

CURRICULUM VITAE
Elaine Ruth Farkas, Ph.D.

EDUCATION **Ph.D.**, Physics, **Cornell University**, Ithaca, NY **May, 2010**
 B.S., Physics, **University of Florida**, Gainesville, FL **May, 2002**
 B.S., Chemistry, **University of Florida**, Gainesville, FL **May, 2002**
 Undergraduate minor: Mathematics

HONORS and AWARDS **2019**, Hamilton Syringe Educational Grant • **2018**, GCAT-SEEK RNA sequencing workshop grant • **2018**, Outstanding mentor to a female student • **2018**, MU FPDC Grants • **2016**, Outstanding mentor to a female student • **2015-2016**, PASSHE FPDC “Innovations” Grant • **2007-2008**, NIH Molecular Mechanisms of Behavior Training Grant fellowship (NIH Kirschstein NRSA T32GM-08267) • **2003-2006**, NIH Molecular Biophysics Training Grant fellowship (NIH Kirschstein NRSA 2T32GM -007469) • **2003**, Phi Beta Kappa • **2002**, National Society of Collegiate Scholars **2001-2002**, University Scholars Research Program • **2000**, Golden Key National Honor Society • **2000**, Dean's List

PROFESSIONAL EXPERIENCE

Assistant Professor of Physics (tenure-track) *Department of Chemistry and Physics*, Mansfield University **2017-present**
Planetarium Director *Department of Chemistry and Physics*, Mansfield University **2015-present**
Assistant Professor of Physics (adjunct) *Department of Chemistry and Physics*, Mansfield University **2013-2017**
Adjunct Professor of Physics *MPTE Department*, Corning Community College, Corning, NY **2011-2013**
Postdoctoral Associate *School of Applied and Engineering Physics*, Cornell University, Ithaca, NY **2009-2011**
Graduate Research Assistant *Department of Physics*, Cornell University, Ithaca, NY **2003-2009**
Grader *Department of Physics*, Cornell University, Ithaca, NY **2006-2009**
Student-athlete tutor *Department of Athletics*, Cornell University, Ithaca, NY **2005-2006**
Teaching Assistant *Department of Physics*, Cornell University, Ithaca, NY **2002-2003**

RESEARCH EXPERIENCE

Assistant Professor of Physics *Department of Chemistry and Physics*, Mansfield University **2017-present**
Currently investigating the effects of micro- and nano-plastic consumption on plant and animal species, including tardigrades and CBL-6 mice using optical and histological techniques, as well as qRT-PCR to profile gene expression in collaboration with Dr. Kristen Long (biology). Other biophysical projects include investigating the response to osmotic stress of the tardigrade species *Hypsibius dujardini*, and the role of mesoscale morphology on the frictional properties of fish scales using atomic force microscopy.

Postdoctoral Associate *School of Applied and Engineering Physics*, Cornell University, Ithaca, NY **2009-2011**
Investigated diagnostic capabilities of second harmonic- and multiphoton fluorescence-imaging in animal models of liver disease as part of a broad effort to develop a novel endoscopy system based on imaging of nonlinear optical signals. Acted in the position of lab safety advisor, overseeing compliance with OSHA and EHS regulations.

Graduate Research Assistant *Department of Physics*, Cornell University, Ithaca, NY **2003-2009**
Characterized thermodynamic phase behavior and critical phenomena in model cell membrane lipid mixtures using a variety of optical techniques including multiphoton fluorescence microscopy and polarization anisotropy. Designed and fabricated a controlled-temperature microscopy system with milli-Kelvin resolution and stability. Supervisor: Dr. Watt Webb

Undergraduate Research Assistant *Department of Physics*, University of Florida, Gainesville, FL **2001-2002**
Developed methods for the purification and sorting of single-walled carbon nanotubes. Learned carbon nanotube chemistry, optimization of separation techniques, and the operation of an atomic force microscope. Supervisor: Dr. Andrew Rinzler

Undergraduate Research Assistant *Department of Geology*, University of Florida, Gainesville, FL **1999-1999**
Collected paleomagnetic data from oceanic sediment cores using SQUID magnetometers. Supervisor: Dr. James E. T. Channel

PROFESSIONAL ORGANIZATIONS American Chemical Society • American Physical Society • Biophysical Society • Mid-Atlantic Planetarium Society • Sigma Alpha Iota (Patroness member) • American Association of Physics Teachers

PUBLICATIONS

Peer-Reviewed

Farkas, E. R. and W. W. Webb (2010). Multiphoton polarization imaging of steady-state molecular order in ternary lipid vesicles for the purpose of lipid phase assignment, *Journal of Physical Chemistry B*, **114**, 15512-22.

Farkas, E. R. and W. W. Webb (2010). Precise and stable temperature control for fluorescence imaging: application to phase transitions in lipid membranes, *Reviews of Scientific Instruments*, **81**, 093704 (8), doi: 10.1063/1.3483263

Morales-Pennington, N. F., Wu, J., **Farkas, E. R.**, Goh, S. L., Konyakhina, T. M., Zheng, J. Y., Webb, W. W. and G. W. Feigenson (2010). GUV preparation and imaging: minimizing artifacts, *Biochimica et Biophysica Acta*, **1798**, 1324-1332.

Baumgart, T., Hunt, G., **Farkas, E.R.**, Webb, W.W., and G. W. Feigenson (2007). Fluorescence probe partitioning between L_o/L_d phases in lipid membranes. *Biochimica et Biophysica Acta*, **1768**, 2182-2194.

Farkas, E., Anderson, M.E., Chen, Z., and A. G. Rinzler (2002). Length sorting cut single-walled carbon nanotubes by high performance liquid chromatography. *Chemical Physics Letters*, **363**, 111-116.

