Contact Information

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Formerly known as: Christine Lind

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Education

University of Washington, Seattle, Washington USA

- Ph.D., Applied Mathematics, August 2011

  Dissertation: Mathematical Models for Facilitated Diffusion and the Brownian Ratchet
  Advisor: Hong Qian

- M.Sc., Applied Mathematics, December 2004

Macalester College, Saint Paul, Minnesota USA

- B.A., Mathematics and Physics, May 2002

Research Interests

Applied Stochastic Processes, Partial Differential Equations, Dynamical Systems, Mathematical Biology, Molecular Motors, Mathematical Modeling

Honors and Awards

University of Washington:

- Boeing Teaching/Service Award 2009
  for outstanding teaching and service by a student in the department of Applied Mathematics at the University of Washington in the 2008-2009 academic year
- VIGRE Fellowship 2005, 2006, and 2009
- GK-12 Fellowship 2007 and 2008
- Graduate School Top Scholar 2003

Macalester College:

- Russell B. Hastings Book Award 2002
  for achievement in physics and service to the department
- Graduated *Cum Laude*
- Pi Mu Epsilon
  elected in sophomore year

University of Washington Teaching Experience

Instructor:

Complete responsibility for lectures, exams, homework assignments, and final grades. Received excellent evaluations from students.

- Introduction to Continuous Mathematical Modeling (AMATH 383)
  Summer 2008 & Spring 2009
  Mathematical modeling course with differential equations as a prerequisite. Final grades based on homework and a 10-15 page written report on a modeling project about a topic of the student's choosing. Summer 2008 class size: 22. Spring 2009 class size: 40.
- Introduction to Differential Equations and Applications (AMATH 351)
  Spring 2006
  Introductory ordinary differential equations course with multivariate calculus as a prerequisite. Final grades based on homework, two mid-term exams, and a comprehensive final exam. Class size: 35.

Teaching Assistant:

Responsible for quiz sections that met twice a week. Held office hours, extra review sessions, and participated in grading of midterm and final exams. Received excellent evaluations from both students and supervising professors.

- Algebra with Applications (Business Algebra, MATH 111)
  Autumn 2008 & Winter 2009
  Taught two quiz sections each quarter with 40 students in each section.
  Supervising professors: Alexandra Nichifor and Andrew Loveless.
- Precalculus (MATH 120)
  Autumn 2004
  Taught two quiz sections of 40 students each.
  Supervising professor: David Schneider.
- Calculus with Analytic Geometry II (Integral Calculus, MATH 125)
  Autumn 2003 & Winter 2004
  Taught two quiz sections each quarter with 27 students in each section.
  Supervising professors: Patrick Perkins and Tatiana Toro.

Other Teaching Experience

- **GK-12 Fellow**, Emerson Elementary School, Seattle, Washington
  September 2006-June 2008
  Served as a "mathematics specialist" in third and fourth grade classrooms. Fellows supported classroom teachers as they learned to teach inquiry-based mathematics. Duties included teaching and planning lessons with teachers, and working with students in small groups or one-on-one.
- **Summer School Instructor**, Charles Wright Academy, University Place, Washington
  June-August 2000
  Taught summer school classes for up to 12 middle and high school students on Mathematics and SAT Preparation. Duties included lecturing, creating lesson plans and homework assignments, as well as one-on-one tutoring. Instructed elementary school students in basic baseball skills.

Experience with Undergraduate Research

- **Mathematics Capstone Project:** *Map Projection Distortion*, Macalester College
  September 2001- May 2002
  Studied techniques from both differential geometry and cartography for quantifying the distortions introduced by projecting the Earth, as a sphere, onto a flat map. The project culminated in both a 30-minute presentation and a 33 page written report.

- **Physics Research Assistant**, Macalester College
  Summer 2001
  Designed and implemented experimental set-ups for studying resonance phenomena in quantum wells. Participated in research that led to the publication listed below.

