

Jeffrey M. Epstein

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jeffrey.m.epstein@gmail.com

jeffreymepstein.github.io

Quantum information theorist with experience in characterization and benchmarking of quantum processors. Particularly interested in approaches that provide actionable feedback for hardware improvement and comprehensive error models that allow evaluation of error correction schemes.

## Professional Experience

**Atom Computing**; Berkeley, CA

Quantum Applications Engineer, August 2021-July 2023

Senior Quantum Applications Engineer, August 2023-present

- Developed circuit-level tools for efficient and informative characterization of single and two-qubit gates
- Led characterization/benchmarking component of DARPA US2QC program
- Developed and studied novel state preparation algorithm for constrained optimization (patent pending)

**University of California, Berkeley**; Berkeley, CA

Graduate Student Instructor: Physics 112 (intro. to statistical and thermal physics) Fall 2015, Physics 7b (intro. thermodynamics and electromagnetism for scientists and engineers) Fall 2014, Spring 2015

**IBM**; Yorktown Heights, NY

Intern, September 2012-July 2013

- Studied robustness of randomized benchmarking under varying noise models

## Academic Experience

**National Institute of Standards and Technology**; Gaithersburg, MD

NRC postdoctoral scholar, February 2021-June 2021

**PhD**, Physics, December 2020

Dissertation: *Statistical Mechanics of Transport Processes in Active Matter*

**MA**, Physics, December 2016

**University of California, Berkeley**; Berkeley, CA

**MSc**, Perimeter Scholars International (PSI), June 2014

**Perimeter Institute for Theoretical Physics**; Waterloo, ON

**AB**, Chemistry and Physics, May 2012

**Harvard College**; Cambridge, MA

*magna cum laude* with high honors in field

secondary field, Mathematics; language citation, Chinese

## Awards

- NIST NRC Postdoctoral Research Associateship, 2020
- National Defense Science and Engineering Graduate (NDSEG) Fellowship, 2016
- Herchel Smith-Harvard Undergraduate Science Research Program, 2010

## Scientific Publications

1. *Note on simple and consistent gateset characterization including calibration and decoherence errors.* **JME**. manuscript in preparation (2024)
2. *Subspace Correction for Constraints.* K Pawlak, **JME**, D Crow, S Gandhari, M Li, T Bohdanowicz, J King arXiv:2310.20191 (2024)

3. *Iterative assembly of  $^{171}\text{Yb}$  atom arrays in cavity-enhanced optical lattices.* M Norcia *et al.* arXiv:2401.16177 (2024)
4. *Mid-circuit qubit measurement and rearrangement in a  $^{171}\text{Yb}$  atomic array.* M Norcia *et al.* arXiv:2305.19119 (2023)
5. *Thermally driven quantum refrigerator autonomously resets superconducting qubit.* M Aamir, P Suria, J Guzmán, C Castillo-Moreno, **JME**, N Yunger Halpern, S Gasparinetti. arXiv:2305.16710 (2023)
6. *Odd Diffusivity of Chiral Random Motion.* C Hargus, **JME**, KK Mandadapu. Phys. Rev. Lett. 127, 178001 (2021).
7. *Quantum noise limits for a class of nonlinear amplifiers.* **JME**, KB Whaley, J Combes. Phys. Rev. A 103 (5), 052415 (2021).
8. *Time reversal symmetry breaking and odd viscosity in active fluids: Green-Kubo and NEMD results.* C Hargus, K Klymko, **JME**, KK Mandadapu. J. Chem. Phys. 152, 211102 (2020).
9. *Time reversal symmetry breaking in two-dimensional non-equilibrium viscous fluids.* **JME**, KK Mandadapu. Phys. Rev. E 101, 052614 (2020).
10. *Continuous quantum error correction for evolution under time-dependent Hamiltonians.* J Atalaya, S Zhang, MY Niu, A Babakhani, HCH Chan, **JME**, KB Whaley. arXiv:2003.11248 (2020).
11. *Statistical Mechanics of Transport Processes in Active Fluids II: Equations of Hydrodynamics for Active Brownian Particles.* **JME**, K Klymko, KK Mandadapu. J. Chem. Phys. 150, 164111 (2019).
12. *Postponing the orthogonality catastrophe: efficient state preparation for electronic structure simulations on quantum devices.* NM Tubman, C Mejuto-Zaera, **JME**, D Hait, DS Levine, W Huggins, Z Jiang, JR McClean, R Babbush, M Head-Gordon, KB Whaley. arXiv:1809.05523 (2018).
13. *Quantum Speed Limits for Quantum Information Processing Tasks.* **JME**, KB Whaley. Phys. Rev. A 95, 042314 (2017).
14. *Investigating the Limits of Randomized Benchmarking Protocols.* **JME**, AW Cross, E Magesan, and JM Gambetta. Phys. Rev. A 89, 062321 (2014)
15. *CD36 in the periphery and brain synergize in stroke injury in hyperlipidemia.* E Kim, M Febbraio, Y Bao, AT Tollhurst, **JME**, S Cho. Annals of Neurology. 71(6) (2012)