ZIJIA CHENG

(609) 356-2200 www.linkedin.com/in/zijia-cheng-1588791b4/ Princeton, NJ, 08540
zijiac@princeton.edu

EDUCATION

Princeton University, Princeton, NJ 2018 - expected 2024
Phd student of Science in Physics
Key courses: Financial Econometrics, Machine Learn & Pattern Recognition, Quantitative Data Analysis in Finance. Game theory. Natural Language Programming with Deep Learning.

Tsinghua University, Bejing, China. 2014 - 2018
Bachelor of Science in Physics (Tsinghua Xuetang Talents Program, top 20%)

RESEARCH

Laboratory for Topological Quantum Matter and Advanced Spectroscopy 2018 - Present
Research Assistant *Princeton, NJ*

- Adopted state-of-the-art **angular-resolved photoemission spectroscopy** (ARPES) and **scanning tunneling spectroscopy** (STM) techniques to discover novel strong-correlated topological materials, including Weyl line/loop state and high-order fermions, and characterize their electronic structures.
- Constructed the **tight-binding** and **mean-field models** for analyzing materials' band structure. Developed **Python-based multithreading numerical framework** for simulating spectrum function and calculating response functions based on the Hamiltonian, which is 40% faster than the previous framework.
- Developed and maintained **Python-based data acquisition and analysis tools**, significantly improving the work efficiency (>50%) of the group members and coworkers at national labs.
- Published over 15 peer-reviewed papers in high-profile journals (***Nature***, ***Phys. Rev. Let.***, ***Adv. Mat.***), with more than **1000** citations (Link).

The State Key Laboratory of Low-Dimensional Quantum Physics. 2015 - 2018
Undergraduate Research Assistant *Beijing, CN*

- Adopted machine learning method (Including SVM and neural network) and self-developed instrument control software (LabView-based) to develop an automatic workflow for calibrating the tip of the STM without supervision. Related patent: Link .
- Analyzed the universal scaling behavior of quantum anomalous hall systems using nonlinear fitting and Bootstrap method with Python. (Link)

COMPUTER SKILLS

Programming: Python/Igor Pro/Mathematica/C/LabView/R/Latex/Markdown. GitHub: (Link)
Packages: NumPy, Pandas, Matplotlib, SciPy, Sklearn, Numba, Pytorch, Trax
Toolkit: Git, Docker, mySQL, Linux Terminal

HONORS AND AWARDS

- Tsinghua Xuetang Talents Program Scholarship 2014-2018
- Hengda Scholarship for the top students in Department of Physics 2016-2017
- Academic Excellence Scholarship 2015-2016

ACADEMIC AND TEACHING ACTIVITIES

- Three conference talks (Link) and **session chair** of 2022, 2023 APS march meeting.
- Journal referee for **Physical Review Letters**, **Advanced Materials**, Physics Review B, Physics Review Materials, Physica B: Condensed Matter
- Teaching Assistant for General Physics I and II for over two semesters.

SELECTED PUBLICATIONS

(Co-) First Author:

- Evidence of a topological Kondo magnet. *Nat. Phy.* **2023**, in review.
- Discovery of a hybrid topological phase in an elemental solid. *Nature* **2023**, in review**.**
- Magnetization-Direction-Tunable Kagome Weyl Line. *Adv. Mat.* **2022**, 35 (3), 2205927.
- Observation of a Linked-Loop Quantum State in a Topological Magnet. *Nature* **2022**, 604 (7907), 647–652.
- Signatures of Weyl Fermion Annihilation in a Correlated Kagome Magnet. *Phys. Rev. Lett.* **2021**, 127 (25).
- Visualizing the Out-of-Plane Electronic Dispersions in an Intercalated Transition Metal Dichalcogenide. *Phys. Rev. B* **2022**, 105 (12).

Contributing author:

- Tunable topologically driven Fermi arc van Hove singularities. *Nat. Phy.* **2023** 1-7.
- Visualizing Higher-Fold Topology in Chiral Crystals. *Phys. Rev. Let.* **2023**, 130 (6), 066402.
- Room-Temperature Quantum Spin Hall Edge State in a Higher-Order Topological Insulator Bi_4Br_4. *Nat. Mater.* **2022**. 21,1111-1115.
- Unconventional Chiral Charge Order in Kagome Superconductor KV_3Sb_5. *Nat. Mater.* **2021**. 20,1353–1357.
- Rare Earth Engineering in RMn_6Sn_6 (R = Gd − Tm , Lu) Topological Kagome Magnets. *Phys. Rev. Lett.* **2021**, 126 (24), 246602.
- Quantum-Limit Chern Topological Magnetism in $TbMn_6Sn_6$. *Nature* **2020**, 583 (7817), 533–536.