

# CHARLES ZHAOXI XIONG

EMAIL: [REDACTED] | CELL: [REDACTED] | WEB: CHARLESZXIONG.COM

## EDUCATION

- 2016 – 2019 **Harvard University**  
Ph.D., Physics  
Thesis: Classification and Construction of Topological Phases of Quantum Matter  
Committee: Ashvin Vishwanath (chair), Subir Sachdev, Arthur Jaffe
- 2014 – 2016 **University of California, Berkeley**  
Thesis advisor: Ashvin Vishwanath
- 2011 – 2014 **Massachusetts Institute of Technology**  
B.S., Physics and Mathematics
- 2010 – 2011 **Peking University**

## EMPLOYMENT

- 2019 – present **The Voleon Group (hedge fund)**  
I conduct high-dimensional applied machine learning research in the financial domain, and implement systematic, automated trading strategies in end-to-end machine learning pipelines.

## HONORS AND AWARDS

- 2020 **Harvard University White Teaching Prize**
- 2014 **Phi Beta Kappa Honor Society**
- 2009 **40<sup>th</sup> International Physics Olympiad**  
Gold Medal
- 2009 **10<sup>th</sup> Asian Physics Olympiad**  
Gold Medal, Special Prize for the Highest Score in Theoretical Examination

## PUBLICATIONS AND PREPRINTS

11. **Classification and Construction of Topological Phases of Quantum Matter**

Charles Zhaoxi Xiong  
Ph.D. thesis  
arXiv:1906.02892 [cond-mat.str-el]

10. **Bosonic Crystalline Symmetry Protected Topological Phases Beyond the Group Cohomology Proposal**  
Hao Song, Charles Zhaoxi Xiong, Sheng-Jie Huang  
arXiv:1811.06558 [cond-mat.str-el]  
Phys. Rev. B 101, 165129 (2020)
9. **Generalized homology and Atiyah-Hirzebruch spectral sequence in crystalline symmetry protected topological phenomena**  
Ken Shiozaki, Charles Zhaoxi Xiong, Kiyonori Gomi  
arXiv:1810.00801 [cond-mat.str-el]
8. **Organizing symmetry-protected topological phases by layering and symmetry reduction: A minimalist perspective**  
Charles Zhaoxi Xiong and A. Alexandradinata  
arXiv:1709.06998 [cond-mat.str-el]  
Physical Review B 97, 115153 (2018)
7. **Minimalist approach to the classification of symmetry protected topological phases**  
Charles Zhaoxi Xiong  
arXiv:1701.00004 [cond-mat.str-el]  
Journal of Physics A: Mathematical and Theoretical 51 (44), 445001 (2018)
6. **Realization of a Josephson Switch**  
Zhaoxi Xiong  
arXiv:1308.5950 [cond-mat.supr-con]
5. **Models of Topology Change**  
Alfred D. Shapere, Frank Wilczek, and Zhaoxi Xiong  
arXiv:1210.3545 [hep-th]
4. **General method for finding ground state manifold of classical Heisenberg model**  
Zhaoxi Xiong and X.-G. Wen  
arXiv:1208.1512 [cond-mat.stat-mech]
3. **General quantum key distribution in higher dimension**  
Z. Xiong, H.-D. Shi, Y.-N. Wang, L. Jing, J. Lei, L.-Z. Mu, and H. Fan  
arXiv:1108.4540 [quant-ph]  
Physical Review A 85, 012334 (2012)
2. **Non-compression of quantum phase information**  
Y.-N. Wang, H.-D. Shi, L. Jing, Z. Xiong, J. Lei, L.-Z. Mu, and H. Fan  
arXiv:1105.5258 [quant-ph]  
Journal of Physics A 45, 025304 (2012)

1. **Unified universal quantum cloning machine and fidelities**  
Y.-N. Wang, H.-D. Shi, Z. Xiong, L. Jing, X.-J. Ren, L.-Z. Mu, and H. Fan  
arXiv:1104.4014 [quant-ph]  
Physical Review A 84, 034302 (2011)

## PRESENTATIONS

- 08/2018 **Center of Mathematical Sciences and Applications, Harvard University**  
Kickoff Workshop on Topology and Quantum Phases of Matter  
“Mayer-Vietoris sequence and symmetry-protected topological orders with reflection symmetry”
- 11/2017 **University of Calgary**  
Quantum Science and Technology Seminars  
“Organizing (interacting) symmetry protected topological orders by layering and symmetry forgetting”
- 11/2017 **Yale University**  
Condensed Matter Seminars  
“Organizing (interacting) symmetry protected topological orders by layering and symmetry forgetting”
- 04/2017 **Harvard University**  
Mathematical Physics Seminars  
“What generalized cohomology theories may have to do with symmetry protected topological phases”
- 04/2017 **Harvard University**  
Condensed Matter Kid’s Seminars  
“Minimalist classification of glide symmetry protected topological phases and beyond”
- 02/2017 **Massachusetts Institute of Technology**  
Informal Condensed Matter Seminars  
“Minimalist approach to the classification of symmetry protected topological phases”

## WORKSHOPS / SUMMER SCHOOLS / CONFERENCES

- 08/2018 **Kickoff Workshop on Topology and Quantum Phases of Matter**  
Center of Mathematical Sciences and Applications, Harvard University  
Organizers: Ashvin Vishwanath, Ying Ran, Cumrun Vafa
- 06/2018 **Machine Learning for Quantum Many-Body Physics Workshop**

Max Planck Institute for the Physics of Complex Systems, Dresden, Germany  
Organizers: Roger Melko, Titus Neupert, Simon Trebst, Mandy Lochar

- 06/2017 **Strongly Correlated Topological Phases of Matter Workshop**  
Simons Center for Geometry and Physics, Stony Brook University  
Organizers: Lukasz Fidkowski, Dan Freed, Anton Kapustin
- 07-08/2016 **Boulder Summer School CMMP: Topological Phases of Quantum Matter**  
University of Colorado, Boulder  
Organizers: Jason F. Alicea, Joseph Checkelsky, Victor Gurarie, Michael Hermele, Leo Radzihovsky
- 05/2016 **Hot Topics in Cold Matter Workshop**  
University of California, Berkeley  
Organizers: Ehud Altman, Joel Moore, Ashvin Vishwanath
- 04/2015 **Open Questions at the Intersection of Mathematics and Quantum Physics Workshop**  
University of California, Berkeley  
Organizer: Mina Aganagic
- 2012-2018 **APS March Meeting**  
Boston, MA (2012), Baltimore, MD (2013), New Orleans, LA (2017), Los Angeles, CA (2018)  
Organizer: American Physical Society

## SERVICE

- 11/2015 **Co-organizer, Graduate Student Poster Session**  
University of California, Berkeley
- 07/2015 **Student representative, Preliminary Exam Committee**  
University of California, Berkeley
- 2015-2016 **Mentor, Grad-to-Grad Mentoring Program**  
University of California, Berkeley
- 11/2014 **Judge, Graduate Student Poster Session**  
University of California, Berkeley

## TEACHING

- Spring 2019 **Wave Phenomena**  
Harvard University  
Instructor: Mara Prentiss

Fall 2018      **Special Topics in Condensed Matter Physics**  
Harvard University  
Instructor: Ashvin Vishwanath

Spring 2016    **Introduction to Mathematical Physics**  
University of California, Berkeley  
Instructor: Ori Ganor

Spring 2015    **Introductory Physics**  
University of California, Berkeley  
Instructor: Melvin Pomerantz

Fall 2014      **Introductory Physics**  
University of California, Berkeley  
Instructor: Catherine Bordel