Aakanksha Gubbala

SUMMARY

Ph.D. Candidate in Chemical Engineering. Experienced in analytical modeling and numerical simulations of soft condensed matter systems.

EDUCATION

University of California, Santa Barbara — California, USA
Ph.D., Chemical Engineering — GPA: $4.0/4.0$ — 2022 - Present

Institute of Chemical Technology (ICT), Mumbai — Maharashtra, India
B.S., Chemical Engineering — GPA: $9.56/10$ — 2018 - 2022

RESEARCH

Graduate Researcher | **UC Santa Barbara** - Advisor: Sho C. Takatori — Jan 2023 - Present

- Collaborated with experimentalists to understand phase transitions in biological membranes
- Investigated the role of active flows in the dynamics of membrane domains using analytical theory
- Developed custom numerical implementations to solve continuum field models
- Revealed new coarsening growth laws and relaxation dynamics in active membrane systems

Undergraduate Researcher | **ICT Mumbai** — May 2019 - May 2022

- Conducted molecular dynamics simulations of ternary systems to optimize the recovery of acetic acid using various organic solvents
- Developed methods to calculate solubility and tie-lines from GROMACS output
- Automated the simulation workflow using Python scripts, improving runtime efficiency

PUBLICATIONS

† equal contribution, ∗ corresponding author

2. **Gubbala, A.**†, Arnold, D. P.†, Jena, A., Anujarerat, S., and Takatori, S. C.∗ Dynamic Swarms Regulate the Morphology and Distribution of Soft Membrane Domains. *Phys. Rev. E* (2024). DOI: 10.1103/PhysRevE.110.014410

1. Arnold, D. P.†, **Gubbala, A.**† and Takatori, S. C.∗ Active Surface Flows Accelerate the Coarsening of Lipid Membrane Domains. *Phys. Rev. Lett.* (2023). **[cover article]** DOI: 10.1103/PhysRevLett.131.128402

INDUSTRY

Intern | **Aleph**, Singapore — Jun 2022 - Aug 2022

- Implemented Surrogate-Based Optimization algorithm for chemical process optimization
- Implemented data processing, mapping, and visualization techniques for manufacturing models
- Developed modules to be integrated into the company's software product

Intern | **Jayant Agro**, India — May 2021 - Sep 2021

- Investigated the kinetics of a complex process for the production of a high-value product
- Formulated & tested various non-ideal reactor models to design a specialized reactor
- Conducted optimization exercises to identify the optimal conditions for achieving maximum product yield

CONFERENCES

2. **A. Gubbala**, D.P. Arnold, S.C. Takatori. Dynamic swarms regulate the growth and morphology of membrane domains. APS March Meeting, Minneapolis, MI. (Mar 2024) [Oral]

1. **A. Gubbala**, D.P. Arnold, S.C. Takatori. Dynamic swarms regulate the growth and morphology of membrane domains. SoCal Polymers & Soft Matter Symposium, UCLA, CA. (Jun 2023) [Oral]

AWARDS

Professor R. A. Rajadhyaksha Award in Chemical Reaction Engineering, ICT Mumbai 2022
Endowment for Recognition of Innovative Thinking, Creativity, and Performance, ICT Mumbai 2021

TEACHING & LEADERSHIP

- **Teaching Assistant**, Computational Methods (ChE 132B) | UC Santa Barbara Fall 2023
  - Conducted recitation sessions for ~ 50 undergraduate students, instructing them on coding numerical algorithms
  - Collaborated in creating recitation assignments and developing solutions for weekly assignments
  - Held office hours to provide additional support to students
- **DEI Representative**, ChE Graduate Student Association | UC Santa Barbara 2023 - 2024
  - Organized a diversity panel representing various campus groups to support department recruitment of diverse students as part of DEI initiatives

SKILLS

- **Programming:** Python, C++, Matlab/Octave
- **Computational:** Spectral methods, Finite element methods, Machine learning (NumPy, Pandas, Scikit-learn)
- **Simulations:** CUDA, GROMACS
- **Relevant coursework:** Statistical mechanics, Complex analysis & asymptotics, Matrix & spectral theory, Level set methods
- **Other:** Git, Linux, CMake, Inkscape, LaTeX

SOFTWARE & TOOLS

- STHE | Web application for designing shell-and-tube heat exchangers 2021
  - Developed using Python and Streamlit
  - Implemented a discrete optimization algorithm for heat exchanger design
- VLE | Web application for vapor-liquid equilibrium calculations 2020
  - Scraped equilibrium data from Dortmund Data Bank for 30 important compounds
  - Created for pedagogical purposes to demonstrate the use of correlation models in phase equilibrium calculations