

Howard Beck

hbeck@mit.edu

www.mit.edu/~hbeck

github.com/howard-beck

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA

Bachelors of Science in *Pure Mathematics* (Course 18), expected **May 2025**

Humanities concentration in *Philosophy*

GPA: 4.8/5.0

Relevant coursework: Graduate Topology Seminar (Kan Seminar), Algebraic Topology I and II, Motivic Homotopy Theory (at Harvard)

RESEARCH INTERESTS

Chromatic homotopy theory, equivariant homotopy theory, algebraic K-theory

EXPOSITORY TALKS

Adams on the Image of the J -homomorphism, MIT Kan Seminar

April 2nd, 2025

Chromatic Blueshift and Redshift in Stable Homotopy Theory, MIT/Harvard Zygotop Seminar

March 5th, 2025

Borel on the mod 2 Cohomology of Homogeneous Spaces, MIT Kan Seminar

February 7th, 2025

The Quillen-Lichtenbaum Conjectures, MIT Directed Reading Program Symposium

January 31st, 2025

The Slice, Reduction, and Gap Theorems of HHR, MIT/Harvard Babytop Seminar

December 3rd, 2024

RESEARCH EXPERIENCE

Undergraduate Researcher, Department of Mathematics, MIT

Spring 2025 - present

- Studying the chromatic support of equivariant commutative algebras over the $\mathcal{N}_\infty$ -operad
 - Joint with Natalie Stewart and Eunice Sukarto, supervised by Keita Allen and Professor Haynes Miller
- Work in progress*

Undergraduate Researcher, Department of Mathematics, MIT

Summer 2024

- Investigated blueshift phenomena of $\mathbb{E}_\infty$ -MU-algebras using calculations with power operations
 - Found an algebraic condition on homotopy groups that guarantees blueshift, and a counterexample in algebra that may not necessarily be realized by topology
 - Learned the basics of chromatic homotopy theory, used Maple to perform calculations of some power operations
 - Joint with Kyle Roke, supervised by Tristan Yang and Professor Jeremy Hahn
- Preprint in preparation*

TEACHING EXPERIENCE

Undergraduate Assistant for Multivariable Calculus (18.02), Department of Mathematics, MIT

Spring 2024

Mentor for Real Analysis (18.100A), Undergraduate Mathematics Association, MIT

Spring 2023

Co-teacher for Playing Games with Infinity, Educational Studies Program, MIT

Spring 2022

LEADERSHIP AND SERVICE

Co-organizer for Algebraic Topology II Reading Group, with Haynes Miller, Cambridge, MA

Fall 2024

Association of Student Activities Executive Board, Cambridge, MA

Summer 2024 - present

MIT Spinning Arts Executive Board, Cambridge, MA

Summer 2022 - Fall 2024

Summer Resident Advisor at Random Hall, Cambridge, MA

Summer 2023, Summer 2024

LANGUAGES

Human: English (native), Spanish (also native), French

Computer: $\text{\LaTeX}$, Python, MATLAB, Java, JavaScript, Lua, HTML

HOBBIES

Rock climbing, running, fire spinning, figure skating, weight lifting, collecting dice

Last updated: March 28, 2025