

William A. Tarpeh

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ACADEMIC APPOINTMENTS

- 9/2018- **Assistant Professor**, Department of Chemical Engineering, Stanford University
Assistant Professor, by courtesy, Department of Civil & Environmental Engineering
Center Fellow, by courtesy, Woods Institute for the Environment
- 2017-2018 **Postdoctoral Research Fellow**, University of Michigan, Ann Arbor, MI
Department of Civil & Environmental Engineering

EDUCATION

- 2017 **Ph.D.** **University of California at Berkeley**, Berkeley, CA
Environmental Engineering; Designated Emphasis in Development Engineering
- 2013 **M.S.** **University of California at Berkeley**, Berkeley, CA
Environmental Engineering
- 2012 **B.S.** **Stanford University**, Stanford, CA
Chemical Engineering with Distinction, African Studies Minor

HONORS AND AWARDS

Research

- 2024 NSF CAREER Award
- 2024 Scialog Fellow, Sustainable Minerals, Metals, and Materials
- 2023 Paul L. Busch Award, Water Research Foundation
- 2023 AIChE 35 Under 35 Award: Energy & Environment Category
- 2023 AIChE Environmental Division Early Career Award
- 2023 Mellichamp Lecture, Georgia Institute of Technology Chemical Engineering
- 2022 Rich Earth Institute Golden Funnel Award
- 2023 *ACS ES&T Engineering* Excellence in Review
- 2022 Camille Dreyfus Teacher-Scholar Award
- 2022 Electrochemical Society/Toyota Research Institute Young Investigator Fellowship
- 2022 3M Non-Tenured Faculty Award
- 2022 Scialog Fellow, Negative Emissions Science
- 2019 *Chemical & Engineering News* Talented 12
- 2019 *Forbes* 30 Under 30: Science Category
- 2019 *The Root's* List of 100 Influential African-Americans
- 2019 Hellman Faculty Fellow
- 2019 Early Career Scientist, *Environmental Science & Technology/ES&T Letters*
- 2019 Early-Career Research Fellowship, National Academies Gulf Research Program
- 2019 *Environmental Science & Technology* Excellence in Review
- 2014 Harvey Fellow, Mustard Seed Foundation
- 2012 National Science Foundation Graduate Research Fellowship
- 2012 Ford Foundation Pre-Doctoral Fellowship
- 2012 UC Berkeley Chancellor's Fellowship (Top 4% of admitted PhD students)
- 2012 Jack Kent Cooke Foundation Graduate Scholar

Teaching

- 2021 St. Clair Drake Award for Undergraduate Teaching
- 2021 Tau Beta Pi Engineering Teaching Honor Roll
- 2018 Center for Teaching and Learning Teaching Advancement Grant

Mentoring and Outreach

- 2020 Matthew J. Quinn Prize, Jack Kent Cooke Foundation
- 2020 Stanford Faculty Entrepreneurship Leadership Program
- 2018 Bouchet Honor Society, University of Michigan
- 2017 Professorial Advancement Initiative, Big Ten Alliance
- 2016 Featured in NBCBLK "28 under 28" for African-American innovators

Editorial Activities

Topic Editor	<i>Environmental Science & Technology Letters</i>	2023- present
Associate Editor	<i>Resources, Conservation, & Recycling</i>	2021-2022
Early Career Advisory Board	<i>Environmental Science & Technology</i>	2020-present
Early Career Editorial Board	<i>ACS ES&T Engineering</i>	2020-present
Editor, Virtual Issue for <i>Environmental Science & Technology/ACS Sensors</i> : Taking Earth's Pulse with Low-Cost Sensors		

PUBLICATIONS

Peer-Reviewed Publications (underline= PhD student, italics= postdoc, ^U=undergraduate author; #=equal contribution; *=corresponding author)