  Heyman, J. N., Wrage, H., **Lind, C.**, Hebert, D., Neocleous, P., Crowell, P. A., Müller, T., Unterrainer, K. Terahertz Emission From Magneto-plasma Oscillations in Semiconductors, *Ultrafast Phenomena in Semiconductors VI*, Tsen, Song, Jiang, Editors, Proceedings of SPIE, 2002, Vol. 4643: 12-18.

Professional Service and Outreach

- **Math Fair Volunteer**
  2010-2011
  Volunteered at math fairs at Lockwood Elementary School in Bothell, WA and Emerson Elementary School in Seattle, WA. Played math games with students, helped students calculate the height of a basketball hoop using similar triangles and lasers, helped students investigate gravity using stopwatches to time a dropped marble.

- **Mathematical Biology Journal Club Participant, Organizer**
  2004-2011
  Participated in the departmental mathematical biology journal club throughout graduate school. Current and classic journal articles were discussed in a collaborative setting. Participants were mainly graduate students, with occasional participation by faculty members. Served as the organizer for the journal club from January 2006 until December 2008.

- **SIAM UW Student Chapter Officer**
  Autumn 2008-Spring 2009
  Served as an officer for the SIAM student chapter at the University of Washington. Duties included recruiting and scheduling speakers for a weekly seminar attended by graduate students, as well as buying snacks and facilitating seminars.

- **Undergraduate Seminar Organizing Committee Member, Chair, Speaker**
  Autumn 2009-Spring 2010, Spring 2004-Spring 2006
  Co-organized a new seminar (AMATH 490) in Spring 2004, offered to interest undergraduates in mathematical research areas at an early stage in their careers. Served as a member of the Undergraduate Mathematical Sciences Seminar organizing committee for the 2004-2005 and 2009-2010 academic years, and as the chair for the 2005-2006 academic year. Duties as chair included advertising, seminar announcements, recruiting speakers, CR/NC grade assignment, and delegating responsibilities to seven other committee members. Presented my own research twice, in June 2005 and February 2006.

Publications

- **Cole, C. L.**, Qian H. The Brownian Ratchet Revisited: Diffusion Formalism, Attraction, and Multiple Filamentous Bundle Growth, *Biophysical Reviews and Letters*, 2011, 6 (1 & 2): 59-79.
- **Cole, C. L.**, Qian H. Simple Chemical Model for Facilitated Transport with an Application to Wyman-Murray Facilitated Diffusion, *Acta Phys. -Chim. Sin.*, 2010, 26 (11): 2857-2864.
- Heyman, J. N., Wrage, H., **Lind, C.**, Hebert, D., Neocleous, P., Crowell, P. A., Müller, T., Unterrainer, K. Terahertz Emission From Magneto-plasma Oscillations in Semiconductors, *Ultrafast Phenomena in Semiconductors VI*, Tsen, Song, Jiang, Editors, Proceedings of SPIE, 2002, Vol. 4643: 12-18.

Conference Presentations

- **SIAM Conference on Nonlinear Waves and Coherent Structures 2012:**
  MS36 Diffusion-Driven Pattern Formation in Biological Model Systems:
  The Brownian Ratchet Revisited: Multiple Filamentous Bundle Growth
  (Mini-Symposium Presentation)
- **Frontiers in Biophysics 2011:**
  The Brownian Ratchet Revisited: Multiple Filamentous Bundle Growth
  (Poster Presentation)
- **International Conference on Mathematical Biology and Annual Meeting of the Society for Mathematical Biology 2009:**
  A Simple Chemical Kinetic Model for Facilitated Diffusion
  (Poster Presentation)
- **Joint Mathematics Meetings 2008:**
  AMS Special Session on Learning and Math Graduate Students in K–12 Classroom:
  Panel 7: Effects of the University of Washington's GK-12 project on fellows' teaching pedagogy and on elementary school teachers' and students' content knowledge.
  (Panelist)

Other Presentations

- **University of Puget Sound Mathematics Department Seminar November 2012:**
  Mathematical Models for Molecular Motors - The Polymerization Ratchet
  (Scheduled Presentation)
- **Pacific Lutheran University Mathematics Department Seminar December 2011:**
  Mathematical Models for Molecular Motors - The Polymerization Ratchet