Aditya Shah

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Education

Stanford University **Stanford, CA**
Ph.D., M.S., Chemical Engineering 2022 – Present
Advisor: Jian Qin

The University of Texas at Austin **Austin, TX**
B.S., Chemical Engineering, GPA: 3.964/4.000 2018 – 2022
Engineering Honors Program, Elements of Computing Certificate

Awards and honors

Chevron Fellowship in Energy 2025
Centennial Teaching Assistant Award (university-wide) 2025
Stanford Community Impact Award (university-wide) 2025
Stanford Bio-X Travel Award 2025
Outstanding Teaching Assistant Award (department-wide) 2024
NSF Graduate Research Fellowship 2022
Stanford Graduate Fellowship (Gerhard Casper Fellow) 2022
Future Leaders in Chemical Engineering Symposium Award Winner 2021
Virginia & Ernest Cockrell, Jr. Scholarship (covered tuition at UT Austin) 2018
Chevron REACH Scholarship 2018
Chevron Federal Credit Union's David P. Smay Scholarship 2018

Experience

Stanford University, Graduate Student Researcher in the Qin Lab April 2023 – Present

- Collaborate with experimental research teams across multiple departments to design and validate experiments while connecting computational predictions to real-world evidence.
- Develop interfacial molecular dynamics simulations to characterize behavior of asymmetric solvent molecules near electrode, which enable battery electrolytes with up to 480% higher exchange current densities.
- Formulate novel dipolar field theories quantifying ion-electrode charge transfer, establishing an analytical framework that streamlines complex interfacial redox kinetics modeling.
- Apply non-equilibrium statistical mechanics to study ion correlation and rotational diffusion in high concentration battery electrolytes, enhancing fundamental understanding of ion transport mechanisms.
- Implement advanced sampling techniques (e.g., metadynamics) to investigate temperature dependence of ion pair and triplet formation in electrolytes, enabling better battery performance at extreme temperatures.

Texas Instruments, Process Engineering Intern May 2021 – August 2021

- Optimized semiconductor manufacturing processes through experiments and data analysis, increasing fab throughput by 2000 wafers/day while reducing equipment downtime and costs by 32% for non-metal furnaces.

Publications

†denotes equal contribution; *denotes corresponding author(s); full list on Google Scholar.

3. **Aditya Shah**†, Il Rok Choi†, Sanzeeda Baig Shuchi, Taejoon Heo, Jane K. J. Lee, Jun Ho Lee, Jacob Florian, Elizabeth Zhang, John Holoubek, Hao Lyu, Sang Cheol Kim, Junyoung Lee, Yi Cui*, Jian Qin*, and Zhenan Bao*. "Solvent molecular asymmetry and rotational inertia modulate interfacial redox kinetics in Li-metal batteries" *In preparation.*
2. Sang Cheol Kim†, Jou-An Pan†, **Aditya Shah**, Yuelang Chen, Hyunchang Park, Yufei Yang, Wenbo Zhang, Louisa C. Greenburg, Tomi Sogade, Alex Chen, Jian Qin*, Zhenan Bao*, and Yi Cui*. "Correlating Solvation Free Energy to Electrolyte Properties for Lithium Metal Batteries." ***Nano Letters*** (2025). [doi]
1. Il Rok Choi, Yuelang Chen, **Aditya Shah**, Jacob Florian, Chad Serrao, John Holoubek, Hao Lyu, Elizabeth Zhang, Jun Ho Lee, Yangju Lin, Sang Cheol Kim, Hyunchang Park, Pu Zhang, Junyoung Lee, Jian Qin*, Yi Cui*, and Zhenan Bao*. "Asymmetric ether solvents for high-rate lithium metal batteries." ***Nature Energy*** (2025). [doi]

Presentations

3. APS Global Summit; Anaheim, CA (oral) 2025
2. Future Leaders in Chemical Engineering; North Carolina State University; Raleigh, NC (poster) 2021
1. Undergraduate Research Symposium; University of Texas at Austin; Austin, TX (poster) 2021

Teaching

Stanford University, Graduate Teaching Assistant

- Statistical and Multi-Component Thermodynamics (CHEMENG 110B, undergraduate; Winter 2024) [evals]

  "I think what made Adi's teaching most effective was his approachability. I never felt like any question I had was "dumb" and his rapport with the students was fundamental to the healthy learning environment."

  "Aditya explains from the ground up! He doesn't assume you know the basics and goes to them if needed. He has a serene tone that facilitates understanding."

- Molecular Thermodynamics (CHEMENG 340, graduate; Fall 2024) [evals]

  "Aditya was an incredible TA that performed on a level that all other TAs should aspire to. More than that, he is an incredibly caring and empathetic person, who was sensitive to the stressors of being a grad student or just being a person dealing with hard times. I am so grateful to have had him as my TA!"

  "Aditya is one of the most helpful, knowledgeable, and thoughtful teaching assistants I have ever had."

- Awards: Centennial TA Award (university-wide, 2025); Outstanding TA Award (department-wide, 2024)

The University of Texas at Austin, Undergraduate Teaching Assistant/Tutor

- Material and Energy Balances (CHE 317, undergraduate; Fall 2019 and Spring 2020)
- Materials Science (CHE 350; undergraduate, Fall 2020)
- Transport Phenomena (CHE 319, undergraduate; Fall 2021 and Spring 2022)

Mentoring

Elizabeth Hinks (Ph.D. student in Chemical Engineering at Stanford) 2024 – Present
James Han (undergraduate student in Chemical Engineering at Stanford) 2024 – Present

Service

Stanford Chemical Engineering Summer REU, *Program Coordinator*	2024
Stanford Chemical Engineering Graduate Student Action Committee, *Treasurer*	2023 – 2024
Stanford Chemical Engineering Recruiting, *Recruitment Buddy, Panelist*	2023 – 2025
ATX Science Olympiad, *Advisor, Director*	2018 – 2022
Cockrell School Cares, *Publicity Subcommittee*	2019 – 2022
UT Austin AIChE, *Freshman Rep., Treasurer, Student Development Chair*	2018 – 2020

Outreach and volunteering

Written and supervised 34 exams for 28 Science Olympiad tournaments	2018 – Present
Science Olympiad, *National Earth and Space Science Committee Member*	2018 – Present
Science Olympiad, *National Event Supervisor*	2021 – Present
Palo Alto High School Science Olympiad, *Advisor*	2023 – Present
Stanford Research Conference, *Volunteer Judge*	2025
RAINN, *National Sexual Assault Hotline Operator*	2023
Texas Exes, *Scholarship Reviewer*	2023