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EMPLOYMENT

University of California, Berkeley and Lawrence Berkeley National Laboratory

Postdoctoral Researcher February 2023 – present

California Institute of Technology

IQIM Postdoctoral Fellow September 2021 – January 2023

EDUCATION

PhD University of California, Santa Barbara, Physics September 2021
Advisor: Dr. Andrea F. Young

BS University of Science and Technology of China, Physics June 2015

AWARDS

Innovators Under 35, China, MIT Technology Review, 2022

PUBLICATIONS

Preprints and in-preparation work

H. Zhou, K. Yu, Y. Balaji, L. Sementilli, Z.-H. Zhang, A. Schwartzberg, A. Sipahigil, “Observation of Transmon–Mechanical Cavity Coupling Mediated by Interface Piezoelectricity”, *in preparation*.

S. Jahanbani, Z.-H. Zhang, B. Hua, K. Godeneli, B. Müllendorff, X. Zhang, **H. Zhou**, A. Sipahigil, “A Nanomechanical Atomic Force Qubit”. [arXiv:2407.15387](https://arxiv.org/abs/2407.15387). (submitted to *Physical Review Letter*)

Published and accepted articles

H. Zhou, E. Li, K. Godeneli, Z.-H. Zhang, S. Jahanbani, K. Yu, M. Odeh, S. Aloni, S. Grifin, A. Sipahigil, “Observation of interface piezoelectricity in superconducting devices on silicon”. [Nature Communications](https://doi.org/10.1038/s41467-024-15240-0) (accepted)

M. Odeh, K. Godeneli, E. Li, R. Tangirala, **H. Zhou**, X. Zhang, Z.-H. Zhang, A. Sipahigil, “Non-Markovian dynamics of a superconducting qubit in a phononic bandgap”, [*Nature Physics* 21, 406 \(2025\)](#)

L. Holleis, T. Xie, S. Xu, **H. Zhou**, C. L. Patterson, A. Panigrahi, T. Taniguchi, K. Watanabe, L. S. Levitov, C. Jin, E. Berg, A. F. Young, “Isospin Pomeranchuk effect and finite temperature resistivity minimum in rhombohedral graphene”. [*Nature* 640, 355 \(2025\)](#)

C. L. Patterson, O. I. Sheekey, T. B. Arp, L. F. W. Holleis, J. M. Koh, Y. Choi, T. Xie, S. Xu, Y. Guo, H. Stoyanov, E. Redekop, C. Zhang, G. Babikyan, D. Gong, **H. Zhou**, X. Cheng, T. Taniguchi, K. Watanabe, C. Jin, E. Lantagne-Hurtubise, J. Alicea, A. F. Young, “Superconductivity and spin canting in spin-orbit proximitized rhombohedral trilayer graphene”. [*Nature* 641, 632 \(2025\)](#)

L. Holleis, C. L. Patterson, Y. Zhang, Y. Vituri, H. M. Yoo, **H. Zhou**, T. Taniguchi, K. Watanabe, E. Berg, S. Nadj-Perge, A. F. Young, “Nematicity and Orbital Depairing in Superconducting Bernal Bilayer Graphene with Strong Spin Orbit Coupling”. [*Nature Physics* 640, 355 \(2025\)](#)

H. Zhou, “No heat flow in charge-neutral graphene”, [*Nature Physics* 20, 1849 \(2024\)](#).

Z.-H. Zhang, K. Godeneli, J. He, M. Odeh, **H. Zhou**, S. Meesala, Alp Sipahigil, “Acceptor-induced bulk dielectric loss in superconducting circuits on silicon”. [*Physical Review X* 14, 041022 \(2024\)](#).

T. Arp, O. Sheekey, **H. Zhou**, C.L. Tschirhart, C. L. Patterson, H. M. Yoo, L. Holleis, E. Redekop, G. Babikyan, T. Xie, J. Xiao, Y. Vituri, T. Holder, T. Taniguchi, K. Watanabe, M. E. Huber, E. Berg, A. F. Young, “Intervalley coherence and intrinsic spin-orbit coupling in rhombohedral trilayer graphene.” [*Nature Physics* \(2024\)](#).

