

DYLAN MAHONEY

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[GitHub](#) & [ORCID](#)

INTERESTS

Theoretical and computational research in condensed matter physics, quantum information theory, or the intersection of the two

Broad interest in connections to other fields of physics

Application of numerical methods (including high-performance computing and machine learning) to physics

EDUCATION

Princeton University, Princeton, NJ
(August 2024 - present)
Ph.D. Physics (expected)

Stanford University, Stanford, CA
(September 2020 - June 2024)
B.S. Physics (with honors) & B.S. Mathematics

PAPERS

Transport and integrability-breaking in non-Hermitian many-body quantum systems, Dylan Mahoney & Jonas Richter, [Phys. Rev. B **110**, 134302 \(2024\)](#), [arXiv:2403.01681](#).

RESEARCH

Khemani Group, Stanford University
(April 2023 - October 2024)

- Numerically studied many-body quantum dynamics.
- Investigated transport properties in open quantum systems.
- Characterizing spin transport and integrability-breaking in non-Hermitian spin chains, including the Hatano-Nelson model.

Stanford Undergraduate Research Institute in Mathematics
(June 2022 - August 2022)

- Elucidated an alternative way to show that elliptic curves over the complex numbers are isomorphic to tori as groups
- Carried out numerical simulations and visualized their results
- Collaborated with another undergraduate while mentored by a graduate student

Kuo Group, Stanford University
(March 2021 - January 2022)

- Investigated meteorological sources of polarized noise in Cosmic Microwave Background measurements from the South Pole Telescope
- Performed statistical tests and visualized results comparing local weather data with telescope noise data

HONORS, AWARDS, & GRANTS

NSF Graduate Research Fellowship (2024-2029)

David S. Levine Award (2023)

- Awarded annually by the Stanford physics department to 1-3 junior physics majors

Top 500 on the Putnam Exam (2022)

TEACHING

High School Support Initiative Tutor, Stanford University
(October 2023 - May 2024)

- Tutored high school students from historically marginalized communities
- Provided mentorship for students exploring their college and career plans

Stanford Winter Enrichment Experience for Teens
(February 20 & 22, 2024)

- Ran 1-hour afternoon workshop introducing high school students to logical reasoning and mathematical proofs.

Center for Teaching and Learning Tutor, Stanford University
(September 2021 - May 2022)

- Supported Stanford undergraduates in math and physics courses having difficulties with homework or course concepts
- Content including linear algebra, single and multivariable calculus, differential equations, classical mechanics, and electricity and magnetism
- Helped students coming from a wide variety of backgrounds and levels of subject matter experience

POSTERS

APS March Meeting 2024, poster [J00.00395](#).

A poster describing the pre-print arXiv:[2403.01681](#).

Stanford Symposium of Undergraduate Research and Public Service (2022 & 2023)

In each year I presented a poster on my research from that year.