

Yuxin Wang

CONTACT INFORMATION	<i>Office:</i> 3253 Atlantic Building, QuICS College Park, MD 20742, USA	<i>E-mail:</i> yuxinw@umd.edu
CURRENT POSITION	<i>Joint Center for Quantum Information and Computer Science (QuICS)</i> <i>University of Maryland, College Park, MD, USA</i> Hartree Postdoctoral Fellow	2023 - present
EDUCATION	<i>University of Chicago, Chicago, IL, USA</i> Ph.D. in Quantum Science and Engineering • Thesis Topic: <i>Noise and Fluctuations in Open Quantum Systems</i> • Adviser: Professor Aashish Clerk <i>Peking University, Beijing, China</i> B.S. in Physics	2017 - 2023 2013 - 2017
RESEARCH INTERESTS	I am broadly interested in the theory of open quantum systems and have research expertise in topics such as reservoir engineering, quantum noise spectroscopy, non-reciprocal interactions, and non-Hermitian systems. I also collaborate with multiple experimental groups to implement my theoretical work in different physical systems including solid-state spin defects, superconducting circuits, and trapped ions. My current research focuses on understanding noise and dissipation in quantum systems and their implications for quantum information processing, including quantum sensing and quantum error correction.	
AWARDS AND HONORS	<i>QuICS, University of Maryland, College Park, MD, USA</i> Hartree Postdoctoral Fellowship <i>American Physical Society</i> APS DQI thesis award finalist <i>Chicago Quantum Exchange</i> Boeing Quantum Creators Prize <i>Pritzker School of Molecular Engineering (PME), University of Chicago</i> Harper Dissertation Fellowship <i>PME 10th Anniversary Celebration Poster Competition</i> Best Presentation in Quantum Engineering <i>2022 MRS Fall Meeting & Exhibit, Symposium EQ07: Diamond Electronics, Devices and Sensors—From Synthesis to Applications</i> Student Presentation Prize <i>Peking University</i> Fang-Zheng Scholarship Wei-Ming Scholarship of Undergraduate Research Jia-Neng Scholarship	2023 - present 2025 2024 2022 - 2023 2021 2022 2014, 2016 2015 2015

