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Education

- 2005 – 2011 **Ph. D. in Physics, Brown University, Advisor: Humphrey J. Maris**
Dissertation Title: "Studies of electron bubbles and quantized vortices in superfluid helium 4"
- 2001 – 2005 **B. Sc. in Physics, Nanjing University, Advisor: Zheng-Zhong Li**
Dissertation Title: "Spin-filter tunneling magnetoresistance in a magnetic tunnel junction"

Postdoctoral Training

- 2016 – 2017 **Research Scientist, University of California, Berkeley, Supervisor: Xiang Zhang**
Research Areas: Topological electronics and photonics
- 2012 – 2016 **Postdoctoral Associate, Massachusetts Institute of Technology, Supervisor: Nicholas X. Fang**
Research Areas: Quantum electronics and photonics

Employment

- 2025 – **Concurrent Associate Professor of Electrical Engineering, University of Notre Dame**
- 2022 – **Associate Professor of Physics, University of Notre Dame**
- 2022 – 2024 **Affiliate Quantum Scientist, Argonne National Laboratory**
- 2019 – 2022 **Consortium for Advanced Science and Engineering Fellow, University of Chicago**
- 2019 – 2020 **Interim Group Leader, Argonne National Laboratory**
- 2018 – 2022 **Scientist, Argonne National Laboratory**

Awards, Honors, and Fellowships

- 2024 **2024 DOE Early Career Award**
- 2022 **Physical Science and Engineering Early Investigator Named Award at Argonne**
- 2021 **Julian Schwinger Foundation Award for Physical Research**
- 2020 **Impact Argonne Award on Innovation**

Patents

- D. Jin, S. Sheludiyakov, Y. Wen, S. Zou, "Electron Qubits on Solid-State Hydrogen Isotopes", (filed and pending); Notre Dame Internal Tech ID: 25-009 (2024).
- D. Jin, X. Zhou, G. Yang, G. Koolstra, D. Schuster, "Noble-Gas Solid-State Single Electron Qubit Platform", US Patent 12,254,999 (filed 02/2022, granted 03/2025).

Publications

[*corresponding author; [†]senior personnel; #former mentor; %postdoctoral researcher supervised; @graduate student supervised; §undergraduate student supervised]

Invited Review, Expository, and Survey Articles

- W. Guo[†], D. Konstantinov[†], and D. Jin^{*†}, “Quantum Electronics on Quantum Liquids and Solids”, **Prog. Quantum Electron.** **99**, 100552 (2025).

Book Chapter

- D. Jin, “Semiconductor quantum bits: Structures and principles”, In: Fornari, R. (Ed.), **Comprehensive Semiconductor Science and Technology**, Second Edition, vol. 3, pp. 639–656, Elsevier (2025).

