Curriculum Vitae

Courtney N. Lannert

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Academic Positions

- July 2012-present: Associate Professor, Physics Department, Smith College and University of Massachusetts, Amherst
- July 2009-July 2012: Associate Professor, Physics Department, Wellesley College
- July 2002-July 2009: Assistant Professor, Physics Department, Wellesley College

Education

- Ph. D. in theoretical condensed matter physics, June 2002, University of California, Santa Barbara.
- Sc.B., Magna Cum Laude, in Physics with honors, May 1996, Brown University, Providence, Rhode Island.

Publications (undergraduate co-authors are marked with *)

- "Static and Dynamic Properties of Shell-shaped Condensates," Kuei Sun, Karmela Padavić, Frances Yang*, Smitha Vishveshwara, Courtney Lannert, submitted to *Phys. Rev. A*.
- "Physics of hollow Bose-Einstein condensates," Karmela Padavić, Kuei Sun, Courtney Lannert, Smitha Vishveshwara, *Euro. Phys. Lett.* **120**, 20004 (2017).
- "Small-network approximations for geometrically frustrated Ising systems," B. Zhuang* and C. Lannert, *Phys. Rev.* **E 85**, 031107 (2012).
- "Probing condensate order in deep optical lattices," K. Sun, C. Lannert, and S. Vishveshwara, *Phys. Rev.* **A79**, 043422 (2009).
- "Josephson physics mediated by the Mott insulating phase," S. Vishveshwara and C. Lannert, *Phys. Rev.* **A78**, 053620 (2008).
- "Supercurrent Survival under a Rosen-Zener Quench of Hard-Core Bosons," I. Klich, C. Lannert, and G. Refael, *Phys. Rev. Lett.* **99**, 205303 (2007).
- "Coexistence of superfluid and Mott phases of lattice bosons," R. A. Barankov, C. Lannert, and S. Vishveshwara, *Phys. Rev.* **A75**, 063622 (2007).
- "Dynamics of condensate shells: Collective modes and expansion," C. Lannert, T.-C. Wei, and S. Vishveshwara, *Phys. Rev.* **A75**, 013611 (2007).
- "Structure and stability of Mott-insulator shells of bosons trapped in an optical lattice," B. DeMarco, C. Lannert, S. Vishveshwara, and T.-C. Wei, *Phys. Rev.* **A73**, 063601 (2005).
- "Critical dynamics of superconductors in the charged regime," C. Lannert, S. Vishveshwara, M.P.A. Fisher, *Phys. Rev. Lett.*, **92**, 97004 (2004).
- "Neutron scattering signal from spinons in a fractionalized antiferromagnet," C. Lannert and M.P.A. Fisher, *Int. J. of Mod. Phys. B*, **17**, 2821 (2003).

- "The electron spectral function in two-dimensional fractionalized phases," C. Lannert, M.P.A. Fisher, T. Senthil, *Phys. Rev.* **B64**, 14518 (2001).
- "Quantum confinement transition in a d-wave superconductor," C. Lannert, M.P.A. Fisher, T. Senthil, *Phys. Rev.* **B63**, 134510 (2001).

Honors Theses Advised

- "Simulation of Excitations in Shell Bose-Einstein Condensates at Finite Temperature," Shuyao Gu, Smith College (2017).
- "Simulation of Excitations in Bose-Einstein Condensates," Frances Yang, Smith College (2015).
- "Thermodynamics of the Triangular Kagome Lattice with Heisenberg Spins," Kelsea Gill, Smith College (2014).
- "Modeling the Expansion and Collapse of Bose-Einstein Condensates," Lydia Shannon, Smith College (2014).
- "Simulating the Time Evolution and Interference of Bose-Einstein Condensates," Catherine Lee, Wellesley College (2011).
- "Thermodynamics of Ising Systems on the Triangular Kagome Lattice and Small-Model Approximations to Geometrically Frustrated Systems," Bilin Zhuang, Wellesley College (2009).
- "Variational Monte Carlo Method Applied to Spins in Two-Dimensional Square Lattices with Zero Doping," Sunita Kannan, Wellesley College (2008).
- "Determining the Time Evolution of Bose-Einstein Condensates," Merideth Frey, Wellesley College (2007).
- "Variational Wavefunction Monte Carlo Studies of Two-Dimensional Square Magnets," Xinxin Du, Wellesley College (2006).
- "Expected Properties and Experimental Signals of Bose-Einstein Condensed Atoms," Mona Ali, Wellesley College (2006).

