Jonathan Fischer

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SUMMARY

PhD researcher in biophysics with deep experience building computational models, scientific software, and simulation pipelines for complex biological systems. Built Julia- and Python-based workflows for nonlinear dynamical modeling, SLURM/HPC execution, technical mentoring, and clear communication with interdisciplinary audiences. Led the first-author study "A membrane-driven biochemical oscillator tunable by volume-to-surface-area ratio."

EXPERIENCE

PhD Researcher | *Johns Hopkins University*
Baltimore, MD | 2020–2025

- Built computational models of membrane-localized biochemical networks to study oscillatory dynamics, transport constraints, and tunability in biological signaling systems.
- Developed simulation and analysis workflows from scratch in Julia and Python, including parameter sweeps, optimization pipelines, checkpointing, and large-scale SLURM/HPC execution; built the Julia package OscillatorOptimization.jl.
- Created publication-quality figures, visualizations, and animations to communicate high-dimensional model behavior to interdisciplinary scientific audiences.
- Led the first-author study "A membrane-driven biochemical oscillator tunable by volume-to-surface-area ratio" (bioRxiv DOI: 10.1101/2025.11.14.688573); gave talks at ASCB 2022, APS 2023, and the 2023 Gordon Research Conference "Stochastic Physics in Biology," and presented posters at additional scientific meetings including BPS.
- Mentored undergraduate and graduate trainees, including a long-term undergraduate mentee who became a coauthor; served as TA for two quarters of General Biology Lab and Quantitative Biology Lab I–II.

Vice President | *Hopkins Biotech Network*
Baltimore, MD | 2022–2023

- Organized and hosted educational and networking events featuring biotech industry speakers and Johns Hopkins alumni.
- Helped connect graduate students with industry professionals through career-focused discussions and campus programming.

Research Assistant | *Craig D. Montell Laboratory, UC Santa Barbara*
Santa Barbara, CA | 2018–2019

- Maintained transgenic Drosophila melanogaster and Aedes aegypti populations and supported molecular biology workflows including PCR-based screening and insert verification.

Research Assistant | *Joel Rothman Laboratory, UC Santa Barbara*
Santa Barbara, CA | 2017–2018

- Supported RNAi screening workflows in C. elegans developmental biology, including daily experimental maintenance five days per week and associated strain/culture handling.

EDUCATION

Johns Hopkins University — PhD, Biophysics, 2025
University of California, Santa Barbara — B.S., Pharmacology, 2019 | GPA: 3.83

TECHNICAL SKILLS

Languages: Julia, Python, MATLAB, R
Scientific Computing: ODE/PDE modeling, stochastic simulation, optimization, parameter sweeps, nonlinear dynamics
Tools & Platforms: Git, Linux, SLURM, LaTeX, HPC workflows
Visualization & Workflow: Makie, matplotlib, scientific figure design, reproducible analysis pipelines
Developer Tooling: MCP-based automation, LLM-assisted code navigation, familiarity reading C++ scientific codebases