

BOWEN SHI

BIMSA, Huairou District ◊ Beijing, China

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EMPLOYMENT HISTORY

- BIMSA (Beijing Institute of Mathematical Sciences and Applications), Huairou, China** 08/2026-now
Assistant Professor
- University of Illinois Urbana-Champaign, Urbana, IL, USA** 10/2024-08/2026
Postdoc, Illinois Quantum Information Science and Technology Center Fellow
Research advisors: Jong Yeon Lee, Bryan Clark, Tomas Faulkner and Marius Junge
- UC Davis, Davis, CA, USA** 07/2024-09/2024
Postdoc, Department of Computer Science
Research advisor: Isaac Kim
- UC San Diego, La Jolla, CA, USA** 07/2020-06/2024
Postdoc, Simons Collaboration on Ultra-Quantum Matter Fellow
Research advisors: John McGreevy and Tarun Grover

EDUCATION

- The Ohio State University, Columbus, USA** 08/2013-06/2020
Ph.D. in Physics, Condensed Matter Theory (05/03/2020).
Thesis advisor: Yuan-Ming Lu
Earlier research experience: with Stuart Raby, on High Energy Theory/Phenomenology
- Nanjing University, Nanjing, China** 09/2010-06/2013
Physics and mathematics (no degree)
Research advisors: Mingzhe Li (physics) and Xuejun Guo (math)
Research area: Cosmology and gravity theory
- Nanjing University, Nanjing, China** 09/2006-06/2010
B.Sc. in Physics

PUBLICATIONS

25. Y. Song, Z. Liu, Z. Wang, J. Y. Lee, B. Shi (2026),
“*Approximate Quantum Error Correction at Chiral Topological Edges*”, arXiv: 2608.06258
24. M. Buican, R. Geiko, M. Moses, B. Shi (2025),
“*An Algebraic Theory of Gapped Domain Wall Partons*”, arXiv: 2506.22544
23. T.-H. Yang, B. Shi, J. Y. Lee (2025),
“*Topological Mixed States: Phases of Matter from Axiomatic Approaches*”,
Phys. Rev. X (accepted 2026) arXiv: 2506.04221
22. S. Vardhan, B. Shi, I. H. Kim, Y. Zou (2025)
“*Chirality, magic, and quantum correlations in multipartite quantum states*”,
SciPost Phys. 20, 066 (2026) arXiv: 2503.10764
21. X. Li, T.-C. Lin, J. McGreevy, B. Shi (2024)
“*Strict area law entanglement versus chirality*”,
Phys. Rev. Lett. 134 18, 180402 (2025) arXiv: 2408.10306

