

QI ZHAO

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Address: 3100 Atlantic Building, University of Maryland, College Park,
MD 20742-2420, USA

EDUCATION

Doctor of Natural Science | *Physics*

Tsinghua University

Supervisor: Xiongfeng Ma

Aug. 2014 – Dec. 2018

Beijing, China

Bachelor of Science | *Pure and Applied Mathematics*

Tsinghua University

Aug. 2010 – Jul. 2014

Beijing, China

EMPLOYMENT

Assistant Professor (incoming)

The University of Hong Kong

Department of Computer Science

Jul. 2022

Hong Kong, China

Hartree Fellow

University of Maryland

Supervisor: Andrew Childs

Dec. 2019 – Present

College Park, MD, USA

Postdoctoral researcher

University of Science and Technology of China

Supervisor: Chao-Yang Lu

Jan. 2019 – Nov. 2019

Shanghai, China

RESEARCH INTERESTS

Quantum Computing, Quantum Simulation, Quantum Information, Quantum Resource Theories, Quantum Communication

RESEARCH SUMMARY

- **Publications:** 35 peer-reviewed journal publications (1 Nature, 8 Physical Review Letters, 2 Physical Review X, 2 npj Quantum Information, 1 PNAS, 1 IEEE Transactions on Information Theory, 1 National Science Review, 2 Physical Review Applied, 2 Physical Review Research, 2 Quantum, 1 New Journal of Physics, 10 Physical Review A, 1 Journal of Physics A, 1 Advanced Quantum Technologies)
- **Google Scholar Citations:** 1323 with an H-index of 17, an i10-index of 24
<https://scholar.google.com/citations?user=VVQuTDMAAAAJ&hl=zh-CN&authuser=1>.

HONORS AND AWARDS

Institute of Physics (IOP) Outstanding Reviewer Award

Institute of Physics, IOP

2021

Institute of Physics (IOP) trusted Reviewer

Institute of Physics, IOP

2020

QuICS Hartree Fellowship

University of Maryland, College Park

2019

China National Scholarship for doctoral students

Ministry of Education of the People's Republic of China

2018

Boeing Scholarship Tsinghua University	2017
Comprehensive Merit Scholarship Tsinghua University	2016
Mathematical Contest in Modeling (MCM), Meritorious Winner Consortium for Mathematics and Its Applications, COMAP, USA	2013

CONFERENCES

Quantum Information Processing (QIP) California Institute of Technology	2022
Quantum Roundabout University of Nottingham	2018
Theory of Quantum Computation, Communication and Cryptography (TQC) Universit Pierre et Marie Curie	2017
Asian Quantum Information Science Conference (AQIS) Academia Sinica (AS), Taipei	2016
International Conference on Quantum Communication, Measurement and Computing (QCMC) University of Science and Technology of China	2014

PROFESSIONAL SERVICE

- **Journal Referee:**
Nature Communications, Physical Review Letters, Physical Review X, IEEE Transactions on Information Theory, npj Quantum Information, Physical Review Research, Physical Review A, Journal of Physics A: Mathematical, Quantum Science and Technology
- **Conference Referee:**
Conference on Quantum Information Processing (QIP), International Conference on Quantum Cryptography (QCrypt), Theory of Quantum Computation, Communication and Cryptography (TQC), Asian Quantum Information Science Conference (AQIS)
- **Guest Editors:** Frontiers in Physics

TEACHING ASSISTANT

Quantum Information Tsinghua University	Sep. 2017 – Jan. 2018
Quantum Information Tsinghua University	Sep. 2016 – Jan. 2017
General Physics I Tsinghua University	Mar. 2016 – Jun. 2017
Linear Algebra Tsinghua University	Sep. 2015 – Jan. 2016
Calculus Tsinghua University	Mar. 2015 – Jun. 2015
Calculus Tsinghua University	Sep. 2015 – Sep. 2015

