

# Kit Newton

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University of Wisconsin-Madison  
Department of Mathematics

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## Education

### University of Wisconsin-Madison

Ph.D. Candidate, Physics, 2016-Present.

Expected completion date: May 2020

Field: Computational Mathematics

Adviser: Qin Li

M.A., Mathematics, December 2018

M.A., Physics, May 2018

### Reed College

B.A., Physics, 2016.

Thesis: Bohmian Mechanics and Magnetism: A Computational Approach

Adviser: Joel Franklin

## Publications

Q. Li, R.-Y. Lai, L. Wang, and K. Newton,  
Stability deterioration of linear and nonlinear optical tomography  
in the Bayesian framework  
*in preparation.*

K. Chen, Q. Li, K. Newton, and S. Wright  
Structured random sketching for PDE inverse problems  
*in preparation.*

Q. Li and K. Newton,  
Diffusion equation assisted Markov chain Monte Carlo methods  
for the inverse radiative transfer equation.  
*Entropy* 21 (3) 2019.  
E-print: <https://www.mdpi.com/1099-4300/21/3/291>.

K. Newton, Q. Li, and A. Stuart,  
Diffusive optical tomography in a Bayesian framework.  
*Submitted February 2019*  
E-print: <https://arxiv.org/abs/1902.10317>.

J. Franklin and K. Cole Newton,  
Classical and quantum mechanical motion in magnetic fields.  
*American Journal of Physics* 84 (263) 2016  
E-print: <https://arxiv.org/abs/1603.01211>.

J. Franklin, Y. Guo, K. Cole Newton, and M. Schlosshauer,  
The dynamics of the Schrödinger-Newton system with self-field coupling.  
*Classical and Quantum Gravity* 33 (7), 2016  
E-print: <https://arxiv.org/abs/1603.03380>

**Presentations** “Stability of diffuse optical tomography in the optically thick case”  
Mini-symposium, ICIAM  
University of Valencia, July 2019.

“Two-level MCMC methods for diffuse optical tomography”  
AWM Symposium  
Rice University, April 2019.

“A Bayesian perspective on diffuse optical tomography”  
Applied and Computational Math Seminar  
Dartmouth College, April 2019.

“Diffusion equation-assisted MCMC methods for the inverse radiative transfer equation”  
JMM AWM poster session  
Baltimore, MD, January 2019.

“Diffuse optical tomography in the Bayesian framework”  
AMS Fall Southeastern Sectional Meeting:  
Validation and Verification Strategies in Multiphysics Problems  
University of Arkansas, November 2018.

“Diffusive optical tomography in the Bayesian framework” (Poster)  
IMA: Recent advances in Machine Learning and Computational Methods for Geoscience  
University of Minnesota, October 2018.

“Diffusive optical tomography in a Bayesian framework” (Poster)  
ICERM: Advances in PDEs: Theory, Computation, and Application to CFD  
Brown University, August 2018.

“Diffusive optical tomography in a Bayesian framework”  
Institute for Foundations of Data Science Student Workshop  
University of Wisconsin-Madison, April 2018.

“Towards a new numerical method for solving the Bethe ansatz equations”  
Quantum Effects on Precision Cosmological Experiments  
Los Alamos National Labs, August 2017.

“Revival times for a supersymmetric coherent state” (Poster)  
Conference for Undergraduate Women in Physics  
Oregon State University, January 2016

“Revival times for a supersymmetric coherent state” (Poster)  
Conference Experience for Undergraduates  
APS Division of Nuclear Physics, October 2015

## Teaching

**Department of Physical Science, Madison Area Technical College**  
Instructor, College Physics I, Fall 2019.

**Department of Mathematics, University of Wisconsin-Madison**  
Teaching assistant and coordinator, Calculus III, Fall 2019.

**Department of Mathematics, University of Wisconsin-Madison**  
Teaching assistant and coordinator, Calculus II, Fall 2018.

**College of Engineering, University of Wisconsin-Madison**  
Engineering Summer Program  
Instructor, Precalculus, Summer 2018.

**Department of Mathematics, University of Wisconsin-Madison**  
Teaching Assistant, Calculus I, Spring 2018.

**Department of Physics, University of Wisconsin-Madison**  
Teaching Assistant, Electricity and Magnetism for Engineers, Fall 2017.

**Department of Physics, Reed College**  
Grader, Quantum Mechanics II, 2016  
Tutor/Grader, Mathematical Methods for Physics, 2014-2016  
Tutor/Grader, Introduction to Modern Physics, 2014-2016  
Tutor, Introduction to Mechanics, 2014-2016  
Tutor, Introduction to Electricity and Magnetism, 2014-2016

**Department of Mathematics, Reed College**  
Tutor, Calculus, 2014-2016  
Tutor, Introduction to Analysis, 2014-2016  
Tutor, Multivariable Calculus I and II, 2014-2016  
Teaching Assistant, Introduction to Computing, 2014-2016

## Fellowships

**University Fellowship**  
Department of Physics  
University of Wisconsin-Madison, 2016-2017

**Graduate School Fellowship**  
Department of Physics  
University of Wisconsin-Madison, 2016

**Firminhac Fellowship for Women in Physics**  
Department of Physics  
University of Wisconsin-Madison, 2016

## **Outreach and Service**

### **Volunteer**

Girls Math Night Out  
September 2018 - December 2018

### **Speaker**

Madison Math Circle  
October 2018

### **Mentor**

Directed Reading Program  
September 2018 - December 2018

### **President and Founder**

Out in Science, Technology, Engineering, and Mathematics at UW-Madison  
July 2017 - July 2018

### **Volunteer**

Expanding Your Horizons  
November 2017

### **Seminar Series Coordinator**

Women and Gender Minorities in Physics  
September 2016 - July 2018

## **Awards and Honors**

### **Mid-Career TA award**

University of Wisconsin-Madison, 2019

### **Phi Beta Kappa**

Reed College, 2016

### **Commendation for Excellence**

Reed College, 2013 and 2015

## **Languages and Skills**

English (native), French (advanced)  
 $\LaTeX$ , MATLAB, Mathematica