

Zihuai Zhang

CoorsTek 307, Colorado School of Mines, Golden, CO 80401
(+1) 609-356-2025 [◇ zihuai.zhang@mines.edu](mailto:zihuai.zhang@mines.edu)

Appointments

Colorado School of Mines
Assistant Professor of Physics

Aug. 2026 –

UC Berkeley & Lawrence Berkeley National Laboratory
Postdoctoral Scholar with Alp Sipahigil

Nov. 2022 – Aug. 2026

Research Interest

Quantum information science with solid-state devices, including spin qubits, superconducting circuits, mechanical systems, and color centers. Focused on coherence engineering, noise mitigation, and device-scale integration for scalable quantum systems.

Education

Princeton University
Ph.D. in Electrical and Computer Engineering
Advisor: Nathalie de Leon
Thesis: [Engineering quantum defects in diamond for quantum networks](#)

2016 - 2022

University of Science and Technology of China (USTC)
B.S. in Physics with honors, School of the Gifted Young
Advisor: Chuan-Feng Li

2012 - 2016

Selected Publications

Y. Zhu, **Z.-H. Zhang**, W. Chen, M. Sakib, A. Weber-Bargioni, S. Griffin, A. Raja, A. Sipahigil, G. Hautier, “Point defects in semiconductors: friends and foes for quantum technologies”, *MRS Bulletin* 51, 615–629 (2026)

H. Song, X. Zhang, L. Komza, N. Fiaschi, Y. Xiong, Y. Zhi, S. Dhuey, A. Schwartzberg, T. Schenkel, G. Hautier, **Z.-H. Zhang**, A. Sipahigil, “Entanglement of a nuclear spin qubit register in silicon photonics”, *Nature Nanotechnology* 21, 53–57 (2026)

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, 406–411 (2025)

Z.-H. Zhang^{*}, K. Godeneli^{*}, J. He, M. Odeh, H. Zhou, S. Meesala, A. Sipahigil, “Acceptor-induced bulk dielectric loss in superconducting circuits on silicon”, *Phys. Rev. X* 14, 041022 (2024)

Z.-H. Zhang, J.A. Zuber, L.V.H. Rodgers, X. Gui, P. Stevenson, A.M. Edmonds, N. Palmer, M.L. Markham, R.J. Cava, P. Maletinsky, N.P. de Leon, “Neutral silicon vacancy centers in undoped diamond via surface control”, *Phys. Rev. Lett.* 130, 166902 (2023)

S. Mukherjee^{*}, **Z.-H. Zhang**^{*}, M.O. de Vries, D. Oblinsky, A. Stacey, B.C. Johnson, A.M. Edmonds, N. Palmer, M.L. Markham, G.D. Scholes, B.C. Gibson, P. Reineck, N.P. de Leon, “A telecom O-band emitter in diamond”, *Nano Letters* 23, 7, 2557–2562 (2023)

Z.-H. Zhang, A.M. Edmonds, N. Palmer, M.L. Markham, N.P. de Leon, “Neutral silicon vacancy centers in diamond via photoactivated itinerant carriers”, *Phys. Rev. Applied* 19, 034022 (2023)

Z.-H. Zhang, P. Stevenson, G. Thiering, B.C. Rose, D. Huang, A.M. Edmonds, M.L. Markham, S.A. Lyon, A. Gali, N.P. de Leon, “Optically detected magnetic resonance in neutral silicon vacancy centers in diamond via bound exciton states”, *Phys. Rev. Lett.* 125, 237402 (2020)

B.C. Rose*, D. Huang*, **Z.-H. Zhang**, P. Stevenson, A.M. Tyryshkin, S. Sangtawesin, S. Srinivasan, L. Loudin, M.L. Markham, A.M. Edmonds, D.J. Twitchen, S.A. Lyon, N.P. de Leon, “Observation of an environmentally insensitive solid-state spin defect in diamond”, *Science* 361, 60-63 (2018)

Z.-H. Zhang, G. Chen, X.-Y. Xu, J.-S. Tang, W.-H. Zhang, Y.-J. Han, C.-F. Li, G.-C. Guo, “Ultrasensitive biased weak measurement for longitudinal phase estimation”, *Phys. Rev. A* 94, 053843 (2016)

Full Publications

H. Zhou*, K. Yu*, Y. Balaji, S. Shirol, L. Sementilli, **Z.-H. Zhang**, A. Schwartzberg, A. Sipahigil, “Interface Piezoelectric Loss in Superconducting Qubits”, arXiv:2605.15554 (2026)

S. Mukherjee, A. Li, J. Eberle, S. Karg, **Z.-H. Zhang**, M.M. Feldman, Y. Chen, M.E. Turiansky, M. Wang, Y. Limbu, T.O. Puel, Y. Shi, M.L. Markham, R.L. Patel, P. Gumann, M.E. Flatte, C.G. Van de Walle, S.A. Lyon, N.P. de Leon, “Defect in diamond with millisecond-scale spin relaxation time at room temperature”, *Phys. Rev. B* 114, 074105 (2026)

H. Zhou, E. Li, K. Godeneli, **Z.-H. Zhang**, S. Jahanbani, K. Yu, M. Odeh, S. Aloni, S. Griffin, A. Sipahigil, “Observation of Interface Piezoelectricity in Superconducting Devices on Silicon”, *Nature Communications* 17, 377 (2025)

