Xin-Chi Zhou

Curriculum Vitae

Max Planck Institute for the Physics of Complex Systems
Nöthnitzer Straße 38, 01187 Dresden, Germany
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Google Scholar

Experience

2025–present **Max Planck Institute for the Physics of Complex Systems**, *Dresden, Germany*,
Postdoctoral Researcher.

Education

2019–2025 **Peking University**, *Beijing, China*,
PhD in Physics, Advisor: Xiong-Jun Liu
Thesis: Exotic Phases of Matter with Neutral Atoms: From Strong Correlations to Quasiperiodicity.

2015–2019 **Southern University of Science and Technology**, *Shenzhen*, China
Bachelor of Science Degree in Physics,
Thesis: The effect of single disorder to dynamical classification of topological phases.
(Outstanding thesis award)

Research Interest

Non-equilibrium many-body system; Quantum simulation in ultracold atoms and Rydberg atoms; Topological phases of matter

Publications

First and co-first author publications

2025 ***Xin-Chi Zhou***, B.-C. Yao, Y. Wang, Y. Wang, Y. Wei, Q. Zhou, X.-J. Liu†
***Science Bulletin* 71, 1654 (2026)**,
The fundamental localization phases in quasiperiodic systems: a unified framework and exact results.

2025 W. Huang*, ***Xin-Chi Zhou****, L. Zhang*, J. Zhang*, Y. Zhou*, Z. Guo, B.-C. Yao, P. Huang, Q. Li, Y. Liang, Y. Liu, J. Qiu, D. Sun, X. Sun, Z. Wang, C. Xie, Y. Xiong, X. Yang, J. Zhang, Z. Zhang, J. Chu, W. Guo, J. Jiang, X. Linpeng, W. Ren, Y. Yuan, J. Niu, Z. Tao†, S. Liu†, Y. Zhong†, X.-J. Liu†, D. Yu†
arXiv:2502.19185 (In press at *Nature Physics*),
Experimental observation of exact quantum critical states.

2024 T.-F. J. Poon*, ***Xin-Chi Zhou****, B.-Z. Wang, T.-H. Yang, X.-J. Liu†
***Adv. Quantum Technol.* 7, 2300356 (2024)**,
Fractional quantum anomalous Hall phase for Raman superarray of Rydberg atoms.

2023 ***Xin-Chi Zhou****, Y. Wang*, T.-F. J. Poon*, Q. Zhou†, X.-J. Liu†
***Phys. Rev. Lett.* 131, 176401 (2023)**,
Exact new mobility edges between critical and localized states.

2024 ***Xin-Chi Zhou***, K. Wang†
arXiv:2405.01640 (under revision at *SciPost Physics*),
Universal non-Hermitian flow in one-dimensional PT-symmetric quantum criticalities.

2023 ***Xin-Chi Zhou***, T.-H. Yang, Z.-Y. Wang, X.-J. Liu†
arXiv:2309.12923 (under revision at *Nature Communications*),
Non-Abelian dynamical gauge field and topological superfluids in optical Raman lattice.

Co-author publications

2026 Y.-B. Zhang, ***Xin-Chi Zhou***, B.-Z. Wang, X.-J. Liu†
Phys. Rev. Lett. 136, 033402 (2026), ,
Quantum many-body dynamics for fermionic t-J model simulated with atom arrays.

2025 Y.-H. Chen, S.-Y. Chen, ***Xin-Chi Zhou***, X.-J. Liu†
arXiv:2507.21501 (under revision at *Phys. Rev. Lett.*),
Non-interacting fractional topological Stark insulator.

2024 Y.-H. Chen, B.-Z. Wang, T.-F. J. Poon, ***Xin-Chi Zhou***, Z.-X. Liu, X.-J. Liu†
***Phys. Rev. Research* 6, L042054 (2024)**,
Realization and detection of Kitaev quantum spin liquid with Rydberg atoms.

2023 W. Jia, ***Xin-Chi Zhou***, L. Zhang, L. Zhang, X.-J. Liu†
***Phys. Rev. Research* 5, L022032 (2023)**,
Unified characterization for higher-order topological phase transitions.

