

MINGNING ZHU

nancyzmn@stanford.edu | (470) 334-2142 | 736 Escondido Rd, Apt #302, Stanford, CA, 94305

EDUCATION

Stanford University **Stanford, CA**
Ph.D., Theoretical Chemistry 2021-Present
Notable Coursework: The Principles of Quantum Mechanics; Statistical Mechanics; Practical Machine Learning; Probabilistic Graphical Model
Teaching: Chemical Principles, Physical Chemistry

Emory University **Atlanta, GA**
Bachelor of Science in Chemistry **May 2021**
Bachelor of Arts in Computer Science **GPA: 3.947/4.000**
Notable Coursework: Physical Chemistry (5 courses including 2 experimental labs, 1 computational lab, and 1 graduate course); Inorganic Chemistry (2 courses including 1 graduate course); Cellular Biochemistry; Machine Learning; Linear Optimization; Data Structure and Algorithms; Numerical Analysis
Teaching: Organic Chemistry Laboratory, Calculus II

RESEARCH EXPERIENCE

Stanford University **Stanford, CA**
Graduate Research Fellow, Department of Chemistry June 2021-Present
Principal Investigator: Prof. Todd Martinez

- Perform Ab initio Multiple Spawning dynamics to study the excited state dynamics of red-fluorescent proteins (RFP), elucidate their quenching pathways and tune their brightness
- Design methods to systematically pick QM regions for accurate reproduction of absorption spectra
- Perform molecular dynamics simulations and QM/MM dynamics to study the ground-state dynamics of RFPs by comparing the geometric and electrostatic features of the systems

Emerson Center for Scientific Computation **Atlanta, GA**
Undergraduate Research Fellow, Department of Chemistry September 2018 - May 2021
Principal Investigator: Prof. James Kindt

- Performed molecular dynamics simulations to study the spontaneous aggregation of long-chain carboxylate surfactants with alkali and organic cations
- Utilized Python to analyze trajectories and developed tools to generate cluster histograms
- Investigated definitions of surfactant clusters with different counterions to accurately predict their micellization properties
- Developed phenomenological models to predict the free energy change and the enthalpy change of surfactant self-assembly and provided physical insights to the predictions
- Identified experimental trends in calculated thermophysical properties, including the critical micelle concentration, degree of counterion binding, the free energy and enthalpy change of micellization
- Attended workshops for preparation in navigating difficult research ethical situations and identifying professional opportunities

Chemical Theory Center, University of Minnesota **Minneapolis, MN**
Summer Research Fellow, Department of Chemistry May 2020 - August 2020
Principal Investigator: Prof. Ilja Siepmann

- Performed molecular dynamics simulations to study the effects of surfactants on cavitation
- Utilized Python to analyze simulation trajectories and calculated thermophysical properties of the systems, including the free energy of nucleation, diffusion coefficients, heat capacity, etc.
- Observed different pressure behavior, lower surface tension, lower nucleation barrier and higher dependence of interfacial tension on curvature down to nanometer scale in cavitating surfactant systems compared to the cavitating neat water systems

Yerkes National Primate Research Center **Atlanta, GA**
Volunteer Summer Research Fellow May 2018 - September 2018
Research Advisor: Prof. Larry Young

- Examined oxytocin signaling in the facilitation of social information processing using rodents
- Developed lab techniques including the extraction and purification of DNA and RNA, PCR and gel electrophoresis
- Maintained, established and transfected neuron and astrocyte cultures with virus

TECHNICAL SKILLS

Programming (proficient) Python, Java; (familiar) C, Bash/Shell, LaTeX
Chemistry Software (proficient) TeraChem, Amber, VMD; (familiar) Gromacs, Lammmps

AWARDS AND HONORS

Undergraduate Award in Physical Chemistry, **Emory University** 2020
Dean's List /Phi Eta Sigma, **Emory University** Fall 2017, Fall 2018, Fall 2019

PRESENTATIONS

Oral Presentations

Mingning Zhu, Jingyi Chen. (2020, 8). Effect of 3-pentanol on the Thermophysical Properties of Bubbly Water Probed by Molecular Simulations. Summer Undergraduate Research Fellowship in Computational and Theoretical Chemistry, Minneapolis, MN.

Mingning Zhu, Xiaokun Zhang. (2019, 11). Predicting Micellization Behavior of Carboxylate Surfactants from Molecular Simulation. Gulf Coast Undergraduate Research Symposium, Houston, TX.

Mingning Zhu, Xiaokun Zhang. (2019, 8). A Micellization Model of Long-chain Carboxylate Surfactants with Alkali and Organic Cations. 2019 Summer Undergraduate Research Experience Symposium, Atlanta, GA.

Poster Presentations

Mingning Zhu, Xiaokun Zhang. (2019, 9). Predicting Micellization Behavior of Carboxylate Surfactants from Molecular Simulation. Herty Medalist Undergraduate Research Symposium, Lawrenceville, GA.

Mingning Zhu, Xiaokun Zhang. (2019, 5). Comparison of Micellization Behavior of Octanoates with Alkali and Organic Cations from Molecular Dynamics Simulation. 2019 Emory Undergraduate Research Symposium, Atlanta, GA.

LEADERSHIP AND COMMUNITY ENGAGEMENT

Chihuo Inc

Main Writer

Atlanta, GA

September 2017 - June 2019

- Wrote reviews on restaurants in Atlanta for 5000 followers of the official account on WeChat
- Served as a liaison between the company's headquarter and the Emory campus to ensure timely workflow of article production

Hungry Emory

Treasurer & Event Planning Head

Atlanta, GA

September 2018- May 2020

- Organized and coordinated cooking events of food from different countries
- Cooperated with other clubs to facilitate cultural communication across campus
- Audited club expenditure and receipts, managed funding and made budgets for club events and team-building activities

Destined for Greatness Outreach Youth Center

Youth Mentor

Atlanta, GA

February 2019- June 2019

- Mentored a child from a single-parent family for 8 hours a month, assisted her schoolwork and counselled for her troubles.
- Participated in monthly volunteer activities, such as the elderly give back, homeless outreach, etc.

ALPHA PHI OMEGA

Project Coordinator & Brother

Atlanta, GA

September 2017-December 2018

- Planned and coordinated around 10 service projects in Atlanta area, including Atlanta Habitat, Children Hospital, etc.
- Volunteered for 20 hours per semester on and off campus

SKILLS AND INTERESTS

Language: English (Fluent), Mandarin (Native), French (Beginner)

Interests: Volleyball, Badminton, Piano, Traveling, Reading