# Emil Khabiboulline

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#### EMPLOYMENT

National Institute of Standards and Technology &

University of Maryland, College Park

(Joint Center for Quantum Information and Computer Science) September 2023 - Present Gaithersburg & College Park, MD

National Resource Council Postdoctoral Associate

Harvard University, Department of Physics

Postdoctoral Fellow

Visiting Researcher

Seasonal Employee

Cambridge, MA

**Amazon Quantum Computing** 

June - September 2022 Research Scientist Intern Pasadena, CA

Kavli Institute for the Physics and Mathematics of the Universe

June - August 2013 Kashiwa, Japan

Fermi National Accelerator Laboratory

June - August 2011, June - July 2012 Batavia, IL

**EDUCATION** 

Harvard University

August 2016 - December 2022

Ph.D. and M.A. in Physics

Cambridge, MA

February - May 2023

- · Dissertation: Quantum Communication and Thermalization, From Theory to Practice.
- · Committee: Mikhail Lukin (chair), Aram Harrow, Daniel Jafferis, Ashvin Vishwanath.
- · Funding: National Science Foundation Graduate Research Fellow.

#### California Institute of Technology

September 2012 - June 2016

B.S. in Physics

Pasadena, CA

- · Funding: Stamps Scholar, Dunham Scholar, Fermi Research Alliance Scholar.
- · Honors: Frank Teruggi Memorial Award, Lucy Guernsey Service Award, SanPietro Travel Prize.

# Illinois Mathematics and Science Academy

August 2009 - June 2012

High School Diploma

Aurora, IL

· Honors: National Merit Finalist, National AP Scholar.

#### PATENTS

· E. T. Khabiboulline, J. S. Sandhu, M. U. Gambetta, M. D. Lukin, and J. Borregaard. Efficient quantum voting with information-theoretic security, U.S. Ser. No. 18/069,179.

## **PUBLICATIONS**

· E. T. Khabiboulline, J. S. Sandhu, M. U. Gambetta, M. D. Lukin, and J. Borregaard. Efficient Quantum Voting with Information-Theoretic Security, arXiv:2112.14242. In revision for PRX Quantum.

- · T. Schuster, B. Kobrin, P. Gao, I. Cong, E. T. Khabiboulline, N. M. Linke, M. D. Lukin, C. Monroe, B. Yoshida, and N. Y. Yao. Many-Body Quantum Teleportation via Operator Spreading in the Traversable Wormhole Protocol. *Phys. Rev. X*, 12:031013, Jul 2022.
- · E. T. Khabiboulline, J. Borregaard, K. De Greve, and M. D. Lukin. Quantum-assisted telescope arrays. *Phys. Rev. A*, 100:022316, Aug 2019.
- · E. T. Khabiboulline, J. Borregaard, K. De Greve, and M. D. Lukin. Optical Interferometry with Quantum Networks. *Phys. Rev. Lett.*, 123:070504, Aug 2019.
- · S. Peng, R. Zhang, V. H. Chen, E. T. Khabiboulline, P. Braun, and H. A. Atwater. Three-Dimensional Single Gyroid Photonic Crystals with a Mid-Infrared Bandgap. *ACS Photonics*, 3(6):1131–1137, 2016.
- · E. T. Khabiboulline, C. L. Steinhardt, J. D. Silverman, S. L. Ellison, J. T. Mendel, and D. R. Patton. Changing Ionization Conditions in SDSS Galaxies with Active Galactic Nuclei as a Function of Environment from Pairs to Clusters. *The Astrophysical Journal*, 795(1):62, 2014.
- · E. J. DiMarco, E. Khabiboulline, D. F. Orris, M. A. Tartaglia, and I. Terechkine. Superconducting Solenoid Lens for a High Energy Part of a Proton Linac Front End. *IEEE Transactions on Applied Superconductivity*, 23(3):4100905, June 2013.

#### Presentations

- · Talk (Invited): JQI-QuICS Special Seminar at Joint Center for Quantum Information and Computer Science (July 26, 2023).
- · Poster: Quantum Information Processing 2021.
- · Talk (Invited): Dinner Seminar at Cosmic Dawn Center (July 21, 2020).
- · Talk (Invited): Provocateur Presentation at Quantum Leap Challenge: Quantum Sensing Ideas Lab (May 18, 2020).
- · Talk (Invited): Quantum Computing Seminar (January 13, 2020) at Brookhaven National Laboratory.
- · Talk: American Physical Society March Meeting 2019 Focus Session on Distributed Quantum Computation, Networking, and Information Security.
- · Poster: Quantum Information Processing 2019.
- · Talk (Invited): Lunch Seminar (November 8, 2018) at Institute for Theoretical Atomic, Molecular, and Optical Physics (Harvard).
- · Talk: Workshop on Quantum Information (April 23-24, 2018) at Center of Mathematical Sciences and Applications (Harvard).
- · Talk: American Physical Society March Meeting 2016.
- · Poster: International Conference on Quantum, Atomic, Molecular, and Plasma Physics 2015.
- · Poster (Chambliss Astronomy Achievement Student Award): 223rd Meeting of the American Astronomical Society.
- · Poster (Special Award from CERN): Intel International Science and Engineering Fair 2011.

#### SERVICE

- · Referee: QIP 2023.
- · Referee: QCrypt 2022.
- · Reviewer: IEEE Transactions on Computers.
- · Referee: Quantum Computing Theory in Practice 2020.

### Instruction

- · Teaching Fellow: Harvard Computer Science 127/227 (Cryptography), Fall 2021.
- · Teaching Fellow: Harvard Physics 271 (Topics in the Physics of Quantum Information), Fall 2020.

# Coding

 $\cdot$  Languages: C++, Python, Julia.