- [1] H. Nguyen, **Y.-X. Wang**, J. Taylor, *Measurement-Induced Dynamics of Particles and Quasiparticles in a Bose-Einstein-condensate array*, arXiv: 2602.05924.
- [2] **Y.-X. Wang**, F. Salvati, David R. M. Arvidsson-Shukur, W. F. Braasch Jr., K. Murch and N. Yunger Halpern, *Quantum metrology enhanced by effective time reversal*, arXiv: 2601.20952 (invited by *Nat. Rev. Phys.*).
- [3] T.-X. Zheng, M. Iqbal Bakti Utama, X. Gao, M. Kar, X. Yu, S. Kang, H. Cai, T. Ruan, D. Ovetsky, U. Zvi, G. Lao, **Y.-X. Wang**, O. Raz, S. Chitransh, G. T. Smith, L. R. Weiss, M. H. Czyz, S. Yang, A. J. Fairhall, K. Watanabe, T. Taniguchi, D. D. Awschalom, A. P. Alivisatos, R. H. Goldsmith, G. C. Schatz, M. C. Hersam, P. C. Maurer, *A Surface-Scaffolded Molecular Qubit*, arXiv: 2601.19976.
- [4] J. A. M. Guzmán, **Y.-X. Wang**, T. Manovitz, P. Erker, N. M. Linke, S. Gasparinetti and N. Yunger Halpern *Proposals for experimentally realizing (mostly) quantum-autonomous gates*, arXiv: 2510.07372.
- [5] E. Abbasgholinejad, S. R. Muleady, J. Bringewatt, A. J. Brady, **Y.-X. Wang**, A. Fahimniya, A. V. Gorshkov, *Optimally learning functions in interacting quantum sensor networks*, arXiv: 2510.06360.
- [6] J. T. Iosue, **Y.-X. Wang**, I. Datta, S. Ghosh, C. Oh, B. Fefferman, A. V. Gorshkov, *Higher moment theory and learnability of bosonic states*, arXiv: 2510.01610.
- [7] T. Steckmann, D. Luo, **Y.-X. Wang**, S. R. Muleady, A. Seif, C. Monroe, M. J. Gullans, A. V. Gorshkov, O. Katz, A. Schuckert, *Error mitigation of shot-to-shot fluctuations in analog quantum simulators*, arXiv:2506.16509.
- [8] X. Song, S. S. Borjigin, F. Salvati, **Y.-X. Wang**, N. Yunger Halpern, D. R. M. Arvidsson-Shukur, K. Murch, *Superconducting antiqubits achieve optimal phase estimation via unitary inversion*, arXiv:2506.04315 (under review, *Nature Communications*).
- [9] T.-S. Huang, A. Grankin, **Y.-X. Wang**, and M. Hafezi, *Optical engineering and detection of magnetism in moiré semiconductors*, arXiv:2504.13758.
- [10] C. Zeledon, B. Pingault, J. C. Marcks, M. Onizhuk, Y. Tsaturyan, **Y.-X. Wang**, B. S. Soloway, H. Abe, M. Ghezellou, J. Ul-Hassan, T. Ohshima, N. T. Son, F. J. Heremans, G. Galli, C. P. Anderson, D. D. Awschalom, *Minute-long quantum coherence enabled by electrical depletion of magnetic noise*, arXiv:2504.13164.
- [11] A. J. Brady, **Y.-X. Wang**, V. V. Albert, A. V. Gorshkov, Q. Zhuang, *Correlated Noise Estimation with Quantum Sensor Networks*, arXiv:2412.17903.
- [12] Y. Cao*, S. Liu*, H. Deng, Z. Xia, X. Wu, **Y.-X. Wang**, *Robust analog quantum simulators by quantum error-detecting codes*, arXiv:2412.07764.
* These authors contributed equally.
- [13] **Y.-X. Wang**, J. Bringewatt, A. Seif, A. J. Brady, C. Oh, A. V. Gorshkov, *Exponential entanglement advantage in sensing correlated noise*, arXiv:2410.05878.
- [14] J. Yu, S. R. Muleady*, **Y.-X. Wang***, N. Schine, A. V. Gorshkov, A. M. Childs, *Efficient preparation of Dicke states*, Phys. Rev. Lett. **136**, 030601 (2026).
- [15] J. Shah, C. Fechisin, **Y.-X. Wang**, J. T. Iosue, J. D. Watson, Y.-Q. Wang, B. Ware, A. V. Gorshkov, C.-J. Lin, *Instability of steady-state mixed-state symmetry-protected topological order to strong-to-weak spontaneous symmetry breaking*, Quantum **9**, 1912 (2025).
- [16] J. Youm, J. T. Iosue, A. Ehrenberg, **Y.-X. Wang**, and A. V. Gorshkov, *Average Rényi Entanglement Entropy in Gaussian Boson Sampling*, Phys. Rev. Research **7**, 023125 (2025).