Independent Group

1. N Sharma, E Apraku, M Gong, **WA Tarpeh***. Integrating Adsorbents and Electrochemistry to Advance Selective Wastewater Phosphate Separations. *Current Opinion in Chemical Engineering*.
2. KN Abels, AB Botelho Junior, X Chen, **WA Tarpeh***. Ligand content and driving force effects on ion-ion permselectivity in ligand-functionalized membranes. *Journal of Membrane Science*. ([link](#))
3. E Apraku[#], M Farmer[#], C Lavallis, DA Soriano^U, J Notestein, K Tyo, J Dunn, **WA Tarpeh***, G Wells*. Towards a Circular Nitrogen Bioeconomy: Integrating Nitrogen Bioconcentration, Separations, and High-Value Products for Nitrogen Recovery. *Current Opinion in Biotechnology*. ([link](#))
4. LM Mendoza Grijalva, A Seck, L Roldán-Hernandez, KE Graham, AB Boehm, **WA Tarpeh***. Persistence of respiratory, enteric, and fecal indicator viruses in fecal sludge from on-site sanitation in Dakar, Senegal. *Journal of Water, Sanitation, and Hygiene for Development*. ([link](#))
5. J Guo, MJ Liu, CM Laguna^U, DM Miller, KS Williams, BD Clark, CM Muñoz^U, SJ Blair, A Nielander, TF Jaramillo, **WA Tarpeh***. Electrodialysis and nitrate reduction to enable distributed ammonia manufacturing from wastewaters. *Energy & Environmental Science*. ([link](#))
6. E Apraku, CM Laguna^U, RM Wood^U, N Sharma, H Dong, **WA Tarpeh*** (2024). Enhancing resource recovery through electro-assisted regeneration of an ammonia-selective cation exchange resin. *ACS ES&T Water*. ([link](#))
7. A Kogler, M Gong, KS Williams, **WA Tarpeh*** (2024). Flexible electrochemical stripping for wastewater ammonia recovery with on-demand product tunability. *Environmental Science & Technology Letters*. ([link](#))
8. DM Miller, MJ Liu, KN Abels, KS Williams, A Kogler, **WA Tarpeh*** (2024). Engineering a molecular electrocatalytic system for energy-efficient ammonia production from wastewater nitrate. *Energy & Environmental Science*. ([link](#))
9. W Lee, S Choung, S Kim, J Hong, D Kim, **WA Tarpeh**, JW Han, K Cho* (2024). Atomically Dispersed Ru-doped Ti₄O₇ Electrocatalysts for Chlorine Evolution Reaction with a Universal Activity. *Small*. ([link](#))
10. ER Corson, J Guo, **WA Tarpeh*** (2024). ATR-SEIRAS Method to Measure Interfacial pH during Electrocatalytic Nitrate Reduction on Cu. *Journal of the Electrochemical Society* ([link](#))
11. BD Clark, N Sharma, EA Apraku, H Dong, **WA Tarpeh*** (2024). Ligand Exchange Adsorbents for Selective Phosphate and Total Ammonia Nitrogen Recovery from Wastewaters. *Accounts of Materials Research*. ([link](#))
12. X Shao, Y Huang, RM Wood^U, **WA Tarpeh*** (2024). Electrochemical sulfate production from sulfide-containing wastewaters and integration with electrochemical nitrogen recovery. *Journal of Hazardous Materials*. ([link](#))
13. A Kogler, N Sharma, D Tiburcio^U, M Gong, DM Miller, KS Williams, X Chen, **WA Tarpeh*** (2024). Long-term robustness and failure mechanisms of electrochemical stripping for wastewater ammonia recovery. *ACS Environmental Au. Editor's Choice; Rising Environmental Stars Special Issue*. ([link](#))
14. M Farmer, R Rajasabhai, **WA Tarpeh**, KEJ Tyo, GF Wells* (2023). Meta-omic profiling reveals ubiquity of genes encoding for the nitrogen-rich biopolymer cyanophycin in activated sludge microbiomes. *Frontiers in Microbiology*.. ([link](#))
15. T Autrey, SR Bare, EJ Biddinger, S Boettcher, PF Britt, RC Brown, RM Bullock, JG Chen, C Daniel, M Delferro, PK Dorhout, KJ Gaffney, L Gagliardi, AS Harper, DJ Heldebrant, MK Kidder, OR Luca, M Lyubovsky, J Male, D Miller, JR Morris, T Prozorov, R Rallo, RM Rioux, AD Sadow, JA Schaidle, LA Schulte, SD Senanayake, WJ Shaw, DS Sholl, **WA Tarpeh**, F Toma, DF Vlachos, VD Vogt, JY Yang, E Arenholz, Ba Helms, W Huang, JL Jordahl, C Karakya, K Kian, J Kothandaraman, J Lercher, P Liu, D Maholtra, KT Mueller, CP O'Brien, RM Paloomino, L Qui, JA Rodriguez, R Rousseau, JC Russell, ML Sarazen, EA Smith, MB Stevens, Y Surendranath, CJ Tassone, B Tran, W Tumas, KS Walton (2024). A US perspective on closing the carbon cycle to defossilize difficult-to-electrify segments of our economy *Nature Chemistry Reviews*. ([link](#))
16. L Ostervold, A Smerigan, MJ Liu, L Filardi, F Vila, J Perez-Agular, J Hong, **WA Tarpeh**, A Hoffmann, L Greenlee, E Clark, M Janik, S Bare* (2023). Cation Incorporation into Copper Oxide Lattice at Highly Oxidizing Potentials. *ACS Applied Materials & Interfaces*.

