

YUXUAN (VINCENT) ZHANG

MP1023, 60 St George St, Toronto, ON, Canada

quantum.zhang@utoronto.ca ♦ [personal page](#)

EDUCATION

Ph.D. in Physics, The University of Texas at Austin

Aug. 2017 – Aug. 2023

Advisors: Andrew C. Potter and Scott Aaronson

Specialized in **quantum information** and **condensed matter theory**

Thesis: *Exploring quantum matter in the era of quantum computers*

B.S. in Physics, University of California, Santa Barbara

Sep. 2013 – Jun. 2016

Graduated with Highest Honors (top 2.5% of the class)

EMPLOYMENT

CQIQC Prize Post-Doctoral Fellowship, University of Toronto

Sep. 2023 – Present

Joint appointment at the [Vector Institute for Artificial Intelligence](#)

Hosts: Yong-Baek Kim and Juan Felipe Carrasquilla Álvarez

PUBLICATIONS

Scalable quantum dynamics compilation via quantum machine learning

[arXiv](#)

Y. Zhang, R. Wiersema, Y. B. Kim, J. Carrasquilla, and L. Cincio

Classical Simulability of Circuits with Shallow Magic Depth

[arXiv](#)

Y. Zhang, and **Y. Zhang**

Under review, *PRX Quantum*

Observation of a non-Hermitian supersonic mode on a trapped-ion quantum processor

[arXiv](#)

Y. Zhang, J. Carrasquilla, and Y. B. Kim

Under review, *Nature Communications*

On verifiable quantum advantage with peaked circuit sampling

[arXiv](#)

S. Aaronson, **Y. Zhang** (corresponding author)

Under review, *Physical Review X*

Possibility of entanglement of purification to be less than half of the reflected entropy

[PRA](#)

J. Couch, P. Nguyen, S. Racz, G. Stratis, **Y. Zhang** (corresponding author)

Physical Review A, 109, 022426

Sequential quantum simulation of spin chains with a single circuit QED device

[PRA](#)

Y. Zhang, S. Shabani, A. Riswadkar, S. Shankar, and A. C. Potter

Physical Review A, 109, 022606

All-photonic one-way quantum repeaters

[npj-QI](#)

D. Niu, **Y. Zhang**, A. Shabani, and H. Shapourian

npj Quantum Information 9, 106

Holographic Quantum Simulation of Entanglement Renormalization Circuits

[PRX-Q](#)

S. Anand, J. Hauschild, **Y. Zhang**, A. C. Potter, and M. P. Zaletel

PRX Quantum 4, 030334

Quantum volume for photonic quantum processors

[PRL](#)

Y. Zhang, D. Niu, A. Shabani, and H. Shapourian

Physical Review Letters, 130, 110602

CLEO conference 2023

Qubit-efficient simulation of thermal states with quantum tensor networks Y. Zhang , S. Jahanbani, D. Niu, R. Haghshenas, and A. C. Potter <i>Physical Review B</i> , 106, 165126	PRB
Holographic simulation of correlated electrons on a trapped-ion quantum processor D. Niu, R. Haghshenas, Y. Zhang , M. Foss-Feig, G. K. Chan, and A. C. Potter <i>PRX Quantum</i> , 3, 030317	PRX-Q
Straddling-gates problem in multipartite quantum systems Y. Zhang <i>Physical Review A</i> , 105, 062430	PRA
QED driven QAOA for network-flow optimization Y. Zhang , R. Zhang, and A. C. Potter <i>Quantum</i> , 5, 510 (2021)	Quantum
CEPC Conceptual Design Report Volume II: Physics & Detector M. Abbrescia et al., including Y. Zhang	arXiv
CEPC Conceptual Design Report: Volume 1 – Accelerator M. Abbrescia et al., including Y. Zhang	arXiv

MANUSCRIPTS IN PREPARATION

Mixed-state phase transitions in spin-Holstein models
B. Min, Y. Guo, **Y. Zhang** (co-first author), D. Segal, and Y. Ashida

Decoding approximate quantum error correcting codes from quantum criticality
Y. Zhang, Y. Zou, Y.B. Kim, and T. Hsieh

