ANTHONY P. STRAUB

Assistant Professor, University of Colorado Boulder
Environmental Engineering Program | Materials Science and Engineering Program
Department of Civil, Environmental and Architectural Engineering
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Education

Postdoc	**Massachusetts Institute of Technology**, Cambridge, MA Department of Materials Science and Engineering	2019
Ph.D.	**Yale University**, New Haven, CT Department of Chemical & Environmental Engineering	2017
M.Phil.	**Yale University**, New Haven, CT Department of Chemical & Environmental Engineering	2015
M.Sc.	**Yale University**, New Haven, CT Department of Chemical & Environmental Engineering	2014
B.S.	**University of Illinois**, Urbana-Champaign, IL Department of Civil & Environmental Engineering	2012

Academic Appointments and Professional Experience

Assistant Professor | University of Colorado Boulder Aug. 2019 – Present
Materials Science & Engineering Program; Environmental Engineering Program
Department of Civil, Environmental and Architectural Engineering

Co-Founder | OsmoPure Technologies, Inc. Jan. 2024 – Present
Current Role: Chief Scientific Advisor

Postdoctoral Research Fellow | Massachusetts Institute of Technology Nov. 2017 – July 2019
Department of Materials Science & Engineering
Advisor: Prof. Jeffrey Grossman

NSF Graduate Research Fellow | Yale University Aug. 2012 – Oct. 2017
Department of Chemical & Environmental Engineering
Advisor: Prof. Menachem Elimelech

Research Intern | Ben-Gurion University of the Negev May – Aug. 2011, May – Aug. 2012
Department of Desalination & Water Treatment
Advisor: Prof. Moshe Herzberg

Research Assistant | University of Illinois at Urbana-Champaign Jan. 2010 – May 2012
Department of Civil & Environmental Engineering
Advisor: Prof. Thanh H. Nguyen

Publications

H-index: 21 | Total citations: 4461 | Underline indicates student advisee

Accepted or Published Journal Articles

1. Allouzi, M.; Avidar, M.; Birnhack, L.; Epsztein, R.*; **Straub, A.P.*** "Reliable Methods to Determine Experimental Energy Barriers for Transport in Salt-Rejecting Membranes." *Journal of Membrane Science Letters.* Accepted (2024).
2. Lopez, K.; Nguyen, M.; Ban, C.; **Straub, A.P.*** "Pore Wetting and Compaction in Pressure-Driven Distillation: Insights form Impedance Spectroscopy." *ACS ES&T Engineering*. Accepted (2024).

