



Association for
Computing Machinery

News Release

MIT Grad Recognized for Developing Tools That Entirely Reshaped our Understanding of Quantum Systems

Allen Liu Receives the ACM Doctoral Dissertation Award

New York, NY, June 10, 2026 – ACM, the Association for Computing Machinery, today announced that Allen Liu is the recipient of the ACM Doctoral Dissertation Award for his dissertation “[Learning Theoretic Foundations for Understanding Quantum Systems](#),” toward a PhD earned at the Massachusetts Institute of Technology. Liu is an Assistant Professor of Computer Science at the Courant Institute School of Mathematics, Computing, and Data Science at New York University.

Liu’s thesis reshapes our understanding of quantum systems through perspectives in learning theory. His dissertation resolved two major questions that have been considered central to understanding how to harness exotic quantum phenomena and use computing to simulate physics. Firstly, given many copies of a quantum state at thermal equilibrium, can we measure that quantum state and estimate its local interactions? Conversely, given a description of the local interactions of the quantum state and the temperature, can we prepare the state that describes what it looks like at equilibrium?

Liu developed groundbreaking algorithms that not only resolved these problems but proved a new physical law in the process. The quantum computing community is still trying to unravel the far-reaching implications of his work.

Honorable Mentions for the ACM Doctoral Dissertation Award go to Gal Arnon, Research Fellow, Bocconi University, for his dissertation “[New Advancements in Interactive Oracle Proofs: Theory, Practice, and Limitations](#),” toward a PhD earned at the Weizmann Institute of Science; and Rachit Nigam, Assistant Professor, Massachusetts Institute of Technology, for his dissertation “[Modular Abstractions for Efficient Hardware Design](#),” toward a PhD earned at Cornell University.

About the ACM Doctoral Dissertation Award

Presented annually to the author(s) of the best doctoral dissertation(s) in computer science and engineering. [The Doctoral Dissertation Award](#) is accompanied by a prize of \$20,000, and the Honorable Mention Award is accompanied by a prize totalling \$10,000. Winning dissertations will be published in the ACM Digital Library as part of the ACM Books Series.

About ACM

[ACM, the Association for Computing Machinery](#) is the world's largest educational and scientific computing society, uniting computing educators, researchers and professionals to inspire dialogue, share resources and address the field's challenges. ACM strengthens the computing profession's collective voice through strong leadership, promotion of the highest standards, and recognition of technical excellence. ACM supports the professional growth of its members by providing opportunities for life-long learning, career development, and professional networking.

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