Qiang Gao

Curriculum Vitae

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Google Scholar

Education

2018–2023 **Ph.D. in Physics**, *The University of Texas at Austin*, Austin, TX
Thesis: *Exotic phases in condensed matter systems: space-time crystals and moiré superlattices.*
Advisors: Qian Niu.

2013–2017 **B.Sc. in Applied Physics**, *University of Science and Technology of China*, Hefei, China
Thesis: *On the Efficiency and its Enhancement of the Quantum-dot based light-emitting diode (QLED).*
Advisor: Zhenyu Zhang.

Appointments

2024–present **Postdoctoral Fellow**, *Harvard University*, Cambridge, MA

2019–2023 **Research Assistant**, *The University of Texas at Austin*, Austin, TX

2018–2019 **Teaching Assistant**, *The University of Texas at Austin*, Austin, TX

2017–2018 **Research Assistant**, *USTC & Shenzhen University*, China

Publications

Peer-reviewed

[1] **Qiang Gao**, Ryan A Lanzetta, Patrick Ledwith, Jie Wang, Eslam Khalaf. "Bootstrapping the quantum hall problem". In: *Physical Review X* 15.3 (2025), p. 031034.

[2] Yanxing Li, Chuqiao Shi, Fan Zhang, Xiaohui Liu, Yuan Xue, Viet-Anh Ha, **Qiang Gao**, Chengye Dong, Yu-Chuan Lin, Luke N Holtzman, et al. "Robust supermoiré pattern in large-angle single-twist bilayers". In: *Nature Physics* (2025), pp. 1–8.

[3] Yanxing Li, Fan Zhang, Viet-Anh Ha, Yu-Chuan Lin, Chengye Dong, **Qiang Gao**, Zhida Liu, Xiaohui Liu, Sae Hee Ryu, Hyunsue Kim, et al. "Tuning commensurability in twisted van der Waals bilayers". In: *Nature* 625.7995 (2024), pp. 494–499.

[4] **Qiang Gao**, Junkai Dong, Patrick Ledwith, Daniel Parker, Eslam Khalaf. "Untwisting moiré physics: Almost ideal bands and fractional Chern insulators in periodically strained monolayer graphene". In: *Physical Review Letters* 131.9 (2023), p. 096401.

[5] **Qiang Gao**, Eslam Khalaf. "Symmetry origin of lattice vibration modes in twisted multilayer graphene: Phasons versus moiré phonons". In: *Physical Review B* 106.7 (2022), p. 075420.

[6] **Qiang Gao**, Qian Niu. "Semiclassical dynamics of electrons in a space-time crystal: Magnetization, polarization, and current response". In: *Physical Review B* 106.22 (2022), p. 224311.

[7] **Qiang Gao**, Yafei Ren, Qian Niu. "DC current generation and power feature in strongly driven Floquet-Bloch systems". In: *Physical Review Research* 4.1 (2022), p. 013216.

[8] **Qiang Gao**, Zhi Lin, Xiaoguang Li, Zhenyu Zhang. "Spontaneous surface plasmon polariton decay of band-edge excitons in quantum dots near a metal surface". In: *Physical Review B* 103.3 (2021), p. 035416.

[9] **Qiang Gao**, Qian Niu. "Floquet-Bloch oscillations and intraband Zener tunneling in an oblique spacetime crystal". In: *Physical Review Letters* 127.3 (2021), p. 036401.

[10] Yafei Ren, **Qiang Gao**, AH MacDonald, Qian Niu. "WKB estimate of bilayer graphene's magic twist angles". In: *Physical Review Letters* 126.1 (2021), p. 016404.

[11] Huaibin Shen, **Qiang Gao**, Yanbin Zhang, Yue Lin, Qingli Lin, Zhaohan Li, Ling Chen, Zaiping Zeng, Xiaoguang Li, Yu Jia, et al. "Visible quantum dot light-emitting diodes with simultaneous high brightness and efficiency". In: *Nature Photonics* 13.3 (2019), pp. 192–197.

Preprints

[12] **Qiang Gao**, Zhaoyu Han, Eslam Khalaf. "Bootstrapping Flat-band Superconductors: Rigorous Lower Bounds on Superfluid Stiffness". In: (2025). arXiv: 2506.18969.

[13] Zhaoyu Han, Jonah Herzog-Arbeitman, **Qiang Gao**, Eslam Khalaf. "Exact models of chiral flat-band superconductors". In: (2025). arXiv: 2508.21127.

[14] Zhida Liu, **Qiang Gao**, Yanxing Li, Xiaohui Liu, Fan Zhang, Dong Seob Kim, Yue Ni, Miles Mackenzie, Hamza Abudayyeh, Kenji Watanabe, et al. "Field-Tunable Valley Coupling and Localization in a Dodecagonal Semiconductor Quasicrystal". In: (2024). arXiv: 2408.02176.

Talks

Seminars

08/2025 Seminar @UChicago, Chicago, IL. *Quantum Many Body Bootstrap beyond Energies.*

05/2025 Kid's Seminar @Harvard, Boston, MA. *Bootstrapping the Quantum Hall problem.*

Contributed Talks

03/2025 APS March Meeting, Anaheim, CA. *Bootstrapping the Quantum Hall problem.*

03/2023 APS March Meeting, Las Vegas, NV. *Almost ideal Chern bands in periodically strained graphene.*

03/2018 APS March Meeting, Los Angeles, CA. *Surface plasmon polariton controlled de-excitation of quantum dot.*

Skills

Languages Mandarin Chinese (native), English

Coding MATLAB, Mathematica, Python, LaTeX, Java

Awards and Fellowships

2018–2023 Provost's Graduate Excellence Fellowship, The University of Texas at Austin

2017 Outstanding Undergraduate Thesis, University of Science and Technology of China