

## Education

- **Colorado School of Mines** Golden, CO  
*PhD Candidate in Applied Physics* Expected Graduation Date 2013
  - Research Topics: Quantum Hydrodynamics and Emergent Phenomena in Ultracold Quantum Gases
  - Topics of Study: Statistical Mechanics, Classical Mechanics, Electrodynamics
  - Advisor: Dr. Lincoln Carr
- **Colorado School of Mines** Golden, CO  
*M.S. Computational and Applied Mathematics* December 2006
  - Topics of Study: Wave Modeling, Quantum Mechanics, Numerical Linear Algebra and Differential Equations, Real, Functional and Asymptotic Analysis
- **Colorado School of Mines** Golden, CO  
*B.S. Mathematical and Computer Sciences* 2001
  - Topics of Study: Dynamical systems, Complex Analysis, Parallel Computing, Algorithms, Operating Systems
  - Undergraduate Project: Implementation of iterative schemes in *CLAPACK* to study spectra of sparse matrices derived from crystal lattice structures.

## Employment History

- **Colorado School of Mines** Golden, CO  
*Instructor* August 2003 - Present
- **Colorado School of Mines** Golden, CO  
*Adjunct Instructor* August 2001 - May 2003

## Teaching History

- **Programing Concepts in C++** MACS261  
*Total of 408 Students* Fall 2001-Fall 2003
- **Engineering and Design Practices** EPIC251  
*Total of 25 Students* Spring 2002
- **Introduction to Topics for Calculus** MACS100  
*Total of 20 Students* Summer 2002
- **Introduction to Differential Equations** MACS315/MATH225  
*Total of 292 Students* Spring 2003 - Fall 2004, Fall 2008
  - Course Coordinator : Spring 2007, Fall 2007, Spring 2008
- **Freshman Success Seminar** CSM101  
*Total of 40 Students* Fall2003, Fall 2004

- **Calculus for Engineers I** MACS111  
*Total of 116 Students* *Spring 2004 - Fall 2004*
- **Linear Algebra** MACS332/MATH332  
*Total of 39 Students* *Summer 2006, Summer 2009*
- **Introduction to Differential Equations w/ Honors** MACS325/MATH235  
*Total of 40 Students* *Spring 2007, Spring 2008*
- **Advanced Engineering Mathematics** MACS348/MATH348  
*Total of 928 Students* *Fall2006 - Present*

## Service

- **Mathematical and Computer Sciences Department**

- Advisor (Present) : Currently advising a total 34 undergraduate students.
- Committee Member (Present) : Departmental Outreach Committee
- Project Manager (2008) : Field Session - Finite dimensional approximation of solutions to the Schrödinger equation via minimization of energy functionals represented in the Hermite basis.
- Presenter (2008, 2007, 2006, 2003) : Presenter for Discover CSM and Explore CSM
- Organizer (2006) : Helped organize materials for ABET accreditation review.
- Presenter (2006) : Presenter at CSM Options Showcase
- Assessor (2005) : Helped conduct assessment of department in preparation for ABET accreditation review.
- Co-Organizer (2004) : Helped organize First Annual Front Range Undergraduate Mathematics Conference.

## Service - Continued

- **Colorado School of Mines**

- Committee Member (Present) : Readmissions Committee
- Advisor (Present) : First-year Student Academic Advisor
- Panelist (2009) : Parents Weekend Panelist
- Instructor (2007, 2008, 2009, 2010) : EIT/FE Mathematics Review Session
- Committee Member (2004) : Member of the ad hoc committee on undergraduate advising, which produced the current CSM Undergraduate Advising Manual.
- Advisor (2007) : Faculty advisor to the CSM Boxing Club
- Advisor (2004) : Faculty advisor to the CSM Ballroom Dancing Organization
- Instructor (2004, 2003) : CSM101-Freshman Success Seminar

- **External**

- Reviewer (2009) :  
An Introduction to Differential Equations I : Deterministic Modeling Methods and Analysis,  
A. G. Ladde and G. S. Ladde, Oxford Press
- Reviewer (2009) :  
An Introduction to Differential Equations II : Stochastic Modeling Methods and Analysis, A.  
G. Ladde and G. S. Ladde, Oxford Press
- Reviewer (2009) : Advanced Engineering Mathematics, Larry Turyn, McGraw-Hill

- Reviewer (2009) : Differential Equations, Yunus A. Cengel and William J. Palm, McGraw-Hill
- Instructor (2008) : Instructed employees of Al Waha Petrochemical Company on linear algebra and differential equations.
- Reviewer (2008) : Differential Equations, Merle Potter, Jack Goldberg and Matthew Boelkins, Oxford Press
- Reviewer (2004) : Problem Solving with C++ Walter Savitch, Addison-Wesley, 6<sup>th</sup> ed.

