

Rohit Dilip

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Education

California Institute of Technology

2021-Present

PhD. in Computer Science, GPA: 4.1/4.0

Selected Coursework: Inverse Data Problems, Quantum Computation, Advanced Topics in Machine Learning, Networks: Structure and Economics, Topics in Optimization.

Princeton University, A.B. in Physics with High Honors

2015-2019

Certificates in Applied and Computational Mathematics & Values and Public Life (Philosophy), GPA – 3.90

Awards: Elected to Sigma Xi, Phi Beta Kappa. Sigma Xi Book Prize in Princeton Physics Department. Fulbright Award Semifinalist. NSF Honorable Mention. Kusaka Memorial Prize, Allen G. Shenstone Prize, Manfred Pyka Memorial Prize in Physics. US Physics Olympiad Gold Medal.

Selected Coursework: *Graduate:* Condensed Matter, Quantum Field Theory, Quantum Information, Complex/Functional Analysis
Undergraduate: Algorithms & Data Structures, Applied Algebra, Quantum Theory, Statistical Mechanics, Biophysics.

Publications

Interacting models for twisted bilayer graphene: a quantum chemistry approach. Fabian M. Faulstich, Kevin D. Stubbs, Qinyi Zhu, Tomohiro Soejima, **Rohit Dilip**, Huanchen Zhai, Raehyun Kim, Michael P. Zaletel, Garnet Kin-Lic Chan, Lin Lin. *Under review*.

Data compression for quantum machine learning. **Rohit Dilip**, Yu-Jie Liu, Adam Smith, Frank Pollmann. *Physical Review Research* 4, 043007.

Real and imaginary-time evolution with compressed quantum circuits. Sheng-Hsuan Lin, **Rohit Dilip**, Andrew G Green, Adam Smith, and Frank Pollmann. *PRX Quantum* 2.1 (2021): 010342.

Trapped arrays of alkaline earth Rydberg atoms in optical tweezers. Jack Wilson, Samuel Saskin, Yijian Meng, Shuo Ma, **Rohit Dilip**, Alex Burgers, and Jeff Thompson. *Physical review letters* 128.3 (2022): 033201.

Characterizing fractional topological phases of lattice bosons near the first Mott lobe. Julian Boesl, **Rohit Dilip**, Frank Pollmann, and Michael Knap. *Physical Review B* 105.7 (2022): 075135.

Invited Talks

Data compression for quantum machine learning. Technical University of Munich. June 13, 2022

Research Experience

California Institute of Technology

Pasadena, California

Advised by Prof. David Van Valen

August 2020 - Present

o Developing deep learning models for biological applications.

Technical University of Munich

Garching, Germany

Advised by Prof. Frank Pollmann

July 2019 - August 2020

o Developed algorithm to perform image classification directly on a quantum computer.

o Created novel algorithms for real and imaginary time evolution on a quantum computer (accepted to PRX Quantum).

o Used tensor network methods (Density Matrix Renormalization Group, Time Evolving Block Decimation) to study quantum hall states in the 2D Bose Hubbard model.

Princeton Department of Electrical Engineering

Princeton, NJ

Advised by Prof. Jeffrey Thompson

January 2017 - June 2019

o Senior thesis titled *Spectroscopy of Rydberg states in Ytterbium-174*. Awarded EE Department research grant and Allen G. Shenstone Prize in Physics. Constructed a UV laser system and measurement protocol for MOT depletion spectroscopic measurements. Extracted first measurements of Yb-174 spectrum (submitted for publication to *Physical Review X*).

o Junior paper titled *Building an acousto-optic deflection system for projecting and manipulating large arrays of optical tweezers*. Awarded Kusaka Memorial Prize in Physics. Programmed FPGA for neutral atom quantum computing platform.

Princeton Department of Physics

Princeton, NJ

Advised by Prof. Barry Bradlyn

January 2018 - June 2019

- o Project titled *Numerical Investigation of Triaxially Strained Graphene Under a Homogeneous Magnetic Field*. Awarded the Princeton University Applied and Computational Mathematics departmental award. Used stochastic Chebyshev expansions to approximate graphene density of states. Analytically modeled energy levels using strain tensor symmetry properties.

Max Planck Institute for Quantum Optics

Garching, Germany

Advised by Prof. Monika Aidelsburger

June 2017 - August 2017

- o Implemented a Pound-Drever-Hall lock for laser stabilization. Characterized and reduced noise effects on laboratory equipment.

Skills

Programming: Python, Cython, Java, C++, Mathematica, L^AT_EX, Verilog

Languages: English (fluent), Italian (proficient), Spanish (basic), Tamil (basic)

Work experience / interests

Graduate resident associate: Caltech, 2022-Present. Residential associate for graduate students. Responsible for conflict management and incoming student programming.

Resident advisor: Princeton University, 2018-2019. Residential college advisor for sophomores. Assisted with residential programming, personal crisis management, and academic advising.

Princeton Debate Panel: Varsity team, 2016/17/18. Selected to represent Princeton at World Championships 2018/2019. Awards at Stanford APDA Tournament, American University APDA Tournament, etc.

Princeton Brazilian Jiu Jitsu: President, 2017/18