

Stephen Whitcomb

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Education

Northeastern University

Candidate for Bachelors of Science in Physics with a Minor in Mathematics

Boston, MA

Sept 2022 - Present

- **GPA:** 3.8/4.0
- **Coursework:** Statistical Physics, Quantum Mechanics, Classical Mechanics, Fourier Series and PDEs, Linear Algebra, Complex Variables, Symplectic Geometry
- **Awards:** Dean's List, PEAK Trailblazer Award, Department of Physics Research Fellowship, PEAK Summit Award, PEAK Ascent Award, Dean's Undergraduate Research Scholarship

Experience

Research Assistant, Whitford Lab – Northeastern University

Oct 2023 - Present

- Investigated original questions regarding ribosomal protein synthesis using novel techniques
- Used high performance computing resources to simulate and analyze large (>100,000 atoms) biomolecular systems such as the ribosome
- Utilized parallelization and code optimization to analyze molecular simulations, often cutting analysis times from days to seconds
- Received a Department of Physics Research Fellowship along with the PEAK Trailblazer and PEAK Summit Awards in Summer 2024, Summer 2024, and Spring 2025, respectively

Emergency Medical Technician, Jones Beach State Park, NY

July 2022 – September 2022

- Treated and assessed patients using hands on skills according to EMT standard protocol
- Communicated frequently with dispatch using radio, both to relay and to receive information
- Responded to emergency situations quickly and decisively

Projects

Characterizing the Impact of Ions on the Ribosome

January 2024 - Present

- Used structure-based models to dissect the effects of diffuse electrostatics on tRNA translocation
- Ran MD simulations using OpenMM in order to simulate tRNA transitions over millisecond timescales in various ionic environments

Using MD Simulations to Identify SARS-CoV-2 Spike Protein Vaccine Targets

August 2024 - Present

- Used structure-based models to simulate SARS-CoV-2 Spike Protein membrane fusion events
- Analyzed MD simulation data using principle component analysis to identify potential vaccine targeting sites

Selected Presentations

Characterizing the Impact of Ions on the Ribosome

Biophysical Society 2025

The Impact of Diffuse Ion Electrostatics on tRNA Translocation

RISE 2024

Skills

- **Packages:** OpenMM, OpenSMOG, SMOG2, MDTraj