William Forrest Drayer

4202 E. Fowler Avenue · Tampa, FL, 33620, USA · drayer587@gmail.com (330)-618-6527

Education

University of South Florida 2018–Current

- Ph.D., Chemical Engineering; expected graduation Spring 2023
  - Preliminary Title: Developments in Mechanistic Understanding of Glass Transition Modifications with Polymer Sequence and Chain Length and Foundations of the Glass Transition At Large

University of Akron 2013–2018

- B.A.: Multidisciplinary Studies
  - Primary concentration: Mathematics
  - Secondary concentration: Physical Chemistry
  - Minors: Polymer Science and Engineering; 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 Detecting the Emergence of the Cage: High Temperature Signatures of Cage Formation using a Shifted Spring Force

In Prep Revisiting the Molecular Weight Dependence on the Glass Transition for Polymers: Chain End Effects and High Temperature Signatures

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