Original Research Articles

- X. Li%, C. S. Wang, B. Dizdar, Y. Huang%, Y. Wen%, W. Guo, X. Zhang, X. Han, X. Zhou%, and D. Jin^{*†}, “Noise-resilient solid host for electron qubits above 100 mK”, **arXiv:2502.01005** (2026), accepted by **Nature Electronics**.
- X. Li%, Y. Huang%, X. Han, X. Zhou%, A. Yacoby[†], and D. Jin^{*†}, “Coherent manipulation of interacting electron qubits on solid neon”, **arXiv:2503.23738** (2026), under review in **Nature Physics**.
- S. Inui, Y. Qi, Y. Xing, C. Peretti%, D. Jin[†], and W. Guo, “On-Chip Levitated Neon Particle Arrays for Robust and Scalable Electron Qubits”, **arXiv:2512.00654** (2026), under review in **Phys. Rev. X**.
- S. Zou%, X. Li%, Q. Chen%, and D. Jin[†], “Electron charge coherence on a solid neon surface”, **Quantum Sci. Technol.** **11**, 025003 (2026).
- Y. Tian, I. Grytsenko, A. Jennings, J. Wang, H. Ikegami, X. Zhou%, S. Tamate, H. Terai, H. Kutsuma, D. Jin[†], M. Benito, E. Kawakami, “NbTiN Nanowire Resonators for Spin-Photon Coupling on Solid Neon”, **Phys. Rev. Applied** **25**, 024011 (2026).
- C. Chang, T. J. Hobbs, D. Jin[†], Y. Li, M. Lisovenko, V. Novosad, Z. H. Saleem, T. Trickle, G. Wang, “Searching for axion dark matter with array-scalable single magnon detectors”, **Phys. Rev. D** **113**, 015016 (2026).
- K. Yoshimura, T.-C. Hsieh, H. Ma, D. V. Chichinadze, S. Zou%, M. Stuckert, D. Graf, R. Nowell, M. A. Karim, D. Kozawa, R. Kitaura, X. Liu, X. Liu, D. Jin[†], C. Lewandowski, Y.-T. Hsu, B. A. Assaf, “g-Factor Enhanced Upper Critical Field in Superconducting PdTe₂ due to Quantum Confinement”, **arXiv:2508.07547** (2025), under review in **Phys. Rev. Lett.**
- Q. Du%, J. Yang, A. Imamovic, X. Li%, X. Zhou%, J. Pearson, C. Liu%, U. Welp, A. Higginbotham, J. S. Jiang, D. Jin[†], M. R. Norman[†], A. Bhattacharya, “Tuning Kinetic Inductance with Doping in Superconducting Electron Gases at the KTaO₃ (111) Interface”, **Nano Lett.** **25**, 7234-7240 (2025).
- J. Zhou%, R. Huang, N. Moldovan, L. Stan, J.-G. Wen, D. Jin[†], D. R. Nelson, A. Košmrlj, D. A. Czaplewski, and D. López, “Rippled metamaterials with scale-dependent tailorable elasticity”, **PNAS** **122**, e2425200122 (2025).
- T. Kanai, D. Jin^{*†}, and W. Guo, “Single-Electron Qubits Based on Quantum Ring States on Solid Neon Surface”, **Phys. Rev. Lett.** **132**, 250603 (2024).
- J. Xu%, C. Zhong, S. Zhuang, C. Qian, Y. Jiang, A. Pishehvar, X. Han, D. Jin[†], J. Jornet, B. Zhen, J. Hu, L. Jiang, and X. Zhang, “Slow-Wave Hybrid Magnonics”, **Phys. Rev. Lett.** **132**, 116701 (2024).
- X. Zhou%, X. Li%, Q. Chen%, G. Koolstra, G. Yang, B. Dizdar, Y. Huang%, C. S. Wang, X. Han, X. Zhang, D. I. Schuster, and D. Jin^{*†}, “Electron charge qubits with 0.1 millisecond coherence time”, **Nat. Phys.** **20**, 116–122 (2024). – *Highlighted by Nature Physics*