PROFESSIONAL EXPERIENCE

Academic guest ETH Zurich	Nov. 2024 – Dec. 2024
Visitor Perimeter Institute for Theoretical Physics	Aug. 2023, Mar., May, Jul. 2024
Program Participant Kavli Institute for Theoretical Physics	Apr. 2024
Visitor Tsinghua University	Dec. 2023
Participant: Condensed Matter Summer School University of Minnesota	Jun. 2023
Graduate Research Assistant UT Austin	Jan. 2020 – Aug. 2023
Mentor: The Quantum Collective UT Austin	Sep. 2022 – May 2023
PhD Intern Cisco Systems, Inc.	May 2022 – Aug. 2022
Mentor: Directed Reading Program UT Austin	Jan. 2018 – May 2022
Participant: Quantum Ideas Summer School Duke University	Jun. 2019
Teaching Assistant: Quantum Computing UT Austin	Jan. 2019 – Dec. 2019
Teaching Assistant: Physics Lab for Engineers UT Austin	Sep. 2017 – Dec. 2018
Visitor The Institute of High Energy Physics	Jul. 2016 – Aug. 2017

AWARDS AND FELLOWSHIPS

Vector Research Grant Vector Institute	Summer 2024
Professional Development Award UT Austin	Spring 2023
Professional Development Award UT Austin	Fall 2019

Lawrence C. Biedenharn Jr. Endowed Fellowship UT Austin	Fall 2017 – Spring 2018
Highest Honors at Graduation , UCSB	Summer 2016
Dean’s Honors , UCSB	Fall 2013 – Spring 2016

ON-CAMPUS ACTIVITIES

Chair and Representative Graduate Welfare Committee, UT Austin	Jun. 2020 – May 2022
<ul style="list-style-type: none"> • Tripled the physics department’s budget for students • Fought for equity and diversity in graduate school • Coordinated social events regularly 	

PROFESSIONAL SERVICE

Currently at the University of Toronto, I am helping to organize a seminar series and have hosted speakers like Dr. Takato Mori (Perimeter), Prof. Sarang Gopalakrishnan (Princeton), Dr. Xiuzhe Luo (QuEra), and Prof. Zi-Wen Liu (Tsinghua).

Below is a list of conferences and journals for which I have served as a reviewer, along with the initial invitation date:

Referee <i>EPJ Quantum Technology</i>	Fall 2024
Referee <i>Physical Review A</i>	Fall 2024
Referee <i>Scientific Reports</i>	Summer 2024
Referee <i>Quantum Machine Intelligence</i>	Summer 2024
Referee <i>Theory of Quantum Computation, Communication, and Cryptography</i>	Spring 2024
Referee <i>Physical Review Research</i>	Fall 2023
Referee <i>Physical Review Letters</i>	Summer 2023
Referee <i>Physical Review B</i>	Spring 2023
Referee <i>Neural Networks</i>	Spring 2023
Referee <i>International Symposium on Symbolic and Algebraic Computation</i>	Fall 2023
Session Chair <i>APS March Meeting</i>	Spring 2023
Abstract Sorter <i>APS March Meeting</i>	Fall 2022
Referee <i>Quantum Information Processing</i>	Spring 2021

UNDERGRADUATE STUDENTS MENTORED

Adam Martinez, UofT → Oxford	Honors Thesis, 2024
Xiaoxiao (Alice) Xiong, UBC → Stanford	Honors Thesis, 2023
Michelle Gelman, UT Austin → USC	Honors Thesis, 2023
Shahin Jahanbani, UT Austin → UCB	Research Project, 2022

PRESENTATIONS AND INVITED TALKS

- “Scalable quantum dynamics compilation via quantum machine learning,” National University of Singapore, Singapore, Fall 2024
- “Scalable quantum dynamics compilation via quantum machine learning,” Vector Institute, Toronto, Fall 2024

- “Observation of a non-Hermitian supersonic mode on a trapped ion quantum computer,” University of Toronto, Toronto, Fall 2024
- “Advancing science in the era of quantum and AI”, IBM-CQIQC meeting, Toronto, Spring 2024
- “Qubit-efficient quantum simulation with sequential circuits,” Tsinghua University, Beijing, Winter 2023
- “Quantum volume for measurement-based quantum processors,” APS March Meeting, Las Vegas, Spring 2023
- “Quantum volume for photonic quantum computing,” Cisco Research, San Jose, Fall 2022
- “Holographic simulation of correlated electrons and thermal states on a trapped-ion quantum processor,” APS March Meeting, Chicago, Spring 2022
- “Holographic simulation of correlated electrons and thermal states on a trapped-ion quantum processor,” Brookhaven National Laboratory, Spring 2022
- “Interacting fermions on a quantum processor,” Quantum Circuits, Inc., New Haven, Spring 2022
- “QED driven QAOA for network-flow optimization,” Quantum Information Processing (QIP), Shenzhen, Winter 2020
- “Quantum computing today,” The Institute of High Energy Physics, Beijing, Summer 2019