- [17] T.-S. Huang, **Y.-X. Wang**, Y.-Q. Wang, D. Chang, M. Hafezi, and A. Grankin, *Collective optical properties of moiré excitons*, Phys. Rev. Lett. **134**, 176901 (2025).
- [18] **Y.-X. Wang**, A. Seif, A. A. Clerk, *Uncovering measurement-induced entanglement via directional adaptive dynamics and incomplete information*, Phys. Rev. A **110**, L050602 (2024).
- [19] J. C. Marcks, M. Onizhuk, **Y.-X. Wang**, Y. Zhu, Y. Jin, B. S. Soloway, M. Fukami, N. Delegan, F. J. Heremans, A. A. Clerk, G. Galli, and D. D. Awschalom, *Quantum spin probe of single charge dynamics*, Phys. Rev. Lett. **133**, 130802 (2024).
- [20] A. Seif, **Y.-X. Wang**, R. Movassagh, A. A. Clerk, *Measurement and feedforward induced entanglement negativity transition*, Phys. Rev. Lett. **133**, 050402 (2024).
- [21] M. Onizhuk, **Y.-X. Wang**, J. Nagura, A. A. Clerk, G. Galli, *Understanding Central Spin Decoherence Due to Interacting Dissipative Spin Baths*, Phys. Rev. Lett. **132**, 250401 (2024).
- [22] A. Lingenfelter, M. Yao, A. Pocklington, **Y.-X. Wang**, A. Irfan, W. Pfaff, A. A. Clerk, *Exact Results for a Boundary-Driven Double Spin Chain and Resource-Efficient Remote Entanglement Stabilization*, Phys. Rev. X **14**, 021028 (2024).
- [23] Y.-Y. Wang, **Y.-X. Wang**, S. van Geldern, T. Connolly, A. A. Clerk, and C. Wang, *Dispersive Non-reciprocity between a Qubit and a Cavity*, Sci. Adv. **10**, eadj8796 (2024).
- [24] J. C. Marcks, M. Onizhuk, N. Delegan, **Y.-X. Wang**, M. Fukami, M. Watts, A. A. Clerk, F. J. Heremans, G. Galli, and D. D. Awschalom, *Guiding Diamond Spin Qubit Growth with Computational Methods*, Phys. Rev. Materials **8**, 026204 (2024).
- [25] G. Lee, T. Jin, **Y.-X. Wang**, A. McDonald, A. A. Clerk, *Entanglement Phase Transition Due to Reciprocity Breaking without Measurement or Postselection*, PRX Quantum **5**, 010313 (2024).
- [26] P. C. Jerger, **Y.-X. Wang**, M. Onizhuk, B. S. Soloway, M. T. Solomon, C. Egerstrom, F. J. Heremans, G. Galli, A. A. Clerk, and D. D. Awschalom, *Detecting spin bath polarization with quantum quench phase shifts of single spins in diamond*, PRX Quantum **4**, 040315 (2023).
- [27] Q. Xu, G. Zheng, **Y.-X. Wang**, P. Zoller, A. A. Clerk, and L. Jiang, *Autonomous quantum error correction and fault-tolerant quantum computation with squeezed cat qubits*, npj Quantum Inf. **9**, 78 (2023).
- [28] A. Pocklington, **Y.-X. Wang**, and A. A. Clerk, *Dissipative Pairing Interactions: Quantum Instabilities, Topological Light, and Volume-Law Entanglement*, Phys. Rev. Lett. **130**, 123602 (2023).
- [29] **Y.-X. Wang**, C. Wang, and A. A. Clerk, *Quantum nonreciprocal interactions via dissipative gauge symmetry*, PRX Quantum **4**, 010306 (2023).
- [30] A. Pocklington, **Y.-X. Wang**, Y. Yanay, and A. A. Clerk, *Stabilizing volume-law entangled states of fermions and qubits using local dissipation*, Phys. Rev. B **105**, L140301 (2022).
- [31] A. Seif, **Y.-X. Wang**, and A. A. Clerk, *Distinguishing between Quantum and Classical Markovian Dephasing Dissipation*, Phys. Rev. Lett. **128**, 070402 (2022).
- [32] Y.-Y. Wang, S. van Geldern, T. Connolly, **Y.-X. Wang**, A. Shilcusky, A. McDonald, A. A. Clerk, and C. Wang, *Low-Loss Ferrite Circulator as a Tunable Chiral Quantum System*, Phys. Rev. Applied **16**, 064066 (2021).
- [33] **Y.-X. Wang** and A. A. Clerk, *Intrinsic and induced quantum quenches for enhancing*

qubit-based quantum noise spectroscopy, Nat. Commun. **12**, 6528 (2021).

