Emmy Blumenthal — Curriculum Vitae

Pronouns: They/them/theirs
Princeton, NJ || Salt Lake City, UT
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Education

Princeton University **Sep. 2024 – Present**
PhD in Physics (affiliate of the Center for the Physics of Biological Function)

Boston University (BU) **Sep. 2019 – May 2023**
B.A. in Physics (with Honors) and Mathematics

- Thesis: Typicality and Chaos in Asymmetric Consumer-Resource Models (Advisor: Pankaj Mehta)
- GPA: 3.91, Magna cum laude in College of Arts and Sciences

Honors and Awards

- Hertz Fellow (2024–2029)
- National Science Foundation Graduate Research Fellowship Program (2024–2027)
- Princeton Centennial Fellowship (2024–2029)
- Sigma Xi Member
- American Physical Society Division of Biological Physics Travel Award (March Meeting 2023)
- BU Department of Physics College Prize for Excellence (awarded to one senior in each department)
- BU Trustee Scholarship (full-tuition, merit-based)
- BU Undergraduate Research Opportunities Project (4 semesters)
- University of Utah Department of Chemistry High School Research Award

Scientific Papers

- Emmy Blumenthal, Pankaj Mehta, *Giant blooms and busts emerge generically in ecosystems with highly non-reciprocal species-resource interactions*, in preparation (2025)
- Zhijie Feng, Emmy Blumenthal, Pankaj Mehta, Akshit Goyal, *A theory of ecological invasions and its implications for eco-evolutionary dynamics*, bioRxiv (currently undergoing peer review) (2025).
- Emmy Blumenthal, Jason W. Rocks, Pankaj Mehta, *Phase transition to chaos in complex ecosystems with non-reciprocal species-resource interactions*, Physical Review Letters 132, 12740, **Editors' Suggestion** (2024).
- Emmy Blumenthal, Pankaj Mehta, *Geometry of ecological coexistence and niche differentiation*, Physical Review E 08, 044409 (2023).
- Deniz Aybas, Janos Adam, Emmy Blumenthal, Alexander O Sushkov, et. al., *Search for axionlike dark matter using solid-state nuclear magnetic resonance*, Physical Review Letters 126, 141802 (2021).
- Matthew J. Kummer, Yoo Seok Lee, Mengwei Yuan, Bassam Alkotaini, John Zhao, Emmy Blumenthal, Shelley Minteer, *Substrate channeling by a rationally designed fusion protein in a biocatalytic cascade*, JACS Au (2021).
- Min Li, Kevin Klunder, Emmy Blumenthal, Matthew B Prater, Jack Lee, John E Matthiesen, Shelley D Minteer, *Ionic liquid stabilized 2,2,6,6-Tetramethylpiperidine 1-Oxyl catalysis for alcohol oxidation*, ACS Sustainable Chemistry & Engineering (2020).

Research Presentations

- American Physical Society March Meeting, *Minneapolis, MN* (2024)
  "Phase transition to chaos in complex ecosystems with non-reciprocal species-resource interactions"
- American Physical Society March Meeting, *Las Vegas, NV* (2023)
  "A new geometric framework for niche theory and consumer-resource models"
- MIT Physics of Living Systems Short Talks, Invited Speaker, *Cambridge, MA* (2023)
  "Typicality and dynamical fluctuations in nonreciprocal consumer-resource models"
- BU Chapter of Society of Physics Students (Photon), Invited Speaker, *Boston, MA* (2023)
  "Statistical physics and chaos in consumer-resource models for complex ecosystems"
- BU Biological Design Center Symposium, Poster Presentation, *Boston, MA* (2023)
  "Phase transition to chaos in complex ecosystems with nonreciprocal species-resource interactions"

Research Experience

Biophysics Theory Group (Dr. Gautam Reddy) || Princeton **Oct. 2024 – present**
Occasional collaboration with others at the CPBF
Graduate student researcher

Biophysics Theory Lab (Dr. Pankaj Mehta) || BU **Dec. 2021 – Aug. 2024**
Undergraduate Researcher (UROP funded) until May 2023
Full-time Post-baccalaureate Researcher from May 2023 to Aug. 2024

Quantum Lab (Dr. Alexander O Sushkov) || BU **May 2020 – Sep. 2021**
Undergraduate Researcher (UROP funded)

Bioelectrochemistry Lab (Dr. Shelley Minteer) || University of Utah **May 2018 – Sep. 2019**
High School Research (Award funded)

Systematic Randomness Testing || Wolfram Summer School **Jul. 2019**
Research Project

Teaching, Mentoring, and Outreach Experience

Physics Department || BU **Sep. 2022 – May 2023**
Learning Assistant — CAS PY 451, 452 (Quantum Mechanics I & II)

Faculty of Computing and Data Sciences (CDS) || BU **Sep. 2022 – May 2023**
Lead tutor — CDS DS 122 (Foundations of Data Science III)
Tutor — CDS DS 121, 210 (Foundations of Data Science II, Programming for Data Science)

Wizards After School Program || BU Community Service Center **Sep. 2022 – May 2023**
Volunteer

PeeRs for Incoming Student Mentorship (PRISM) || BU **Sep. 2021 – May 2022**
Mentor

Chapter of Society of Physics Students (Photon) || BU **Sep. 2019 – May 2023**
Member, regular presenter