

# Audrey Shih

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## EDUCATION

### Stanford University

Ph.D., Chemical Engineering, GPA 3.95

M.S., Chemical Engineering

Stanford, CA

Expected June 2025

2020-2023

### Princeton University

B.S.E., Chemical and Biological Engineering, *cum laude*

Minor, Materials Science and Engineering

Princeton, NJ

2016 – 2020

## EXPERIENCE

### Stanford University, Stanford, CA

2021 - Present

Doctoral Researcher | PI: 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 | PI: 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 | PI: Sujit S. Datta

- Investigated elastic turbulence in polymer flow using 3D-printed microfluidic model porous channels
- 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 | PI: 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 & 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

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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

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- **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.
- **Shih, A.**, Chung, S. J., Shende, O. B., Herwald, S. E., Vezeridis, A. M., Fuller, G. G., *Rheological Characterization of Biological Fluids*. 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

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**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 support services and professional development, utilizing annual training on suicide prevention, servant leadership, bias intervention, and sexual harassment prevention

**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 preparing for qualification exams, sharing resources and support through three meetings per quarter

**Stanford Splash**, Stanford, CA 2023

Teacher Volunteer

- Taught hands-on workshop on polymer crosslinking to middle- and high-school students in two classes

## PROFESSIONAL AFFILIATIONS

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Society of Rheology, American Institute of Chemical Engineers