20. I. H. Kim, T.-C. Lin, D. Ranard, B. Shi (2024)
“Strict area law implies commuting parent Hamiltonian”,
arXiv: 2404.05867
19. I. H. Kim, X. Li, T.-C. Lin, J. McGreevy, B. Shi (2024)
“Conformal geometry from entanglement”,
SciPost Phys. 18, 102 (2025) arXiv: 2404.03725
18. I. H. Kim, X. Li, T.-C. Lin, J. McGreevy, B. Shi (2024)
“Chiral Virasoro algebra from a single wavefunction”
Ann. Phys., vol 471, 169849 (2024) arXiv: 2403.18410
17. B. Shi (2023)
“Immersed figure-8 annuli and anyons”,
Annales Henri Poincaré, pp. 1-43, Springer, (2024) arXiv: 2309.17155
16. I. H. Kim, M. Levin, T.-C. Lin, D. Ranard, B. Shi (2023)
“Universal lower bound on topological entanglement entropy”,
Phys. Rev. Lett. 131, 166601 (2023) arXiv: 2302.00689
15. B. Shi, J. Huang, J. McGreevy (2023)
“Remote detectability from entanglement bootstrap I: Kirby’s torus trick”,
SciPost Phys. 18, 126 (2025) arXiv: 2301.07119
14. Y. Zou, B. Shi, J. Sorce, I. T. Lim, and I. H. Kim (2022)
“Modular Commutators in Conformal Field Theory”,
Phys. Rev. Lett. 129, 260402 (2022) arXiv: 2206.00027
13. J. Huang, J. McGreevy, B. Shi (2021)
“Knots and entanglement”,
SciPost Phys. 14, 141 (2023) arXiv: 2112.08398
12. I. H. Kim, B. Shi, K. Kato, V. V. Albert (2021)
“Modular commutator in gapped quantum many-body systems”,
Phys. Rev. B 106, 075147 (2022) arXiv: 2110.10400
11. I. H. Kim, B. Shi, K. Kato, V. V. Albert (2021)
“Chiral central charge from a single bulk wave function”,
Phys. Rev. Lett. 128, 176402 (2022) arXiv: 2110.06932
10. B. Shi, X. Dai and Y.-M. Lu (2020)
“Entanglement negativity at the critical point of measurement-driven transition”,
arXiv: 2012.00040
9. B. Shi and I. H. Kim (2020)
“Domain wall topological entanglement entropy”,
Phys. Rev. Lett. 126 (14), 141602 (2021) arXiv: 2008.11794
8. B. Shi and I. H. Kim (2020)
“Entanglement bootstrap approach for gapped domain walls”,
Phys. Rev. B 103 (11), 115150 (2021) arXiv: 2008.11793
7. B. Shi (2019)
“Verlinde formula from entanglement”,
Phys. Rev. Res. 2 (2), 023132 (2020) arXiv: 1911.01470
6. B. Shi, K. Kato, and I. H. Kim (2019)
“Fusion rules from entanglement”,
Annals of Physics 418, 168164 (2020) arXiv: 1906.09376
5. B. Shi (2018)
“Seeing topological entanglement through the information convex”,
Phys. Rev. Res. 1, 033048 (2019) arXiv: 1810.01986

4. B. Shi and Y.-M. Lu (2018)
“Characterizing topological orders by the information convex”,
 Phys. Rev. B 99, 035112 (2019) arXiv: 1801.01519
3. B. Shi and Y.-M. Lu (2017),
“Deciphering the nonlocal entanglement entropy of fracton topological orders”,
 Phys. Rev. B 97, 144106 (2018) arXiv: 1705.09300
2. F. Lu, B. Shi, Y.-M. Lu (2017),
“Classification and surface anomaly of glide symmetry protected topological phases in three dimensions”,
 New J. Phys. 19, 073002 (2017) arXiv: 1701.00784
1. B. Shi and S. Raby (2015),
“Basis invariant descriptions of chemical equilibrium with implications for a recent axionic leptogenesis model”,
 Phys. Rev. D 92, 085008 (2015) arXiv: 1507.08392

AWARDS

Illinois Quantum Information Science and Technology Center Fellow, UIUC	10/2024-08/2026
Simons Collaboration on Ultra-Quantum Matter Fellow, UCSD	07/2020-06/2024
Poster award in EPiQM Summer School 2017, Cornell University, Ithaca	06/2017

