

Eric S. Harper

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Current Position

Computational Scientist, Azimuth Corporation for Air Force Research Laboratories, Wright-Patterson

- Modeling non-linear mechanical properties in liquid-crystalline elastomers (LCEs)

Areas of Specialization

Computational Materials Science:

- Simulation Techniques: Finite Element Analysis, Molecular Dynamics, Monte Carlo
- Machine Learning: Scikit-image, Scikit-learn, Keras, TensorFlow
- Programming: Python, C++ (CUDA, MPI, OpenMP, Intel Thread Building Blocks), OpenGL
- Web Development: HTML, CSS, Javascript
- Remote Unix/Linux system usage and administration including flux at UM, Blacklight and Pittsburgh, and Stampede at UT-Austin

Appointments Held

2017 – Present: *Computational Scientist*, Azimuth Corporation, Air Force Research Laboratories

2011 – 2017: *Graduate Student Research Assistant*, Glotzer Group, University of Michigan

2010 – 2011: *Consultant*, Composite Technical Services, Dayton, OH

2008 – 2009: *Undergraduate Research Assistant*, Air Force Research Laboratories (AFRL), Wright-Patterson Air Force Base

Education

2018: Ph.D. in Materials Science and Engineering, University of Michigan

- Thesis Topic: *The Nature of the Entropic Bond*
 - Advisor: Sharon C. Glotzer
 - Co-Advisor: Greg van Anders
 - Defended Sept. 22, 2017

2014: MS in Materials Science and Engineering, University of Michigan. GPA: 3.774/4.000

2011: Bachelor of Chemical Engineering, University of Dayton. GPA: 3.92/4.00

Scientific Software Development

Freud: lead developer, <https://bitbucket.org/glotzer/freud/>

Publications and Talks

Journal Articles

- [1] Shape Allophiles Improve Entropic Assembly, E. S. Harper, R. L. Marson, J. A. Anderson, G. van Anders, and S. C. Glotzer, *Soft Matter*, 2015, 11, 7250-56. DOI: 10.1039/c5sm01351h. *Cover: 7 October 2015*
- [2] Freud: a software suite for high-throughput simulation analysis, E. S. Harper, M. P. Spellings, J. A. Anderson, and S. C. Glotzer, *in preparation*
- [3] Nature of the Entropic Bond in Particle Assemblies, E. S. Harper, G. van Anders, and S. C. Glotzer, *submitted to Nature*, 2018

- [4] Entropic Engineering of Phase Transitions in Two Dimensions, E. S. Harper, J. A. Anderson, G. van Anders, and S. C. Glotzer, *in preparation for Physical Review Letters*, 2018
- [5] Hierarchical Self-Assembly of Hard Cube Derivatives, E. S. Harper, B. Waters, and S. C. Glotzer, *in preparation for Soft Matter*, 2018

Poster Sessions

- 2017: *Freud: A Software Suite for High-Throughput Simulation Analysis*, MICDE Symposium, University of Michigan
- 2015: Entropic Bonding in Colloidal Systems, Engineering Graduate Symposium, University of Michigan
- 2014: Shape Allophiles Improve Entropic Assembly, Engineering Graduate Symposium, University of Michigan
- 2013: Self-assembly of complementary shape alloys, CyberInfrastructure Days, University of Michigan
- 2013: Self-assembly of complementary shape alloys, Engineering Graduate Symposium, University of Michigan

Talks

- 2018: *The Nature of the Entropic Bond in Particle Assemblies*, APS March Meeting
- 2017: *Freud: A Software Suite for High-Throughput Simulation Analysis*, APS March Meeting
- 2016: *Freud: A Software Suite for High-Throughput Simulation Analysis*, AIChE Fall Meeting
- 2016: *Entropic Bonding in Colloidal Systems*, MSE Graduate Symposium, University of Michigan – Silver Award
- 2016: *Shape Allophiles Improve Entropic Assembly*, APS March Meeting
- 2015: *Shape Allophiles Improve Entropic Assembly*, MRS Fall Meeting

Teaching

- 2015: GSI, Materials Science & Engineering Undergraduate Lab
- 2012: Teaching Assistant, VSCSE Parallel Programming
- 2011: Head Robotics Coordinator, Summer Honors Institute, University of Dayton
- 2010 – 2011: Teaching Associate, Chemical Engineering Department, University of Dayton

Service to the Profession

- 2015 – 2016: Scientific Computing Student Club, founding member and President
- 2014 – 2016: Advisor, Tau Beta Pi, MI Γ Chapter
- 2009 – 2011: President, Tau Beta Pi, OH Θ Chapter

Grants, Honors, & Awards

- 2016 – 2017: MICDE Fellowship, University of Michigan
- 2012 – 2014: NSF Open Data IGERT Fellow, University of Michigan
- 2011 – 2012: William F. Hawkins Fellow, University of Michigan
- 2010 – 2011: Tau Beta Pi Geico Scholar

Professional Organizations

- 2014: American Physical Society
- 2014: Materials Research Society
- 2009: Tau Beta Pi
- 2008: ACS
- 2007: AIChE