Angela F. Harper Curriculum Vitae

Employment Background

Teaching Assistant, Department of Physics, Wake Forest University, Fall 2015 – Spring 2017
- Teaching assistant for Electronics (PHY 230) laboratory
- Set up weekly laboratory assignments to enhance and reiterate basic electronics concepts introduced in lecture
- Ran tutorials for Introductory Physics and graded homework and tests for this class

Tutor, Learning Assistance Center and Student-Athlete Services, Wake Forest University, Fall 2015 – Spring 2017
- Tutored students both individually and in small groups in Introduction to Modern Physics, Introduction to Computer Science, and Fundamentals of Computer Science

Academic Background

MPhil Physics, Theory of Condensed Matter, Cavendish Laboratory, University of Cambridge, Fall 2017 - Present
Research Advisor: Dr. Andrew Morris
- Using the *Ab Initio* Random Structure Searching (AIRSS) technique to construct the binary and ternary energetic hulls for transition metal phosphide battery anode materials
- Modelling the most energetically favorable structures using the CASTEP plane-wave DFT code to determine their energetic properties

Undergraduate Researcher, Department of Physics, Wake Forest University, Fall 2015 – Spring 2017, (8h/week)
Research Advisor: Dr. Oana Jurchescu
- Fabricate and characterize organic field effect transistors comprised of novel organic semiconductor materials
- Aid in the development of a novel process for deposition of the organic layer using a laser printing technique
- Attended the Solar Energy Research Center Conference in Chapel Hill, NC in October 2015
- Gave a poster presentation on this work at Harvard University's National Collegiate Research Conference in Cambridge, MA in January 2016

NSF REU Undergraduate Researcher, Cornell Center for Materials Research, Cornell University, Ithaca, NY, Summer 2016, (10 weeks)
Research Advisor: Dr. Paulette Clancy
- Studied the solution processing of Hybrid Organic-Inorganic Perovskites using DFT, with the Orca and LAMMPS simulation programs
- Collaborated with Dr. Joshua Choi at Virginia Tech modelling sulfoxide solvents for use in perovskite processing
- Presented this work at Cornell's REU Symposium in Ithaca, NY in August 2016
- Presented this work at Wake Forest's Undergraduate Research Day in Winston-Salem, NC in September 2016

Independent Researcher, Department of Structural and Molecular Biology, University College London, London, England, Summer 2015, (11 weeks)
Research Advisor: Dr. Christine Orengo
- Analyzed how the FunFHMMER protein classification algorithm used in CATH: Protein Structure Classification Database, compared to the Deacon Active Site Profiler
- Selected as undergraduate speaker at the Protein Society Symposium in Barcelona, Spain in July 2015 with funding through the Finn Wold Travel Award
- Presented this work at the Wake Forest Physics Department Colloquium in September, 2015
- Presented a poster at Wake Forest Undergraduate Research Symposium in October 2015
- This project was fully funded by the Stamps Scholarship

Undergraduate Researcher, Department of Physics, Wake Forest University, Spring 2014 – Fall 2015 (8h/week)
Research Advisor: Dr. Jacquelyn Fetrow
- Developed a protocol to computationally cluster protein sequence information, to elucidate the relationship between structure, sequence, and function of proteins using Python, on a Linux cluster
- Studied the functional relationships between subgroups of the Peroxiredoxin superfamily of proteins using the Deacon Active Site Profiler for computationally clustering proteins
- Presented a poster on this research at the Women in Physics Conference in Raleigh, NC in January 2015
- Obtained a Wake Forest Research Fellowship Grant to work in this lab for ten weeks in the Summer 2014

Principal Publications and Presentations

A. F. Harper, J. B. Leuthaeuser, P. C. Babbitt, J. H. Morris, T. E. Ferrin, L. B. Poole, J. S. Fetrow, *PLOS Comput. Biol.* **2017**, *13*, e1005284