17. DM Miller, KN Abels, J Guo, KS Williams, MJ Liu, **WA Tarpeh*** (2023). Electrochemical wastewater refining: a vision for circular chemical manufacturing. *Journal of the American Chemical Society*. ([link](#))
18. H Dong[#], X Shao[#], S McBeath, **WA Tarpeh***, MR Hoffmann (2023). Understanding the catalytic active sites of crystalline CoSb₂O₅ for electrochemical chlorine evolution. *ACS Applied Materials & Interfaces*. ([link](#))
19. VA Niemann, M Huck, HG Steinrück, MF Toney*, **WA Tarpeh***, SE Bone* (2023). X-ray Absorption Spectroscopy Reveals Mechanisms of Calcium and Silicon Fouling on Reverse Osmosis Membranes Used in Wastewater Reclamation. *ACS ES&T Water*.
20. J Guo, P Brimley, MJ Liu, ER Corson, CM Muñoz ^U, WA Smith, **WA Tarpeh*** (2023). Mass Transport Modifies the Interfacial Electrolyte to Influence Electrochemical Nitrate Reduction. *ACS Sustainable Chemistry & Engineering*. ([link](#))
21. MJ Liu[#], DM Miller[#], **WA Tarpeh*** (2023). Reactive separation of ammonia from wastewater nitrate via molecular electrocatalysis. *Environmental Science & Technology Letters*.
22. VA Niemann, P Benedek, J Guo, Y Xu, SJ Blair, ER Corson, A Nielander, TF Jaramillo*, **WA Tarpeh*** (2023). Co-designing electrocatalytic systems with separations to improve the sustainability of reactive nitrogen management. *ACS Catalysis*. ([link](#))
23. **WA Tarpeh**, Y Du, CMG Carpenter, EE Rodriguez, DE Helbling, DS Aga, NG Love, KR Wigginton* (2023). A unit process approach to nontarget screening of organic contaminants during urine treatment. *ACS ES&T Engineering*. ([link](#))
24. H Dong, CM Laguna ^U, MJ Liu, J Guo, **WA Tarpeh*** (2023). Electrified ion exchange enabled by water dissociation in bipolar membranes for nitrogen recovery from source-separated urine. *Environmental Science & Technology*. ([link](#))
25. C Shin, A Szczuka, MJ Liu, LM Mendoza Grijalva, R Jian, SH Tilmans, **WA Tarpeh**, WA Mitch, C Criddle* (2022). Recovery of clean water and ammonia from domestic wastewater: impacts on embodied energy and greenhouse gas emissions. *Environmental Science & Technology*. ([link](#))
26. E. Bakker*, CP Ward, **WA Tarpeh**, Z Wang (2022). Taking Earth's Pulse with Low-Cost Sensors. *ACS Sensors*. ([link](#))
27. Y Li, X Zhang, VL Morgan, HAC Lohman, LS Rowles, S Mittal^U, A Kogler, RD Cusick, **WA Tarpeh**, JS Guest* (2022). QSDsan: an integrated platform for quantitative sustainable design of sanitation and resource recovery systems. *Environmental Science: Water Research & Technology*. ([link](#))
28. Y Zhao, N Mamrol, Y Xing, Y Guo, **WA Tarpeh**, Van de Bruggen B* (2022). Advanced ion transfer materials in electro-driven membrane processes for sustainable ion-resource extraction and recovery. *Progress in Materials Science*. ([link](#))
29. MJ Liu[#], J Guo[#], AS Hoffman, JH Stenlid, MT Tang, ER Corson, KH Stone, F Abild-Pedersen, SR Bare, **WA Tarpeh*** (2022). Catalytic performance and near-surface x-ray characterization of titanium hydride electrodes for the electrochemical nitrate reduction reaction. *Journal of the American Chemical Society*. ([link](#))
30. LM Mendoza Grijalva, B Blake, A Cauble, **WA Tarpeh*** (2022). Diurnal variability of SARS-CoV-2 RNA concentrations in hourly grab samples of wastewater influent during low COVID-19 incidence. *ACS ES&T Water*. ([link](#))
31. BD Clark, G Gilles^U, **WA Tarpeh*** (2022). Resin-mediated pH control of metal-loaded ligand exchangers for selective nitrogen recovery from wastewaters. *ACS Applied Materials & Interfaces*. **Invited: Early Career Forum**. ([link](#))
32. X Shao, SJ Johnson^U, **WA Tarpeh*** (2022). Mechanistic insights into electrochemical sulfide oxidation to improve wastewater recovery. *ACS ES&T Engineering*. ([link](#))
33. E Rodriguez, **WA Tarpeh**, KR Wigginton, NG Love* (2022). Application of Plasma and UV/H₂O₂ for the Removal of Pharmaceuticals in Synthetic Urine. *Environmental Science: Water Research & Technology*. ([link](#))
34. A Lalwani[#], H Dong[#], L Mu[#], K Woo, HA Johnson, MA Holliday, J Guo, D Senesky, **WA Tarpeh*** (2021). Selective aqueous ammonia sensors using electrochemical stripping and capacitive detection. *American Institute of Chemical Engineering Journal*. **Invited: AIChE Futures Issue**. ([link](#))
35. T Le, X Chen, H Dong, **WA Tarpeh**, Perea-Cocho A, Coronas J, Martin S, Mohammad M, Razmjou A, Esfahani AR, Koutahzadeh N, Cheng P, Kidambi P, Esfahani M* (2021). An Evolving Insight into Metal Organic Framework-Functionalized Membranes for Water and Wastewater Treatment and Resource Recovery. *Industrial & Engineering Chemistry Research*, 60 (19), 6869-6907. ([link](#))
36. A Kogler, M Farmer, J Simon^U, S Tilmans, G Wells, **WA Tarpeh*** (2021). Advancing systematic investigation toward resource efficiency: characterizing and categorizing next-generation nutrient removal and recovery. *ACS ES&T Engineering*, 1(4) 662-684. ([link](#))
37. **WA Tarpeh***, X Chen (2021). Making Wastewater Obsolete: Selective Separations to Enable Circular Water Treatment. *Environmental Science & Ecotechnology*, 5. **Invited: Young Lion Perspective. Editor's Choice Award**. ([link](#))
38. H Dong, Z Wu, MJ Liu, **WA Tarpeh*** (2021). The role of intraparticle diffusion path length on electro-assisted regeneration of ion exchange resins: implications for selective adsorbent design and reverse osmosis pretreatment. *Chemical Engineering Journal*, 407. ([link](#))
39. H Dong, L Wei, **WA Tarpeh*** (2020). Electro-assisted regeneration of pH-sensitive ion exchangers for sustainable phosphate removal and recovery. *Water Research*, 184. ([link](#))

40. T Hasseler, A Ramachandran, **WA Tarpeh**, M Stadermann, J Santiagov (2020). User-friendly tool for techno-economic analysis and design of capacitive deionization systems. *Water Research*, 183. ([link](#))
41. **BD Clark**, **WA Tarpeh*** (2020). Selective recovery of ammonia nitrogen from wastewaters with transition metal-loaded polymeric cation exchange adsorbents. *Chemistry: A European Journal*, 26 (44) 10099-10112. **Invited Special Issue: Young Chemists.** ([link](#))
42. *L Mu*, Y Wang^U, **WA Tarpeh*** (2020). Validation and mechanism of a low-cost graphite carbon electrode for electrochemical brine valorization. *ACS Sustainable Chemistry & Engineering*, 8 (23): 8648-8654. ([link](#))
Press: [ABC7 News](#), [Stanford News](#)
43. T Jafary, S Rahman, HK Saif, MM Baawain, **WA Tarpeh**, BH Kim* (2020). Novel two-chamber tubular microbial desalination cell for bioelectricity production, wastewater treatment and desalination with a focus on self-generated pH control. *Desalination*, 481. ([link](#))
44. **MJ Liu**, BS Neo, **WA Tarpeh*** (2020). Building an operational framework for nitrogen recovery via electrochemical stripping. *Water Research*, 169. ([link](#))
45. S Carl, K Waldrop, P Pintauro, LT Thompson, **WA Tarpeh*** (2019). Selective Hydrogenation of Furfural in Proton Exchange Membrane Reactor Using Hybrid Pd black/Pd on Alumina. *ChemElectroChem*, 6(22), 5563-5570. **Featured on Issue Cover.** ([link](#))
46. C Hyun, Z Burt, Y Crider, KL Nelson, CSP Prasad, S Rayasam, **WA Tarpeh**, I Ray* (2019). Sanitation for Low-Income Regions: A Cross-Disciplinary Review. *Annual Review of Environment and Resources*, 44(1), 287-318. ([link](#))