- C. Liu, X. Zhou^{%,} D. Hong, B. Fisher, H. Zheng, J. Pearson, J. S. Jiang, D. Jin[†], M. R. Norman, and A. Bhattacharya, “Tunable superconductivity and its origin at KTaO₃ interfaces”, **Nat. Commun.** **14**, 951 (2023).
- M. I. Dykman, O. Asban, Q. Chen^{%,} D. Jin[†], and S. A. Lyon, “Spin dynamics in quantum dots on liquid helium”, **Phys. Rev. B** **107**, 035437 (2023).
- K. Peng, R. Tao, L. Haeberlé, Q. Li, D. Jin[†], G.R. Fleming, S. Kéna-Cohen, X. Zhang, and W. Bao, “Room-temperature polariton quantum fluids in halide perovskites”, **Nat. Commun.** **13**, 7388 (2022).
- Q. Chen^{%,} I. Martin, L. Jiang, and D. Jin^{*†}, “Electron spin coherence on a solid neon surface”, **Quantum Sci. Technol.** **7**, 045016 (2022).
- R. Tao, K. Peng, L. Haeberlé, Q. Li, D. Jin[†], G. R. Fleming, S. Kéna-Cohen, X. Zhang, and W. Bao, “Halide perovskites enable polaritonic XY spin Hamiltonian at room temperature”, **Nat. Mater.** **21**, 761–776 (2022).
- X. Zhou^{%,} G. Koolstra, X. Zhang, G. Yang, X. Han, B. Dizdar, X. Li^{%,} R. Divan, W. Guo, K. W. Murch, D. I. Schuster, and D. Jin^{*†}, “Single electrons on solid neon as a new solid-state qubit platform”, **Nature** **605**, 46–50 (2022).
- R. Kleiner, X. Zhou^{%,} E. Dorsch, X. Zhang, D. Koelle, and D. Jin^{*†}, “Space-time crystalline order of a high-critical-temperature superconductor with intrinsic Josephson junctions”, **Nat. Commun.** **12**, 6038 (2021).
- R. Chen, F. Luo, Y. Liu, Y. Song, Y. Dong, S. Wu, J. Cao, F. Yang, A. N’Diaye, P. Shafer, Y. Liu, S. Lou, J. Huang, X. Chen, Z. Fang, Q. Wang, D. Jin[†], R. Cheng, H. Yuan, R. J. Birgeneau, and J. Yao, “Tunable room-temperature ferromagnetism in Co-doped two-dimensional van der Waals ZnO”, **Nat. Commun.** **12**, 3952 (2021).
- J. Xu^{%,} C. Zhong, X. Zhou, X. Han, D. Jin[†], S. Gray, L. Jiang, and X. Zhang, “Coherent pulse echo in hybrid magnonics with multimode phonons,” **Phys. Rev. Appl.** **16**, 024009 (2021).
- J. Xu^{%,} C. Zhong, X. Han, D. Jin[†], L. Jiang, and X. Zhang, “Coherent gate operations in hybrid magnonics”, **Phys. Rev. Lett.** **126**, 207202 (2021).
- C. Liu, X. Yan, D. Jin[†], Y. Ma, H.-W. Hsiao, Y. Lin, T. M. Bretz-Sullivan, X. Zhou^{%,} J. Pearson, B. Fisher, J. S. I. Jiang, W. Han, J.-M. Zuo, J. Wen, D. D. Fong, J. Sun, H. Zhou, and A. Bhattacharya, “Two-dimensional superconductivity and anisotropic transport at KTaO₃ (111) interfaces”, **Science** **371**, 716–721 (2021).
- Y.-Y. Lyu, X. Zhou^{%,} Z.-L. Xiao, R. Fotovat, J. Xu, G. Basnet, Y.-L. Wang, D. Jin[†], R. Divan, H.-B. Wang, and W.-K. Kwok, “Non-Ohmic negative longitudinal magnetoresistance in a two-dimensional electron gas”, **Phys. Rev. B** **103**, 035422 (2021).
- J. Xu^{%,} C. Zhong, X. Han, D. Jin[†], L. Jiang, and X. Zhang, “Floquet cavity electromagnonics”, **Phys. Rev. Lett.** **125**, 237201 (2020).
- X. Zhou^{%,} X. Han, D. Koelle, R. Kleiner, U. Welp, X. Zhang, and D. Jin^{*†}, “On-chip sensing of hotspots in superconducting terahertz emitters”, **Nano Lett.** **20**, 4197–4203 (2020).
- D. Jin^{*†}, “Quantum electronics and optics at the interface of solid neon and superfluid helium”, **Quantum Sci. & Technol.** **5**, 035003 (2020).
- M. Otten^{%,} X. Zhou^{%,} X. Zhang, and D. Jin^{*†}, “Coherent manipulation of single electrons with optical photons in condensed helium-4”, **Adv. Theory Simul.** **3**, 2000008 (2020). – *Selected as journal front cover*
- X. Zhang, A. Galda, X. Han, D. Jin[†], and V. M. Vinokur, “Strong coupling-enabled broadband non-reciprocity”, **Phys. Rev. Applied** **13**, 044039 (2020). – *Selected as Editor’s Suggestions*
- T. Kanai, W. Guo, M. Tsubota, and D. Jin[†], “Torque and angular-momentum transfer in merging rotating Bose-Einstein condensates”, **Phys. Rev. Lett.** **124**, 105302 (2020).
- D. Hong, C. Liu, H.-W. Hsiao, D. Jin[†], J. E. Pearson, J.-M. Zuo, and A. Bhattacharya, “Molecular beam epitaxy of the magnetic kagome metal FeSn on LaAlO₃ (111)”, **AIP Advances** **10**, 105017 (2020).
- X. Zhang, K. Ding, X. Zhou^{%,} J. Xu, and D. Jin[†], “Experimental observation of exceptional surface in synthetic dimensions with magnon polaritons”, **Phys. Rev. Lett.** **123**, 237202 (2019). – *Selected as Editor’s Suggestions*

