

William A. Tarpeh

Assistant Professor, Stanford University
wtarpeh@stanford.edu | www.tarpehlab.com

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

- 2022 Camille Dreyfus Teacher-Scholar Award
 2022 Electrochemical Society/Toyota Research Institute Young Investigator Fellowship
 2022 3M Non-Tenured Faculty Award
 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
 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
 2011 Stanford School of Engineering Diversity Leadership Award

Editorial Activities

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|--|---|--------------|
| Associate Editor | <i>Resources, Conservation, & Recycling</i> | 2021-present |
| 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 (*=undergraduate author; #=equal contribution)

Independent Group

1. 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](#))
2. E. Bakker, CP Ward, **WA Tarpeh**, Z Wang (2022). Taking Earth's Pulse with Low-Cost Sensors. *ACS Sensors*. ([link](#))
3. Y Li, X Zhang, VL Morgan, HAC Lohman, LS Rowles, S Mittal*, 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*. In press. ([link](#))
4. 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*. In press. ([link](#))
5. 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*. In press. ([link](#))
6. 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](#))
7. BD Clark, G Gilles*, **WA Tarpeh** (2022). Resin-mediated pH control of metal-loaded ligand exchangers for selective nitrogen recovery from wastewaters. *ACS Applied Materials & Interfaces*. In press. **Invited: Early Career Forum**. ([link](#))
8. X Shao, SJ Johnson*, **WA Tarpeh** (2022). Mechanistic insights into electrochemical sulfide oxidation to improve wastewater recovery. *ACS ES&T Engineering*. In press. ([link](#))
9. 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*. In press. ([link](#))
10. 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](#))
11. T Le, X Chen, H Dong, **WA Tarpeh**, Perea-Cochero 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](#))
12. A Kogler, M Farmer, J Simon*, 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](#))
13. **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](#))
14. 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](#))
15. 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](#))
16. T Hasseler, A Ramachandran, **WA Tarpeh**, M Stadermann, J Santiago (2020). User-friendly tool for techno-economic analysis and design of capacitive deionization systems. *Water Research*, 183. ([link](#))
17. 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](#))
18. L Mu, Y Wang*, **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](#)
19. 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](#))
20. MJ Liu, BS Neo, **WA Tarpeh** (2020). Building an operational framework for nitrogen recovery via electrochemical stripping. *Water Research*, 169. ([link](#))
21. 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](#))

22. 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

23. 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](#))
24. **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](#))
25. **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](#))
26. **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*
27. 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](#))
28. 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](#))
29. **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](#))

Patents

1. 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.
2. Electrodialysis and Nitrate Reduction. **WA Tarpeh**, MJ Liu, BD Clark. Provisional Patent, August 2020.
3. Flexible electrochemical stripping. **WA Tarpeh**, A Kogler, MJ Liu, BD Clark, W Chow. Provisional Patent, Aug 2020.

Non Peer-Reviewed Publications

1. 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.
2. **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. *In press*.
3. **WA Tarpeh** (2018). *Advocacy in the Academy*. Bouchet Society Blog, University of Michigan Rackham School ([link](#))

SELECTED INVITED PRESENTATIONS AND WORKSHOPS

(Selected from over 40 invited seminar presentations and workshops)

1. Gordon Research Conference: Chemical Separations. February 2022. *Postponed due to COVID*.
2. Gordon Research Conference: Electrochemistry. January 2022. *Postponed due to COVID*.
3. American Chemical Society, San Diego Section. July 2021.
4. National Academy of Engineering Annual Meeting, Civil Engineering Section. October 2021.
5. ACS Northern California Section, Environmental Sustainability Series. July 2020.
6. University of Sao Paulo, Graduate Program for Sustainability. Sao Paulo, Brazil. March 2020.
7. *Chemical & Engineering News* Talented 12 Symposium. ACS Meeting, San Diego CA. August 2019.
8. Berkeley Haas Africa Business Forum. Berkeley, CA. April 2018.
9. Gordon Research Seminar: Environmental Sciences, Water. Holderness, NH. June 2016.
10. Education Solution Network Technical Convening 2014. Sponsored by United States Agency for International Development. Berkeley, CA. November 2014.

MENTORING

Student & Postdoctoral Scholars Supervised

Current Doctoral Students (12): Anita Shao, Brandon Clark, Matthew Liu, Anna Kogler, Lorelay Mendoza Grijalva, Jinyu Guo, Valerie Niemann, Dean Miller, Samantha Bunke, Kristen Abels, Edward Apraku, Orisa Coombs

Current Postdoctoral Scholars (4): Xi Chen, Elizabeth Corson, Kindle Williams, Qianhong Zhu

Current Undergraduate Students (7): Carolina Muñoz, Genesis Gilles, Chloe Laguna, Robert Wood, Kristy Chan, Diego Bustamante, Hope Adhanom-Simpson

Former Postdoctoral Scholars (2): Linchao Mu (Asst Prof), Lucas Dong (Asst. Prof GTSI)

Former Undergraduate Students (13): 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