Prior to Independent Group

47. Y Li, **WA Tarpeh**, KL Nelson, T Strathmann* (2018). Quantitative evaluation of an integrated system for valorization of wastewater algae as bio-oil, fuel gas, and fertilizer products (2018). *Environmental Science & Technology*, 52(21), 12717-12727. ([link](#))
48. **WA Tarpeh**, I Wald, M Omollo, T Egan, KL Nelson* (2018). Evaluating ion exchange for nitrogen recovery from urine in Nairobi, Kenya (2018). *Development Engineering*, 3, 188-195. ([link](#))
49. **WA Tarpeh**, I Wald, M Wiphrächtiger, KL Nelson* (2018). Effects of operating parameters on ion exchange columns for nutrient recovery from urine *Environmental Science: Water Research and Technology*, 4(6), 828-838. ([link](#))
50. **WA Tarpeh**, J Barazesh, T Cath, KL Nelson* (2018). Electrochemical stripping to recover nitrogen from source-separated urine (2018). *Environmental Science & Technology*, 52(3), 1453-1460. ([link](#))
Press: [Environmental Science & Technology Early Career Scientist Issue](#), [RTI Advisors Nutrient Solutions Report](#)
51. O Kavvada, **WA Tarpeh**, A Horvath A, KL Nelson* (2017). Life-cycle cost and environmental assessment of decentralized nitrogen recovery using ion exchange from source-separated urine through spatial modeling *Environmental Science & Technology*, 51(21), 12061-12071. ([link](#))
52. M Chrispim, **WA Tarpeh**, D Salinas, M Nolasco* (2017). The sanitation and urban agriculture nexus: urine collection and application as fertilizer in São Paulo, Brazil. *Journal of Water, Sanitation and Hygiene for Development*, 7(3), 455-465. ([link](#))
53. **WA Tarpeh**, K Udert, KL Nelson* (2017). Comparing ion exchange adsorbents for nitrogen recovery from source-separated urine. *Environmental Science & Technology*, 51(4), 2373–2381. ([link](#))

Manuscripts Under Review

1. M Machala[#], X Chen[#], **SP Bunke[#]**, G Forbes, A Yegizbay, J de Chalendar, IL Azevedo, SM Benson, **WA Tarpeh***. Life cycle comparison of industrial-scale lithium-ion battery recycling and mining supply chains. *Submitted November 2023.* ([link](#))
2. X Foster, **WA Tarpeh**, H Dong, C Vaneekhaute*. Enhancing the regeneration efficiency of hybrid anion exchanger for removal of phosphorus from wastewater with a lower environmental impact. *Submitted August 2024.*
3. **K Abels**, **VY Yang**, **WA Tarpeh***. Informing ion exchange membrane design targets for Donnan Dialysis-mediated lithium brine concentration. *Submitted September 2024.*
4. **OZ Coombs**, **AB Botelho Junior**, D Chalise, **WA Tarpeh***. Prototyping and Modeling a Photovoltaic/Thermal Electrochemical Stripping System for Distributed Urine Nitrogen Recovery. *Submitted September 2024.*

Patents

1. Electrochemical reactor for homogeneous catalyst reuse in chemical manufacturing. **WA Tarpeh**, **BD Clark**, **MJ Liu**, **A Kogler**, **J Guo**, **KS Williams**, **DM Miller**, **KN Abels**, **K Chan**^U. July 2023.
2. Electrochemical pre-concentration for improved detection of gaseous species in water. **WA Tarpeh**, D Senesky, A Lalwani, M Holliday, *L Mu*, **BD Clark**, **MJ Liu**. September 2020. PCT/US2020/051554.
3. Electrodialysis and Nitrate Reduction. **WA Tarpeh**, **MJ Liu**, **BD Clark**. Provisional Patent, August 2020.
4. Flexible electrochemical stripping to recover alkaline and acidic ammonia from wastewaters. **WA Tarpeh**, **A Kogler**, **MJ Liu**, **BD Clark**, **W Chow**^U. Provisional Patent, Aug 2020.

Non Peer-Reviewed Publications

1. **WA Tarpeh** (2022). Electrifying Climate Change Mitigation. *Nature Energy*. ([link](#))
2. A Kogler, M Farmer, J Simon*, Z Cheng, X Shao, T Panayiotou, D Katehis, S Tillmans, G Wells, **WA Tarpeh** (2021). Characterizing, Categorizing, and Communicating Next-Generation Nutrient Removal Processes for Resource Efficiency. *Water Research Foundation*. Project 4976.
3. **WA Tarpeh**, BD Clark, KL Nelson, K (2022). “Reimagining Excreta as a Resource: Recovering Nitrogen from Urine in Nairobi, Kenya.” Chapter in *An Introduction to Development Engineering*. Springer.
4. **WA Tarpeh** (2018). Advocacy in the Academy. Bouchet Society Blog, University of Michigan Rackham School ([link](#))

SELECTED INVITED PRESENTATIONS

Invited Department Seminars

1. Spelman College, Department of Chemistry, Atlanta, GA, November 12, 2024.
2. University of Colorado Boulder, Department of Chemical and Biomolecular Engineering, Boulder, CO, October 22, 2024.
3. Shenzhen University, Department of Civil & Environmental Engineering, Shenzhen, China, August 1, 2024.
4. Northwestern University, Department of Chemical Engineering, Evanston, IL, July 10, 2024.
5. Rice University, Department of Chemical Engineering, Houston, TX, April 18, 2024.
6. University of Delaware, Department of Chemical Engineering, Newark, DE, April 12, 2024.
7. Cornell University, Department of Chemical Engineering, Ithaca, NY, April 9, 2024.
8. California Institute of Technology, Resnick Institute of Sustainability, Pasadena, CA, April 5, 2024.
9. Swarthmore College, Sigma Xi Honor Society, Swarthmore, PA, February 27, 2024.
10. Tufts University, Department of Chemical Engineering, Medford, MA, January 22, 2024.
11. Georgia Institute of Technology, Department of Chemical Engineering; Mellichamp Distinguished Lecturer, Atlanta, GA, April 26, 2023.
12. University of Michigan, Department of Civil & Environmental Engineering, “Electrochemical Reactive Separations: Refining Wastewater Pollutants”, April 3, 2023.
13. University of Illinois Urbana-Champaign, Department of Civil & Environmental Engineering, “Electrochemical Engineering to Integrate Catalysis and Separations for Wastewater Valorization,” March 10, 2023.
14. University of California, Berkeley, Department of Civil & Environmental Engineering, “Electrochemical Wastewater Refining: Converting Pollutants and Extracting Products,” Berkeley, CA, February 10, 2023.
15. University of Münster, Münster Electrochemical Energy Technologies Center. “Selective Separations to Enable Battery Recycling,” Münster, Germany, January 25, 2023.
16. University of Washington, Department of Chemical Engineering, “Electrochemical Wastewater Refining: Using Reactive Separations to Convert Nitrogen Pollutants to Products,” Seattle, WA, April 25, 2022.
17. Northwestern University, Department of Chemical Engineering; Department of Civil & Environmental Engineering (joint seminar for both departments). “Electrochemical Wastewater Refining: Using Reactive Separations to Convert Nitrogen Pollutants into Products”, Evanston, IL, April 15, 2022.
18. University of California Riverside, Department of Chemical and Environmental Engineering. “Electrochemical Wastewater Refining: Using Reactive Separations to Convert Nitrogen Pollutants into Products,” Riverside, CA, April 8, 2022.
19. University of Texas Austin, Department of Chemical Engineering; Department of Civil, Architectural, and Environmental Engineering (joint seminar for both departments). “Electrochemical Wastewater Refining: Using Reactive Separations to Convert Nitrogen Pollutants into Products,” Austin, TX, March 1, 2022.
20. Cornell University, Department of Civil & Environmental Engineering. “Electrochemical Wastewater Refining: Reframing Nutrient Pollutants as Products,” Ithaca, NY, February 17, 2022.
21. Willamette University, Department of Chemistry, Taking the Pulse of the Nitrogen Cycle via Electrochemical Monitoring and Mitigation,” Salem, OR, February 7, 2022.
22. University of California Santa Barbara, Department of Chemical Engineering, “Electrochemical Wastewater Refining: Catalysis and Separations for Distributed Ammonia Manufacturing,” Santa Barbara, CA, December 1, 2021.
23. Johns Hopkins University, Department of Environmental Health Science and Environmental Engineering, “Preserving Planetary Health: Stewarding the Nitrogen Cycle via Wastewater Refining,” Baltimore, MD, November 8 2021.
24. University of Pittsburgh, Department of Civil & Environmental Engineering, “Electrochemical Wastewater Refining: Reframing Nitrogen Pollutants as Products,” Pittsburgh, PA, November 12, 2021.