3. Mungan, A.L.; Hjelvik, E.A.; **Straub, A.P.**; Korak, J.A.* "A hybrid anion exchanger with nanoscale zero valent iron for trace hexavalent chromium removal from drinking water." *Environmental Science: Advances* 3, 1598–1615 (2024).
4. Fan, S.; Nguyen, D.T.; Martinez, J.; Fung, K.; Sirkar, K.; **Straub, A.P.**, Ding, Y.* "The Effect of Sharklet Patterns on Thermal Efficiency and Salt-Scaling Resistance of Poly (vinylidene fluoride) Membranes During Direct Contact Membrane Distillation." *Journal of Membrane Science*. Accepted (2024).
5. Schwindt, N.S.; Avidar, M.; Epsztein, R.; **Straub, A.P.**, Shirts, M.R.* "Interpreting effective energy barriers to membrane permeation in terms of a heterogenous energy landscape." *Journal of Membrane Science* 712, 123233 (2024).
6. Kalam, S.; Dutta, A.; Li, X.; Lee, S.; Nguyen, D.T.; **Straub, A.P.*;** Lee J.* "Maximizing Biochemical and Energy Recovery from Wastewater using Vapor-Gap Membranes." *ACS ES&T Engineering* 4, 7, 1540–1561 (2024).
7. Lee, S.; Shirts, M.R.; **Straub, A.P.*** "Molecular fingerprint-aided prediction of organic solute rejection in reverse osmosis and nanofiltration." *Journal of Membrane Science* 705, 122927 (2024).
8. **Straub, A.P.*** "Perfecting size-selective membrane separations." *Nature Water* 2, 509–510 (2024).
9. Lopez, K.P.; Flynn, M.; **Straub, A.P.*** "Pressure-driven Distillation as a Novel Method to Improve Water Recovery in Spaceflight Systems." *53rd International Conference on Environmental Systems* (Peer-reviewed conference paper), ICES-2024-353 (2024).
10. Cairney, H.; Hjelvik, E.; **Straub, A.P.*** "Impact of oxidative chemicals on hydrophobic porous membranes used in membrane distillation." *ACS Applied Engineering Materials* 2, 4, 1162–1169 (2024).
11. Roth, R.S.; Birnhack, L.; Avidar, M.; Hjelvik, E.A.; **Straub, A.P.**; Epsztein, R.* "Effect of solution ions on the charge and performance of nanofiltration membranes." *npj clean water* 7, 25 (2024).
12. Nguyen, D.T.; Lopez, K.P.; Lee, S.; Lee, J.; Hernandez, M.; **Straub, A.P.*** "Water Desalination via Pressure-Driven Distillation with Chlorine-Resistant and Large-Area Polymeric Membranes." *Environmental Science & Technology Letters* 10, 8, 711-717 (2023).
13. Nguyen, D.T.; Lee, S.; Lopez, K.P.; Lee, J.; **Straub, A.P.*** "Pressure-driven distillation using air-trapping membranes for fast and selective water purification." *Science Advances*, 9, 28, eadg6638 (2023).
14. Liu, W.; Wang, R.; **Straub, A.P.**; Lin, S.* "Membrane Design Criteria and Practical Viability of Pressure-driven Distillation." *Environmental Science & Technology*, 57, 5, 2129-2137 (2023).
15. Lopez, K.P.; Wang, R.; Hjelvik, E.H.; Lin, S.; **Straub, A.P.*** "Toward a universal framework for evaluating transport resistances and driving forces in membrane-based desalination processes." *Science Advances*, 9, 1, eade0413 (2023).
16. Nickerson, T.; McNally, D.; Antonio, E.; Toney, M.F.*; Ban, C.*; **Straub, A.P.*** "Unlocking the potential of polymeric desalination membranes by understanding molecular-level interactions" *Chemical Science*, 14, 4, 751-770 (2023).
17. Shefer, I.[1]; Lopez, K.[1]; **Straub, A.P.***; Epsztein, R.* "Applying transition-state theory to explore transport and selectivity in salt-rejecting membranes: A critical review." *Environmental Science & Technology* 56, 12, 7467–7483 (2022).
18. Lee, S.; **Straub, A.P.*** "Analysis of Volatile and Semivolatile Organic Compound Transport in Membrane Distillation Modules." *ACS ES&T Engineering* https://doi.org/10.1021/acsestengg.1c00432 (2022).

19. Jiang, H.; **Straub, A.P.**; Karanikola, V.* "Ammonia Recovery with Sweeping Gas Membrane Distillation: Energy and Removal Efficiency Analysis." *ACS ES&T Engineering* https://doi.org/10.1021/acsestengg.1c00294 (2022)

20. **Straub, A.P.***; Bergman, D.S.; Getachew, B.A.; Leahy, L.; Patel, J.J.; Ferralis, N.; Grossman, J.C.* "Highly Conductive and Permeable Nanocomposite Ultrafiltration Membranes Using Laser-Reduced Graphene Oxide." *Nano Letters* 21, 6, 2429–2435 (2021)

21. Lee, S.; **Straub, A.P.* "**Opportunities for high productivity and selectivity desalination via osmotic distillation with improved membrane design." *Journal of Membrane Science* 611, 118309 (2020)

22. **Straub, A.P.***; Asa, E.; Zhang, W.; Nguyen, T.H.; Herzberg, M.* "In-Situ Graft-Polymerization Modification of Commercial Ultrafiltration Membranes for Long-Term Fouling Resistance in a Pilot-Scale Membrane Bioreactor." *Chemical Engineering Journal*, 382, 122865 (2020).

23. Wang, Z.; Horseman, T.; **Straub, A.P.**; Yip, N.Y.; Li, D.; Elimelech, M.*; Lin, S.* "Pathways and Challenges for Efficient Solar-Thermal Desalination." *Science Advances*, 5, eaax0763 (2019).

