

JIAQI CAI

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EDUCATION

Department of Physics University of Washington

2019 - Present

Graduate

Major in Physics, in condensed matter experiment & 2D material, under the supervision of Prof. Xiaodong Xu.

GPA: 3.62/4

School of Physics, Huazhong University of Science and Technology

2015 - 2019

Undergraduate

Thesis in *quantum simulation based on superconducting circuits*

Major in Applied physics.

GPA: 3.86/4

AWARDS

Clean Energy Institute Fellowship, Clean Energy Institute, University of Washington, 2020-present

Best Undergraduate Thesis, Huazhong University of Science and Technology, 2020

Honored Graduates, Huazhong University of Science and Technology, 2019

National Scholarships, Ministry of Education, P.R.C, 2017

RESEARCH PAPERS

1. Tunable correlation-driven symmetry breaking in twisted double bilayer graphene. Minhao He, Yuhao Li, **Jiaqi Cai**, Yang Liu, K. Watanabe, T. Taniguchi, Xiaodong Xu, Matthew Yankowitz arXiv: 2002.08904, accepted by *Nature Physics*
2. Non-Hermitian topological microwave photonics with synthetic non-Abelian gauges. **Jia-Qi Cai**, Zheng-Yuan Xue, Ming Gong, Guang-Can Guo, Yong Hu arXiv:1812.02610
3. Out-of-Time-Order Correlators and Quantum Phase Transitions in the Rabi and Dicke Models. Zheng-Hang Sun*, **Jia-Qi Cai***, Qi-Cheng Tang, Yong Hu, Heng Fan, arXiv:1811.11191, ANNALEN DER PHYSIK 2020, 1900270
4. Implementing universal nonadiabatic holonomic quantum gates with transmons, Zhuo-Ping Hong*, Bao-Jie Liu*, **Jia-Qi Cai***, Xin-Ding Zhang, Yong Hu, Z. D. Wang, Zheng-Yuan Xue arXiv:1710.03141, Phys. Rev. A, **97**, 022332

RESEARCH EXPERIENCE

Research assistant of Xu Lab, University of Washington

Sep 2019- Present

Condensed matter experiment/theory:

- Mechanical exfoliation of layered crystal into 2D material flake by Scotch tape, Polydimethylsiloxane, and gold film.
- Atomic force microscope based surface characterization and manipulation.
- Fabrication of 2D material into tunneling junction or floating gated/dual gated/edge-contacted transistor device.
- Characterization of material based on DC/AC transport measurement, optical characterization including Raman spectroscopy, photoluminescence, second harmonic generation, etc.
- Electronic structure simulation based on $k \cdot p$ model, include band structure, transport simulation and optical response.

*those authors contributed equally to this work

Research intern, University of Science and Technology of China(USTC)

Sep 2017- Apr 2019

Undergraduate research on superconducting circuit

- Quantum simulation of topological material based on superconducting circuits.
- Quantum information in condensed matter and quantum optical system.

LEADERSHIP AND ACTIVITY

- Participant, MRSEC (biweekly) seminar in condensed matter
- Superuser of shared facilities(AFM& Glovebox) at MEM-C.
- Participant, TIQM Seattle Inaugural Workshop 2020.
- Chairman of Innovative Base of Physics Experiment(IBPE), Huazhong University of Science and Technology.
- Chairman of Academic Seminar for Seniors, School of Physics, Huazhong University of Science and Technology.
- Tutor of Classical Reading Seminar for Freshman, School of Physics, Huazhong University of Science and Technology.