25. Massachusetts Institute of Technology, Department of Civil & Environmental Engineering, “Electrochemical Ammonia Synthesis and Sensing in Environmental Waters”, Cambridge, MA, November 5, 2021.
26. American University, Department of Chemistry, “Electrochemical Ammonia Synthesis and Sensing in Environmental Waters,” Washington, DC, October 13, 2021.
27. Colorado School of Mines, Department of Chemical Engineering, “Electrochemical Wastewater Refining: Reframing Nitrogen Pollutants as Products,” Golden, CO, October 1, 2021.
28. Massachusetts Institute of Technology, Department of Materials Science and Engineering, Distinguished Speaker Series, “Designing Nitrogen-Selective Materials for Electrochemical Wastewater Valorization,” Cambridge, MA, April 27, 2021.
29. Middlebury College, Department of Chemistry; Department of Environmental Sciences (joint seminar for both departments). “Tracking and Treating Aqueous Nitrogen Emissions,” Middlebury, VT, April 2, 2021.
30. Stanford University, Department of Earth Systems Science, “Taking the Pulse of the Nitrogen Cycle: Designing Electrochemical Monitoring and Mitigation Strategies,” Stanford CA, March 17, 2021.
31. Oregon State University, Department of Chemical, Biological, and Environmental Engineering, Integrating Materials and Electrochemical Processes for Selective Nitrogen Recovery from Wastewaters,” Corvallis, OR, March 8, 2021.
32. Notre Dame University, Department of Chemical and Biomolecular Engineering, “Reactive Separations for a Circular Economy,” Notre Dame, IN, March 2, 2021.
33. Colorado School of Mines, Department of Civil & Environmental Engineering, “Electrochemical Nitrogen Cycling: Nitrate Reduction and Ammonia Recovery,” Golden, CO, February 12, 2021.
34. University of California, Davis, Department of Civil & Environmental Engineering, “Selective Materials and Electrochemical Processes to Valorize Nitrogen in Wastewater,” Davis, CA, January 26, 2021.
35. Woods Hole Oceanographic Institute, “Sensing and Preventing Marine Nitrogen Pollution Using Selective Electrochemistry,” Falmouth, MA, November 10, 2020.
36. City College of New York, Department of Chemical Engineering, “Electrifying the Nitrogen Cycle: Designing Selective Processes to Create Circular Water Treatment,” New York, NY, November 2, 2020.
37. Yale University, Department of Chemical & Environmental Engineering, “Designing the Future Nitrogen Cycle: Selective Materials, Processes, and Sensors for Nitrogen Recovery from Wastewaters,” New Haven, CT, October 11, 2020.
38. Caltech Futures of Chemical Engineering Symposium, Department of Chemical Engineering, “Valorizing Wastewater: Designing Selective Separations to Facilitate a Circular Nitrogen Economy,” Pasadena, CA, September 30, 2020.
39. Rice University, Department of Civil & Environmental Engineering, “Converting Pollutants to Products: Designing Electrochemical Processes for Selective Nitrogen Separations in Wastewater,” Houston, TX, September 11, 2020.
40. Columbia University, Department of Earth and Environmental Engineering. New York, NY, August 14, 2020.
41. University of São Paulo, Graduate Program in Sustainability, “Designing a Circular Economy: Next-Generation Materials and Approaches for Sustainable Water and Sanitation”, Sao Paulo, Brazil. March 4, 2020.
42. Georgia Institute of Technology, Department of Civil & Environmental Engineering, “Selective Separations to Enable Resource-Efficiency Water Treatment,” Atlanta, GA, October 2, 2019.
43. Sultan Qaboos University, Muscat Oman, Departments of Civil, Architectural, and Environmental Engineering; Department of Chemical and Petroleum Engineering (joint seminar for both departments). “Designing Selective Materials and Processes for Electrochemical Resource Recovery from Wastewaters,” Sultanate of Oman, July 14, 2019.
44. Zhejiang University, College of Chemical & Biomolecular Engineering, “Designing Materials and Processes for Electrochemical Resource Recovery from Wastewaters,” Zhejiang, China, May 18 2019.
45. Stanford University, Department of Civil & Environmental Engineering, “Designing Materials and Processes for Electrochemical Resource Recovery from Wastewaters,” Stanford CA, March 15 2019.
46. Stanford University, Department of Materials Science Engineering, “Designing Materials and Processes for Electrochemical Resource Recovery from Wastewaters,” Stanford CA, February 1 2019.
47. University of Maryland, Baltimore County. Department of Chemical, Biomolecular, and Environmental Engineering and Meyerhoff Program, “Pollutants to Products: Designing Resource Recovery from Wastewaters,” College Park, MD, November 28 2018.
48. Nanyang Environment & Water Research Institute (NEWRI), Nanyang Technical University, “Reimagining Waste: Designing and Evaluating Nitrogen Recovery from Urine,” Singapore, December 8, 2017.
49. University of Michigan, Dept. of Civil & Environmental Engineering, “Reimagining Waste: Designing and Evaluating Nitrogen Recovery from Urine,” Ann Arbor, MI, September 10, 2017.
50. University of Southern California, Department of Civil & Environmental Engineering, “Reimagining Waste: Designing and Evaluating Nitrogen Recovery from Urine,” Los Angeles, CA, April 8, 2017.