SCIENTIFIC PRESENTATIONS

Seminar on quantum many-body systems, UC Davis	05/2026
Blackboard Seminar, Physics department, UC San Diego	05/2026
Seminar in a workshop, Simons Center for Geometry and Physics, Stonybrook	05/2026
Chez Pierre Seminar, Physics department, MIT, Boston	02/2026
Lectures×6, Yau Mathematical Sciences Center, Tsinghua University, Beijing	12/2025
Talk, Yang Institute for Theoretical Physics Seminar, Stony Brook	12/2025
Talk, High Energy Theory Seminar, Purdue University, West Lafayette	10/2025
Talk, Quantum Symmetry Seminar, Math department, Ohio State University, Columbus	10/2025
Talk, Quantum Matter Seminar, Ohio State University, Columbus	10/2025
Talk, High Energy Theory Seminar, UIUC, Urbana	09/2025
Gong Show, Isaac Newton Institute, Cambridge University, UK	09/2025
Talk, Isaac Newton Institute, Program: Quantum field theory with boundaries, impurities, and defects, Cambridge University, UK	09/2025
Invited talk, Yukawa institute, workshop: New advancements on defects and their applications, Kyoto University, Japan	07/2025
Talk, workshop: Quantum Field Theory and Topological Phases via Homotopy Theory and Operator Algebras, CMSA, Harvard University, Boston	07/2025
Talk, seminar series at National University of Singapore (online), Singapore	04/2025
Talk, Global Physics Summit 2025, Anaheim, California	03/2025
Talk, UC Davis, California	03/2025
Colloquium, Department of Physics and Astronomy, University of Kentucky, Lexington	01/2025
Invited Talk, Urbana Chicago Fest 2024, UIUC, Urbana	12/2024
Talk, The Anthony J Leggett Institute for Condensed Matter Theory Seminar, UIUC, Urbana	10/2024
UIUC Institute for Condensed Matter Talk, Theory Postdoc Meeting, Urbana	10/2024
Talk, Quantum Matter Theory group meeting ×2, Perimeter Institute, Waterloo	09-10/2024
Gong Show and Poster, PiTP 2024, IAS Princeton	07/2024
Chalk talk, Beijing Institute of Mathematical Sciences and Applications, Yanqi Lake	05/2024
Talk×2, theoretical physics seminar, Institute for advanced study, Tsinghua University	05/2024
Talk, condensed matter seminar, Nanjing University	05/2024
Talk, theoretical physics seminar, Shing-Tung Yau center, Southeast University	05/2024

Talk, condensed matter seminar, Fudan University, Shanghai	05/2024
Talk, London TQFT Journal Club, Queen Mary University of London	05/2024
Talk, condensed matter discussion group, University of Washington Seattle	04/2024
Talk, Condensed Matter Theory Seminar, UCLA	01/2024
Talk, Condensed Matter Theory Seminar (zoom), UIUC	01/2024
Talk, Physics of quantum information, Special Seminar, Harvard University, Cambridge	01/2024
Talk, Condensed Matter Theory Group Meeting, Caltech, Pasadena	12/2023
Lectures, London TQFT Journal Club (zoom), Queen Mary University of London	12/2023
Talk, Quantum Matter Seminar at Department of Physics OSU, Columbus	09/2023
Chalk talk, Quantum Symmetry Seminar at Department of Mathematics OSU, Columbus	09/2023
Poster, Simons Collaboration on Ultra-Quantum Matter Meeting, CU Boulder	05/2023
Talk, Kavli ITS Young Scholars Forum 2023, Beijing (online)	02/2023
Poster, Simons Collaboration on Ultra-Quantum Matter Annual Meeting, New York	01/2023
Talk, Ultra-Quantum Matter Collaboration Mini Meeting, UT Austin, Austin	08/2022
Talk, ITP Workshop on General-Purpose QC and QI, Beijing, China (online)	06/2022
Talk, March Meeting 2022 (online)	03/2022
Talk, QIP 2022, Conference on Quantum Information Processing, Caltech, Pasadena, USA	03/2022
Talk, Simons Collaboration on Ultra-Quantum Matter Annual Meeting, New York	01/2022
Talk, NJU overseas theoretical physics Annual gathering, (organizer: Gang Chen), online	12/2021
Talk, KITS Seminar, Beijing, China (online)	12/2021
Talk, UCSD CMT Journal Club, (organizer: Yi-Zhuang You), UCSD	11/2021
Poster, Workshop on Ultra-Quantum Matter, IAS Princeton	10/2021
Talk, March Meeting 2021 (online)	03/2021
Guest lecture, MATH 8800: Topological Phases of Matter (David Penneys), (online) OSU	02/2021
Talk, Ultra-Quantum Matter online seminar	10/2020
Talk, Quantum Symmetry Student Seminar, Math department, (online) OSU	10/2020
Talk, UCSD CMT Journal Club, (the one Yi-Zhuang You organizes)	09/2020
Talk, Ultra-Quantum Matter online seminar	02/2020
Talk, Quantum Algebra / Quantum Topology Seminar, Math Department, OSU	10/2019
Talk, March Meeting 2019, Boston	03/2019
Talk, Perimeter Institute Condensed Matter Theory Seminar, Waterloo, Ontario, Canada	11/2018
Talk, March Meeting 2018, Los Angeles	03/2018
Talk, Condensed Matter Theory Journal Club, OSU	01/2018
Poster, 6th Theory Winter School in the MagLab, Tallahassee	01/2018
Poster, KITP, Frontiers of quantum information Physics, Santa Barbara	10/2017
Poster, EPiQM summer school 2017, Cornell University, Ithaca	06/2017
Talk, March Meeting 2017, New Orleans	03/2017

