proceedings of the 31th International Workshop on Bayesian Inference and Maximum Entropy Methods in Science and Engineering. > [doi:10.1063/1.3703632](#) | [arXiv:1111.0935](#)
- *How to best sample a periodic probability distribution, or on the accuracy of Hamiltonian finding strategies*, Christopher Ferrie, **Christopher E. Granade**, David G. Cory. Quantum Information Processing. > [doi:10.1007/s11128-012-0407-6](#) | [arXiv:1110.3067](#)
- *Parallel Information Transfer in a Multi-Node Quantum Information Processor*, Troy W. Borneman, **Christopher E. Granade**, David G. Cory. Physics Review Letters 108 140502. > [doi:10.1103/PhysRevLett.108.140502](#) | [arXiv:1107.4333](#)

2009

- *Why Complexity Matters* (senior undergraduate Honors thesis). > [PDF](#)

2008

- *Ease and Toil: Analyzing Sudoku*, with Seth Chadwick and Rachel Krieg. > [PDF](#)

Academic Projects

I have contributed or am an active contributor to the following academic projects:

- Complexity Zoo
- [QuTiP](#)
- [QuaEC](#)
- [QInfer](#)
- [QuantumUtils for MATLAB](#)
- [QuantumUtils for Mathematica](#)

Awards and Honors

- Outstanding Submission and INFORMS Prize Winner, Mathematical Contest in Modeling, 2008.
- University of Alaska Fairbanks Physics Department Scholarship Recipient, 2006 and 2007.
- Usibelli Honors Scholarship Recipient, 2006.
- University of Alaska Scholar, 2001-2006.