2022 T.-H. Yang, B.-Z. Wang, ***Xin-Chi Zhou***, X.-J. Liu†
***Phys. Rev. A* 106, L021101 (2022)**,
Quantum Hall states for Rydberg arrays with laser-assisted dipole-dipole interactions.

Talks

2025 **IQTC Workshop: Emerging Fundamental Physics in Synthetic Quantum Systems**, Hefei, China.
The fundamental localization phases in quasiperiodic systems: a unified framework and exact results

2025 **Symposium on Theoretical and Computational Aspects of Quasicrystals**, Tianjin, China.
The fundamental localization phases in quasiperiodic systems: a unified framework and exact results

2024 **Symposium for young scholars in cold atom physics**, Chongqing, China.
Simulating Non-Abelian dynamical gauge field and topological superfluids in optical Raman lattice

2024 **55th Division of Atomic, Molecular and Optical Physics (DAMOP)**, Texas, US.
Non-Abelian dynamical gauge field and topological superfluids in optical Raman lattice

2024 **Jiangsu Physical Society Spring Meeting**, Suzhou, China.
Non-Abelian dynamical gauge field and topological superfluids in optical Raman lattice (Outstanding speaker)

2023 **Workshop on Quantum Many-Body Physics: Beyond Standard**, Beijing, China.
Discussion: Many-body localized and critical phases in quasiperiodic/disordered systems

2023 **Joint Annual Conference of Physical Societies in Guangdong-Hong Kong-Macao Greater Bay Area**, Hong Kong, China.
Exact new mobility edges between critical and localized states

2023 **Jiangsu Physical Society Spring Meeting**, Nanjing, China.
Exact new mobility edges between critical and localized states (Outstanding speaker)

2022 **Chinese Physical Society Fall Meeting**, Shenzhen, China.
FQAH phase for Raman superarray of Rydberg atoms

2022 **National PhD Candidates Conference on Physics**, Beijing, China.
FQAH phase for Raman superarray of Rydberg atoms (Outstanding speaker)

Posters

2026 **Simulation of far-from-equilibrium quantum many-body dynamics**, Munich, Germany.
Self-Similar Quantum Revivals

2025 **International Workshop on Atomic Physics**, Dresden, Germany.
Non-Abelian dynamical gauge field and topological superfluids in optical Raman lattice

2025 **International Symposium on Quantum Technology**, Beijing, China.
The fundamental localization phases in quasiperiodic systems: a unified framework and exact results

2025 **Symposium for young scholars in cold atom physics**, Yunnan, China.
The fundamental localization phases in quasiperiodic systems: a unified framework and exact results

2024 **Conference of Condensed Matter Physics**, Liyang, China.
Non-Abelian dynamical gauge field and topological superfluids in optical Raman lattice

2024 **Symposium for young scholars in cold atom physics**, Chongqing, China.
Non-Abelian dynamical gauge field and topological superfluids in optical Raman lattice

2024 **10th International Symposium on Cold Atom Physics (ISCAP2024)**, Shanghai, China.
Non-Abelian dynamical gauge field and topological superfluids in optical Raman lattice

2024 **55th Division of Atomic, Molecular and Optical Physics (DAMOP)**, Texas, US.
Simulating Exact New Mobility Edges using Rydberg Raman superarray

2023 **International Conference on Emerging Quantum Technology**, Hefei, China.
Exact New Mobility Edges between Critical and Localized States

2023 **Conference on Quantum Simulations of Fundamental Physics** , Shanghai, China.
Exact New Mobility Edges between Critical and Localized States

2023 **Symposium for young scholars in cold atom physics**, Zhengzhou, China.
Fractional Quantum Anomalous Hall Phase for Raman Superarray of Rydberg Atoms

2022 **Symposium for young scholars in cold atom physics**, Nei Mongol, China.
Quantum Hall states for Rydberg arrays with laser-assisted dipole-dipole interactions

2021 **Symposium for young scholars in cold atom physics**, Qingdao, China.
Unified Characterization for Higher-Order Topological Phase Transitions

Skills

Analytical Theory:	Global theory for quasiperiodic cocycle, renormalization group, self-consistent mean-field theory, Topological band theory
Numerical Methods:	Exact diagonalization, Tensor Network (DMRG, TEBD, TDVP), Functional determinant approach
Programming:	MATLAB, Python, Julia