CONFERENCES AND WORKSHOPS

ICM 2026 (International Congress of Mathematicians), Philadelphia, Pennsylvania	07/2026
Workshop at Simons Center for Geometry and Physics: Bridging classic and contemporary perspectives on open quantum systems, Stonybrook	05/2026
Simons Collaboration on Ultra-Quantum Matter Annual Meeting, New York	01/2026
Isaac Newton Institute, Program: Quantum field theory with boundaries, impurities, and defects, Cambridge University, UK	09-12/2025
ICTP, Simons Collaboration Bootstrap 2025, São Paulo, Brazil	07-08/2025
Yukawa institute, New advancements on defects and their applications, Kyoto University	07/2025
Quantum Field Theory and Topological Phases via Homotopy Theory and Operator Algebras, CMSA, Harvard University, Boston	07/2025
Global Physics Summit 2025, Anaheim, California	03/2025
Tensor Network States: Algorithms and Applications, Hong Kong	12/2024
Urbana Chicago Fest 2024, UIUC, Urbana	12/2024
Symmetries 2024, Mathematical Institute, University of Oxford, UK	08/2024

Simons Collaboration on Ultra-Quantum Matter Annual Meeting, New York	01/2024
Ultra-Quantum Matter Collaboration Meeting, Harvard	09/2023
Ultra-Quantum Matter Collaboration Meeting, CU Boulder	05/2023
Kavli ITS Young Scholars Forum 2023, Beijing (online)	02/2023
Simons Collaboration on Ultra-Quantum Matter Annual Meeting, New York	01/2023
Ultra-Quantum Matter Collaboration Meeting, Caltech, Pasadena	09/2022
Ultra-Quantum Matter Collaboration Mini Meeting, UT Austin, Austin	08/2022
ITP Workshop on General-Purpose QC and QI, Beijing, China (online)	06/2022
March Meeting 2022, (online)	03/2022
QIP 2022, Conference on Quantum Information Processing, Caltech, Pasadena, USA	03/2022
Simons Collaboration on Ultra-Quantum Matter Annual Meeting, New York	01/2022
Workshop on Ultra-Quantum Matter, IAS Princeton	10/2021
March Meeting 2021, (online)	03/2021
QIP 2021, Conference on Quantum Information Processing, (online) Munich, Germany	02/2021
March Meeting 2019, Boston	03/2019
March Meeting 2018, Los Angeles	03/2018
KITP, Frontiers of quantum information Physics, Santa Barbara	10/2017
March Meeting 2017, New Orleans	03/2017

