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 Artifical 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

2017

- *Logical randomized benchmarking*, Joshua Combes, **Christopher E. Granade**, Christopher Ferrie, Steven T. Flammia. > arXiv:1702.03688

2016

- *Structured filtering*, **Christopher E. Granade**, Nathan Wiebe. > arXiv:1612.00762
- *QInfer: Statistical inference software for quantum applications*, **Christopher E. Granade**, Christopher Ferrie, Ian Hincks, Steven Casagrande, Thomas Alexander, Jonathan Gross, Michal Kononenko, Yuval Sanders. > arXiv:1610.00336

- *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

- Oustanding 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.