Hong-Yi Wang

👤 He/him/his

🎓 Ph. D. student in Quantum Science and Engineering

🏛 Princeton University

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RESEARCH INTEREST

- Driven, dissipative, or monitored quantum systems
- Condensed matter theory: topological phenomena
- Quantum information, entanglement, and complexity in many-body systems
- Quantum fields, gravity and information: information paradoxes, firewall, etc.

EDUCATION

Princeton University, Ph. D. in Quantum Science and Engineering   Sep. 2024-now

Stanford University, Visiting Student Researcher   Sep. 2023–Jun. 2024
Advisor: Prof. Xiao-Liang Qi, Stanford Institute for Theoretical Physics, Stanford University

Tsinghua University, Ph. D. in Physics program (withdrawn)   Sep. 2021–Jul. 2024
Advisor: Prof. Zhong Wang, Institute for Advanced Study, Tsinghua University

- **Academics:** overall GPA 3.84/4.00
- **Advanced Courses:** cold atom physics, topics in field theory and condensed matter, selected topics in experimental condensed matter physics, selected topics in computational quantum physics, conformal field theory, quantum gravity and quantum information

Peking University, B.Sc. in Physics   Sep. 2017–Jul. 2021

- **Academics:** overall GPA 3.81/4.00; major GPA 3.89/4.00
- **GRE:** Verbal 162, Quantitative 170, AW3.0; Physics sub 990
- **Advanced Courses:** quantum statistical physics, solid state theory, properties of quantum materials, general relativity, quantum gauge field theory, Lie group and Lie algebra, homology, characteristic classes, low-dimensional manifolds

The High School Affiliated to Renmin University of China   Sep. 2011-Jul. 2017

- **Award:** Gold Medal in the Asian Physics Olympiad 2017

PUBLICATION LIST

- *Featured* <u>H.-Y. Wang</u>, F. Song and Z. Wang. *Phys. Rev. X 14, 021011 (2024)* "Amoeba Formulation of Non-Bloch Band Theory in Arbitrary Dimensions"
- Y.-M. Hu, <u>H.-Y. Wang</u>, Z. Wang and F. Song. *Phys. Rev. Lett. 132, 050402 (2024)* "Geometric Origin of Non-Bloch PT Symmetry Breaking"

- F. Song, <u>H.-Y. Wang</u> and Z. Wang. *A Festschrift in Honor of the C N Yang Centenary, pp. 299-311 (2022)*
  "Non-Bloch PT Symmetry Breaking: Universal Threshold and Dimensional Surprise"

CONFERENCE ATTENDENCE

- APS March Meeting 2024
  In-person oral presentation: witness of non-Hermitian skin effect in arbitrary dimensions
- Invited special seminar at Princeton Physics Department, 2023
  Non-Bloch band theory in arbitrary dimensions: the stable and the fragile
- Boulder Summer School 2023: "Non-Equilibrium Quantum Dynamics".
  Poster presentation: the amoeba formulation
- Gordon Research Conference 2023: "Topological and Correlated Matter".
  Poster presentation: the amoeba formulation

RESEARCH EXPERIENCE

Non-Hermitian quantum systems and topology   Sep. 2018–now
Collaborators: Prof. Zhong Wang, Dr. Fei Song and others

- Non-Hermitian skin effect in two and higher dimensions
- Interplay between PT symmetry, exceptional points and skin effect
- Integrability in non-Hermitian systems
- Experimental collaboration on non-Hermitian physics

Many-body physics and entanglement phenomena   Sep. 2022–now
Collaborators: Prof. Xiao-Liang Qi and others

- Quantum dynamics (entanglement, operator size, OTOC, etc.) in randomized evolution
- General formalism of shadow tomography
- Quantum information perspectives of quantum gravity models

TEACHING EXPERIENCE

Mathematical Physics Equations   Sep. 2021–Jan. 2022
Teaching assistant, Physics undergraduate course at Tsinghua University

Physics Olympiad Training   Summers, 2017-2019
Lecturer at Zhixin Education (High school Science Olympiads training corporation)

PROFESSIONAL SKILLS

- **Physics:** frequently used models in quantum many-body physics, topological band theory, quantum information, etc. Basic knowledge about holographic duality.
- **Mathematics:** algebraic topology, differential geometry, spinors, etc. Basic knowledge about TQFT, algebraic geometry and stochastic calculus.
- **Programming:** Basic knowledge about Python, Mathematica, MATLAB, and LaTeX. Experience in many-body algorithms including ED and MPS/MPO algorithms.
- **Languages:** Chinese (native); English, Japanese (daily conversation, academic writing); German and Latin (intermediate)