Samuel L. Foley, Ph.D.

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Positions

Postdoctoral Researcher — July 2023 – Present
Johns Hopkins University — Baltimore, MD
Research Group of Professor Margaret Johnson, Biophysics Department

Education

Carnegie Mellon University — Pittsburgh, PA
Ph.D. in Physics — May 2023
Advisor: Markus Deserno
Thesis: Mechanics and Thermodynamics of Differentially Stressed Lipid Membranes: Theory and Coarse-Grained Simulation

M.S. in Physics — May 2020

Pennsylvania State University — University Park, PA
B.S. in Physics, with Honors and Highest Distinction — May 2016
Minors: Mathematics, Spanish

Publications

Journal Articles

6. **Foley, S. L.**, & Johnson, M. E. Protein Self-Assembly Senses Membrane Receptors. (2024) *In Preparation*

5. Soubias, O., **Foley, S. L.**, Jian, X., Jackson, R. A., Zang, Y., Rosenberg, E. M. Jr., Li, J., Heinrich, F., Johnson, M. E., Sodt, A. J., Randazzo, P. A., & Byrd, R. A. A Newly Discovered Function of a PH Domain as an Integral Element of a Catalytic Interface in the Arf GAP ASAP1. (2024) *In Preparation*

4. **Foley, S. L.** & Deserno, M. Asymmetric Membrane "Sticky Tape" Enables Simultaneous Relaxation of Area and Curvature in Simulation. *The Journal of Chemical Physics* **160** (2024)

3. **Foley, S. L.**, Varma, M., Hossein, A. & Deserno, M. Elastic and Thermodynamic Consequences of Lipid Membrane Asymmetry. *Emerging Topics in Life Sciences* **7,** 95–110 (2023)

2. **Foley, S. L.**, Hossein, A. & Deserno, M. Fluid-Gel Coexistence in Lipid Membranes under Differential Stress. *Biophysical Journal* **121,** 2997–3009 (2022)

1. **Foley, S. L.** & Deserno, M. Stabilizing Leaflet Asymmetry under Differential Stress in a Highly Coarse-Grained Lipid Membrane Model. *Journal of Chemical Theory and Computation* **16,** 7195–7206 (2020)

Book Chapters

1. **Foley, S. L.** & Deserno, M. Quantifying Uncertainty in Trans-Membrane Stresses and Moments in Simulation. *Methods in Enzymology* **701,** 83–122 (2024)

Teaching

Carnegie Mellon University
Graduate Teaching Assistant

- Physics I for Engineering Students (Mechanics & Thermodynamics) — Fall 2017, Spring 2018, Fall 2018
- Physics I for Science Students — Fall 2022
- Physics II for Engineering Students (E&M) — Spring 2021, Fall 2021, Spring 2022
- Physics for Future Presidents (Non-STEM Majors) — Fall 2019

Service

- Reviewer: JHU Office for Undergraduate Research Provost's Undergraduate Research Award — Fall 2023
- CMU Physics Graduate Admissions Committee — Spring 2020

Awards

- Physics Department Teaching Award (Carnegie Mellon) — 2021–2022
- ARCS Scholarship (Achievement Rewards for College Scientists) — 2017–2020
- Graduate Student Assembly/Provost Conference Travel Award (Carnegie Mellon) — 2019
- Bert Elsbach Honors Scholarship in Physics (Penn State) — 2014
- Penn State-New York Times Civic Engagement Speaking Contest Finalist — 2013

Talks

- *Letting Asymmetric Membranes Relax with Simulation Sticky Tape* — Dec 2023
  JHU Soft Matter & Biological Physics Group Meeting
- *Nano-Scale "Sticky Tape" Stabilizes Open-Edge Boundary Conditions in MD Simulations of Asymmetric Membranes* — Dec 2022
  APS MAS22 Meeting
- *Asymmetry and Phase Coexistence: From van der Waals to Lipid Bilayers* — Nov 2021
  Plots and Scotch (CMU Biophysics Seminar)
- *Stabilizing Leaflet Asymmetry under Differential Stress in a Highly Coarse-Grained Lipid Membrane Model* — Nov 2020
  Plots and Scotch (CMU Biophysics Seminar)

Posters

Biophysical Society Annual Meetings:

- *Binding Cargo Boosts Clathrin Adaptor Residence Time* — Feb 2024
- *Nano-Scale "Sticky Tape" Stabilizes Open-Edge Boundary Conditions in Simulations of Asymmetric Membranes* — Feb 2023
- *Liquid-Gel Coexistence in Membranes under Differential Stress* — Feb 2022
- *Stabilizing Leaflet Asymmetry in a Highly Coarse-Grained Lipid Membrane Model* — Feb 2021
- *Properties of Asymmetric Membranes from Coarse Grained Molecular Dynamics Simulations* — Feb 2020
- *Extending a Highly Coarse-Grained Lipid Model to Asymmetric Membranes for MD Simulations* — March 2019

Technology

High-Performance Computing

Experience maintaining a 24-node computing cluster utilizing **Ubuntu Server** and **SLURM Workload Manager**. Experience working with **OpenMP** and **MPI** parallelization.

Programming Languages

C++, Python, Julia: Used extensively for simulation and data analysis
Java, Lua, MATLAB: Some experience
HTML, CSS, JavaScript, PHP: Basic knowledge