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
    - Music

Work

University of South Florida 2018–Present

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

- Lead instructor for Undergraduate Thermodynamics I (Fall 2022)
- Teaching assistant for three semesters of thermodynamics (I and II); assistance with lecture, assignment, and examination preparation and evaluation, and occasional supplementary lectures.
- Research work involves molecular dynamic simulation of glasses (especially polymers) investigating mechanistic sources of and theories surrounding the glass transition and correlations from equilibrium properties.
  - 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 2015–2017

Department of Corrosion Engineering; Research Assistant

- Development of capsule-embedded coating simulation in Python (Anaconda)
- Simulation and analysis of coating damage and self-healing performance for use in anti-corrosive coatings

NASA Glenn Research Center 2015 Summer

Ballistic Impact Lab; Research Assistant

- Refabrication of Hopkinson tube for high-speed impact measurements
- Strain gauge and adhesive selection and installation
- Ballistic gelatin preparation
- Operating data collection of high-speed impact tests

Conferences and Publications

APS March Meetings

2022 Molecular Origins of the Glass Transition Temperature

2021 Copolymer Glass Transition Temperature Suppression from Block to Alternating Copolymers Dependence on Chain Length in Polymers

2019 Sequence Effects on the Glass Transition of a Model Copolymer

Publications

In Prep Computational Study revealing 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

Skills, Proficiencies, and Interests

Programming Languages:

Julia	Python	Bash	Powershell
C++	Mathematica	MATLAB	Java

Technical Software Experience:

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

Coursework Highlights:

Statistical Mechanics	Polymer Chemistry
Optics and Scattering Theory	Materials Characterization
Parallel Programming (CUDA)	Electrochemical Impedance Spectroscopy
Partial Differential Equations	Advanced Calculus

Primary academic interests:

- infinitesimal calculus
- optimization (mathematical and programmatic)
- soft matter and polymer dynamics
- computational physics

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, performer, Spring 2016
- Kent State Stark Band, Spring 2012-Spring 2014