William Forrest Drayer

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Education

University of South Florida 2018–Current

- Ph.D., Chemical Engineering; expected graduation Summer 2023

University of Akron 2013–2018

- B.A.: Multidisciplinary Studies
  - Primary concentration: Mathematics
  - Secondary concentration: Physical Chemistry
  - Minors: Polymer Science and Engineering and Music

Work

University of South Florida 2018–Present

Department of Chemical, Biological, and Materials Engineering;
Teaching Associate; Research and Teaching Assistant

- Lead instructor for Thermodynamics I (Fall 2022)
- Teaching assistant for three semesters of thermodynamics (I and II)
- Research involves molecular dynamic simulation of glasses (especially polymers) investigating mechanistic sources of and theories surrounding the glass transition
  - Extensive use of distributed computing (SLURM, Bash, C++)
  - LAMMPS simulation of systems such as bead-spring and all-atom (co-)polymers
  - Data analysis and visualization using tools including Excel, Python (matplotlib, seaborn), Julia (Plots, Gadfly), MATLAB, Mathematica

University of Akron 2015–2018

Department of Polymer Engineering; Undergraduate Research

- Simulated and analyzed relaxation behavior of bead-spring copolymers

Department of Corrosion Engineering; Research Assistant

- Developed of capsule-embedded coating simulation in Python (Anaconda)
- Simulated coating damage and analyzed self-healing performance for use in anti-corrosive coatings

NASA Glenn Research Center 2015 Summer

Ballistic Impact Lab; Research Assistant

- Refabricated Hopkinson tube for high-speed impact measurements
- Selected and installed strain gauge and appropriate adhesive
- Prepared ballistic gelatin for impact testing
- Operated high-speed impact data collection

Publications and Conferences

Publications

In Prep High Temperature Signatures of the Molecular Weight Dependence on the Glass Transition in Polystyrene

2022 Sequence Effects on the Glass Transition of a Model Copolymer System; William F. Drayer and David S. Simmons; Macromolecules 2022 55 (14), 5926-5937; DOI: 10.1021/acs.macromol.2c00664

Presentations

- Drayer, W. and Simmons, D., 2022. Computational Insights into the Molecular Origins of the Chain Length Dependence of Polymers' Glass Transition. In APS March Meeting Abstracts (Vol. 2022, pp. Y16.008).
- Drayer, W. and Simmons, D., 2021. Sequence Effects on the Glass Transition-Suppression from Block to Alternating Copolymers. In APS March Meeting Abstracts (Vol. 2021, pp. S08-005).
- Drayer, W. and Simmons, D., 2019. Polymer chain sequence effects on the glass transition. In APS March Meeting Abstracts (Vol. 2019, pp. P54-001).

Awards and Proficiencies

Selected Awards:

- USF Outstanding Teaching Assistant Award (2022)
- USF Outstanding Departmental Contribution Award (2021)
- University of Akron President's List (6 semesters)
- University of Akron Dean's List (10 semesters)
- Richard L. Waldman, Jr. Scholarship (Fall 2018)
- Greater Cleveland Automobile Dealers Association Scholarship Recipient (thrice; 2014-2016)

Programming Languages:

Julia	Python	Bash	Powershell
C++	Mathematica	MATLAB	Java

Technical Software Experience:

CUDA (C & Julia) | LAMMPS | SLURM | VMD | Anaconda (Python Suite)

Professional Bassoonist:

- Canton Concert Band, 2012-2018
- Alliance Symphony Orchestra, Spring 2012-Spring 2014, Spring 2018
- University of Akron, Fall 2013-Spring 2017
- Ohio Band Director's Conference, Spring 2016
- Kent State Stark Band, Spring 2012-Spring 2014