Trainee Awards & Recognitions

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

FUNDING

Early Career Research Fellowship <i>National Academies Gulf Research Program</i>	\$75,000	2019-2021	Single PI
Electro-Assisted Nutrient Recovery <i>Environmental Protection Agency</i>	\$125,000	2019-2023	Single PI
Characterizing, Categorizing, and Communicating Next-Generation Nutrient Removal Processes <i>Water Research Foundation</i>	\$60,000	2019-2020	Lead PI
[NSF EFRI] Re-Engineering the Nitrogen Cycle: Distributed Electrochemical Nitrogen Refineries for Ammonia Synthesis and Water Purification <i>National Science Foundation</i>	\$2,000,000	2021-2025	Lead PI
[NSF ECO-CBET] Towards a Circular Nitrogen Bioeconomy: Tandem Bio- and Chemocatalysis for Sustainable Nitrogen Recovery and Nitrous Oxide Mitigation <i>National Science Foundation</i>	\$1,700,000	2021-2025	PI: G. Wells, Northwestern
Reimaging Wastewater to Reduce Excreta Emissions: Electrochemical Fertilizer Production and Water Reuse <i>Woods Institute Environmental Ventures Program</i>	\$200,000	2019-2021	Lead PI
Development and Validation of Techno-Economic Analysis Tools for Modular, Energy-Efficient Agricultural Water Treatment Systems <i>TomKat Center for Sustainable Energy</i>	\$150,000	2019-2021	Lead PI
Designing Nitrogen-Selective Materials for Water Treatment using Ks-Amt5 Bacterial Membrane Transporters <i>Bio-X Interdisciplinary Biosciences Institute</i>	\$225,000	2020-2022	Lead PI
Designing a Circular Lithium Economy: Li-Selective Materials and Processes for Recovery from Batteries <i>Precourt Institute for Energy, StorageX Initiative</i>	\$80,000	2020-2021	Single PI
Environmental Analysis of Battery Recycling Processes <i>Precourt Institute for Energy, StorageX Initiative</i>	\$160,000	2021-2022	Lead PI
Getting in Front of the Additive Manufacturing Revolution: Enabling the Automotive Industry to be Completely Chemically Circular <i>Precourt Institute for Energy</i>	\$400,000	2021-2023	PI: R. Waymouth, Stanford
Electrodeionization for Salt Removal from Wastewater			

CV				W. Tarpeh, Stanford University
<i>National Aeronautics and Space Agency</i>	\$100,000	2021-2022		PI: L. Roberson, Kennedy Space Center
Developing In Situ Techniques To Understand Mechanisms Of Bubble Formation At Aqueous Electrochemical Interfaces <i>Stanford Linear Accelerator Center Lab-Directed Research/Development</i>	\$360,000	2020-2022		Lead PI
Designing Urban Circular Economies: Electrochemical Nitrogen Recovery from Urine <i>UPS Foundation</i>	\$50,000	2020-2021		Single PI
Selective Biomimetic Materials for Sustainable Nitrogen Management <i>Hellman Faculty Fellows Program</i>	\$40,000	2020-2021		Single PI
Creating Value from Fecal Sludge: Producing Ammonia Disinfectants Electrochemically in Dakar, Senegal <i>Center for Innovations in Global Health</i>	\$50,000	2019-2021		Lead PI
Reimagining Excreta as a Resource: Developing and Evaluating Techniques to Valorize Urine and Accelerate Sustainable Sanitation Access <i>King Center for Global Development</i>	\$80,000	2021-2023		Single PI
Wastewater Mining: Detecting SARS-CoV-2 and Extracting Marketable Disinfectant from Fecal Sludge in Dakar, Senegal <i>King Center for Global Development</i>	\$100,000	2020-2022		Single PI
Engineering Agricultural Resilience after Natural Disasters: Deployable Fertilizer Production to Rehabilitate Arable Land <i>King Center for Global Development</i>	\$60,000	2019-2021		Single PI
Hybrid electrochemical-ion exchange process for selective phosphate recovery as struvite (Under Agreement) <i>Department of Energy, National Alliance for Water Innovation</i>	\$1,700,000	2022-2025		Lead PI
Advancing Sanitation Justice: Linking climate-exacerbated nitrogen, cyanotoxins, and parasites with reimagined sanitation infrastructure and services in African-American communities <i>Environmental Protection Agency</i>	\$1,350,000	2022-2025		Lead PI
Electrified Nutrient Recovery <i>Doerr School of Sustainability Accelerator</i>	\$400,000	2022-2023		Lead PI
Enzymatic Electrochemistry for Wastewater Nitrogen Refining <i>Bio-X Interdisciplinary Institute</i>	\$200,000	2022-2024		Lead PI
Taking the Pulse of the Nitrogen Cycle: Electrochemical Water Quality Sensor Design, Deployment and Data <i>Woods Institute for the Environment</i>	\$200,000	2022-2024		Lead PI
High-Throughput Development of Next-Gen Resins for Water Purification <i>Woods Institute for the Environment</i>	\$200,000	2022-2024		PI: E. Appel, Stanford
Scaling Sanitation to Safeguard Human and Planetary Health: Designing, Evaluating, and Deploying Urine Separation and Treatment <i>Center for Innovations in Global Health</i>	\$50,000	2022-2024		Lead PI
Co-Creating Sanitation Justice: Community-based monitoring and mitigation of climate-exacerbated pollution <i>Healthy Planet, Healthy People Early Career Research</i>	\$200,000	2022-2024		Lead PI