

Ewin Tang

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CURRENT POSITION	University of California, Berkeley Miller Postdoctoral Fellow, hosted by Umesh Vazirani	<i>2023 – Present</i>
RESEARCH INTERESTS	quantum computing; learning theory; entanglement in quantum systems; numerical linear algebra	
EDUCATION	University of Washington <i>PhD</i> in Computer Science Thesis: Quantum machine learning without any quantum Advisor: James Lee	<i>2018 – 2023</i>
	University of Texas at Austin <i>Bachelor of Science</i> in Computer Science <i>Bachelor of Science</i> in Pure Mathematics Thesis: A quantum-inspired classical algorithm for recommendation systems Advisor: Scott Aaronson	<i>2014 – 2018</i>
RECOGNITION	QIP 2025 plenary talk For “High-temperature Gibbs states are unentangled and efficiently preparable” [BLMTb]	<i>2025</i>
	QIP 2024 plenary talk For “Learning quantum Hamiltonians at any temperature in polynomial time” [BLMTc]	<i>2024</i>
	Miller Postdoctoral Fellowship Awarded by the Miller Institute for Basic Research in Science	<i>2023</i>
	QIP 2020 plenary talk and best student paper For “Quantum-inspired algorithms for recommendation systems, principal component analysis, and supervised clustering” [Tan; Tan21]	<i>2020</i>
	NSF Graduate Research Fellowship	<i>2019</i>
	Forbes 30 Under 30	<i>2019</i>
	Dean’s Honored Graduate Research and academic distinction given to the top 1% of graduating students of UT College of Natural Sciences	<i>2018</i>
	Best Undergraduate Thesis For “A quantum-inspired classical algorithm for recommendation systems”, selected from all undergraduate computer science honors students	<i>2018</i>
SERVICE	Co-organizer , “ Mathematical Challenges of Quantum Algorithms for Open Quantum Systems ” Simons Institute	<i>October 2024</i>
	FOCS program committee	<i>2024</i>
	QIP program committee	<i>2022</i>
	QIP program committee	<i>2020</i>
TEACHING	Lecturer , “ Quantum and quantum-inspired linear algebra ” PCMI Graduate Summer School	<i>July 2023</i>

PUBLICA- TIONS

Ainesh Bakshi, Allen Liu, Ankur Moitra, and Ewin Tang. “[Structure learning of Hamiltonians from real-time evolution](#)”. In: *FOCS 2024*. To be presented at QIP 2025.

Ainesh Bakshi, Allen Liu, Ankur Moitra, and Ewin Tang. “[High-temperature Gibbs states are unentangled and efficiently preparable](#)”. In: *FOCS 2024*. To be presented in **plenary talk** at QIP 2025.

Ainesh Bakshi, Allen Liu, Ankur Moitra, and Ewin Tang. “[Learning quantum Hamiltonians at any temperature in polynomial time](#)”. In: *STOC 2024*. Presented in **plenary talk** at QIP 2024, awarded best student paper; invited to **SICOMP special issue**.

Ewin Tang and Kevin Tian. “[A CS guide to the quantum singular value transformation](#)”. In: *SOSA 2024*.

Ainesh Bakshi and Ewin Tang. “[A classical singular value transformation for quantum machine learning](#)”. In: *SODA 2024*.

Jeongwan Haah, Robin Kothari, Ryan O’Donnell, and Ewin Tang. “[Query-optimal estimation of unitary channels in diamond distance](#)”. In: *FOCS 2023*. Presented at QIP 2024.

Ewin Tang. “[Dequantizing algorithms to understand quantum advantage in machine learning](#)”. In: *Nature Reviews Physics* (2022). [Review article].

Jeongwan Haah, Robin Kothari, and Ewin Tang. “[Learning quantum Hamiltonians from high-temperature Gibbs states and real-time evolutions](#)”. In: *Nature Physics* (2024). Presented at QIP 2022 and FOCS 2022.

András Gilyén, Zhao Song, and Ewin Tang. “[An improved quantum-inspired algorithm for linear regression](#)”. In: *Quantum* (2022).

Nai-Hui Chia, András Gilyén, Tongyang Li, Han-Hsuan Lin, Ewin Tang, and Chun-hao Wang. “[Sampling-based sublinear low-rank matrix arithmetic framework for dequantizing quantum machine learning](#)”. In: *Journal of the ACM* (2022). Appeared in STOC 2020, presented at QIP 2020.

