

# YUEXIAO SHEN

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## PROFESSIONAL APPOINTMENTS

**Texas Tech University, Civil, Environmental and Construction Engineering**

Assistant Professor

Sept. 2019-present

## EDUCATION AND RESEARCH EXPERIENCE

**University of California, Berkeley, Chemistry, Postdoc.**

2017-2019

Optimization of artificial photosynthesis using light harvesting semiconductor materials and bacteria ([CUBES](#))  
Symbiotic coculturing system performing both carbon and nitrogen fixations  
Research supervisor: Dr. Peidong Yang

**The Pennsylvania State University, Chemical Engineering, Postdoc.**

2016-2017

Characterization of polymeric membrane materials using electron tomography  
Research supervisor: Dr. Enrique Gomez and Dr. Manish Kumar

**The Pennsylvania State University, Chemical Engineering, Ph.D.**

2011-2016

Development of artificial water channel based-membranes for desalination and other environmental applications.  
Aquaporin-based supported biomimetic desalination membranes  
Research supervisor: Dr. Manish Kumar

**Tsinghua University, Environmental Engineering, Master of Science**

2009-2011

Physiochemical and biological properties of mixed liquor in full-scale membrane bioreactors  
Research supervisor: Dr. Xia Huang

**Tsinghua University, Water Supply and Sewer System Engineering, Bachelor of Science**

2005- 2009

Fouling in a membrane bioreactor coupled with anaerobic-anoxic-oxic process for coke wastewater treatment.  
Research supervisor: Dr. Xia Huang

## FUNDED, CURRENT, & PENDING SUPPORT

- Enhancing bioremediation of groundwater co-contaminated by chlorinated volatile organic compounds and 1,4-dioxane using novel macrocyclic materials, PI, NIH, R01 ES032692-01, 01/01/2021-12/31/2025, \$1,351,855
- Develop Synergetic Novel Macrocyclic-based Sorbents with Thermal Destruction for Enhanced Per- and Polyfluoroalkyl Substances (PFAS) Removal in Groundwater and Drinking Water Treatment, PI, DoD SERDP, ER21-C1-1256, 08/19/2022-08/18/2025, \$1,150,758
- Strategic Management and Resource Recovery Transformation (SMAR2T): Recovery of Water and Elements of Interest from Produced Water Using Intensified Membrane Distillation and Metal Extraction, Co-PI, DoE, 01/01/2025-12/31/2027, \$1,499,993
- Developing a Regional Evaluation and Assessment of critical Minerals – Gulf Coast and Permian Basin (DREAM-GCPB), DoE, Co-PI, \$3,300,000
- Bio-Inspired and Biocatalytic Degradation of “Forever Chemicals”, investigator, \$393,638, subcontracted from Geosyntec Consultants leading NSF Convergence Accelerator’s 2025 Cohort Phase 2 Award \$4,981,076
- Diversity Supplement (PA-21-071) of R01 ES032692-01, PI, NIH, 01/11/2022-10/31/2023, \$39,261
- Intensified Membrane Distillation Crystallization-Nanofiltration (iMDC-NF) for Direct Lithium Extraction by DOE, Geothermal Lithium Extraction Prize first phase winner. Co-PI, 12/01/2021-04/07/2022

## AWARDS & HONORS

- One of the recipients of the 2025 40 Under 40 Recognition Program by the American Academy of Environmental Engineers and Scientists (AAEES). ([link](#))
- Whitacre Engineering Research Award. Texas Tech, 2024
- One of the best reviewers of Frontiers of Environmental Science & Engineering in 2022
- Geothermal Lithium Extraction Prize first phase winner, 2021

## REPRESENTATIVE PUBLICATIONS ([Google Scholars](#))

- Li, D., Liu, W., Wang, X., Lin, W., Zhai, J., Fan, H., Xiao, K., Wang, K., Li, Y., Jin, Y., Fang, J., **Shen, Y.\***, Elimelech, M. & Huang, X. Nodular networks in hydrated polyamide desalination membranes enhance water transport. *Science Advances*. **11**,

- eadt3324 (2025). ([link](#))
- Li, D., Zhai, J., Wang, K., **Shen, Y.\*** & Huang, X. 3-Dimensional Reconstruction-Characterizations of Polymeric Membranes: A Review. *Environ. Sci. Technol.* **59**, 2891–2916, (2025). ([link](#))
  - Zhai, J., Balogun, A., Bhattacharjee, S., Vogler, R. J., Khare, R., Malmali, M., Deonaraine, A. & **Shen, Y.\*** Nanofiltration as pretreatment for lithium recovery from salt lake brine. *Journal of Membrane Science* **710**, 123150, (2024). ([link](#))
  - Abaie, E., Kumar, M., Garza-Rubalcava, U., Rao, B., Sun, Y., **Shen, Y.\*** & Reible, D. Chlorinated volatile organic compounds (CVOCs) and 1,4-dioxane kinetics and equilibrium adsorption studies on selective macrocyclic adsorbents. *Environmental Advances* **16**, 100520, (2024). ([link](#))
  - Shen, Y.\*** Beating natural proteins at filtering water. *Science* **376**, 698-699, (2022). ([link](#))

## PATENTS

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- Thin-film composite membrane and methods of making and using the same, U.S. Serial No. 62/739,912
- Method for biological or biomimetic channel-based membrane fabrications using layer-by-layer structure, U.S. Serial No. 16/414,330

## TEACHING AND MENTORSHIP ACTIVITIES

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- Instructor of CE 3303, Fluid Mechanics, Spring and Fall, 2023,
- Instructor of CE 3171, Environmental Engineering Lab, Fall 2022, Fall 2024, Spring 2025
- Instructor of CE 5331, Advanced Work in Specific Fields: Advanced Membrane Separation Lab Course, Fall 2021
- Instructor of ENVE 4107/5107, Advanced Physical and Chemical Wastewater Treatment Lab, Fall 2020
- Instructor of ENVE 5303, Design of Air Pollution Control Systems, Spring 2020, 2021, 2022, 2024, 2025
- Instructor of CE 3309, Introduction to Environmental Engineering, Fall 2019

## PROFESSIONAL MEMBERSHIPS, SERVICE AND ACTIVITIES

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- Communication Committee in Department of Civil, Environmental and Construction Engineering, Texas Tech
- Faculty search committee of assistant professor of bio-based products manufacturing in Department of Plant and Soil Science, 2025
- Co-chair of North American Membrane Society Annual Conference Poster session, 2019-2024
- Co-chair of North American Membrane Society Annual Conference Bioinspired and Biomimetic Membranes, 2020-2023
- Youth Editorial Board, Frontiers of Environmental Science & Engineering, 2021-present
- Reviewer of DOE BES and SBIR

## JOURNAL REVIEW

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- AIChE Journal*
- Appl. Microbiol. Biotechnol.*
- Chem*
- Chem. Commun.*
- Chemical Engineering Journal*
- Environ. Sci. Technol.*
- Environ. Sci. Technol. Engineering*
- Environ. Sci. Technol. Water*
- Front. Environ. Sci. Eng.*
- J. Am. Chem. Soc.*
- J. Hazard. Mater.*
- J. Membr. Sci.*
- Membranes*
- Nature Communications*
- npj Clean Water*
- PNAS*
- Science*
- Sci. Adv.*
- Sci. Total Environ.*
- Sep. Purif. Technol.*
- Water Environ. Res.*
- Water Res.*