Casey E. Berger

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Education

The University of North Carolina Chapel Hill, NC
Ph.D. in Physics, May 2020
Advisor: Dr. Joaquín E. Drut
Royster Society of Fellows, Department of Energy Computational Science Graduate Fellow

The Ohio State University Columbus, OH
B.S. in Physics *summa cum laude* and with research distinction, May 2015
Cumulative GPA: 3.93

Boston University Boston, MA
B.A. in Philosophy, B.S. in Film Production, minor in Spanish *summa cum laude*, May 2010
Cumulative GPA: 3.80, *Phi Beta Kappa, College Scholar*

Skills

Programming Languages: C++, python, Mathematica, LaTeX, R
Programming Packages and Libraries: OpenMP, AMReX, Jupyter, lsqfit, pandas
General Computer: Microsoft Office, Adobe suite, Mac, Linux, Windows
Language: English (fluent), Spanish (fluent), French (conversational)

Selected Talks and Presentations

Invited Talks

Circumventing the sign problem with complex Langevin in lattice field theory, FermiLab July 2020
Circumventing the sign problem with complex Langevin in lattice field theory,
RPI Advanced Cyberinfrastructure Training for Modeling Physical Systems June 2020
The complex Langevin approach to the sign problem in lattice field theory, Boston University January 2020
Rotating Superfluids via Complex Langevin, Lawrence Berkeley National Laboratory October 2019
Rotating Superfluids via Complex Langevin, Jefferson Laboratory September 2019
Complex Langevin in Nonrelativistic Rotating Bosonic Systems, University of Maryland October 2018

Conference Presentations

Complex Langevin in Nonrelativistic Rotating Bosonic Systems
20th Conference on Recent Progress in Many Body Theories: Toulouse, France September 2019
Complex Langevin in Nonrelativistic Rotating Bosonic Systems
DOE CSGF Annual Program Review: Arlington, VA July 2019
Strongly interacting rotating bosons via complex stochastic quantization
The American Physical Society March Meeting: Los Angeles, CA March 2018
Equation of state of strongly coupled 1D fermions in harmonic traps
The American Physical Society March Meeting: San Antonio, TX March 2015
Equation of state of strongly coupled 1D fermions in harmonic traps
Conference for Undergraduate Women in Physics: Ann Arbor, MI January 2015
Ground-state energy of interacting one-dimensional fermions in a harmonic trap: a new approach

Selected Professional Service

Organizational Team Member — Summer 2015- present
SciREN (The Scientific Research and Education Network) Triangle

Senior Graduate Student Pre-Candidacy Mentoring Team — Spring 2017-present
UNC Department of Physics and Astronomy

Graduate Representative, Graduate Studies and Affairs Committee — Spring 2017
UNC Department of Physics and Astronomy

Undergraduate Co-Chair — Summer 2013-Spring 2015
Society for Women in Physics: The Ohio State University

Selected Honors and Awards

William Neal Reynolds Fellow, Royster Society of Fellows — Fall 2015 - present
The University of North Carolina at Chapel Hill

Computational Science Graduate Fellow — Fall 2015 - Summer 2019
The United States Department of Energy

NSF Graduate Research Fellowship Program - Honorable Mention — Spring 2015
The National Science Foundation

Best Research Talk in Session — Spring 2015
APS CUWiP, University of Michigan

Arts and Sciences Undergraduate Research Scholarship — Spring 2015
The Ohio State University

CAPstone Award: Best Talk — Summer 2014
Computational Astronomy and Physics REU, UNC Chapel Hill

Matchette Prize for Excellence in Philosophy — Spring 2010
Department of Philosophy, Boston University College of Arts and Sciences

Publications and Preprints

Complex Langevin and other approaches to the sign problem in quantum many-body physics, C. E. Berger, L. Rammelmüller, A. C. Loheac, F. Ehmann, J. Braun, and J. E. Drut, *preprint*, in production at *Physics Reports*

Thermodynamics of rotating quantum matter in the virial expansion , C. E. Berger, K.J. Morrell, and J. E. Drut, *Phys. Rev. A* **102**, 023309 - (2020)

Third- and fourth-order virial coefficients of harmonically trapped fermions in a semiclassical approximation, K. J. Morrell, C. E. Berger, and J. E. Drut, *Phys. Rev. A* **100**, 063626 - (2019)

Interacting Bosons at Finite Angular Momentum Via Complex Langevin , C. E. Berger and J. E. Drut, *Proceedings of the 36th Annual International Symposium on Lattice Field Theory* (2019)

Hard-wall and non-uniform lattice Monte Carlo approaches to one-dimensional Fermi gases in a harmonic trap, C. E. Berger, J. E. Drut, and W. J. Porter, *Computer Physics Communications* **208**, pp. 103-108 (2016)

Harmonically trapped fermions in two dimensions: ground-state energy and contact of SU(2) and SU(4) systems via nonuniform lattice Monte Carlo, Z-H. Luo, C. E. Berger, and J. E. Drut, *Phys. Rev. A* **93**, 033604 - (2016)

Energy, contact, and density profiles of one-dimensional fermions in a harmonic trap via nonuniform-lattice Monte Carlo calculations, C. E. Berger, E. R. Anderson, and J. E. Drut, *Phys. Rev. A* **91**, 053618 - (2015)