A. Assouline, T. Wang, **H. Zhou**, L. A. Cohen, F. Yang, R. Zhang, T. Taniguchi, K. Watanabe, R. S. K. Mong, M. P. Zaletel, A. F. Young, “Energy gap of the even-denominator fractional quantum Hall state in bilayer graphene”, [*Physical Review Letter* 132, 046603 \(2024\)](#).

H. Kim, Y. Choi, É. Lantagne-Hurtubise, C. Lewandowski, A. Thomson, L. Kong, **H. Zhou**, E. Baum, Y. Zhang, L. Holleis, K. Watanabe, T. Taniguchi, A. F. Young, J. Alicea, S. Nadj-Perge, “Imaging inter-valley coherent order in magic-angle twisted trilayer graphene.” [*Nature* 623, 942–948 \(2023\)](#).

Y. Zhang, R. Polski, A. Thomson, É. Lantagne-Hurtubise, C. Lewandowski, **H. Zhou**, K. Watanabe, T. Taniguchi, J. Alicea, S. Nadj-Perge, “Enhanced superconductivity in spin-orbit proximitized bilayer graphene. [*Nature* 613, 268–273 \(2023\)](#).

H. Zhou, C. Huang, N. Wei, T. Taniguchi, K. Watanabe, M. P. Zaletel, Z. Papić, A. H. MacDonald, A. F. Young. "Strong-Magnetic-Field Magnon Transport in Monolayer Graphene." [*Physical Review X* 12, 021060 \(2022\).](#)

H. Zhou, L. Holleis, Y. Saito, L. Cohen, W. Huynh, C. L. Patterson, F. Yang, T. Taniguchi, K. Watanabe, A. F. Young. "Isospin magnetism and spin-polarized superconductivity in Bernal bilayer graphene." [*Science* 375, 774 \(2022\).](#)

A. Jenkins, S. Baumann, **H. Zhou**, S. A. Meynell, D. Yang, K. Watanabe, T. Taniguchi, A. Lucas, A. F. Young, A. C. Bleszynski Jayich, "Imaging the breakdown of ohmic transport in graphene." [*Physical Review Letter* 129, 087701 \(2022\)](#)

H. Zhou, T. Xie, T. Taniguchi, K. Watanabe, A. F. Young. "Superconductivity in rhombohedral trilayer graphene." [*Nature* 598, 434–438 \(2021\).](#)

H. Zhou, T. Xie, A. Ghazaryan, T. Holder, J. Ehrets, E. M. Spanton, T. Taniguchi, K. Watanabe, E. Berg, M. Serbyn, A. F. Young. "Half and quarter metals in rhombohedral trilayer graphene." [*Nature* 598, 429–433 \(2021\).](#)

H. Zhou, H. Polshyn, T. Taniguchi, K. Watanabe, A. F. Young. "Solids of quantum Hall skyrmions in graphene." [*Nature Physics* 16 154-158 \(2020\).](#)

J. O. Island, X. Cui, C. Lewandowski, J.Y. Khoo, E. M. Spanton, **H. Zhou**, D. Rhodes, J.C. Hone, T. Taniguchi, K. Watanabe, L.S. Levitov, M.P. Zaletel, A.F. Young. "Spin-orbit driven band inversion in bilayer graphene by van der Waals proximity effect." [*Nature* 571, 85–89 \(2019\).](#)

H. Polshyn, **H. Zhou**, E. M. Spanton, T. Taniguchi, K. Watanabe, and A. F. Young. "Quantitative transport measurements of fractional quantum Hall energy gaps in edgeless graphene devices." [*Physical Review Letters* 121, 226801 \(2018\).](#)

A. A. Zibrov, E. M. Spanton, **H. Zhou**, C. Kometter, T. Taniguchi, K. Watanabe, A.F. Young "Even denominator fractional quantum Hall states at an isospin transition in monolayer graphene." [*Nature Physics* 14, 930-935 \(2018\).](#)

E. M. Spanton, A. A. Zibrov, **H. Zhou**, T. Taniguchi, K. Watanabe, M. P. Zaletel, A. F. Young. "Observation of fractional Chern insulators in a van der Waals heterostructure." [*Science* 360, 62–66 \(2018\).](#)