24. Shaulsky, E.; Karanikola, V.; **Straub, A.P.**; Deshmukh, A.; Zucker, I.; Elimelech, M.* "Asymmetric Membranes for Membrane Distillation and Thermo-Osmotic Energy Conversion." *Desalination*, 452, 141-148 (2019).

25. Lee, J.*; **Straub, A.P.**, Elimelech, M. "Vapor-gap membranes for highly selective osmotically driven desalination." *Journal of Membrane Science* 555, 407-417 (2018).

26. Deshmukh, A.; Boo, C.; Karanikola, V.; Lin, S.; **Straub, A.P.**; Tong, T.; Warsinger, D.M.; Elimelech, M.* "Membrane Distillation at the Water-Energy Nexus: Limits, Opportunities, and Challenges." *Energy & Environmental Science* 11, 1177-1196 (2018).

27. Rahimi, M.; **Straub, A.P.**; Zhang, F.; Zhu, X.; Elimelech, M.; Gorski, C. A.; Logan, B.E.* "Emerging Electrochemical and Membrane-Based Systems to Convert Low-Grade Heat to Electricity." *Energy & Environmental Science* 11, 276-285 (2017).

28. **Straub, A.P.**; Elimelech, M.* "Energy Efficiency and Performance Limiting Effects in Thermo-Osmotic Energy Conversion from Low-Grade Heat." *Environmental Science & Technology* 51, 12925-12931 (2017).

29. **Straub, A.P.**; Yip, N.Y.; Lin, S.; Lee, J.; Elimelech, M.* "Harvesting Low-Grade Heat Energy Using Thermo-Osmotic Vapour Transport Through Nanoporous Membranes." *Nature Energy* 1, Article Number: 16090 (2016).

30. Matthew, L.E.*; Piedra, L.M.; Wu, C.F; Kramer-Díaz, A.; Wang, H.; **Straub, A.P.**; Nguyen, T.H. "Social Work and Engineering: Lessons from a Water Filtration Project in Guatemala" *International Social Work* 4, Article Number: 655869 (2016).

31. **Straub, A. P.**; Deshmukh, A.; Elimelech, M.* "Pressure-Retarded Osmosis for Power Generation from Salinity Gradients: Is It Viable?" *Energy & Environmental Science* 9, 31-48 (2016).

32. Bar-Zeev, E.; Perreault, F.; **Straub, A. P.**; Elimelech, M.* "Impaired Performance of Pressure-Retarded Osmosis Due to Irreversible Biofouling." *Environmental Science & Technology* 49, 13050-13058 (2015).

33. **Straub, A. P.**; Osuji, C.O.; Cath, T.Y.; Elimelech, M.* "Selectivity and Mass Transfer Limitations in Pressure-Retarded Osmosis at High Concentrations and Increased Operating Pressures." *Environmental Science & Technology* 49, 12551-12559 (2015).

34. **Straub, A. P.**; Lin, S.; Elimelech, M.* "Module-Scale Analysis of Pressure-Retarded Osmosis: Performance Limitations and Implications for Full-Scale Operation." *Environmental Science & Technology* 48, 12435-12444 (2014).

35. Lin, S.; **Straub, A. P.**; Elimelech, M.* "Thermodynamic Limits of Extractable Energy by Pressure-Retarded Osmosis." *Energy & Environmental Science* 7, 2706-2714 (2014).
36. Wang, H.; Narihiro, T.; **Straub, A. P.**; Pugh, C. R.; Tamaki, H.; Moor, J. F.; Bradley, I. M.; Kamagata, Y.; Liu, W.T.; Nguyen, T. H.* "MS2 Bacteriophage Reduction and Microbial Communities in Biosand Filters." *Environmental Science & Technology* 48, 6702–6709 (2014).
37. **Straub, A.P.**; Yip, N.Y.; Elimelech, M.* "Raising the Bar: Increased Hydraulic Pressure Allows Unprecedented High Power Densities in Pressure-Retarded Osmosis." *Environmental Science & Technology Letters* 1, 55–59 (2014).
38. Tirafferi, A.; Yip, N.Y.; **Straub, A.P.**; Romero-Vargas Castrillon, S.; Elimelech, M.* "A Method for Simultaneous Determination of Transport and Structural Parameters of Forward Osmosis Membranes." *Journal of Membrane Science* 444, 523–538 (2013).
39. Bradley, I.; **Straub, A.P.**; Maraccini, P.; Markazi, S.; Nguyen, T. H.* "Iron Oxide Amended Biosand Filters for Virus Removal." *Water Research 45*, 4501-4510. (2011).
40. Romero, O.C.; **Straub, A.P.**; Kohn, T.; Nguyen, T.H.* "Role of Temperature and Suwannee River Natural Organic Matter on Inactivation Kinetics of Rotavirus and Bacteriophage MS2 by Solar Irradiation." *Environmental Science & Technology* 45, 10385-10393 (2011).

