Hyeongjin Kim

PhD Student · Condensed Matter Theory

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Education

Boston University *Boston, MA*

Ph.D. in Physics *2021 - present*

Advisor: Anatoli Polkovnikov

Williams College *Williamstown, MA*

B.A. in Physics *2017 - 2021*

Advisor: Frederick Strauch
Thesis: *Optimal Control and Circuit Synthesis of Quantum Gates*
Academic Honor Societies: *Phi Beta Kappa*, *Sigma Xi*

Research Experience

Research Fellow – Boston University *Boston, MA*

Advisor: Anatoli Polkovnikov *2022-present*

- Investigating the geometry of quantum integrability and chaos of many-body systems in an adiabatic landscape determined by the quantum geometric tensor.

Summer Research Associate – CCQ, Flatiron Institute, Simons Foundation *New York, NY*

Advisors: Matthew Fishman, Dries Sels *2022*

- Developing a novel tensor network method to propagate eigenstates of many-body systems over the parameter space via the quantum geometric tensor.

Research Assistant – Department of Physics, Williams College *Williamstown, MA*

Advisor: Frederick Strauch *2019-2021*

- Analytically developed and numerically optimized gate pulses for fast, high-fidelity gates on a parametrically coupled, fixed-frequency transmon architecture.

Research Assistant – Department of Physics, Williams College *Williamstown, MA*

Advisor: Katharine Jensen *2018*

- Investigated the mechanics of adhesive contacts of rigid glass spheres with silicone gel surfaces of varying Young's modulus.

Awards and Honors

2021 **Phi Beta Kappa Induction**, PBK

2018-2020 **Summer Science Research Fellowship**, Williams College

Invited Talks

Department of Physics, New York University *New York, NY*

Computing Excited States via Adiabatic Transformations *March 2023*

Talks

March 2023. *Integrable Attractors in the Adiabatic Landscape of Chaotic Systems*. APS March Meeting. Las Vegas, NV.

May 2021. *Optimal Control and Circuit Synthesis of Quantum Gates*. Williams College.

July 2018. *Dynamics of adhesive wetout and detachment*. UMass Amherst Soft Matter Day. Amherst, MA.

Posters

August 2019. *Fast and High-Fidelity Quantum Logic Gates for Parametrically Coupled Transmons*. Williams College.

August 2018. *Dynamics of adhesive wetout and detachment*. Williams College.

Teaching Experience

2022 **General Physics I**, Boston University
2021 **Introduction to Physics**, Boston University
2020 **Algorithm Design and Analysis**, Williams College
2019 **Mathematical Methods for Scientists**, Williams College

Other Extracurricular & Work Activities

Williams College Society of Physics Students *Williamstown, MA*
Co-Chair *2020-2021*
- Organized and hosted departmental events for physics students.

Williams College Council *Williamstown, MA*
Finance Committee Member *2018-2019*
- Analyzed budgets and constructed optimal funding strategies for college council.

Other Skills

Language: Python, Julia, LaTeX
Tech: Mathematica, MATLAB, Git