

JUNCHEN YE, Ph.D. student

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Background:

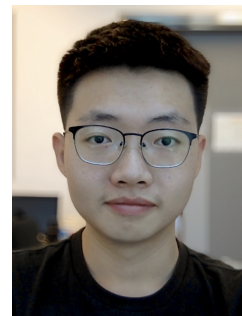
Topological Condensed Matter Theory

Numerical Calculation

Interest:

Quantum Sensing Experiment

Topological Physics



EDUCATION

The Chinese University of Hong Kong HK SAR, China
Experimental Quantum Sensing

Ph.D student in Quantum Physics Aug 2021 – Now

Hunan University (985/211) Changsha, China
 Overall GPA: 3.67/4.0 (88.96) Core GPA: 3.86/4.0 (92.07)
 Rank: 1/29 (1/161, Before dividing majors)

Undergraduate in Finance Sep 2015 – Jun 2017

Switch to Major Class (EE & Applied Physics)

Undergraduate in Applied Physics Sep 2017 – Jun 2020

RESEARCH EXPERIENCES

Experimental Quantum Sensing

Prof. Ren-Bao LIU & Prof. Quan LI Aug 2021 – Now

I'm building an experimental setup for widefield nanodiamond quantum sensing, which will provide a new approach to explore live cells.

In Progressing...

Dynamical Classification of Topological quantum Phases

Prof. Fuxiang LI Dec 2019 – Jun 2020

Dynamical classification of topological quantum phases by quench dynamics provides a novel and efficient scheme in characterizing topological invariants in equilibrium. Different from usual sudden quench, we study the non-adiabatic dynamical classification scheme by a generic non-adiabatic protocol of slowly quenching the system Hamiltonian, which is realized by introducing a Coulomb-like Landau Zener problem. the new scheme can provides a more efficient dynamical characterization approach for ultracold-atom experiments. (cf. **Publications 1.**)

★ **Graduation Project**

Theoretical

Topology

Python

Using DFT to study topological surface states

Prof. Yexin FENG Oct 2019 – Dec 2019

Taking the 3D strong topological insulator Bi_2Se_3 as an example, I learn the whole process from VASP (based on DFT) to constructing Wannier function, and finally using WannierTools to study topological properties, e.g., energy spectrum or spin texture of the surface states. computational results are consistent with experiments by ARPES.

Computational

Topology

VASP

WannierTools

ARPES

Quantum Mechanical Treatment of Single-slit Interference

Prof. Quanhui LIU Dec 2018 – Feb 2019

Marcella published a "quantum-mechanical" treatment of the single-slit interference experiment by assuming wave function is a plateau within a slit. we point out that he made a mistake (infinitely large energy). by correcting wave function with the ground state of the infinitely deep well, we get a new results which are in qualitatively agreement with the real experiment of material particles C_{60} . (cf. **Publications 2.**)

ACHIEVEMENTS

Hong Kong PhD Fellowship (HKPFS)
Research Grants Council, Hong Kong SAR, P.R.China, 2021-2025

2018-2019 China National Scholarship
Ministry of Education, P.R.C, 2019

2017-2018 China National Scholarship
Ministry of Education, P.R.C, 2018

2019 MCM/ICM Contest Honorable Mention (Top 22.75%)
Consortium for Mathematics and Its Applications (COMAP), 2019

2018 National Student Innovation and Entrepreneurship Training Program (Completed as First member, Apr 2020)
Department of Higher Education, MOE of P.R.C, 2018;
<http://gjxcxy.bjtu.edu.cn/Index.aspx>
(Program No.201810532235)

PUBLICATIONS As 1st Author

- Emergent topology under slow non-adiabatic quantum dynamics. **Junchen Ye**, and Fuxiang Li, **Physical Review A** **102**, 042209 (Oct. 2020) ("Editors' Suggestion").
- Energy transfer and position measurement in quantum mechanics. **Junchen Ye**, Shen-Quan Kuang, Zhao Li, Shuo Dai, and Quan-Hui Liu, **Results in Physics** **13**, 102124 (Feb. 2019).
- On "Quantum interference with slits" and its "revisited" **Junchen Ye**, Yang Li, Qing Chen, S. G. Chen, and Quan-Hui Liu, arXiv:1902.00015 (Jan. 2019).

OTHER INTERESTS

Marathon **Full(Half) 1(3)**

Badminton

Video Editing

Game Theory