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Cambridge, MA

Howard Beck

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Education

Massachusetts Institute of Technology Cambridge, MA
Expected graduation date: May 2025

- Majoring in Pure Mathematics with a Humanities concentration in Philosophy. **GPA** 4.8/5.0
- **Relevant coursework**: (*Current*) Motivic Homotopy Theory [G]; Identification, Inference, and Learning [G]; (*Past*) Underactuated Robotics [G]; Algebraic Topology I [G]; Numerical Computation; Probability Theory [G]; Dynamics and Controls I; Functional Analysis; Differential Equations; Complex Analysis; Real Analysis; Algebra I and II

Research, Internships, and Other Work Experience

Research internship at MIT Mathematics [UROP+ Program]
06/2024 to 9/2024 (full time), joint with Kyle Roke

- Studied maps from the complex cobordism spectrum into other ring spectra with $\mathbb{E}_\infty$ structure.
- Proved the recent Chromatic Blueshift Conjecture holds in the simplest case, but cast doubt on the general case.
- Preprint in progress: *Chromatic blueshift conjecture: the simple case and an algebraic analogue*.

Undergraduate Assistant - 18.02 (Calculus II)
Spring 2024

- Host weekly office hours, take notes in class, help with grading as needed.

Research internship at MIT Mathematics
06/2023 to 11/2023 (full time until end of Summer 2023 term)

- Analyzed Markov processes on certain compact Lie groups to establish limit profile of convergence.
- Used techniques from Fourier analysis and representation theory.

Undergraduate Math Association Mentorship Program
3/2022 to 5/2023

- Met weekly with a student taking Real Analysis who didn't come in with extensive math experience.
- Supported them by reviewing material from class and providing feedback on mathematical proofs.

Research internship at MIT Robust Robotics Group (RRG)
5/2022 to 8/2022 (full time)

- Worked on algorithms to estimate distances in monocular and binocular vision using neural networks.

Research internship at MIT Astrodynamics, space Robotics, and Controls Lab (ARCLab)
2/2022 to 5/2022

- Modeled controls of satellite constellations to figure out how orbits evolve under different control systems.
- Worked on a program to model density of space debris after orbital fragmentation events.

10/2021 to 1/2022

- Worked on a program to model density of space debris after orbital fragmentation events.

Extracurriculars

MIT Spinning Arts
Member 12/2021 to present, Executive Officer 5/2022-present

- Flow arts/fire spinning club. Video of me performing: `https://tinyurl.com/hbeck-fire`.
- Interface with MIT departments, social media outreach, room reservations, booking EMTs for shows.
- Help run fire practices and ensure everyone follows rigorous safety protocols.

Association of Student Activities
Member and Executive Officer (Spaces Chair) 04/2024 to present

- Governing body for MIT student clubs.
- Communicating with student groups, MIT administrators, and facilities to advocate for club needs.

Tech Squares
Member 9/2022-present

- Square dancing: Competent in Plus level square dance program, some experience in Advanced program.

Publicity Chair 4/2023-4/2024

- Help make decisions for the club, send weekly emails about the dances happening that week.

Interests and Skills

- Rock climbing, running, figure skating, fire spinning, calisthenics, social dancing (squares, rounds, contra).
- Fluent in Spanish, proficient in French.
- Proficient in LaTeX, Java, Python, MATLAB, Lua, Javascript. Some experience in C++ and Mathematica.