PUBLICATIONS

- [1] H. Fu, D. Wang, and **Q. Zhao**, “Computational self-testing of multi-qubit states and measurements,” *arXiv preprint arXiv:2201.13430*, 2022.
- [2] **Q. Zhao**, Y. Zhou, A. F. Shaw, T. Li, and A. M. Childs, “Hamiltonian simulation with random inputs,” *arXiv preprint arXiv:2111.04773*, 2021, QIP 2022 contributed talk.
- [3] D. Wu, **Q. Zhao (Co-first author)**, X.-M. Gu, H.-S. Zhong, Y. Zhou, L.-C. Peng, J. Qin, Y.-H. Luo, K. Chen, L. Li, N.-L. Liu, C.-Y. Lu, and J.-W. Pan, “Robust self-testing of multiparticle entanglement,” *Phys. Rev. Lett.*, vol. 127, p. 230503, Dec 2021. [Online]. Available: <https://link.aps.org/doi/10.1103/PhysRevLett.127.230503>
- [4] **Q. Zhao** and X. Yuan, “Exploiting anticommutation in Hamiltonian simulation,” *Quantum*, vol. 5, p. 534, Aug. 2021. [Online]. Available: <https://doi.org/10.22331/q-2021-08-31-534>
- [5] Y.-H. Luo, M.-C. Chen, M. Erhard, H.-S. Zhong, D. Wu, H.-Y. Tang, **Q. Zhao**, X.-L. Wang, K. Fujii, L. Li, N.-L. Liu, K. Nemoto, W. J. Munro, C.-Y. Lu, A. Zeilinger, and J.-W. Pan, “Quantum teleportation of physical qubits into logical code spaces,” *Proceedings of the National Academy of Sciences*, vol. 118, no. 36, 2021. [Online]. Available: <https://www.pnas.org/content/118/36/e2026250118>
- [6] X. Yuan, J. Sun, J. Liu, **Q. Zhao***, and Y. Zhou, “Quantum simulation with hybrid tensor networks,” *Phys. Rev. Lett.*, vol. 127, p. 040501, Jul 2021. [Online]. Available: <https://link.aps.org/doi/10.1103/PhysRevLett.127.040501>
- [7] X. Yuan, Y. Liu, **Q. Zhao**, B. Regula, J. Thompson, and M. Gu, “Universal and operational benchmarking of quantum memories,” *npj Quantum Information*, vol. 7, no. 1, pp. 1–8, 2021.
- [8] D. Wu, **Q. Zhao* (Co-first author)**, Y.-H. Luo, H.-S. Zhong, L.-C. Peng, K. Chen, P. Xue, L. Li, N.-L. Liu, C.-Y. Lu, and J.-W. Pan, “Entanglement-free witnessing of quantum incompatibility in a high-dimensional system,” *Phys. Rev. Research*, vol. 3, p. 023017, Apr 2021. [Online]. Available: <https://link.aps.org/doi/10.1103/PhysRevResearch.3.023017>
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- [10] M. Gong, X. Yuan, S. Wang, Y. Wu, Y. Zhao, C. Zha, S. Li, Z. Zhang, **Q. Zhao**, Y. Liu, F. Liang, J. Lin, Y. Xu, H. Deng, H. Rong, H. Lu, S. C. Benjamin, C.-Z. Peng, X. Ma, Y.-A. Chen, X. Zhu, and J.-W. Pan, “Experimental exploration of five-qubit quantum error correcting code with superconducting qubits,” *National Science Review*, 01 2021, nwab011. [Online]. Available: <https://doi.org/10.1093/nsr/nwab011>
- [11] Z.-D. Li, **Q. Zhao (Co-first author)**, R. Zhang, L.-Z. Liu, X.-F. Yin, X. Zhang, Y.-Y. Fei, K. Chen, N.-L. Liu, F. Xu, Y.-A. Chen, L. Li, and J.-W. Pan, “Measurement-device-independent entanglement witness of tripartite entangled states and its applications,” *Phys. Rev. Lett.*, vol. 124, p. 160503, Apr 2020. [Online]. Available: <https://link.aps.org/doi/10.1103/PhysRevLett.124.160503>
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- [13] X. Zhang and **Q. Zhao***, “Simultaneous certification of entangled states and measurements in bounded dimensional semiquantum games,” *Phys. Rev. Research*, vol. 2, p. 033400, Sep 2020. [Online]. Available: <https://link.aps.org/doi/10.1103/PhysRevResearch.2.033400>

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- [31] H.-L. Yin, W.-L. Wang, Y.-L. Tang, **Q. Zhao**, H. Liu, X.-X. Sun, W.-J. Zhang, H. Li, I. V. Puthoor, L.-X. You, E. Andersson, Z. Wang, Y. Liu, X. Jiang, X. Ma, Q. Zhang, M. Curty, T.-Y. Chen, and J.-W. Pan, "Experimental measurement-device-independent quantum digital signatures over a metropolitan network," *Phys. Rev. A*, vol. 95, p. 042338, Apr 2017. [Online]. Available: <https://link.aps.org/doi/10.1103/PhysRevA.95.042338>
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- [38] X. Yuan, P. Zeng, M. Gao, and **Q. Zhao**, "One-shot dynamical resource theory," *arXiv preprint arXiv:2012.02781*, 2020.
- [39] **Q. Zhao** and Y. Zhou, "Constructing multipartite bell inequalities from stabilizers," *arXiv preprint arXiv:2002.01843*, 2020.
- [40] G. Smith, J. A. Smolin, X. Yuan, **Q. Zhao**, D. Girolami, and X. Ma, "Quantifying coherence and entanglement via simple measurements," *arXiv preprint arXiv:1707.09928*, 2017.

PATENTS

1. Xiongfeng Ma and **Qi Zhao**, "Measurement-device-independent quantum key distribution with biased basis choice," Patent number: ZL201621455743.9
2. Xiongfeng Ma and **Qi Zhao**, "Quantum key distribution based on two-way classical communication," Patent number: ZL201621440463.0
3. Xiongfeng Ma and **Qi Zhao**, "Quantum key distribution data postprocessing for detector efficiency mismatch," Patent number: CN201510500542.X; Publication number: CN105049200A