Book Chapters

Chen, H., **Farkas, E. R.**, and W. W. Webb (2008). *In vivo* Applications of Fluorescence Correlation Spectroscopy (FCS). John J. Correia and H. William Dietrich (Ed.), *Methods in Cell Biology (89): Biophysical Tools for Biologists (2): Methods In Vivo*, (3-35). New York, NY: Elsevier.

Student research presentations

Thompson, K., Long, K. B., and **Farkas, E. R.** Analyzing the pervasiveness of microplastic beads in mouse livers, spleens and kidneys. **Poster 141 presented at the 50th Annual meeting of the Commonwealth of Pennsylvania Biologists**, Edinboro, PA. (2019, April 12-13).

Wolfe, K., Davis, K., Long, K. B., and **Farkas, E. R.** Tardigrade viability upon exposure to micro- and nanoplastics. **Poster 219 presented at the 50th Annual meeting of the Commonwealth of Pennsylvania University Biologists**, Edinboro, PA. (2019, April 12-13).

Chilson, J., Hungerford, W., Congdon, M., **Farkas, E.** and K. Long. Differential gene expression in the tardigrade tun state: osmotic stress versus dehydration. **Poster 105 presented at the 50th Annual meeting of the Commonwealth of Pennsylvania University Biologists**, Edinboro, PA. (2019, April 12-13).

Chilson, J., Hungerford, W., Congdon, M., **Farkas, E.** and K. Long. Differential gene expression in the tardigrade tun state: osmotic stress versus dehydration. **21st Annual Undergraduate Research Symposium in the Chemical and Biological Sciences**, University of Maryland Baltimore County, Abstract 21 (October 20th, 2018).

Golden, C., Maris, R., and **Farkas, E.** The Effect of CO₂-addition on the biofluorescent intensity response of *lobophyllia hemprichii*, **Showcase of Student Scholarship**, Mansfield University (April 20th, 2016), http://lib.mansfield.edu/ld.php?content_id=20990008.

Gilbert, D. and **Farkas, E. R.** Pallesthesia abilities in cockroach species. **Showcase of Student Scholarship**, Mansfield University (April 22nd, 2015).

Conference Proceedings, Posters, and Talks

“Are we alone? The search for extraterrestrial life in the universe?” Elaine Farkas, **Commonwealth of Pennsylvania Biologists Annual Meeting**, Mansfield University (April 7th, 2018).

“A chemical tour of the autumn sky.” Elaine Farkas, **American Chemical Society regional meeting**, Mansfield University (September 13th, 2017).

Farkas, E.R., Smith, R. L., Baumgart, T. B., and W. W. Webb (2007). Probing chain-order in model membranes via fluorescence polarization using two-photon microscopy. Biophysical Society 51st Annual Meeting, Baltimore, MD. *Biophysical Journal*, **Supplement**, 420a, poster 2009.

Farkas, E.R., Baumgart, T. and W. W. Webb (2005). Phase behavior in model cell membranes. 6th Annual Nanobiotechnology Symposium, Cornell University, poster 49.

Farkas, E.R., Baumgart, T. and W. W. Webb (2005). The temperature-dependent phase behavior of the quasi-ternary DOPC/SSM/cholesterol system in giant unilamellar vesicles. Biophysical Society 49th Annual Meeting, Long Beach, CA. *Biophysical Journal*, **88** (1), 236A, poster 1159.

Farkas, E.R., Baumgart, T., and W. W. Webb (2004). The temperature-dependent phase behavior of cholesterol/N-stearoyl sphingomyelin/DOPC in model cell membranes. *Biophysical Society Discussions Meeting: Probing Membrane Microdomains*, Asilomar, CA, poster 29.

Baumgart, T., **Farkas, E. R.**, Hess, S., Hammond, A., Holowka, D., Baird, B., and W. W. Webb (2004). Experimental and theoretical analysis of fluid/fluid domain coexistence, interphase tension and curvature in giant unilamellar vesicles (GUVs). Biophysical Society 48th Annual Meeting, Baltimore, MD. *Biophysical Journal*, **86**(1), 18a, platform 85.

Baumgart, T., Hammond, A. T., **Farkas, E. R.**, Holowka, D., Baird, B., and W. W. Webb (2004). Lipid and protein partitioning in membranes with large fluid domains. American Society of Cell Biology Annual Meeting. *Molecular Biology of the Cell*, **15**, 317A, abstract 1753.

Farkas, E.R., Korlach, J., Ebricht, Y.W., Webb, W. W., and R. H. Ebricht (2004). Bidentate Protein Target Attachment of Cy5 Derivatives Measured by Fluorescence Correlation Spectroscopy. Biophysical Society 48th Annual Meeting, Baltimore, MD. *Biophysical Journal*, **86**(1), 93a, poster 498.

“*Membrane probes and anisotropy.*” Elaine Farkas, **Bio-imaging seminar series**, Cornell University Life Sciences Core Laboratories Center (October 6th, 2008).

“*A new spin on old techniques: probing lipid phase behavior with optical microscopy and mass spectrometry.*” Elaine Farkas, **Keck Biomembranes Research Symposium**, Cornell University (June 20th, 2008).

“*What are lipid rafts? Model membrane studies of lipid phase behavior and applications to native cells.*” Elaine Farkas, **Neurobiology and Behavior journal club** (CMMB training grant), Cornell University (May 25th, 2008).

“*Critical phenomena and local order in 3-component lipid mixtures.*” Elaine Farkas, **Keck Biomembranes Research Symposium**, Cornell University (August 8th, 2006).