51. University of Virginia, Department of Civil & Environmental Engineering, "Reimagining Waste: Designing and Evaluating Nitrogen Recovery from Urine," Charlottesville, VA, December 7 2016.
52. North Carolina State University, Department of Construction, Civil, and Environmental Engineering, Reimagining Waste: Designing and Evaluating Nitrogen Recovery from Urine," Raleigh, NC. March 15, 2016.
53. Stanford University, Department of Chemical Engineering, Reimagining Waste: Designing and Evaluating Nitrogen Recovery from Urine," Stanford CA, February 28, 2016.
54. Eawag Engineering Department Seminar Series, Reimagining Waste: Designing and Evaluating Nitrogen Recovery from Urine," Zurich, Switzerland. March 3 2015.

Invited Conference/Workshop Presentations

1. ARPA-E High Energy-Value Materials Recovery from Wastewater Workshop. Washington, DC, August 20, 2024.
2. American Chemical Society Fall Meeting, Geochemistry Division. Denver, CO, August 19, 2024.
3. Virginia Water and Environment Association. Richmond, VA, May 10, 2024.
4. Center for Advancing Sustainable and Distributed Fertilizer Production (CASFER) Convergence Virtual Seminar, Virtual, February 23, 2024.
5. Workshop on Biomimetic and Electroactive Membranes, IIT Bombay, "Ion-Selective Membranes and Processes for Electrochemical Wastewater Valorization," Bombay, India, December 9, 2023.
6. Electrochemical Society, MIT Student Chapter, "Electrochemical Wastewater Refining: Reactive Separations to Convert Pollutants into Product," Boston, MA, November 30, 2023.
7. Materials Research Society Meeting, "Lithium-Selective Membranes for Electrochemical Wastewater Refining," Boston, MA, November 30, 2023.
8. Materials Research Society Meeting, "Reactive Separations using a Cobalt Macrocyclic Molecular Catalyst for Electrochemical Wastewater Refining of Nitrate to Ammonia," Boston, MA, November 29, 2023.
9. American Institute of Chemical Engineers, "Electrochemical Wastewater Refining: Reactive Separations to Convert Pollutants into Products," Orlando, FL, November 6, 2023.
10. Paul L. Busch Award Presentation, "Electrochemical wastewater refining for circular chemical manufacturing," WEFTEC Conference, Chicago, Illinois, October 3, 2023.
11. American Chemical Society Meeting, Symposium in honor of Dick Luthy, "Fate of trace organic contaminants during urine treatment," August 15, 2023.
12. Gordon Research Conference on Urbanization, Water, and Food Security, "Electrochemical Wastewater Refining for a Circular Nitrogen Economy," Barga, Italy, July 17, 2023.
13. International Water Association and Water Environment Federation Innovations in Process Engineering Conference, "Distributed Systems," Portland, OR, June 15, 2023.
14. Miller Institute Symposium, "Electrochemical Wastewater Refining for Circular Chemical Manufacturing," Berkeley, CA, June 1, 2023.
15. MIT Program in Polymers and Soft Matter, "Designing Polymeric Adsorbents and Membranes for Solute-Selective Wastewater Separations," Cambridge MA, April 19, 2023.
16. American Chemical Society Meeting, Aqueous Redox Chemistry Symposium. "Elucidating and controlling electrochemical interfaces for wastewater nitrogen refining," Indianapolis, IN, March 28, 2023.
17. American Chemical Society Meeting, Closing the Carbon Cycle Symposium. "Electrochemical reactive separations to integrate plastics recycling and additive manufacturing," Indianapolis, IN, March 27, 2023.
18. Munster-Stanford-Twente Winter School on Batteries. "Selective Separations to Enable Battery Recycling," Münster, Germany, January 27, 2023.
19. American Chemical Society Webinar. "Converting Pollutants to Products via Electrochemical Wastewater Refining", Virtual, January 18, 2023.
20. National Academies of Science, Engineering, and Medicine Chemical Sciences Roundtable Workshop on Innovations in Catalysis to Address Modern Challenges, "Converting Pollutants to Products via Electrochemical Wastewater Refining", Washington DC, October 25, 2022.
21. Electrochemistry Society Meeting, "Electrochemistry and the Environment", Atlanta, GA, October 13, 2022.
22. Chemical Separations Gordon Research Conference, "Electrochemical Nitrogen Refining from Wastewaters Using Reactive Separations" Ventura, CA, October 2, 2022.
23. LCLS-SSRL User Meeting, "Synchrotron methods for elucidating the electrocatalyst-electrolyte interface during wastewater refining", Virtual, September 27, 2022.
24. Electrochemistry Gordon Research Conference, "Characterizing Electrochemical Interfaces in Reactive Nitrogen Separations", Ventura, CA, September 14, 2022.

