Vinay V. Ramasesh

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EDUCATION

Ph.D. in Physics, Berkeley May 2019

Thesis Advisor: Irfan Siddiqi

GPA: 3.7/4.0

M.Eng. in Electrical Engineering, MIT June 2013

Thesis Advisor: Martin Zwierlein

GPA: 5.0/5.0

S.B. in Physics and Electrical Engineering, MIT June 2012

GPA: 4.9/5.0

HONORS AND AWARDS

NSF Graduate Research Fellow National Science Foundation	2013-2018
NDSEG Research Fellow Department of Defense	Awarded 2013
Berkeley Physics Department Fellow, Gerard E. Fischer Fellowship Fund	2013-2018
MIT Malcolm Brown Award for Research MIT Physics Department	2012
Barry M. Goldwater Award Barry M. Goldwater Scholarship Foundation	2008
National Finalist, Intel Science Talent Search Intel Corporation	2008
Regional Finalist, Siemens Competition Siemens Corporation	2008
Qualifier, USA Mathematical Olympiad	2007, 2008

PUBLICATIONS

In print:

7. Kevin A. Fischer, Rahul Trivedi, **Vinay Ramasesh**, Irfan Siddiqi, & Jelena Vuckovic (2018), *Scattering into one-dimensional waveguides from a coherently-driven quantum-optical system*, Quantum **2** 69, arXiv:1710.02875.
6. James Colless, **Vinay Ramasesh**, Dar Dahlen, Machiel Blok, Mollie Kimchi-Schwartz, Jarrod McClean, Jonathan Carter, Wibe de Jong, & Irfan Siddiqi (2018), *Computation of Molecular Spectra on a Quantum Processor with an Error-Resilient Algorithm*, Phys. Rev. X **8** 011021, arXiv:1707.06408.
5. Emmanuel Flurin, **Vinay Ramasesh**, Shay Hacohen-Gourgy, Leigh Martin, Norman Yao, & Irfan Siddiqi (2018), *Observing Topological Invariants Using Quantum Walk in Superconducting Circuits*, Phys. Rev. X **7** 031023, arXiv:1610.03069.
4. **Vinay Ramasesh**, Emmanuel Flurin, Mark Rudner, Irfan Siddiqi, & Norman Yao (2017), *Direct Probe of Topological Invariants Using Bloch Oscillating Quantum Walks*, Phys. Rev. Lett. **118** 130501, arXiv:1609.09504.
3. Shay Hacohen-Gourgy, Leigh Martin, Emmanuel Flurin, **Vinay Ramasesh**, Birgitta Whaley, & Irfan Siddiqi (2016), *Dynamics of simultaneously measured non-commuting observables*, Nature **538**, 491 - 494 arXiv:1608.06652.
2. Shay Hacohen-Gourgy, **Vinay Ramasesh**, Claudia de Grandi, Irfan Siddiqi, & Steve Girvin (2015), *Cooling and Autonomous Feedback in a Bose-Hubbard Chain with Attractive Interactions*, Phys. Rev. Lett. **115** 240501, arXiv: 1506.05837
1. Lawrence Cheuk, Matthew Nichols, Melih Okan, Thomas Gersdorf, **Vinay Ramasesh**, Waseem Bakr, Thomas Lompe, & Martin Zwierlein (2015), *A Quantum Gas Microscope for Fermionic Atoms*, Phys. Rev. Lett. **114** 193001, arXiv: 1503.02648.

In preparation: (* indicates equal contribution)

3. **Vinay Ramasesh***, Machiel Blok*, Kevin O'Brien, John Mark Kreikebaum, Thomas Schuster, Beni Yoshida, Norman Yao, & Irfan Siddiqi, *Quantum Verified Information Scrambling via Qutrit Teleportation*
2. **Vinay Ramasesh**, Machiel Blok, Kevin O'Brien, & Irfan Siddiqi, *A Coherence-limited Entangling Gate for Superconducting Transmon Qutrits*
1. Machiel Blok, **Vinay Ramasesh**, Kevin O'Brien, & Irfan Siddiqi, *In-situ Charge-noise Mitigation in Superconducting Transmon Qubits*

Invited Talks

2. 7th International Workshop on Quantum Simulation & Quantum Walks — Mar. 2018
1. IARPA LogiQ Technical Exchange Meeting — Aug. 2016

Programming Experience

- **Python, NumPy, SciPy, pyCaffe, Tensorflow**
  - Main experience: one of five main contributors to the software stack used for controlling equipment for performing superconducting qubit experiments, including writing drivers, and analysis/simulation functions

Machine Learning Projects and Publications

- **Complex-valued convolutional neural networks** — Aug. 2016 - May 2017
  - Using Caffe, attempted to build fully complex-valued convolutional neural networks for natively processing complex-valued data. Worked under EECS Ph.D. student.
- **Vulnerability of meta-learning to adversarial attacks** — Aug. 2017 - Jan. 2018
  - Using TensorFlow, showed that Model-Agnostic Meta Learning, a recent meta-learning framework, was vulnerable to transferable adversarial examples. Worked on a team with five undergraduates.

    Riley F. Edmunds, Noah Golmant, **Vinay Ramasesh**, Phillip Kuznetsov, Piyush Patil, Raul Puri, *Transferability of Adversarial Attacks in Model-Agnostic Meta-Learning.* 2017 Deep Learning and Security Workshop (DLSW) in Singapore.

    http://rileyedmunds.com/pdf/dlsw2017.pdf

Research experience prior to PhD

- **MIT-Harvard Center for Ultracold Atoms** — May 2010 - Aug. 2013
  - Designed and built a laser system for cooling and trapping lithium atoms
  - Worked with a team of five graduate students to build the first quantum gas microscope for fermionic atoms
- **MIT Research Laboratory of Electronics** — Jan. 2009 - Jan. 2010
  - Worked out the design and theory behind a low-cost spectral reflectometer for measuring optical properties of thin films
- **MIT Solar Electric Vehicle Team** — Aug. 2008 - Jan. 2010
  - Helped implement control electronics for the MIT solar-powered vehicle, which won 2nd place in the 2009 World Solar Challenge