

Anni SHI

Ph. D in Chemistry

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Education and Training

2025 - present	Postdoctoral Associate, University of California, Berkeley Advisor: Prof. Markita del Carpio Landry
2022 – 2025	Postdoctoral Associate, University of Colorado, Boulder Advisor: Prof. Daniel K. Schwartz
2022	PhD in Chemistry, Purdue University Advisor: Prof. Shelley A. Claridge
2017	B.S. in Chemistry with highest honor, Wuhan University

Research

- University of California, Berkeley
- Subcellular-resolution imaging of oxytocin efflux and extracellular dynamics
 - Single neuron imaging with two-dimensional sensor platform
- University of Colorado, Boulder
- Colloid transport and dynamics in 3D porous nanostructures
 - Ion dynamics in ion exchange membrane
- Purdue University
- **Interfacial polymerization and crosslinking kinetics of diacetylenes in lipid monolayers. (Thesis)**
 - Self-assembly of semiconductor nanocrystals on sub-10-nm chemical patterns.
 - Peptides crystallization on phospholipid-functionalized elastomers.

Teaching

- Purdue University
- Teaching Assistant, *Spectrochemical Instrumentation* (Graduate)
 - Teaching Assistant, *General Chemistry* (Undergraduate)

Awards and Organizations

2024	ACS Colloid and Surface Science Division Travel Award
2023	GRC/GRS Conference Fellowship
2017 - 2018	Ross Fellowship, Purdue University
2017	Chemistry Graduates with Highest Honor, Wuhan University
2013 - 2016	Blue Moon Enterprise Scholarship, Wuhan University

Scientific Contributions

Selected peer-reviewed articles

Anni Shi, Siamak Mirfendereski, Ankur Gupta, and Daniel K. Schwartz, "Electrokinetic Nanoparticle Transport in an Interconnected Porous Environment: Decoupling Cavity Escape and Directional Bias", *in revision with PNAS*

Ian Wyllie, Mohammad A Afzal, **Anni Shi**, Andrew L Zydney, Daniel K Schwartz, "single particle tracking reveals through-membrane diffusion of bacteriophage during process disruption of virus filtration", *J. Membr. Sci.*, 2024

Anni Shi, Daniel K. Schwartz, "Bridging Macroscopic Diffusion and Microscopic Cavity Escape of Brownian and Active Particles in Irregular Porous Networks." *ACS Nano*, 2024.

Anni Shi, Haichao Wu, Daniel K. Schwartz, "Nanomotor-enhanced transport of passive Brownian particles in porous media." *Sci. Adv.*, 2023

Laura O. Williams, Emmanuel K. Nava, **Anni Shi**, Tyler J. Roberts, Chelsea S. Davis, Shelley A. Claridge, "Designed Interfacial Reactions for Nanometer-Scale Surface Patterning of PDMS with Controlled Elastic Modulus." *ACS Appl. Mater. Interfaces*, 2023

Anamika Singh, **Anni Shi**, Shelley Claridge, "Nanometer-Scale Patterning of Hard and Soft Interfaces", *Chem. Comm.*, 2022

Juan Arango, Laura Williams, **Anni Shi**, Anamika Singh, Emmanuel Nava, Racheal Fisher, Joseph Garfield, Shelley Claridge, "Nanostructured Surface Functionalization of Polyacrylamide Hydrogels Below the Length Scale of Hydrogel Heterogeneity", *ACS Appl. Mater. Interfaces*, 2022

Anni Shi, Anamika Singh, Juan C. Arango, and Shelley A. Claridge, "Nanometer-Scale Precision Polymer Patterning of PDMS: Multiscale Insights into Patterning Efficiency Using Alkyldiynamines", *ACS Appl. Mater. Interfaces*, 2022

Anni Shi, Shelley A. Claridge, "Lipids: An Atomic Toolkit for the Endless Frontier", *ACS Nano*, 2021

Anni Shi, Terry Villarreal, Tyler R. Hayes, Tyson C. Davis, Jacob T. Brooks, Anamika Singh, Shelley A. Claridge, "Plenty of Room at the Top: A Multi-Scale Understanding of nm Resolution Polymer Patterning on 2D Materials", *Angew. Chem. Int. Ed.*, 2021

Tyson C Davis*, Jeremiah O Bechtold, **Anni Shi**, Erin N Lang, Anamika Singh, Shelley A Claridge, 'One Nanometer Wide Functional Patterns with a Sub-10 Nanometer Pitch Transferred to an Amorphous Elastomeric Material', *ACS Nano*, 2021.

Presentations

Oral Presentation

Iota Sigma Pi | Chicago Chapter (**Invited**)

- *Seeing the Unseen at Interfaces: Super-Resolution Imaging of Interfacial Dynamics and Reactivity*

AICHE Fall 2024

- *Electrokinetic Transport Dynamics of Nanoparticles in 3D Ordered Porous Media*

- *Plenty of Room at the Interface: Multi-Scale Insights into Nm-Resolution Polymer Pattern Chemistries*

- *Nanomotor-Enhanced Diffusion Transport in Porous Media*

- *Exploration of Irregular Porous Networks By Active and Passive Nanoparticles*

ACS Fall 2024

- *Electrokinetic transport dynamics of nanoparticles in 3D confined ordered porous media*

ACS Spring 2024

- *Dynamics of active nanoparticles in 3D heterogeneous porous media*

Fall 2023 ChBE Postdoc Seminar Series at CU Boulder (**Invited**)

- *Plenty of Room at the Interface: Exploring the Potentials of Micro and Nanostructured Interfaces*

97 the ACS Colloid and Surface Science Symposium Presentation

- *Nanomotor-Enhanced Transport of Passive Brownian Particles under Confinement*

Double Helix Optics Inc. Technical Presentation (**Invited**)

- *Probing Confined Diffusion and Interaction with Single-particle 3D Tracking*

Procter & Gamble Co. Spring 2021 Graduate Research Virtual Symposium

- *Design Principle for on-surface topochemical polymerization*

ACS Fall 2021

- *Polymerization efficiency of striped phase monolayers on 2D materials*

Service

2023 – 2024

Vice president, Postdoctoral Associate of Colorado Boulder

2021 – 2022

Co-chair, Student-Invited Materials Chemistry Seminars at Purdue

2021 – 2022

Vice present, Advanced Degree Consulting Club at Purdue