25. PARC Research, “Electrochemical wastewater refining: using reactive separations to convert nitrogen pollutants into products,” Menlo Park, CA, September 2, 2022.
26. 3M Nontenured Faculty Award Symposium, “Designing PFAS Circularity: Integrating Adsorption and Electrochemical Reduction as Reactive Separations,” Virtual, August 30, 2022.
27. SLAC Critical Materials Workshop, “Ligand-Mediated Selective Separations: Integrating Materials, Processes, and Wastewaters,” Menlo Park, CA, March 7, 2022.
28. Langer Lab in MIT Chemical Engineering, “Designing Selective Polymeric Materials for Electrochemical Wastewater Valorization,” Cambridge MA, February 1, 2022.
29. Rich Earth Summit, “Global Partnerships for Urine Reclamation,” Virtual, November 4, 2021.
30. National Academies Arab-American Frontiers Meeting, “Reimagining the Nitrogen Cycle: Selective Electrochemical Detection and Recovery in Wastewater,” Virtual, November 2, 2021.
31. Rocky Mountain Regional ACS Meeting, “Multiscale benchmarking of the molecular electrocatalyst Co-DIM for nitrate reduction and ammonia recovery from wastewaters,” Tucson, AZ, October 23, 2021.
32. Pacific Coast Catalysis Society Annual Meeting, “Electrocatalysis and Electrochemical Separations to Improve Water Treatment and Chemical Manufacturing,” Virtual, October 19, 2021.
33. Chevron Water Community of Practice, “Electrifying Industrial Water Treatment to Facilitate Resource Recovery,” Virtual, October 19, 2021.
34. SSRL Environment Focus Group, “Challenges in (Waste)Water Treatment: Needs and Future Roles of Synchrotrons,” Virtual, October 4, 2021.
35. The San Diego Chemist, American Chemical Society, “Trash to Treasure: Extracting and Converting Wastewater Pollutants into Products,” San Diego, CA, July 14, 2021.
36. Capacitive Deionization and Engineering Conference, “Electrifying the Nitrogen Cycle: Electrocatalysis and Electrochemical Separations to Refine Water Pollutants into Commodity Chemicals,” Virtual, May 10, 2021.
37. University of British Columbia Future Waters Program, Water and Environment Speaker Series, “Designing Distributed Nitrogen Recovery from Wastewater,” Virtual, April 8, 2021.
38. National Academy of Engineering Annual Meeting, “Electrifying Wastewater Treatment by Recovering Valuable Products,” Virtual, October 6, 2020.
39. Applied Materials: Young Professional Series. “Closing the Loop: Converting Industrial Pollutants into Products with Selective Separations,” Virtual, July 31, 2020.
40. ACS Northern California Section, Environmental Sustainability Series, “Reimagining the Nitrogen cycle: Designing Selective Materials and Processes for Wastewater Valorization,” Virtual, July 22, 2020.
41. Kennedy Space Center, “In-Situ Resource Utilization of Nitrogen using Electrochemical Membrane Reactors, Merritt Island, FL, November 13, 2019.
42. Chemical & Engineering News Talented 12 Symposium. ACS Meeting, “Reimagining Wastewaters: Molecular Design of Materials and Processes for Resource Recovery,” San Diego CA. August 12, 2019.
43. Stanford Environmental & Water Studies Summer Program, “Making Pollution Extinct: Designing Resource Recovery from Wastewater,” Stanford, CA, July 18, 2019.
44. Faraday Technologies Webinar, “Electrochemical Stripping to Recover Nitrogen from Wastewater,” Virtual, October 25, 2018.
45. University of Michigan Food for Thought Seminar, “Pee-cycling: Creating Sustainable Fertilizer from Urine,” Ann Arbor, MI, October 10, 2017.
46. Gordon Research Seminar: Environmental Sciences, Water, “Nitrogen Recovery from Source-Separated Urine via Ion Exchange and Electrochemical Stripping,” Holderness, NH. June 19, 2016.
47. Education Solution Network Technical Convening 2014. Sponsored by United States Agency for International Development. Berkeley, CA. November 10, 2014.

MENTORING

Student & Postdoctoral Scholars Supervised

Current Doctoral Students (12): Lorelay Mendoza Grijalva, Jinyu Guo, Dean Miller, Samantha Bunke, Kristen Abels, Edward Apraku, Orisa Coombs, Joyce An, Emmanuel Kayiwa, Uran Iwata, Victoria Yang, Wylie Kau

Current Postdoctoral Scholars (7): Kindle Williams, Neha Sharma, Woonghee Lee, Hannah Holmes, Taigyu Joo, Pingyu Wang, Carlos Fernandez

Current Undergraduate Students (5): Danna Soriano, Kitan Lanre-Phillips, Nailah Donatto, Nifemi Ibrahim, Shiloh Bolden

Former Doctoral Students (5): Anita Shao (Consultant, BCG), Brandon Clark (Entrepreneur), Matthew Liu (Beckman Postdoc Fellow, MIT), Anna Kogler (TBD), Valerie Niemann (Postdoc Fellow, University of Bern)

Former Postdoctoral Scholars (6): Xi Chen (Asst Prof, City University of Hong Kong), Elizabeth Corson (Asst Prof, University of Kansas), Lucas Dong (Asst. Prof Georgia Tech Shenzhen Institute), Linchao Mu (Assoc Prof, Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences), Qianhong Zhu (Quantumscape), Amilton Barbosa Botelho Junior (Postdoc, MIT DMSE)

Former Masters Students (3): Valmik Lakhlani, Yixuan Huang, Tyler Gogal

Former Undergraduate Students (23): Hope Adhanom-Simpson, Bryan Romero, Nathaniel Ramos, Sydney Johnson, Joshua Tan, Yichong Wang, Naomi Ray, Ji Hun Wang, William Chow, Smiti Mittal, Fatima Karim, James Juma, Julia Simon, Ouriel Ndalamba, Chloe Laguna, Sarah Yribarren, Diana Tiburcio, Franklin Lurie, Carolina Muñoz, Genesis Gilles, Robert Wood, Kristy Chan, Diego Bustamente, Amy Pham