Awards and Outside Grants

- (Co-I) National Aeronautics and Space Administration, for project titled "Microgravity dynamics of bubble-geometry Bose-Einstein condensates. 5-year grant totaling $567,000 (Smith sub-award totaling $131,000). Awarded July 2014.
- National Science Foundation, Division of Materials Theory, for project titled "RUI: Bosons in Optical Lattices: dynamics and criticality in inhomogeneous systems." 3-year grant totaling $105,000. Awarded August, 2011.
- National Science Foundation, Division of Materials Theory, for project titled "RUI: Bosons in Optical Lattices: Physics of the Inhomogeneous Phases." 3-year grant totaling $60,000. Awarded September, 2006.
- Research Corporation Cottrell College Science Award for project titled "Variational wavefunction Monte Carlo analysis of cooperateive ring exchange in the intermediate-U Hubbard model." Two-year grant totaling $35,148. Awarded January, 2004.
- Scholar, Kavli Institute for Theoretical Physics, 2004-2006. The Scholars program provides funding for travel to the institute for scholarly activities for theoretical physicists at primarily undergraduate institutions. Awarded December, 2003.
- Outstanding Faculty Member Recognition Award, Residence Halls Association and Office of Residential Life, University of California, Santa Barbara, 1996-1997.

- David Saxon Award, Physics Department, University of California, Santa Barbara, 1997.
- Winner, Honors Thesis Competition Award, Brown University, 1996.

Courses Taught

- 100-level: Mechanics and Electricity, Magnetism, & Optics at the calculus-pre-requisite and calculus-co-requisite levels, including laboratories; Physics for Future Presidents.
- 200-level: Introduction to Quantum Mechanics and Thermodynamics; Mathematics for the Sciences; Computational Physics.
- 300-level: Quantum Mechanics, Advanced Classical Mechanics, Electromagnetic Theory, Applications of Quantum Mechanics, Writing in Physics, Advanced Lab.

Professional Activities

- At Smith:
  - Chair, Physics Department (2017-2020).
  - Science Center Fellowships and Scholarships Committee (2014-present).
  - Elected to Committee on Mission and Priorities (2013-2016).
  - Campus Planning Committee (2014-2015).
- At Wellesley:
  - Elected College Committees: untenured member of the Agenda Committee (sets agenda for faculty meetings, determines appointed committee membership), 2003-05; group C (sciences) member of the Advisory Committee to Committee on Faculty Appointments (junior faculty liason to the tenure- and reappointment-decision committee), 2006-07; untenured member of the Board of Appeals (hears appeals of tenure and reappointment decisions), 2007-08.
  - Ad-hoc Committees: Ruhlman Committee (organizes the annual Ruhlman Conference of student research and performance), 2007-2009; Brachman-Hoffman Committee (determines recipients of two internal faculty grants and fellowships at the College), 2006-2009; Goldwater Committee (determines nominees for national Goldwater Scholarship competition), 2002-04; Science Center summer research committee (selects students for on-campus research programs from NSF REU, HHMI, and Dean's Office funds), 2003; Judge for Three-Generations Science Writing Prize, 2008;
  - Vice-president (2006-7) and President (2007-8), Wellesley College chapter of Sigma Xi (scientific research society).
- At Large:
  - American Physical Society Task Force on Best Practices in Undergraduate Physics Programs, 2016-2019.
  - American Physical Society Committee on Education, 2015-2018.
  - Elected to Executive Board of New England Section of the American Physical Society, 2014-2016.
  - Manuscript reviewer for *Physical Review A*, *B*, and *Letters*, and *Journal of Physics, B*.
  - Grant proposal reviewer for the National Science Foundation and the Research Corporation.
  - Member of Selection Committee, American Physical Society LeRoy Apker Award for undergraduate physics achievement (2008-2010). The Apker Selection Committee reviews nominees for the award and recommends winner(s) to the APS board.
  - Founding board member of the Anacapa Society (2007-present). The Society promotes theoretical physics research at primarily-undergraduate institutions.