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 (2024)

A. Wood*, A. Lozovoi*, **Z.-H. Zhang**, S. Sharma, G.I. López-Morales, H. Jayakumar, N.P. de Leon, C.A. Meriles, “Room-temperature photo-chromism of silicon vacancy centers in CVD diamond”, *Nano Letters* 23, 3, 1017-1022 (2023)

G. Chen, N. Aharon, Y.-N. Sun, **Z.-H. Zhang**, W.-H. Zhang, D.-Y. He, J.-S. Tang, Y. Kedem, C.-F. Li, G.-C. Guo, “Heisenberg-scaling measurement of the single-photon Kerr non-linearity using mixed states”, *Nat. Commun.* 9, 93 (2018)

G. Chen, Y. Zou, W.-H. Zhang, **Z.-H. Zhang**, Z.-Q. Zhou, D.-Y. He, J.-S. Tang, B.-H. Liu, Y. Yu, G.-W. Zha, H.-Q. Ni, Z.-C. Niu, Y.-J. Han, C.-F. Li, G.-C. Guo, “Experimental demonstration of a hybrid-quantum-emitter producing individual entangled photon pairs in the telecom band”, *Scientific Reports* 6, 26680 (2016)

Patents

N.P. de Leon, J. Thompson, S. Mukherjee, **Z.-H. Zhang**, S. Horvath, M. Markham, N. Palmer, “Erbium Doped Single Crystal Diamond”, Application No. 63/561,478, Filed: March 2024. Provisional patent pending.

N.P. de Leon, B.C. Rose, D. Huang, **Z.-H. Zhang**, A.M. Tyryshkin, S. Sangtawesin, S. Srinivasan, L. Loudin, M.L. Markham, A.M. Edmonds, D.J. Twitchen, S.A. Lyon, “Synthetic engineered diamond materials with spin impurities and methods of making the same”, US20200277196A1 (2025)

Teaching and Mentorship

Teaching Assistant, ELE 302 Building Real Systems, Princeton

2019

Research mentor, for 4 undergraduate students, 2 graduate students at Berkeley, and 2 graduate students at Princeton

Honors and Awards

Early career Ph.D. award (Princeton)	2018
Graduated with university honors (USTC, top 3%)	2016
Outstanding undergraduate dissertation (USTC, top 3%)	2016
Yan Jici talented program in physics (USTC)	2014 – 2016
National scholarship (China, top 3%)	2014 – 2015

Services

Journal reviewer

- Springer Nature: *Nature*, *Nature Physics*, *Nature Communications*, *npj Quantum Information*, *The European Physical Journal Plus*
- American Physical Society: *Physical Review X*, *Physical Review Letters*, *PRX Quantum*, *Physical Review Research*, *Physical Review Applied*, *Physical Review Materials*, *Physical Review B*
- American Chemical Society: *Nano Letters*, *ACS Nano*, *ACS Photonics*
- Optica: *Journal of the Optical Society of America B*, *Optics Express*
- Others: *Advanced Quantum Technologies*, *Thin Solid Films*

Co-organizer: [Quantum gathering](#) of Challenge Institute for Quantum Computation 2024 - Present

Proposal reviewer: NASA, DOE

Session organizer: APS Global Physics Summit 2026 (Division of Quantum Information)

Session chair: APS Global Physics Summit 2026 (Hybrid Quantum Systems)

Outreach: Public science demonstrations at *Día de la Ciencia/Science Day*, Princeton Public Library 2017 - 2019

Invited Talks

<i>Berkeley Sensor & Actuator Center Fall Conference</i> , Berkeley, CA, US	Sept. 2025
<i>Kavli Energy NanoScience Institute Research Seminar</i> , Berkeley, CA, US	May 2023
<i>Berkeley Sensor & Actuator Center Spring Conference</i> , Berkeley, CA, US	Apr. 2023
<i>Princeton-GIA Diamond Symposium</i> , Princeton, NJ, US	Jan. 2019
<i>MRS Fall Meeting</i> , Boston, MA, US	Nov. 2018

Conference Presentations

<i>APS Global Physics Summit</i> , Denver, CO, US	Mar. 2026
<i>Molecular Foundry User Meeting</i> , Berkeley, CA, US	Aug. 2025
<i>APS Global Physics Summit</i> , Anaheim, CA, US	Mar. 2025
<i>Quantum Phononics MURI Review</i> , poster, Arlington, VA, US	May 2024
<i>APS March Meeting</i> , Minneapolis, MN, US	Mar. 2024
<i>APS March Meeting</i> , Las Vegas, NV, US	Mar. 2023
<i>Gordon Research Seminar and Conference</i> , poster, Easton, MA, US	Jul. 2022
<i>SPIE Photonics West</i> , virtual	Feb. 2022

<i>WE-Heraeus-Seminar</i> , virtual (poster)	<i>Aug. 2021</i>
<i>De Beers Diamond Research Conference</i> , virtual (poster)	<i>Jul. 2021</i>
<i>APS March Meeting</i> , virtual	<i>Mar. 2021</i>
<i>Princeton Innovation</i> , poster, Princeton, NJ, US	<i>Nov. 2018</i>
<i>NSF EFRI-ACQUIRE review meeting</i> , poster, Washington, D.C., US	<i>Sept. 2018</i>
<i>Gordon Research Conference</i> , poster, Easton, MA, US	<i>Jul. 2018</i>