A. A. Zibrov, C. R. Kometter, **H. Zhou**, E. M. Spanton, T. Taniguchi, K. Watanabe, M. P. Zaletel, and A. F. Young. "Tunable interacting composite fermion phases in a half-filled bilayer-graphene Landau level." [*Nature* 549, 360–364 \(2017\).](#)

PRESENTATIONS

“Interface Piezoelectricity induced Superconducting Qubit Decoherence”, APS Global Physics Summit, Anaheim, CA, 2024.

“Probing Surface Piezoelectricity with Surface Acoustic Waves”, Nanomachine Seminar
“Observation of Interface Piezoelectricity in Silicon”, Nanomachine Seminar, University of California, Berkeley, California, May 2024.

“Interface Piezoelectricity in Silicon”, APS March Meeting, Minneapolis, MN, 2024.

“Probing Surface Piezoelectricity with Surface Acoustic Waves”, Nanomachine Seminar, University of California, Berkeley, California, May 2023.

“Magnetism and Superconductivity in Crystalline Multilayer Graphene”, Gordon Research Seminar: Topological and Correlated Matter, Ventura, California, May 2023

“Observation of Magnetism and Superconductivity in Crystalline Multilayer Graphene”, APS March meeting (invited), Las Vegas, Nevada, March 2023.

“Magnetism and Superconductivity in Multilayer Graphene”, Institute of Physics, Chinese Academy of Sciences, December 2022.

“Correlated electronic phases in crystalline graphene Van der Waals heterostructures”, Columbia University, October 2022.

“Correlated electronic phases in crystalline graphene Van der Waals heterostructures”, University of California, Berkeley, October 2022.

“Correlated electronic phases in crystalline graphene Van der Waals heterostructures”, Emerging Star Seminar Series, Hong Kong University of Science and Technology, August 2022

“Magnetism and Superconductivity in Crystalline Few-Layer Graphene”, APS March Meeting, Chicago, Massachusetts, March 2022.

“Magnetism and Superconductivity in Crystalline Few-Layer Graphene”, IQIM Seminar at California Institute of Technology, January 2022.

“Magnetism and Superconductivity in Crystalline Few-Layer Graphene”, Condensed Matter Seminar/Zernike Seminar Series, Columbia University, November 2021.

“Ferromagnetism and Superconductivity in Rhombohedral Trilayer Graphene”, USTC Shi Ru Wei Seminar Series, September 2021.

“Ferromagnetism and Superconductivity in Rhombohedral Trilayer Graphene.” UCSB Quantum Foundry Seminar, June 2021.

“Itinerant Spin and Valley Ferromagnetism in Rhombohedral Trilayer Graphene (Part II).” APS March Meeting, March 2021.

“Spin and Valley Ferromagnetism in Graphene van der Waals heterostructures.”, Condensed Matter Seminar, Princeton University, December 2020.

“Spin Wave Transport at a Charge Density Wave to Antiferromagnet Phase Transition in Monolayer Graphene.” Anyon MURI Seminar, September 2020.

“Spin wave transport through electron solids and fractional quantum Hall liquids in graphene”, APS March meeting, Boston, Massachusetts, March 2019.

“Spin wave transport through electron solids and fractional quantum Hall liquids in graphene”, QIS Workshop, East Lansing, Michigan, October 2018.

“Detecting Spin Structures of Graphene Quantum Hall States”, APS March meeting, Los Angeles, California, March 2018.

“Edge state structure of the bilayer graphene Landau levels”, APS March meeting, New Orleans, Louisiana, March 2017.

TEACHING AND ACADEMIC SERVICES

Teaching Assistant of Physics 3 and Physics 3L, University of California, Santa Barbara

Guest Editor of *Symmetry*, MDPI

Peer-reviewed articles in Nature, Nature Physics, Nature Communications, Nano Letters, Physical Review X, Physical Review B, Scientific Reports, Applied Physics Letters, Journal of Physics: Condensed Matter, Journal of Physics D: Applied Physics, etc.