Submitted or Under Review Journal Articles

1. Wang, R.; Liu, W.; Lee, J.; Lopez, K.P.; Laris, O.; **Straub, A.P.**; Lin, S.* "Flux Limit in Membrane Distillation and Anomalies with Nanopore Evaporation." Under revision.
2. Tariqi, A.; **Straub, A.P.**; Cruzado, L.; Hickenbottom, K.*; Karanikola, V.* "Synergistic Solutions: Reverse Osmosis and Nanofiltration Configurations for Efficient Brackish Water Desalination." Submitted.

Patents

1. **Straub, A.P.**; Lopez, K.P. 2024 "High-flux composite pressure-driven distillation membranes and operation methods for the same." U.S. Provisional Patent 63/705,157.
2. **Straub, A.P**; Lopez, K.P. 2024 "Selective gas transport through ultra-high pressure liquid membranes." U.S. Provisional Patent 63/709,941.

Awards and Honors

NSF Faculty Early Career Development CAREER Award (Recommended) 2025
Prestigious grant supporting early-career researchers in STEM.

American Water Works Association (AWWA) Austin F. McCormack, Jr., Award 2025
One annual award to honor contributions in membrane treatment.

Dean's Performance Award for Junior Faculty – University of Colorado Boulder 2023
One annual award in the College of Engineering.

Department Early Career Researcher Award - University of Colorado Boulder 2023
One annual award for excellence in research for pre-tenure faculty.

North American Membrane Society: Young Membrane Scientist Award 2022
One of three annual awards to researchers in membrane science.

ACS Environmental Science & Technology Engineering Best Paper Award 2022
Awarded to the best paper of the year.

Swiss National Science Foundation Postdoc Mobility Fellowship 2018
$76,000 fellowship to support two years of postdoctoral research.

Marie Skłodowska-Curie Individual Fellowship (Awarded and declined) 2017
$190,000 fellowship to support two years of postdoctoral research.

National Science Foundation (NSF) Graduate Research Fellowship 2012
$126,000 fellowship to support three years of graduate studies.

ACS Graduate Student Award in Environmental Chemistry 2016
Awarded by the American Chemical Society for record of research productivity.

Huddleston and Blum Graduate Fellowship 2015
Granted a year of funding for one engineering graduate student at Yale.

Central States Water & Environment Association (CSWEA) Award 2012
Awarded to one student per year for academic excellence.

Wilfred F. and Ruth Davison Langelier Scholarship 2011
$4,000 scholarship based on academic performance and extracurricular activities.

Morrill Engineering Program Award 2010
Awarded for academic excellence.

