

Graham Greve

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EDUCATION

University of Colorado-Boulder

Nov. 2021

Ph.D. Physics

University of Chicago

June 2014

B.A. Physics, B.S. Computer Science

EXPERIENCE

James Thompson's Atomic Physics Lab

July 2014 – Oct. 2021

JILA Research Assistant

- Dissertation: *Entanglement-enhanced matter-wave interferometry in a high-finesse cavity*
- Cavity quantum-electrodynamics with cold atoms: fundamental light/matter interactions; record-setting amounts of useful entanglement; world's first entangled matter-wave interferometer; precision metrology
- Automation, electronics, instrumentation, data processing
- Simulation, data analysis and visualization, presentation

Jon Simon's Atomic Physics Lab

Oct. 2012 – June 2014

Undergraduate Research Assistant

- Optics and imaging: a piezo-controlled atomic transport system
- Soldering, machining, designed the initial data acquisition system (Python)

BiblioVault (University of Chicago Press)

June 2012 – Sept. 2012

Perl/Web Developer

- Object-oriented programming, database engineering, version control, production environments

SELECT PROJECTS

"Bored Games"



Back-end (elixir) and front-end (Elm) for a multiplayer board game arena using functional programming and websockets. Developed logic and solvers for abstract strategy, hidden knowledge, and puzzle games.

Mainsail Café



The largest online repository of maritime music and associated resources. Used various APIs and occasional OCR and OMR to compile data. Built a recommendation engine based on textual similarity.

Reinforcement Learning for Canoe



Artificial intelligence for the abstract strategy game *Canoe*. Followed lessons from AlphaGo to develop an underlying neural net that trains and improves through self-play.

PROFICIENCIES

- Python, Matplotlib, NumPy, pandas, scikit-learn
- Mathematica, Elixir, Elm, Javascript, PHP, SQL, C++, Igor Pro, LabVIEW
- Git, L^AT_EX, quantum mechanics, statistics, research & general problem solving
- *Basic knowledge:* Perl, Java, Rust, FORTRAN, AWS, TensorFlow & Keras

PUBLICATIONS

- GP Greve, C Luo, B Wu, JK Thompson, **Entanglement-enhanced matter-wave interferometry in a high-finesse cavity**. *arXiv: 2110.14027* (2021, to be published).
- B Wu, GP Greve, C Luo, JK Thompson, **Site-dependent selection of atoms for homogeneous atom-cavity coupling**. *arXiv: 2104.01201* (2021, to be published).
- A Shankar, GP Greve, B Wu, JK Thompson, M Holland, **Continuous real-time tracking of a quantum phase below the standard quantum limit**. *Phys. Rev. Lett.* 122 (23), 233602 (2019).
- GP Greve, B Wu, JK Thompson, **Laser cooling with adiabatic transfer on a Raman transition**. *New J. Phys.* 21 (7), 073045 (2019).
- KC Cox, GP Greve, B Wu, JK Thompson, **Spatially homogeneous entanglement for matter-wave interferometry created with time-averaged measurements**. *Phys Rev. A* 94 (6), 061601 (2016).
- KC Cox, GP Greve, JM Weiner, JK Thompson, **Deterministic squeezed states with collective measurements and feedback**. *Phys. Rev. Lett.* 116 (9), 093602 (2016).
- KC Cox, JM Weiner, GP Greve, JK Thompson, **Generating entanglement between atomic spins with low-noise probing of an optical cavity**. *2015 Joint Conf. of the IEEE Int. Freq. Control Symposium* (2015).