

# Ethan Baker Curriculum Vitae

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## EDUCATION

**Boston University**, Boston, MA

PhD Student

Advisor: Hongwan Liu

September 2025 - Present

**Haverford College**, Haverford, PA

Bachelor of Science, *summa cum laude*, Physics and Mathematics

High Honors in Physics, Honors in Mathematics

Physics Thesis: *Particle Self-Energies in the BSBM Model of a Varying Fine Structure Constant*, Advisor: Daniel Grin

Mathematics Thesis: *The Order of Selmer Groups of Congruent Number Curves over Real Quadratic Fields*, Advisor: Anthony Kling

May 2024

## PUBLICATIONS

**E. Baker**, D. Bollweg, P. Boyle, I. Cloët, X. Gao, S. Mukherjee, P. Petreczky, R. Zhang, Y. Zhao, *Lattice QCD calculation of the pion distribution amplitude with domain wall fermions at physical pion mass*, *J. High Energy Phys.* 2024, 211 (2024), [arXiv:2405.20120](https://arxiv.org/abs/2405.20120).

H. Tohfa, J. Crump, **E. Baker**, L. Hart, D. Grin, M. Brosius, and J. Chluba, *Cosmic microwave background search for fine-structure constant evolution*, *Phys. Rev. D* 109, 103529 (2024), [arXiv:2307.06768](https://arxiv.org/abs/2307.06768).

## PRESENTATIONS

*QFT Calculation of Nuclear Electromagnetic Self-Energy in the Presence of Alpha Variation*, Undergraduate Cosmology Workshop, MIT, July 2024

*Quantum Field Theory Calculations in the BSBM Model of a Varying Fine Structure Constant*, American Physical Society April Meeting, April 2024

*Lattice QCD Calculation of Pion Distribution Amplitude Using Domain-Wall Fermions at Physical Pion Mass*, International Symposium on Lattice Field Theory, August 2023

*A Simulation-Based Approach to Bekenstein's Model of a Varying Fine Structure Constant*, American Physical Society April Meeting, April 2023

## HONORS AND SCHOLARSHIPS

Dean's Fellowship, Boston University (2024)

The Faculty-Student Collaborative Research Prize, Haverford College (2024)

\$ 1000 award in recognition of my physics senior thesis work

J. McLain King 1928 Scholarship, Haverford College (2023)

Haverford KINSC Summer Scholar, Haverford College (2022)

## TEACHING EXPERIENCE

**Teaching Assistant** Haverford College Department of Physics

**Grader**, Haverford College Department of Physics

Spring 2022 - Spring 2023

Fall 2021- Spring 2023

## MEMBERSHIPS

Phi Beta Kappa Honor Society

American Physical Society

## RESEARCH INTERESTS

Beyond Standard Model Physics, Radio Cosmology, High Energy Phenomenology