B. J. Foley, J. Girard, B. A. Sorenson, A. Z. Chen, J. Scott Niezgoda, M. R. Alpert, **A. F. Harper**, D.-M. Smilgies, P. Clancy, W. A. Saidi, J. J. Choi, A. D. Mohite, C. R. McNeill, R. A. Caruso, U. Bach, L. Spiccia, Y.-B. Cheng, *J. Mater. Chem. A* **2017**, *5*, 113

P. J. Diemer, **A. F. Harper**, M. R. Niazi, A. J. Petty II, J. E. Anthony, A. Amassian, O. D. Jurchescu, *Adv. Mater. Technol.* **2017**, 2, 1700167

S. T. Knutson, B. M. Westwood, J. B. Leuthaeuser, B. E. Turner, D. Nguyendac, G. Shea, K. Kumar, J. D. Hayden, **A. F. Harper**, S. D. Brown, J. H. Morris, T. E. Ferrin, P. C. Babbitt, J. S. Fetrow, *Protein Sci.* **2017**, *26*, 677

J. B. Leuthaeuser, J. H. Morris, **A. F. Harper**, T. E. Ferrin, P. C. Babbitt, J. S. Fetrow, *BMC Bioinf.* **2016**, *17*, 458.

Harper, A.F. "Laser printed flexible electronics." Bachelor of Science Physics Honors Thesis, Wake Forest University, May 2017. Talk to be given at 2018 APS March Meeting in Los Angeles, CA

"Understanding the Solute and Solvent Effects on Processing of Perovskites using Density Functional Theory." Talk given at the Cornell Center for Materials Research NSF MRSEC REU program, Ithaca, NY, August 2016

"Printing of small molecule organic semiconductors produces low cost flexible electronic devices." Poster presented at the Harvard National Collegiate Research Conference, Cambridge, MA, January 2016.

"Active site clustering identifies functional families of the peroxiredoxin superfamily." Undergraduate talk given at the Protein Society Symposium, Barcelona, Spain, July 2015.

Volunteer Work and Other Contributions

App Developer, Department of Computer Science, Wake Forest University, Spring 2016
Advisor: Dr. David John
- Wrote the code for a first version of a hiking application for trail markers in the North Carolina mountains

Tour Guide, Ambassadors in Admission, Wake Forest University, Spring 2014 – Spring 2017
- Gave weekly tours of the campus to prospective high school students visiting the university

President, Women in STEM, Wake Forest University, Fall 2014 – Spring 2017
- Led weekly science tutorials at an after-school program for girls in science at a local middle school
- Created a mentorship program to help first-year women in STEM to be successful at Wake Forest
- Developed the by-laws and constitution for this organization to become an official chartered group

President, Sigma Pi Sigma Physics Honors Society, Wake Forest University, Fall 2014 – Spring 2017
- Volunteered at the North Carolina Science Olympiad as a judge and event coordinator
- Organized and attended events such as an escape room and volunteer day at the local Science Museum

Volunteer, St. Vincent de Paul Society, Cambridge University, Fall 2017 – Present
- Hand out soup, hot drinks, and sandwiches each week to the homeless around Cambridge downtown

Mentor, Churchill College Mentoring Scheme and STEMNetwork, Cambridge University, Fall 2017 – Present
- Attended STEMNetwork induction and plan to start mentoring for Churchill and the Cambridge network in Lent

Professional Honors

Churchill Scholarship, Cambridge University MPhil in Physics, 2017-2018
LeRoy Apker Award for Undergraduate Achievement in Physics from the American Physical Society, 2017
NSF GRFP Graduate Fellowship, 2017-2022
William E. Speas Memorial Award for Distinguished Work in Physics, 2017
William C. and Ruth N. Archie Award for the WFU Outstanding Senior, 2017
Z. Smith Reynolds Library Senior Showcase Award, Honors Thesis Presentation, 2017
Phi Beta Kappa National Honor Society, 2017
Goldwater Scholar, Barry Goldwater Scholarship and Excellence in Education Program, 2016
Omicron Delta Kappa National Leadership Honor Society, 2016
Sigma Pi Sigma Physics Honors Society, Spring 2015 – Present
Stamps Leadership Scholarship, Stamps Family Charitable Foundation, 2013 – 2017