SUMMER/WINTER SCHOOLS

The Physics and Mathematics of Boundaries, Impurities, and Defects, Isaac Newton Institute, Cambridge University, UK	09/2025
PiTP 2024, “Ultra-Quantum Matter”, IAS Princeton	07/2024
Online School On Ultra Quantum Matter, (online) Perimeter Institute	08/2020
PiTP 2018, From Qubits to Spacetime, IAS Princeton	07/2018
6th Theory Winter School in the MagLab, Tallahassee	01/2018
PSSCMP 2017, Princeton	08/2017
EPiQM 2017, Cornell University, Ithaca	05/2017
ICMT 2016, UIUC, Urbana	08/2016

SHORT TERM VISITS (LONGER THAN A WEEK)

Yau Mathematical Sciences Center ~2 weeks, Tsinghua University, Beijing	12/2025
Isaac Newton Institute, ~3 weeks, Cambridge University, UK	09/2025
Perimeter Institute for Theoretical Physics, ~2 weeks, Waterloo	08/2025
UC Davis, ~10 days, California	03/2025
Perimeter Institute for Theoretical Physics, ~2 weeks, Waterloo	09-10/2024
IAS, Tsinghua University, ~10 days, Beijing	05/2024

SERVICE

Regular referees for PRB, PRX, PRL, SciPost, PRA, PRResearch, JHEP, Quantum	2018-now
Chair for Session F44, March Meeting 2021 (online)	03/2021
Coordinator of “Conformal Field Theory Reading Club”, OSU	Autumn 2019
Coordinator of “Quantum Information Theory Reading Club”, OSU	Autumn 2017
Coordinator of “Anyon Reading Club”, OSU	Spring, Summer 2017
Graduate Research Associate, OSU	Summer 2014-2016; 2017-2019

TEACHING & GRADING

Short course on Entanglement bootstrap, Yau Mathematical Sciences Center, Beijing	Winter 2025
Entanglement bootstrap reading group (organizer and lecturer), UIUC, Urbana	Autumn 2025
Tutorial: “How to draw with Inkscape?”, UIUC, Urbana	Autumn 2025
Entanglement bootstrap lecture series (lecturer), online, UCSD and UC Davis	Spring 2022

Analytic and numeric Methods of physics (7701) with Prof. Christopher Hirata, OSU	<i>Autumn 2016</i>
Quantum Mechanics II (7502) with Prof. Ulrich Heinz, OSU	<i>Spring 2016</i>
Classical and Statistical Mechanics I (7601) with Prof. Linda Carpenter, OSU	<i>Autumn 2015</i>
Quantum Mechanics II (7502) with Prof. Ulrich Heinz, OSU	<i>Spring 2015</i>
Undergraduate Physics (1250H) with Prof. Brian Winer, OSU	<i>Autumn 2014</i>
Undergraduate E&M (5400) with Prof. Christopher Hirata, OSU	<i>Spring 2014</i>
Honored undergraduate E&M (5400H) with Prof. Junko Shigemitsu, OSU	<i>Autumn 2013</i>
Analytical Mechanics, with Prof. Mingzhe Li, Nanjing University	<i>Autumn 2011</i>

OUTREACH

Participate in the UIUC Physics Department T-Shirt Design Contest Fall 2025, Urbana	<i>10/2025</i>
Feed the black cat (named Luna by some local students) at the Isaac Newton Institute, Cambridge University, UK	<i>09/2025</i>
Volunteer, Southeast San Diego Science & Art Expo	<i>08/2023</i>
Course co-designer and Volunteer, Innis Elementary School Outreach “Fun with Shapes.”	<i>04/2019</i>
Poster, OSU Physics Graduate Studies Open House	<i>03/2019</i>
Talk, Quantum Information Seminar Series, OSU	<i>04/2018</i>
Poster, OSU Physics Graduate Studies Open House	<i>03/2018</i>
Talk, Graduate Student Seminar at Math Department, OSU	<i>03/2018</i>
Volunteer, Innis Elementary School’s Annual Science Day	<i>12/2017</i>
Poster, OSU Physics Graduate Studies Open House	<i>03/2017</i>