- D. Jin, Y. Xia, T. Christensen, M. Freeman, S. Wang, K. Y. Fong, G. Gardner, S. Fallahi, Q. Hu, Y. Wang, L. Engel, Z.-L. Xiao[†], M. J. Manfra, N. X. Fang[#], and X. Zhang[#], “Topological kink magnetoplasmons on magnetic domain boundaries”, **Nat. Commun.** **10**, 4565 (2019).
- Y. Liu, J. Wang, S. Kim, H. Sun, F. Yang, Z. Fang, N. Tamura, R. Zhang, X. Song, J. Wen, B. Z. Xu, M. Wang, S. Lin, Q. Yu, K. B. Tom, Y. Deng, J. Turner, E. Chan, D. Jin[†], R. O. Ritchie, A. M. Minor, D. C. Chrzan, M. C. Scott, and J. Yao, “Helical van der Waals crystals with discretized Eshelby twist”, **Nature** **570**, 358–362 (2019).
- J. Xu, M. K. Ma, M. Sultanov, Z.-L. Xiao, Y.-L. Wang, D. Jin[†], Y.-Y. Lyu, W. Zhang, L. N. Pfeiffer, K. W. West, K. W. Baldwin, M. Shayegan, and W.-K. Kwok, “Negative Longitudinal Magnetoresistance in GaAs Quantum Wells”, **Nat. Commun.** **10**, 287 (2019).
- K. Y. Fong, D. Jin[†], M. Poot, A. Bruch, and H. X. Tang, “Phonon coupling between a nanomechanical resonator and a quantum fluid”, **Nano Lett.** **19**, 3716–3722 (2019).
- K. Tom, S. Lin, L. Wan, J. Wang, N. Ahlm, A. N’Diaye, K. Bustillo, J. Huang, Y. Liu, S. Lou, R. Chen, S. Yan, H. Wu, D. Jin[†], H. Yuan, D. Prendergast, and J. Yao, “Solution-based template-assisted realization of large-scale graphitic ZnO”, **ACS Nano** **12**, 7554–7561 (2018). – *Selected as Editor’s Highlights*
- D. Jin^{*}, T. Christensen, M. Soljacic, N. X. Fang[#], L. Lu, and X. Zhang[#], “Infrared topological plasmon in graphene”, **Phys. Rev. Lett.** **118**, 245301 (2017). – *Selected as Editor’s Suggestions*
- Q. Hu, D. Jin^{*}, J. Xiao, S. H. Nam, X. Liu, Y. Liu, X. Zhang[#], and N. X. Fang[#], “Ultrafast fluorescent decay induced by metal-mediated dipole-dipole interaction in two-dimensional molecular aggregates”, **PNAS** **114**, 10017 (2017). – *Featured in MIT News*
- D. Jin, L. Lu, Z. Wang, C. Fang, J. D. Joannopoulos, M. Soljacic, L. Fu, and N. X. Fang[#], “Topological magnetoplasmon”, **Nat. Commun.** **7**, 13486 (2016).
- Z. J. Tan, D. Jin, and N. X. Fang[#], “High-precision broadband measurement of refractive index by picosecond real-time interferometry”, **Appl. Opt.** **55**, 6625–6629 (2016).
- D. Jin, Q. Hu, D. Neuhauser, F. von Cube, Y. Yang, R. Sachan, T. S. Luk, D. C. Bell, and N. X. Fang[#], “Quantum-spillover enhanced plasmonic absorption at the interface of silver and high-index dielectrics”, **Phys. Rev. Lett.** **115**, 193901 (2015). – *Featured in MIT News*
- Y. E. Lee, K. H. Fung, D. Jin, and N. X. Fang[#], “Optical torque from enhanced scattering by multipolar plasmonic resonance”, **Nanophotonics** **3**, 343–350 (2014).
- D. Jin and N. X. Fang[#], “Plasmonic angular momentum on metal-dielectric nano-wedges in a sectorial indefinite metamaterial”, **Opt. Express** **21**, 28344–28358 (2013).
- D. Jin, A. Kumar, K. H. Fung, J. Xu, N. X. Fang[#], “Terahertz plasmonics in ferroelectric-gated graphene”, **Appl. Phys. Lett.** **102**, 201118 (2013). – *Featured in MIT News*
- D. Jin^{*} and W. Guo, “A finite-temperature density functional study of electron self-trapping in ³He and ⁴He”, **J. Chem. Phys.** **136**, 244510 (2012).
- D. Mateo, D. Jin, M. Barranco, and Martí Pi, “Excited electron-bubble states in superfluid ⁴He: A time-dependent density functional approach”, **J. Chem. Phys.** **134**, 044507 (2011).
- D. Jin^{*}, W. Guo, W. Wei, and H. J. Maris[#], “Electrons in superfluid helium 4”, **J. Low Temp. Phys.** **158**, 307 (2010). – *Selected as QFS 2009 Conference Brochure Cover*
- D. Jin^{*} and W. Guo, “Vortex nucleation induced phonon radiation from a moving electron bubble in superfluid helium 4”, **Phys. Rev. B** **82**, 094524 (2010).
- W. Guo, D. Jin^{*}, G. M. Seidel, and H. J. Maris[#], “Experiments with single electrons in liquid helium”, **Phys. Rev. B** **79**, 054515 (2009). – *Selected as APS Viewpoint in Physics*
- W. Guo, D. Jin, and H. J. Maris[#], “Stability of multielectron bubbles in liquid helium”, **Phys. Rev. B** **78**, 014511 (2008).
- D. Jin^{*}, Y. Ren, Z.-Z. Li[#], M.-W. Xiao, G. Jin, and A. Hu, “Spin-filter tunneling magnetoresistance in a magnetic tunnel junction”, **Phys. Rev. B** **73**, 012414 (2006).