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## EXPERIENCE & EDUCATION

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**California Institute of Technology**  
*Sherman Fairchild Postdoctoral Scholar*  
Host: John Preskill

Pasadena, CA  
*Sept. 2023—present*

**University of California, Berkeley**  
*Postdoctoral Researcher*  
Advisor: Norman Y. Yao

Berkeley, CA  
*Jan. 2023—Aug. 2023*

**University of California, Berkeley**  
*Ph.D., Physics*  
Thesis: Many-Body Quantum Information Dynamics  
Advisor: Norman Y. Yao

Berkeley, CA  
*Aug. 2016—Dec. 2022*

- 1 of 4 Finalists for the Deborah Jin Award for Best Thesis in AMO Physics (2024)
- National Science Foundation Graduate Research Fellowship (2016–2021)
- Theory Fellowship, UC Berkeley Physics Department (2016–2017)

**University of California, Berkeley**  
*Bachelors of Science, Engineering Physics*

- Minor in Mathematics

Berkeley, CA  
*Aug. 2011—May 2015*

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## ADDITIONAL EXPERIENCE

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**Google Quantum AI**  
*Visiting Researcher*

Venice, CA  
*Dec. 2024—present*

**Google Quantum AI**  
*Research Intern & Student Researcher*

Venice, CA  
*May 2021—Dec. 2022*

**Boston University**  
*Visiting Researcher, Physics Department*

Boston, MA  
*Aug. 2015—July 2016*

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## PUBLICATIONS & PREPRINTS

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\*: co-first authors.

- [1] Bryce Kobrin\*, **Thomas Schuster\***, Maxwell Block, Bradley Mitchell, Weijie Wu, Emily Davis, Norman Y. Yao, *A universal protocol for quantum-enhanced metrology via information scrambling*. [arxiv:2411.12794](https://arxiv.org/abs/2411.12794) (2024).
- [2] **Thomas Schuster\***, Chao Yin\*, Xun Gao, Norman Y. Yao, *A polynomial-time classical algorithm for noisy quantum circuits*. [arxiv:2407.12768](https://arxiv.org/abs/2407.12768) (2024).
- [3] **Thomas Schuster**, Jonas Haferkamp, Hsin-Yuan Huang, *Random unitaries in extremely low depth*. [arxiv:2407.07754](https://arxiv.org/abs/2407.07754) (2024).

