

Samuel L. Foley, Ph.D.

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Positions Held

Postdoctoral Researcher

Johns Hopkins University
Research Group of Professor Margaret Johnson, Biophysics Department

July 2023 – Present
Baltimore, MD

Education

Carnegie Mellon University

Ph.D. in Physics
Advisor: Markus Deserno
Thesis: Mechanics and Thermodynamics of Differentially Stressed Lipid Membranes:
Theory and Coarse-Grained Simulation

Pittsburgh, PA
May 2023

M.S. in Physics

May 2020

Pennsylvania State University

B.S. in Physics, with Honors and Highest Distinction
Minors: Mathematics, Spanish

University Park, PA
May 2016

Publications

Journal Articles

6. **Foley, S. L.**, & Johnson, M. E. Membrane-Associated Self-Assembly for Cellular Decision Making. (2025) *Submitted*.
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. Redefining PH Domain Function: An Active Allosteric Mechanism in ASAP1-Mediated Arf1 GTP Hydrolysis. (2025) *Submitted*.
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)

Service

- Reviewer: *Nature Communications* Spring 2025
- Reviewer: JHU Office for Undergraduate Research Provost’s Undergraduate Research Award Fall 2023
- CMU Physics Graduate Admissions Committee Spring 2020

Teaching

Carnegie Mellon University

Graduate Teaching Assistant

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|---|-------------------------------------|
| – 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 |

Awards

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|---|-----------|
| ▪ 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

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| ▪ <i>Protein Self-Assembly Senses Membrane Receptors</i>
APS Global Physics Summit | Mar 2025 |
| ▪ <i>Letting Asymmetric Membranes Relax with Simulation Sticky Tape</i>
JHU Soft Matter & Biological Physics Group Meeting | Dec 2023 |
| ▪ <i>Nano-Scale “Sticky Tape” Stabilizes Open-Edge Boundary Conditions in MD Simulations of Asymmetric Membranes</i>
APS MAS22 Meeting | Dec 2022 |
| ▪ <i>Asymmetry and Phase Coexistence: From van der Waals to Lipid Bilayers</i>
Plots and Scotch (CMU Biophysics Seminar) | Nov 2021 |
| ▪ <i>Stabilizing Leaflet Asymmetry under Differential Stress in a Highly Coarse-Grained Lipid Membrane Model</i>
Plots and Scotch (CMU Biophysics Seminar) | Nov 2020 |