- [34] **Y.-X. Wang** and A. A. Clerk, *Spectral characterization of non-Gaussian quantum noise: Keldysh approach and application to photon shot noise*, Phys. Rev. Research **2**, 033196 (2020).
- [35] **Y.-X. Wang**, and A. A. Clerk, *Non-Hermitian dynamics without dissipation in quantum systems*, Phys. Rev. A **99**, 063834 (2019).
- [36] **Y.-X. Wang**, L.-Z. Mu, V. Vedral, and H. Fan, *Entanglement Rényi α entropy*, Phys. Rev. A **93**, 022324 (2016).

INVITED

CONFERENCE

TALKS

DQI Thesis Award Session: Uncovering measurement-induced entanglement via directional adaptive dynamics and incomplete information

APS March Meeting 2025, Anaheim, CA Mar. 2025

Exponential entanglement advantage in sensing correlated noise

APS March Meeting 2025, Anaheim, CA Mar. 2025

Quantum Innovators Workshop Nov. 2024

2024 Chicago Quantum Summit - Quantum Creators Prize Symposium Oct. 2024

Quantum Sensing Workshop, IMSI institute, Chicago, IL (recording) Oct. 2024

Unbounded deterministic entanglement generation by autonomous quantum measurement and feedforward

APS March Meeting 2023, Las Vegas, NV Mar. 2023

SEMINARS

Exponential entanglement advantage in sensing spatially correlated noise

JQI Friday Quantum Seminar, University of Maryland, College Park Dec. 2025

Quantum Sensors of Noise: fundamental limits and quantum advantage

JQI Seminar, University of Maryland, College Park Sep. 2025

Exponential entanglement advantage in sensing spatially-correlated noise

Special Quantum Seminar, Princeton University Aug. 2025

AMO-QIS seminar, Columbia University Jul. 2025

The reservoir engineering toolbox: unidirectional interactions, autonomous quantum error correction and entanglement stabilization

Special QI Seminar, Rutgers Aug. 2025

Exponential entanglement advantage in sensing correlated noise

Center for Quantum Information Physics Seminar, NYU Aug. 2025

Computer Science Colloquium, UCSB Jun. 2025

Quantum quenches for enhancing qubit-based quantum noise spectroscopy

JQI Friday Quantum Seminar, UMD, College Park, MD Oct. 2023

CONTRIBUTED

CONFERENCE

TALKS

Quantum Enhancement in Estimating Spatially-Correlated Gaussian White Noise

Optica Sensing Congress, Long Beach, CA Jul. 2025

Uncovering measurement-induced entanglement via directional adaptive dynamics and incomplete information

APS March Meeting 2024, Minneapolis, MN Mar. 2024

Control and Sensing of Dark-Spin Bath Polarization via a Single Probe Qubit

MRS Fall Meeting 2022, Boston, MA Nov. 2022

	<i>Non-reciprocal quantum interactions without real or synthetic magnetic fields</i>	
	APS March Meeting 2022, Chicago, IL	Mar. 2022
	<i>Enhancing qubit noise spectroscopy using a quantum quench</i>	
	APS March Meeting 2021 (virtual)	Mar. 2021
	NPQC 2021 All Hands Meeting (virtual)	Feb. 2021
	<i>Dissipation-free non-Hermitian physics using quantum parametric amplifiers</i>	
	APS March Meeting 2019, Boston, MA	Mar. 2019
ACADEMIC SERVICE	<i>Referee: PRA, PRB, PRRsearch, PRL, PRX, PRX Quantum, npj Quantum Info., and Nat. Comm.</i>	
	<i>Program Committee: QIP 2025</i>	
	<i>Session Chair: APS March meetings 2020-2025; APS DAMOP meeting 2025; QIP 2025</i>	
OUTREACH	<i>JQI volunteer at Maryland Day</i>	2024 & 2025
	<i>PME 10th Anniversary Celebration Poster Competition</i>	Sept. 2021
	<i>PME Science Communications Program, University of Chicago</i>	2018 - 2021