- Presenter, Undermountain School (Sheffield, MA) 5th grade and Rudolf Steiner School (Great Barrington, MA) 6th grade science classes. Developed materials and led students through 45-minute activity demonstrating magnetic principles and devices, January 2008 and March 2010.
- Invited participant at career panels for the Physics Department, Brown University (May 2009) and the Polymer Science Department, University of Massachusetts (May 2007 and 2008).
- Young Women in Science program, Simon's Rock College. Presented one-hour research talk and led 14 middle-school girls in a two-hour lab activity on magnetism, June 2008 and July 2013.
- Chair of Greater Boston Area Statistical Mechanics Meeting session, 2004.
- Member, American Physical Society, New England chapter of APS, and Sigma Xi.

Conferences and Workshops (* indicates work by undergraduate advisees)

- American Physical Society Meeting, March 2018, Los Angeles, California. Invited talk on "Effective Practices in Physics Programs" project of the American Physical Society. [Due to winter storm flight cancellation, a collaborator delivered my talk as I was unable to attend.]
- American Physical Society Division of Atomic, Molecular, and Optical Physics, June 2017, Sacramento, California. Co-author presented a contributed talk.
- American Physical Society Meeting, March 2017, New Orleans, Louisiana. Co-author presented a contributed talk*.
- American Physical Society Meeting, March 2016, Baltimore, Maryland. Presented a contributed talk*.
- Kavli Institute for Theoretical Physics "Workshop for Theorists at Undergraduate Institutions", Santa Barbara, CA. June 22-July 2, 2015. Presented research talk.
- American Physical Society Meeting, March 2015, San Antonio, Texas. Presented a contributed talk*.
- American Physical Society Meeting, March 2014, Denver, Colorado. Undergraduate research students presented contributed talk*.
- American Physical Society Meeting, March 2011, Dallas, Texas. Undergraduate research student presented contributed talk*.
- AAPT/APS/AAS New Faculty Workshop Reunion, November 5-7th, 2010, College Park, MD. Selected participant, presented poster on recent changes to Wellesley's introductory courses.
- American Physical Society Meeting, March 2010, Portland, Oregon. Collaborator presented a contributed talk. Undergraduate research student presented Apker Award talk*.
- Anacapa Society Workshop for Theorists at Undergraduate Institutions, Amherst, MA, August 2009. Presented invited seminar.
- American Physical Society Meeting, March 2009, Pittsburgh, Pennsylvania. Undergraduate research student presented a contributed talk*.
- Invited participant, Aspen Center for Physics summer program as part of a working group, July 6-20, 2008, Aspen, Colorado.
- American Physical Society Meeting, March 2008, New Orleans, Louisiana. Presented a contributed talk, collaborators presented three contributed talks*.
- Invited participant, "Theorists at Undergraduate Institutions" Workshop, July 2007, KITP, Santa Barbara, California. Presented an invited talk and was elected to the governing board of the Anacapa Society.
- American Physical Society Meeting, March 2007, Denver, Colorado. Collaborators presented two contributed talks*.
- American Physical Society Meeting, March 2006, Baltimore, Maryland. Presented a contributed talk. Collaborators presented an additional contributed talk and two contributed posters*.
- Invited participant, Aspen Center for Physics workshop, "Ultracold Trapped Atomic Gases", June, 2005, Aspen, Colorado.
- American Physical Society Meeting, March 2005, Los Angeles, California. Presented a contributed talk.
- "Quantum Phase Transitions" conference, Kavli Institute for Theoretical Physics, January 2005, Santa Barbara, California.