- [4] **Thomas Schuster**, Nathanan Tantivasadakarn, Ashvin Vishwanath, Norman Y. Yao, *A holographic view of topological stabilizer codes*. [arxiv:2312.04617](#) (2023).
- [5] Alicja Dutkiewicz, Thomas O’Brien, **Thomas Schuster**, *The advantage of quantum control in many-body Hamiltonian learning*. [arxiv:2304.07172](#) (2023). (**QIP 2023**)
- [6] **Thomas Schuster**, Norman Y. Yao, *Operator growth in open quantum systems*. *Physical Review Letters*, **131** 160402 (2023).
- [7] **Thomas Schuster**, Murphy Niu, Jordan Cotler, Thomas O’Brien, Jarrod R. McClean, Masoud Mohseni, *Learning quantum systems via out-of-time-order correlators*. *Physical Review Research* **5** 043284 (2023).
- [8] Jordan Cotler, **Thomas Schuster**, Masoud Mohseni, *Information-theoretic hardness of out-of-time-order correlators*. *Physical Review A* **108** 062608 (2023).
- [9] Bryce Kobrin, **Thomas Schuster**, Norman Y. Yao, *Comment on “Traversable wormhole dynamics on a quantum processor”*. [arxiv:2302.07897](#) (2023).
- [10] **Thomas Schuster\***, Bryce Kobrin\*, Ping Gao, Iris Cong, Emil Khabiboulline, Norbert Linke, Chris Monroe, Mikhail D. Lukin, Beni Yoshida, Norman Y. Yao, *Many-body quantum teleportation via operator spreading in the traversable wormhole protocol*. *Physical Review X*, **12** 031013 (2022).
- [11] Machiel S. Blok\*, Vinay V. Ramasesh\*, **Thomas Schuster**, Kevin O’Brien, John M. Kreikebaum, Dar Dahlen, Alexis Morvan, Beni Yoshida, Norman Y. Yao, Irfan Siddiqi, *Quantum information scrambling on a superconducting qutrit processor*. *Physical Review X*, **11.2** 021010 (2021).
- [12] **Thomas Schuster**, Felix Flicker, Ming Li, Svetlana Kotochigova, Joel E. Moore, Jun Ye, Norman Y. Yao, *Realizing Hopf insulators in dipolar spin systems*. *Physical Review Letters*, **127.1** 015301 (2021).
- [13] **Thomas Schuster**, Felix Flicker, Ming Li, Svetlana Kotochigova, Joel E. Moore, Jun Ye, Norman Y. Yao, *Floquet engineering ultracold polar molecules to simulate topological insulators*. *Physical Review A*, **103.6** 063322 (2021).
- [14] Jiho Noh\*, **Thomas Schuster\***, Thomas Iadecola, Sheng Huang, Mohan Wang, Kevin P. Chen, Claudio Chamon, Mikael C. Rechstman, *Braiding photonic topological zero modes*. *Nature Physics* **16**, 989-993 (2020).
- [15] **Thomas Schuster**, Snir Gazit, Joel E. Moore, Norman Y. Yao, *Floquet Hopf insulators*. *Physical Review Letters*, **123** 266803 (2019).
- [16] Kevin Landsman, Caroline Figgatt, **Thomas Schuster**, Norbert M. Linke, Beni Yoshida, Norman Y. Yao, Chris Monroe, *Verified quantum information scrambling*. *Nature* **567**, 61-65 (2019).
- [17] Quntao Zhuang, **Thomas Schuster**, Beni Yoshida, Norman Y. Yao, *Scrambling and complexity in phase space*. *Physical Review A*, **99** 062334 (2019).
- [18] Rupert A. Croft, Peter E. Freeman, **Thomas Schuster**, Chad M. Schafer, *Prediction of galaxy ellipticities and reduction of shape noise in cosmic shear measurements*. *Monthly Notices of the Royal Astronomical Society*, **469** 4422-4427 (2017).
- [19] **Thomas Schuster**, Thomas Iadecola, Claudio Chamon, Roman Jackiw, So-Young Pi, *Dissipationless conductance in a topological coaxial cable*. *Physical Review B*, **94** 115110 (2016).
- [20] Thomas Iadecola, **Thomas Schuster**, Claudio Chamon, *Non-abelian braiding of light*. *Physical Review Letters*, **117** 073901 (2016).