Trainee Awards & Recognitions

Kristen Abels	Precourt Institute Distinguished Energy Student Lecturer	2024
Brandon Clark	Stanford Impact Founder Fellowship	2024
Matthew Liu	Beckman Postdoctoral Fellowship	2024
Jinyu Guo	ACS Division of Environmental Chemistry Graduate Research Award	2024
Jinyu Guo	North American Catalysis Society Kokes Travel Award	2023
Anna Kogler	Stanford Lieberman Fellowship	2023
Orisa Coombs	Research, Action, and Impact through Strategic Engagement Fellowship	2023
Anna Kogler	Eckenfelder Graduate Research Award, AAEEES	2023
Orisa Coombs	National Science Graduate Research Fellowship	2023
Matthew Liu	ACS Division of Environmental Chemistry Graduate Research Award	2023
Samantha Bunke	Chemical Engineering Department Service Award	2022
Jinyu Guo	Precourt Institute Distinguished Energy Student Lecturer	2022
Matthew Liu	Achievement Rewards for College Scientists Fellowship	2022
Matthew Liu	(Honorable Mention) Daniel Cubicciotti Award, Electrochemical Society	2022
Brandon Clark	AIChE Separations Division Graduate Student Research Award	2022
Samantha Bunke	Stanford Interdisciplinary Graduate Fellowship	2022
Samantha Bunke	Research, Action, and Impact through Strategic Engagement Fellowship	2022
Samantha Bunke	Best Poster Award, Association of Environmental Eng./Sci. Professors	2022
Lorelay M. Grijalva	Diversifying Academia, Recruiting Excellence (DARE) Fellowship	2022
Dean Miller	NASA Graduate Training Research Fellowship	2022
Julia Simon	National Science Graduate Research Fellowship	2022
Xi Chen	Best Oral Presentation, Membrane Desalination Conference	2021
Matthew Liu	Industrial Electrochemical Engineering Student Achievement Award	2021
Anna Kogler	Stanford Interdisciplinary Graduate Fellowship	2020
Elizabeth Corson	TomKat Center for Sustainable Energy Postdoctoral Fellowship	2020
Matthew Liu	NASA Graduate Training Research Fellowship	2020
Brandon Clark	Best Poster Award, Pan-Nano Conference	2020
Lorelay Mendoza	National Science Graduate Research Fellowship	2019
Valerie Niemann	National Science Graduate Research Fellowship	2018
Brandon Clark	National Science Graduate Research Fellowship	2018

OUTREACH & BROADER IMPACTS

Outreach Activities

Speaker, Preparing for Your Academic Interview. NextProf Nexus Workshop.	2018-present
Faculty Speaker, Stanford Summer Engineering Academy	2019-present
Stanford SURF Research Mentor	2022-present
Co-Founder and Co-Chair, Stanford Early Career Black Faculty Collective	2020-2022
Director, Stanford Chemical Engineering REU Program	2019-2023
Keynote Speaker, Stanford SURF Opening Ceremony	2023
Stanford Medicine Propel Scholars	2023
Speaker, Making Pollution Obsolete. Stanford Reunion Classes Without Quizzes	2021
Panelist, Ron Brown Scholars Program	2020
Science Fair Judge, Greene Scholars Program Annual Science Fair	2020

CV	W. Tarpeh, Stanford University
Stanford Summer Academic Immersion and Leadership	2020
Keynote Address, Bay Area Graduate Pathways to STEM	2020
Speaker, Keep CALM with Culture	2020
College readiness workshop. Urban Life Mentoring, Inc.	2019
Summer Mathematics and Science Honors Academy at Stanford.	2019
Panelist. Stanford Exposure to Research and Graduate Education (SERGE) Program.	2018
Panelist. Stanford Summer First Program.	2018
Speaker. Graduate Fellowships in STEM. Jack Kent Cooke Foundation Scholars Weekend.	2018
Speaker. Thriving as a College Scholar. Jack Kent Cooke Foundation Scholars Weekend.	2018
Keynote Speaker. Welcome Session for Jack Kent Cooke Foundation.	2018
Panelist. Securing Postdoctoral Appointments, California Alliance Retreat.	2018
Using Engineering to Address Societal Problems: Urine-Derived Fertilizer. Fortis Academy, Ypsilanti, MI.	2018
Keynote Speaker, Stanford Black Scientists and Engineers Annual Banquet.	2017
Keynote Speaker, Jack Kent Cooke Foundation Young Scholars' Weekend.	2016
How to apply to graduate school as an undergraduate transfer student. Berkeley JKCF Students.	2015
Environmental Engineers: What we do and where to start. Oakland Boys and Girls' Club.	2013
Everybody Poops, the Sequel: What to do about it. Education Program for Gifted Youth.	2013

Outreach Podcasts and Videos

<i>A School to Cool</i> , Gates Notes	2023
<i>One person's waste is another's treasure</i> , Bringing Chemistry to Life, ThermoFisher.	2022
<i>Untapped Potential</i> , Chemistry Shorts, Dreyfus Foundation.	2022
<i>Our Beautiful Planet: In search of nitrogen</i> , The Climate Initiative.	2022
<i>Our Beautiful Planet: Liquid Gold</i> , The Climate Initiative.	2022
Stereochemistry, American Chemical Society.	2022
<i>How to take the waste out of wastewater</i> , The Future of Everything.	2020
<i>Solving real people's real problems</i> , Jack Kent Cooke Foundation.	2016
<i>How your pee could help billions of people</i> , DNews, Discovery Communications	2016
<i>World Toilet Day Video</i> , UC Berkeley News (link)	2015

Service

- **Professional Membership:** American Institute of Chemical Engineers, American Chemical Society, Electrochemical Society, Association of Environmental Engineering and Science Professors, International Water Association, Sustainable Sanitation Alliance, International Society for Electrochemistry, National Society of Black Engineers; 2018 Arab-American Frontiers Participant with National Academies of Science, Engineering and Medicine; Review Editor, Frontiers in Environmental Science (Water and Wastewater Management)
- **Professional Service:** Reviewer for *Environmental Science: Water Research and Technology*, *Water Research*, *Environmental Science & Technology*, *Joule*, *Science of the Total Environment*, *Environmental Engineering Science*, *Desalination and Water Treatment*, *Journal of Environmental Chemical Engineering*, *Resources Conservation and Recycling*; Reviewer for NSF, DOE, EPA
- **Broadening Participation of Underrepresented Groups in Science and Engineering:** (1) Founding Executive Committee Member for Graduate Pathways Symposium to attract underrepresented minorities to graduate engineering programs (2015-16); (2) Speaker (invited and keynote) at >20 outreach events: NextProf Nexus, Jack Kent Cooke Foundation Scholars Weekend, and Level Playing Field Institute (2015-present); and (3) Member of Edward Bouchet Society (criteria: leadership, character, service, advocacy, scholarship)