## Publications

- Strong, S. & Moskal, B. (2006). “Caveats of Course Coordination.” Paper in the proceedings of the Frontiers in Education Conference, San Diego, California (6 pages)(Invited).
- Moskal, B., Strong, S., & Fairweather, G. (2006). “Assessing core courses in mathematics: Effects of multi-section coordination.” In Madison, B.L. (Eds) Assessment of Student Learning in College Mathematics: Towards Improved Programs and Courses. Tallahassee, FL: Association for Institutional Research (131-143) (Book Contribution).
- Moskal, B., Strong, S. & Fairweather, G. (2005). “First annual front range undergraduate mathematics conference: Lessons learned.” Rocky Mountain Section of the Mathematical Association of America: Newsletter, 6-7 (Newsletter).
- Strong, S., & Carr, L (2010). “The Locally Induced Dynamics of Thin Cored Vortex Geometries with Applications to Bose-Einstein Condensates”, Poster Presentation at DAMOP, Houston, TX.
- Strong, S. (2009). “The Locally Induced Dynamics of Thin Cored Vortex Geometries”, Presentation at CSM Theoretical Physics Seminar, Golden, CO.
- Strong, S. (2008). “Nonlinear Evolutions Equations - CMI Summer School 2008”, Presentation at CSM Theoretical Physics Seminar, Golden, CO.
- Moskal, B., Strong, S. & Fairweather, G. (2007). “The mathematics core: A question of fairness?” Presentation at the Joint Mathematics Meetings, New Orleans, Louisiana.
- Strong, S. & Moskal, B. (2006). “Caveats of Course Coordination.” Paper in the proceedings of the Frontiers in Education Conference, San Diego, California (6 pages).
- Strong, S., Moskal, B., & Fairweather, G. (2006). “Assessing the mathematics core: A mixed method approach at the Colorado School of Mines.” Presentation at the Joint Mathematics Meetings, San Antonio, Texas.
- Moskal, B., Fairweather, G. & Strong, S. (2005). “First Annual Front Range Undergraduate Mathematics Conference” Presentation at the Joint Mathematics Meetings, Atlanta, Georgia.
- Strong, S. (2002) “Fractal Geometry, Chaotic Dynamics and Music Composition.” Presentation for the Davidson Institute - Young Scholars Program, Golden, CO.

## Conferences/Workshops

- **41st Annual Division of Atomic, Molecular and Optical Physics** Houston, TX  
*Presenter : Poster* May 25-29, 2010
- **Nonlinear Finite Element Analysis** Austin, TX  
*Attendee at A Short Course taught by T. J. R. Hughes and T. Belytschko* August 17<sup>th</sup>-21<sup>st</sup>, 2009

- **International Conference on Microwave Magnetics** Ft. Collins, Colorado  
*Attendee* September 2008
- **Evolution Equations** Zürich, Switzerland  
*Attendee at Clay Mathematics Institute Summer School* June-July 2008
- **ASEE/IEEE Frontiers in Education Conference** San Diego, CA  
*Presenter* October 28<sup>th</sup>-31<sup>st</sup>, 2006
- **AMS/MAA Joint Conferences** San Antonio, TX  
*Presenter* January 12<sup>th</sup>-15<sup>th</sup>, 2006
- **First Annual Front Range Undergraduate Mathematics Conference.** Golden, CO  
*Co-Organizer* 2004

## Research Interests

- Quantum Hydrodynamics
  - Derivation of nonlinear model equations arising from nonlocal induction approximations for the dynamics of slender vortex filaments in semi-classical fluid dynamics.
  - Analytic and numerical investigation of vortex dynamics in the context of semi-classical and quantum fluids.
  - Study of broken symmetries induced by vortex generation and its extensions to analogous symmetry breaking physical phenomena.

## Professional Memberships

- American Physical Society