Audrey Shih

Stanford, CA | ashih@stanford.edu | audrey-shih.github.io | www.linkedin.com/in/audrey-shih

EDUCATION

Stanford University — **Stanford, CA**
Ph.D., Chemical Engineering, GPA 3.95 — Expected June 2025
M.S., Chemical Engineering — 2020-2023

Princeton University — **Princeton, NJ**
B.S.E., Chemical and Biological Engineering, *cum laude* — 2016 – 2020
Minor in Materials Science and Engineering

RESEARCH EXPERIENCE

Stanford University, Stanford, CA — 2021 - Present
Doctoral Researcher | Gerald G. Fuller

- Developed a portable magnetic stress rheometer for hospital use, reducing device costs from ~$50k to $160 and enabling predictions of flow during abscess drainage procedures, allowing customized treatment plans
- Engineered 3D bioprinting systems for rheological analysis, elucidating crosslinking kinetics and optimizing mechanical properties in biomanufactured complex biological tissue structures
- Instructed and mentored undergrad/grad students in *Mechanics of Soft Matter: Rheology (CHEMENG 470)*
- Managed lab safety as the designated lab safety officer, attending quarterly meetings with Environmental Health and Safety (EH&S), performing quarterly inspections, and updating annual lab inventory

Stanford University, Stanford, CA — 2021
Doctoral Researcher | Joseph M. DeSimone

- Developed and optimized high-resolution 3D Continuous Liquid Interface Production (CLIP) printing through experiments and simulations of optics and photopolymerization transport/kinetics, enhancing precision in additive manufacturing

Princeton University, Princeton, NJ — 2018 – 2020
Undergraduate Researcher | Sujit S. Datta

- Investigated elastic instabilities in polymer flow through stereolithographic model porous media
- Featured in ACEE's first ever spotlight article on undergraduate contributions to environmental studies
- Thesis featured in profile article by the School of Engineering and Applied Science

Princeton University, Princeton, NJ — 2017 – 2018
Undergraduate Researcher | Celeste M. Nelson

- Analyzed role of tissue mechanics in epithelial-mesenchymal transition (EMT) using immunostaining

SKILLS

Technical/Laboratory: CAD; 3D printing; laser cutting; hardware/embedded systems (PCB assembly, Raspberry Pi); SEM; PCR; tissue/cell culture; immunostaining; confocal microscopy imaging
Software: programming in JAVA, MATLAB, Python; ImageJ; TRIOS; PIV; Adobe Illustrator/Photoshop; LaTeX

PUBLICATIONS AND PATENTS

- **Shih, A.**, Chung, S. J., Shende, O. B., Herwald, S. E., Vezeridis, A. M., Fuller, G. G., Viscoelastic measurements of abscess fluids using a magnetic stress rheometer. *Physics of Fluids* (in review).
- Cai, P. C., Braunreuther, M., **Shih, A.**, Spakowitz, A. J., Fuller, G. G., Heilshorn, S. C., Air-liquid intestinal cell culture allows *in situ* rheological characterization of intestinal mucus. *APL Bioengineering* (2024).
- DeSimone, J. M., Jacobson, G. B., Dulay, M. T., Lee, B. J., Hsiao, K., Rajesh, N., Driskill, M. M., **Shih, A.**, et. al., *Polymeric microstructures and systems and methods for making same.* Patent number WO2023049267A1.
- Hsiao, K., Lee, B. J., Samuelsen, T., Lipkowitz, G., Kronenfeld, J. M., Ilyn, D., **Shih, A.**, et al., Single-digit-micrometer-resolution continuous liquid interface production. *Science Advances* (2022).
- Browne, C. A., **Shih, A.**, Datta, S. S., Bistability in the Unstable Flow of Polymer Solutions in Porous Media. *Journal of Fluid Mechanics* (2020).
- Browne, C. A., **Shih, A.**, Datta, S. S., Pore-Scale Flow Characterization of Polymer Solutions in Microfluidic Porous Media. *Small* (2019).

SELECTED AWARDS

2023	Chemical Engineering Department Service Leadership Award
2021	Judges' Vote and Audience Choice poster awards, Stanford MIPS Retreat, Stanford, CA
2020	National Science Foundation (NSF) Graduate Research Fellowship
2020	Lore von Jaskowsky Memorial Prize, Princeton School of Engineering and Applied Sciences
2020	Materials Science and Engineering Department Outstanding Senior Thesis Award
2020	Sigma Xi Scientific Research Honor Society Nominee
2019	PSEG Best Poster Award, ACEE Annual Meeting, Princeton, NJ

CONFERENCE PRESENTATIONS

- **Shih, A.**, Chung, S. J., Shende, O. B., Herwald, S. E., Vezeridis, A. M., Fuller, G. G., *Viscoelastic measurements of abscess fluids using a magnetic stress rheometer*. American Society of Chemical Engineers Annual Meeting (AIChE 2024), San Diego, CA, Oct. 2024. (upcoming)
- **Shih, A.**, Chung, S. J., Shende, O. B., Herwald, S. E., Vezeridis, A. M., Fuller, G. G., *Viscoelastic measurements of abscess fluids using a magnetic stress rheometer*. NETZSCH Introduction to Rheology and Thermal Analysis Workshop, Palo Alto, CA, Oct. 2024.
- **Shih, A.**, Chung, S. J., Herwald, S. E., Vezeridis, A. M., Fuller, G. G., *Magnetic stress rheometer for biological fluid characterization*. American Society of Chemical Engineers Annual Meeting (AIChE 2023), Orlando, Fl, Nov. 2023.
- **Shih, A.**, Chung, S. J., Herwald, S. E., Vezeridis, A. M., Fuller, G. G., *Magnetic stress rheometer for biological fluid characterization*. XIXth International Congress on Rheology (ICR2023), Athens, Greece, Aug. 2023.
- **Shih, A.**, Chung, S. J., Herwald, S. E., Vezeridis, A. M., Fuller, G. G., *Magnetic stress rheometer for abscess fluid characterization*. Society of Rheology Annual Meeting (SOR2022), Chicago, IL, Oct. 2022.

LEADERSHIP & MENTORSHIP EXPERIENCE

Stanford University, Stanford, CA 2021 - Present

Community Associate | Graduate Life Office

- Coordinated 12 events annually to foster community among graduate student body, managing a $3,600 budget for diverse and inclusive programs, including welcome, orientation, and multicultural initiatives
- Advised graduate residents on available support services and resources, serving as point of contact for guidance on personal and professional development

Private tutoring and teaching 2018 - present

STEM Tutor and Clarinet Instructor | Self-Employed

- Taught math and chemistry to high school students, and beginner clarinet lessons to individuals of all ages

Stanford University, Stanford, CA 2022 - 2023

Social Events Chair | Chemical Engineering Graduate Student Action Committee

- Served as liaison between ChemE student community and administration
- Spearheaded multi-departmental events to expand the department's community, promoting social and collaborative connections across various department programs

Stanford University, Stanford, CA 2022 - 2023

First-Year Mentor | Department of Chemical Engineering

- Guided first-year students in selecting labs, managing classes, and adjusting to graduate school, sharing resources and support through three meetings per quarter to ease their transition

PROFESSIONAL AFFILIATIONS

Society of Rheology, American Institute of Chemical Engineers