András Gilyén, Seth Lloyd, and Ewin Tang. “[Quantum-inspired low-rank stochastic regression with logarithmic dependence on the dimension](#)”. In: *ISAAC 2020*.

Ewin Tang. “[Quantum principal component analysis only achieves an exponential speedup because of its state preparation assumptions](#)”. In: *Physical Review Letters* (2021). Presented at QIP 2020 (joint with 1807.04271).

Ewin Tang. “[A quantum-inspired classical algorithm for recommendation systems](#)”. In: *STOC 2019*. Presented in **plenary talk** at QIP 2020 (joint with 1811.00414), awarded **best student paper**.

Sunita Chepuri, Neeraja Kulkarni, Joe Suk, and Ewin Tang. “[Factorizations of \$k\$ -nonnegative matrices](#)”. In: *Journal of Combinatorics* (2022).

PREPRINTS

Angelos Pelecanos, Xinyu Tan, Ewin Tang, and John Wright. *Beating full state tomography for unentangled spectrum estimation*. In submission. 2024.

Ainesh Bakshi, John Bostancı, William Kretschmer, Zeph Landau, Jerry Li, Allen Liu, Ryan O’Donnell, and Ewin Tang. *Learning the closest product state*. To be presented at QIP 2025. 2024.

João F. Doriguello, Alessandro Luongo, and Ewin Tang. *Do you know what q -means?* 2023.

**INVITED
TALKS**

“Structure learning of Hamiltonians from real-time evolution” [BLMTa]		
Workshop on correlations of quantum many-body systems		December 2024
“A perspective on Gibbs sampling”		
Simons Institute Quantum Industry Day		November 2024
“How to learn a Hamiltonian”		
FOCS 2024 Recent Advances in Quantum Learning workshop		October 2024
“High-temperature Gibbs states are unentangled and efficiently preparable” [BLMTb]		
Stanford Thermalization and Quantum Information workshop		October 2024
“Learning the closest product state” [Bak+24].		
UC Berkeley quantum pod talk.		October 2024
“Learning quantum Hamiltonians at any temperature in polynomial time” [BLMTc].		
• Simons Institute one-day Hamiltonian learning workshop	February 2024	
• UC Berkeley quantum seminar	December 2023	
• MIT Theory Reading Group	November 2023	
• Harvard Special Quantum Information seminar	November 2023	
“An improved classical singular value transformation for quantum machine learning” [BT].		
• Berkeley theory lunch	October 2023	
• Google Quantum CS Theory seminar	May 2023	
“Two results on estimation of unitary channels”		
MIT QI seminar		January 2023
“Query-optimal estimation of unitary channels in diamond distance” [HKOT].		
• Cornell Junior Theorists’ Workshop	May 2023	
• MIT Algorithms and Complexity Seminar	April 2023	
• Chicago Junior Theorists Workshop	January 2023	
• Sandia Labs QPL seminar	December 2022	
• CMU theory group seminar	December 2022	
• Southwest Quantum Information and Technology Workshop	October 2022	
• Quantum Innovators in Computer Science and Mathematics	October 2022	
• Perimeter Institute QI seminar	October 2022	
“Optimal learning of quantum Hamiltonians from high-temperature Gibbs states” [HKT24].		
• MIT A+C seminar	March 2022	
• Simons Institute Quantum Wave in Computing Reunion	July 2021	
Talks surveying quantum-inspired classical linear algebra algorithms:		
• ColdQuanta seminar	March 2023	
• Perimeter Institute colloquium	October 2021	
• University of Illinois IQIST seminar series	April 2021	
• Simons Institute Quantum Colloquium	March 2021	
• Simons Quantum Algorithms workshop	February 2020	
• Simons Quantum Wave in Computing boot camp	January 2020	
• Santa Fe Institute workshop	July 2019	
• TQC (plenary talk)	June 2019	
• TCS+	May 2019	
• CIFAR Quantum Information Systems Meeting	May 2019	
• Microsoft Research QuArC seminar	November 2018	
“A quantum-inspired classical algorithm for recommendation systems” [Tan]		
• Microsoft Research AI seminar	December 2018	
• UW Theory Seminar	October 2018	
• Quantum Cluster, Simons Institute (informal)	June 2018	