- Invited participant, Aspen Center for Physics workshop, "Pseudogaps in Strongly Correlated Metals", August 15-29, 2004, Aspen, Colorado.
- "Exotic Order and Criticality in Quantum Matter" conference, Kavli Institute for Theoretical Physics, June 2004, Santa Barbara, California.
- American Physical Society Meeting, March 2004, Montreal, Quebec.
- Invited Participant, "Theorists at Undergraduate Institutions" conference, July 2003, Kavli Institute for Theoretical Physics, Santa Barbara, California.
- American Physical Society Meeting, March 2003, Austin, Texas. Presented a contributed abstract.
- AAPT/APS New Faculty Workshop, November 2002, College Park, Maryland.
- Summer school on low-dimensional quantum systems: theory and experiment, July 2001, the Abdus Salam International Centre for Theoretical Physics, Trieste, Italy. Presented in invited poster session.
- Sixth International Conference on Spectroscopies of Novel Superconductors, May 2001, Chicago, Illinois. Presented in poster session.
- Boulder School for Condensed Matter and Materials Physics, introduction to superconductivity: fundamentals and applications, July 2000, Boulder, Colorado. Presented seminar.

Other Invited Talks

- "Some explorations of 1d quantum dynamics," Séminaire de Physique Mathématique/Physique Statistique au LPTHE, Université Pierre et Marie Curie, Paris, April 2016.
- "Spherical shell BECs: collective modes and 2d to 3d crossover," Physics Colloquium, Wesleyan University, February 2016.
- "Spherical shell BECs: collective modes and 2d to 3d crossover," JQI Seminar, Joint Quantum Institute, University of Maryland, February 2016.
- "Magnetism," Smith College Summer Science and Engineering Program for high-school girls, July 2014.
- "Studying Quantum Dynamics with Ultracold Atomic Gases," Condensed Matter Seminar, University of Massachusetts, Amherst, March, 2012.
- "Studying Quantum Dynamics with Ultracold Atomic Gases," Physics Department Colloquium, Williams College, October 2010.
- "Bose-Einstein Condensation: macroscopic quantum phenomena," Chemistry 233 (Physical Chemistry, I) guest lecture, Wellesley College, November 2009.
- "Investigating models of magentism using variational Monte Carlo," Physics Department Seminar, Mount Holyoke College, March 2009.
- "Investigating models of magentism using variational Monte Carlo," Physics Colloquium, Yeshiva University, May 2008.
- "Exploring Mott and superfluid phases of bosons," Condensed Matter Seminar, University of Illinois, Champaign-Urbana, February 2008.
- Invited participant, Career Panel, Department of Polymer Science and Engineering, University of Massachusetts, May 2007.
- "Baked Alaska: coexisting Mott and superfluid phases in ultra-cold dilute gases," Physics Department Condensed Matter Seminar, California Institute of Technology, July 2006.

- Invited participant, Career Panel, Department of Polymer Science and Engineering, University of Massachusetts, May 2006.
- "Baked Alaska: inhomogeneous phases of bosons trapped in an optical lattice," Physics Department Colloquium, Worcester Polytechnic Institute, May 2006.
- "Baked Alaska: coexisting Mott and superfluid phases in ultra-cold dilute gases," Physics Department Condensed Matter Seminar, Harvard University, November 2005.
- "Interesting inhomogeneous phases of bosons trapped in an optical lattice," Condensed Matter Seminar, Brown University, April 2005.
- "Monte Carlo methods applied to magnetic systems," Physics Department Colloquium, Amherst College, September 2004.
- Invited speaker, Women in Physics, Harvard University, November 2003.
- "Critical dynamics of superconductors in the charged regime," Physics Department Condensed Matter Seminar, Harvard University, November 2003.
- "Monte Carlo methods applied to magnetic systems," Physics Department Colloquium, Clark University, October 2003.
- "Monte Carlo methods applied to magnetic systems," Physics Department Colloquium, Williams College, September 2003.
- "Teaching physics at a liberal arts college," Physics Department Careers in Physics Seminar, UCSB, July 2003.
- "Does the electron break apart in some materials?" Worcester Polytechnic Institute, Physics Department Colloquium, February, 2003.