

Teaching

- **Lecturer** University of New Hampshire
Department of Mathematics and Statistics August 2015 - Present
 - Teaching an active-learning “Studio” Calculus I and II course sequence for Honors and Physics, Mathematics, and Engineering students. Two-hour meeting periods include both short lectures and activities on concept development and exploration, simple derivations/proofs, technique practice, and/or technique extension completed in groups.
 - Taught and coordinated TAs for 160-200 student *MATH527: Differential Equations with Linear Algebra* lecture using iClicker and PowerPoint outlines with live-written overlays.
 - Taught large lectures of two versions of calculus: *MATH425: Calculus I* (for College of Engineering and Physical Sciences majors) and *MATH424A: Calculus for Social Sciences*.
 - Taught large lecture *MATH418: Analysis and Applications of Functions*.
- **Instructor** University of New Hampshire
Differential Equations with Linear Algebra Summer 2014
 - Hybrid Online Course
 - Live streaming lecture slides and audio; recorded slides and audio
- **Coursework in College Teaching** University of New Hampshire
Issues in College Teaching and Cognition, Teaching, & Learning Summer 2013
- **Teaching Assistant** University of New Hampshire
Differential Equations and General Physics Fall 2010, Spring 2011, Fall 2013
- **Teaching Assistant** University of Texas at Austin
Differential Equations Fall 2005-Summer 2006

Education

- **University of New Hampshire** Durham, NH
Ph.D., Integrated Applied Mathematics September 1, 2015
 - GPA: 3.97/4.00
 - Dissertation: [A Supercell, Bloch Wave Method for Calculating Low-Energy Electron Reflectivity with Applications to Free-Standing Graphene and Molybdenum Disulfide](#)
 - Advisor: Prof. Jian-Ming Tang (Department of Physics)
- **University of Texas** Austin, TX
Master of Arts in Mathematics August 2007
 - GPA: 3.62/4.00
 - 3 years of Ph.D.-track course work in pure mathematics
 - Master’s Report: [Statistical Mechanics of Static Granular Systems](#)
- **Rutgers, The State University of New Jersey** New Brunswick, NJ
Bachelor of Science in Physics and Mathematics May 2003
 - GPA: 3.96/4.00
 - Highest Honors in Physics, High Honors in Mathematics, Rutgers College Highest Honors

Industry Employment

- **Senior Associate** [Frontier Associates, LLC](#); Austin, TX
Forecasting, Design, M&V of Utility Programs for Energy Efficiency and Renewable Energy Oct 2007 - July 2010

Research Interests

- Current Work - Theory and Computation of Low-energy Electron Diffraction: Slab-geometry Bloch-wave matching applied to density functional theory solutions to Schrödinger Equation for low-energy electron scattering
- Past Work - Mathematical Physics: Mathematical Analysis of Ionization in 1D Schrödinger Equations, Statistical Mechanics of Granular Materials
- Interests in Mathematics of Materials Science: Multiscale Modeling of Materials, PDEs of Material Growth, Numerical Aspects of Density Functional Theory, Material/Topology/Structural Optimization
- Interests in Simulation of Energy Technologies: Solar cells, Electrochemical energy storage, Fuel cells, Electrical Grid
- Interests in Data Science for Energy: Smart Metering and Energy Efficiency, Electrical Grid Reliability and Pricing.

Presentations, Talks, and Workshops

- **SIAM@WPI: WPI Chapter of SIAM** Invited Research Talk
First-Principles Computation of LEED Spectra of 2D Materials Worcester, MA; March 2015
- **APS March Meeting** Focus Session Talk
First-Principles Calculations of LEEM Reflectivity Spectra of MoS₂ San Antonio, Tx; March 2015
- **Gene Golub SIAM Summer School** Attendee/Poster Presentation
Simulation, Optimization, and Identification in Solid Mechanics Linz, Austria; August 2014
- **SIAM Annual Meeting 2014** Poster Presentation
Theoretical Analysis of Low-Energy Electron Diffraction Chicago, IL; July 2014
- **APS March Meeting** Focus Session Talk
First-Principles Calculations of Off-Normal LEEM Reflectivity Spectra Denver, CO; March 2014
- **SIAM Conference on Math. Aspects of Materials Science** Poster Presentation
Math. and Comp. Methods for Low-Energy Electron Microscopy Philadelphia, PA; June 2013
- **Frontiers in Applied and Computational Mathematics** Poster Presentation
Math. and Comp. Methods for Low-Energy Electron Microscopy NJIT, Newark, NJ; June 2013
- **APS March Meeting** Focus Session Talk
First-Principles Modeling of LEED of Few Layer Graphene Baltimore, MD; March 2013
- **APS Opportunities in Energy Research Workshop** Attendee
Funded in part by US DOE Baltimore, MD; March 2013
- **APS March Meeting** Focus Session Talk
First-Principles Modeling for LEED Spectra Boston, MA; March 2012

Publications/Preprints

- McClain, J. F., Sun, J., Pohl, K., and Tang, J.-M. (2013). *First-principles theory of low-energy electron diffraction and quantum interference in few-layer graphene.* [arXiv:1311.2917](https://arxiv.org/abs/1311.2917).

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Scholarships, Honors, and Awards

University of New Hampshire Graduate School Dissertation Year Fellowship	2014-2015
UNH CEPS Dorothy Kittredge Memorial Scholarship	2014-2015
University of New Hampshire Graduate School Summer TA Fellowship	2014
Society for Industrial and Applied Mathematics Student Travel Award	2013, 2014
University of New Hampshire Graduate School Travel Award	2012, 2014, 2015
National Science Foundation VIGRE Graduate Fellowship (UT-Austin Mathematics)	2004-2005
Richard T. Weidner Prize (Rutgers Physics)	2003
Weill Scholarship (Rutgers Mathematics)	2001-2003
Mary Wheeler Wigner Memorial Scholarship (Rutgers Physics)	2002-2003
Robert L. Sells Scholarship (Rutgers Physics)	2001-2002
National Merit Scholarship	1999

Service

- **Food Rescuer for Cornucopia Food Pantry** Waysmeet Center, UNH Campus Ministry
Weekly Bread Pickup *Summer 2012-Present*
- **MATHCOUNTS Volunteer** University of New Hampshire
Grader and Proctor for middle school math competition *February 2016, February 2011*
- **Unofficial IAM Grad Seminar Organizer/Co-Organizer** University of New Hampshire
Organized speakers and refreshments for ~20 talks; gave talks *April 2013-May 2015*
- **Graduate Student Senate** University of New Hampshire
Treasurer, External Affairs Officer *2011-2013, 2013-2014*

Programming and Computer Skills

Languages: MATLAB, Quantum ESPRESSO, Python, FORTRAN, $L^A_T E^X$, Visual Basic for Applications with Microsoft Excel

Past Research Experiences

- **Master's Report, under Charles Radin** University of Texas at Austin
Statistical Mechanics of Static Granular Systems *2007*
 - Summarized experimental, theoretical, and computational studies of granular systems
- **NSF-sponsored Rutgers Mathematics Department REU** Rutgers University
Under Ovidiu Costin *Summer 2003*
 - Analytical investigation of the role of delta function potential in ionization of some 1-D models of electrons in external electric fields.
- **“Honors in Physics” Research Project** Rutgers University
Under Ovidiu Costin *2002-2003*
 - Analytical investigation of ionization of electrons in a delta function potential subject to quasiperiodic electric field
- **NSF-sponsored DIMACS-VIGRE REU** Rutgers University
Under Avy Soffer *Summer 2002*