- [1] *Random unitaries in extremely low depth.* Quantum Information Seminar, **QuSoft, Amsterdam**, November 2024.
- [2] *Random unitaries in extremely low depth.* Quantum Innovators workshop, **Institute for Quantum Computing, University of Waterloo**, November 2024.
- [3] *The fidelity and complexity of noisy quantum circuits.* Informal seminar, **Perimeter Institute, Waterloo**, November 2024.
- [4] *Random unitaries in extremely low depth.* QI Seminar, **Perimeter Institute, Waterloo**, November 2024.
- [5] *A polynomial-time classical algorithm for noisy quantum circuits.* Seminar, **AWS Center for Quantum Computing, Pasadena**, September 2024.
- [6] *Random unitaries in extremely low depth.* CS Theory Tea, **California Institute of Technology, Pasadena**, July 2024.
- [7] *The fidelity and complexity of noisy quantum dynamics.* Theory seminar, **Max Planck Institute for Quantum Optics, Garching**, July 2024.
- [8] *The fidelity and complexity of noisy quantum dynamics.* Seminar, **Ludwig-Maximilians University, Munich**, July 2024.
- [9] *The fidelity and complexity of noisy quantum dynamics.* Workshop on Non-Equilibrium Many-body Physics Beyond the Floquet Paradigm, **Max Planck Institute for the Physics of Complex Systems, Dresden**, June 2024.
- [10] *Many-body quantum information dynamics.* Deborah Jin Thesis Prize Session, **Division of Atomic, Molecular, and Optical Physics Annual Meeting**, Fort Worth, June, 2024.
- [11] *Noise, complexity, and information dynamics in quantum circuits.* IPAM workshop on Many-body Quantum Systems via Classical and Quantum Computation, **University of California, Los Angeles**, November 2023.
- [12] *Noise, complexity, and information dynamics in quantum circuits.* IQIM Seminar, **California Institute of Technology**, September 2023.
- [13] *The power of time-reversal in quantum learning.* Quantum Machine Learning Seminar, **National University of Singapore** (virtual), July 2023.
- [14] *Many-body quantum information dynamics.* AMO Seminar, **University of California, Berkeley**, April 2023.
- [15] *Many-body quantum information dynamics.* Quantum Information Group Meeting, **Massachusetts Institute of Technology** (virtual), January 2023.
- [16] *Many-body teleportation and error propagation via quantum information dynamics.* HQI Quantum Fest, **Harvard University**, December 2022.
- [17] *Many-body quantum teleportation via quantum information dynamics.* Condensed Matter Theory Group Meeting, **California Institute of Technology**, November 2022.
- [18] *Many-body quantum teleportation via quantum information dynamics.* Quantum Information Group Meeting, **Massachusetts Institute of Technology**, September 2022.

- [19] *Many-body quantum teleportation via quantum information dynamics*. Harvard Quantum Information Group Meeting, **Harvard University**, September 2022.
- [20] *Learning quantum systems via out-of-time-order correlators*. Theory Seminar, **Google Quantum AI** (virtual), March 2022.
- [21] *Many-body quantum teleportation via operator spreading in the traversable wormhole protocol*. It from Qubit Seminar, **Stanford University**, March 2022.
- [22] *Operator size and error propagation: the Loschmidt echo in many-body quantum systems*. Geoflow Collaboration Meeting, **University of California, Berkeley**, September 2021.
- [23] *Many-body quantum teleportation via operator spreading in the traversable wormhole protocol*. Quantum/Gravity Seminar, **Brandeis University** (virtual), May 2021.
- [24] *Floquet Hopf insulators*. Condensed Matter Seminar, **Technion, Israel Institute of Technology**, June 2019.

## WORKSHOPS & SCHOOLS ATTENDED

- [1] Workshop on Random Quantum Circuits. QuSoft and Centrum Wiskunde & Informatica, Amsterdam, Netherlands, 2024.
- [2] Quantum Innovators workshop. Institute for Quantum Computing, University of Waterloo, Canada, 2024.
- [3] Non-equilibrium Many-body Physics Beyond the Floquet Paradigm. Workshop at the Max Planck Institute for the Physics of Complex Systems, Dresden, Germany, 2024.
- [4] Near-Term Quantum Computers. Workshop at Simons Institute, University of California, Berkeley, 2024.
- [5] Many-body Quantum Systems via Classical and Quantum Computation. Workshop at IPAM, University of California, Los Angeles, 2023.
- [6] Mathematical Aspects of Quantum Learning. Workshop at IPAM, University of California, Los Angeles, 2023.
- [7] Condensed Matter Summer School on Dynamics and Quantum Information in Many-body Systems. University of Minnesota, 2023.
- [8] Online School on Ultra Quantum Matter. Perimeter Institute (virtual), 2020.
- [9] Les Houches Summer School on Quantum Dynamics and Disorder. Les Houches, France, 2019.
- [10] Quantum Connections Summer School. Stockholm, Sweden, 2018.

## ADDITIONAL ACTIVITIES

- I am a regular reviewer for the Physical Review Journals (PRX, PRX Quantum, PRL, PRA, PRD), the Journal for High-Energy Physics (JHEP), and Quantum. I am also a frequent sub-reviewer for QIP, TQC, and STOC.
- I was a member of the program committee for the Theory of Quantum Computation (TQC) Conference, 2024.