Xu Zhang

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Homepage: https://deadworm.github.io/

Education

Nankai University, Tianjin, China *Sep. 2015 - Jun. 2019*
Bachelor of Science, Physics
GPA: 90.06/100 (Ranking: 5/75)
Advisor: Jiangping Hu, Liang Jin

The University of Hong Kong, Hong Kong, China *Sep. 2020 - Present*
PhD student, Physics
PhD physics course names and grades:
PHYS8552 - 2021 -1 Physics of Quantum Liquids (A-)
PHYS8750 - 2021 -1 Nanophysics (A-)
PHYS8550 - 2021 -2 Graduate Statistical Mechanics (A-)
PHYS8351 - 2021 -2 Graduate Quantum Mechanics (A+)
Advisor: Zi Yang Meng

Employment & Exchange Experience

Institution of Physics, Beijing, China *Jun. 2019 - Sep. 2020*
Research Assistant, Advisors: Jiangping Hu, Zi Yang Meng
Density Matrix Renormalization Group computation for 1D copper-oxygen chain and Determinant Quantum Monte Carlo computation for 2D boson-fermion coupling system.

University of Michigan, MI, USA *Feb. 2023 - Mar. 2023*
Junior Short Term Visitor, Host: Kai Sun
Nonlinear Hall effect and fractional Chern insulator simulation by Quantum Monte Carlo.

Honor & Award

QuantEmX Scientist Exchange Award *2022*
Institute for Complex Adaptive Matter, University of California, Davis, CA

Merit Student *2018*
Nankai University, Tianjin, China

Integrated Second-class Scholarship *2018*
Nankai University, Tianjin, China

Dalian Institute of Chemical Physics Scholarship *Jun. 2018*
Dalian Institute of Chemical Physics, Chinese Academy of Science, Liaoning, China

Jici Yan Class Scholarship *2015 - 2017*
Institute of Physics, Chinese Academy of Science, Beijing, China

Integrated First-class Scholarship *2016 & 2017*
Nankai University, Tianjin, China

The 9^{th} Nankai Physics Tournament (NKPT), Second Prize *May 2017*
Nankai University, Tianjin, China

Computer Proficiency

· Languages: C++, MATLAB, Mathematica, Python, LaTeX

Research Interests

· Many-Body System: Analytical and numerical computation based on Quantum Monte Carlo and Exact Diagonalization.
· Explaining experiment-related novel phenomena in 2D materials.

Publications

Momentum space quantum monte carlo on twisted bilayer graphene *2021*
X Zhang, G Pan, Y Zhang, J Kang, ZY Meng
Chinese Physics Letters 38, 077305

Dynamical properties of collective excitations in twisted bilayer graphene *2022*
G Pan, X Zhang, H Li, K Sun, ZY Meng
Physical Review B 105, L121110

Fermion sign bounds theory in quantum monte carlo simulation *2022*
X Zhang, G Pan, XY Xu, ZY Meng
Physical Review B 106, 035121

Superconductivity and bosonic fluid emerging from moiré flat bands *2022*
X Zhang, K Sun, H Li, G Pan, ZY Meng
Physical Review B 106, 184517

Thermodynamic characteristic for a correlated flat-band system with a quantum anomalous hall ground state *2023*

G Pan, X Zhang, H Lu, H Li, BB Chen, K Sun, ZY Meng
Physical Review Letters 130, 016401

Polynomial sign problem and topological Mott insulator in twisted bilayer graphene *2023*
X Zhang, G Pan, BB Chen, H Li, K Sun, ZY Meng
Physical Review B 107, L241105

Intrinsic nonlinear Hall effect and gate-switchable Berry curvature sliding in twisted bilayer graphene *2022*
M Huang, Z Wu, X Zhang, X Feng, Z Zhou, S Wang, Y Chen, C Cheng, ...
Phys. Rev. Lett. 131, 066301

Phases of (2+1)D SO(5) non-linear sigma model with a topological term on a sphere: multicritical point and disorder phase *2023*
BB Chen, X Zhang, Y Wang, K Sun, ZY Meng
arXiv preprint arXiv:2307.05307

Evolution from quantum anomalous Hall insulator to heavy-fermion semimetal in twisted bilayer graphene *2023*
C Huang, X Zhang, G Pan, H Li, K Sun, X Dai, ZY Meng
arXiv preprint arXiv:2304.14064

The "Sign problem" of the 3rd order anomalous Hall effect in topological magnetic materials *2023*

X Zhang, K Sun, ZY Meng
arXiv preprint arXiv:2303.00819