Vincent Flynn

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Education

Sept 2017 - Present	**Dartmouth College** Ph.D. in Physics (Ongoing) Advisor: Prof. Lorenza Viola
Aug 2013 - May 2017	**University of Connecticut** B.S., *Cum Laude*, Double Major in Physics and Mathematics Cum. GPA: 3.705/4.000

Research Experience

June 2018 - Present	Investigating the consequences and manifestations of non-trivial topology in closed and open quantum many-body systems. Advisor: Prof. Lorenza Viola
July 2016 - May 2017	Conducted and analyzed resonant inelastic X-ray scattering experiments on Ytterbium Hexaboride performed at Argonne National Lab in order to better understand the electronic structure of strongly correlated materials. Advisor: Prof. Jason Hancock
Mar 2016 - May 2017	Computational investigation of negative thermal expansion in Scandium Trifluoride using techniques from structural analysis and molecular dynamics. Advisor: Prof. Jason Hancock

Publications

- **Vincent P. Flynn**, Emilio Cobanera, and Lorenza Viola, "*Topology by Dissipation: Majorana Bosons in Metastable Quadratic Markovian Dynamics*", Physical Review Letters **127**, 245701 (2021).
- Qiao-Ru Xu, **Vincent P. Flynn**, Abhijeet Alase, Emilio Cobanera, Lorenza Viola, and Gerardo Ortiz, "*Squaring the fermion: The threefold way and the fate of zero modes*", Physical Review B **102**, 125127 (2020). Editor's Suggestion.
- **Vincent P. Flynn**, Emilio Cobanera, and Lorenza Viola, "*Restoring particle conservation in quadratic bosonic Hamiltonians with dualities*", Europhysics Letters **131**, 40006 (2020)
- **Vincent P. Flynn**, Emilio Cobanera, and Lorenza Viola, "*Deconstructing effective non-Hermitian dynamics in quadratic bosonic Hamiltonians*", New Journal of Physics **22**, 083004 (2020)
- Donal Sheets, **Vincent Flynn**, Jungho Kim, Mary Upton, Diego Casa, Thomas Gog, Zach Fisk, Priscilla Rosa, Maxim Dzero, Jian-Xin Zhu, Ignace Jarrige, and Jason Hancock, "*Exploring itinerant states in divalent hexaborides using rare-earth L edge resonant inelastic x-ray scattering,*" Journal of Physics **32**, 135601 (2019)

Presentations

June 2021	Poster: "*Topological quasi-steady states and the role of Noether's theorem in metastable driven-dissipative bosonic systems*" presented at the "Topology meets Quantum Optics" conference held by the Centro de Ciencias de Benasque Pedro Pascual
March 2021	Talk: "*Restoring number conservation in quadratic bosonic Hamiltonians with dualities: Applications for quantum simulation and topological classification.*" at March Meeting 2021. Link to abstract.
March 2020	Talk: "*Deconstructing Effective Non-Hermitian Dynamics in Quadratic Bosonic Hamiltonians*" at March Meeting 2020. Link to slides.
June 2019	Poster: "*Exploiting mildly broken translation invariance to study effective non-Hermitian dynamics in a bosonic chain*" presented at the international workshop on "Engineering nonequilibrium Dynamics of open quantum Systems" at the Max Planck Institute for the Physics of Complex Systems in Dresden, Germany.

Course Research Projects

June 2018 - Aug 2018	The Kibble-Zurek mechanism and the non-equilibrium dynamics of classical and quantum phase transitions (as part of Physics 109 - Statistical Mechanics II).
Mar 2018 - May 2018	Classical simulations of quantum systems using tensor network techniques (as part of Physics 116 - Quantum Information Science).
Jan 2018 - Mar 2018	Bosonization and its applications to the Tomonaga-Luttinger liquid (as part of Physics 113 - Microscopic Theory of Solids).

Teaching Experience

Mar 2021 - Present	T.A. for Physics 104 - (Graduate) Statistical Mechanics I
Mar 2021 - Apr 2021	Mini-course on thermodynamics for Physics 104 - (Graduate) Statistical Mechanics I
Mar 2020 - June 2020	T.A. for Physics 103 - (Graduate) Advanced Quantum Mechanics
Mar 2019 - June 2019	T.A. for Physics 104 - (Graduate) Statistical Mechanics I
Feb 2019	Guest lecturer for Physics 82 - Mathematical Methods for Physicists
Jan 2019 - Mar 2019	T.A. for Physics 82 - Introductory Mathematical Methods for Physicists
Nov 2018	Guest lecturer for Physics 100 - (Graduate) Mathematical Methods for Physicists
Oct 2018	Guest lecturer for Physics 19 - Relativistic and Quantum Physics.
Sept 2018 - Dec 2018	T.A. for Physics 19 - Relativistic and Quantum Physics.

Mar 2018 - June 2018	T.A. for Physics 19 - Relativistic and Quantum Physics.
Jan 2018 - Mar 2018	T.A. for Physics 13 - Introductory Physics I.
Sept 2016 - Dec 2016	Mentor for an incoming freshman physics student as a part of the first implementation of the UConn physics "Peer Mentor" program.
Sept 2015 - May 2016	Physics and mathematics tutor at the UConn quantitative learning center.

Awards, Honors, and Citations

Summer 2019	The Selamawit Tsehaye Teaching Award, awarded by Dartmouth Physics and Astronomy faculty to the graduate student best exemplifying dedication to the teaching of physics.
Spring 2018	*Dartmouth Center for the Advancement of Learning* outstanding graduate student teacher award, voted by undergraduate students.
Spring 2018	Voted best presentation by peers in Physics 116 - Quantum Information Science.
Winter 2018	Cited as highest performing student in Physics 105 - Electromagnetic Theory I by Prof. Barrett Rogers.
Summer 2016	*Mark E. Miller Award*: $2,000 stipend to conduct research with the UConn Physics Dept.
Spring 2016	Bernard Sippin '52 $7,500 scholarship recipient awarded by UConn Mathematics Dept. for excellence in mathematics.
2016 Academic Year	UConn *New England Scholar* for maintaining a GPA of at least 3.7/4.0 during the 2016 academic year.
2015 Academic Year	UConn *Babbidge Scholar* for maintaining a 4.0/4.0 cumulative GPA during the 2015 academic year.
Spring 2015 - Spring 2017	UConn College of Liberal Arts and Sciences Dean's list (5 consecutive semesters).

Professional Memberships and Societies

Member of the American Physical Society.

Member of the Sigma Pi Sigma physics honor society.

Technical Skills

Programming Languages / Software	Python, Mathematica, MATLAB, LaTeX, Qiskit/IBM Q Experience.
Operating Systems	Windows, Mac OS X, Linux.

Languages

English (fluent), Italian (basic).

Other Skills and Interests

Active multi-instrumental musician, music performance and theory, philosophy of science and mathematics.