Invited Seminars and Conference Presentations

1. **Straub, A.P.** "Energy-efficient distillation driven by pressure rather than heat" *Arizona State University*, Tempe, AZ. Invited seminar. October 28, 2024.
2. Lopez, K.; **Straub, A.P.** "Pressure-driven membrane distillation for high efficiency, selectivity, and oxidation resistance in desalination and wastewater reuse" *Membrane Science Engineering and Technology Center Fall 2024 Meeting*, Boulder, CO. Oral presentation. October 7, 2024.
3. Tomsovic, K.Y.; Doudrick, K.; **Straub, A.P.*** "Nanofiltration and oxidation for removal of per- and polyfluoroalkyl substances" *Membrane Science Engineering and Technology Center Fall 2024 Meeting*, Boulder, CO. Oral presentation. October 7, 2024.
4. **Straub, A.P.*** "Highly permeable and selective air-trapping polymeric membranes." *American Chemical Society Fall 2024 Meeting*, Denver, Colorado. August 19, 2024.
5. **Straub, A.P.*** "Putting bubbles to work: Air-trapping membranes for advanced water purification." *University of Colorado Boulder Innovation in Materials Science Symposium*, Boulder, Colorado. Oral presentation. August 15, 2024.
6. **Straub, A.P.*** "Exploring the flux limits of distillation membranes." *Telluride Science: Water: Grand Challenges for Molecular Science and Engineering.* Oral Presentation. June 13, 2024.
7. Lopez, K.P.; Flynn, M.; **Straub, A.P.*** "Pressure-driven Distillation as a Novel Method to Improve Water Recovery in Spaceflight Systems." *53rd International Conference on Environmental Systems*, Louisville, Kentucky. Oral Presentation. July 22, 2024.
8. Laris, O.; **Straub, A.P.*** "Fast and selective desalination using pressure-driven distillation with nanoscale air gaps" *North American Membrane Society Conference*, Santa Fe, New Mexico. Oral presentation. May 15, 2024.
9. Tomsovic, K.Y.; Doudrick, K.; **Straub, A.P.*** "Impact of feedwater composition on the removal of short, ultrashort, and neutral PFAS in nanofiltration" *North American Membrane Society Conference*, Santa Fe, New Mexico. Poster presentation. May 14, 2024.
10. **Straub, A.P.**, "Putting bubbles to work: Next-generation water treatment systems using air-trapping membranes" *University of California Los Angeles*, Los Angeles, California. Invited Seminar. May 7, 2024.
11. **Straub, A.P.**, "Vapor-phase water transport approaching the flux limit using nanoscale air gaps" *Nanofluidics 2024*, Lenzerheide, Switzerland. Oral presentation. January 22, 2024.

12. **Straub, A.P.** "Pressure-driven distillation using air-trapping membranes for fast and selective water desalination" *International Congress on Membranes*, Chiba, Japan. Oral presentation. July 14, 2023.
13. Lopez, K.; Jorgenson, N.; Nguyen, D.T.; Lee, S.; Summers, S.; **Straub, A.P.** "Applying pressure-driven distillation to water reuse: challenges and solutions" *International Congress on Membranes*, Chiba, Japan. Oral presentation. July 13, 2023.
14. Laris, O.; **Straub, A.P.** "Developing multifunctional hydrogel coatings for membranes" *International Congress on Membranes*, Chiba, Japan. Poster presentation. July 13, 2023.
15. **Straub, A.P.** Nguyen, D.T.; Lopez, K.P. Lee, S.; "Pressure-driven distillation for fast and selective water desalination" *2023 Association of Environmental Engineering and Science Professors (AEESP) Conference*, St. Louis, MO. Oral presentation. June 21, 2023
16. Nguyen, D.T.; Lopez, K.P.; Fan, S.; Ding, Y.; **Straub, A.P.** "Scalable polymeric membranes for pressure-driven distillation" *2023 Association of Environmental Engineering and Science Professors (AEESP) Conference*, Boston, MA. Oral presentation. June 21, 2023
17. Mungan, A.; Hjelvik, E.A.; **Straub, A.P.**, Korak, J. "Scalable polymeric membranes for pressure-driven distillation" *2023 Association of Environmental Engineering and Science Professors (AEESP) Conference*, Boston, MA. Poster presentation. June 21, 2023
18. Nguyen, D.; Lopez, K.L.; Fan, S.; Ding, Y.; Lee, J.; **Straub, A.P.** "High-performance scalable membranes for water desalination by pressure-driven distillation" *North American Membrane Society 2023 Meeting*, Tuscaloosa, AL. Oral presentation. May 17, 2023.
19. Lopez, K.; **Straub, A.P.** "Fouling behavior and mitigation vapor-gap reverse osmosis using nanoporous hydrophobic membranes" *2023 WateReuse Colorado Conference*, Boulder, CO. Poster presentation. May 2, 2023.
20. Lee, S.; **Straub, A.P.** "Predicting contaminant rejection in reverse osmosis and nanofiltration with molecular fingerprints and data-driven models" *2023 WateReuse Colorado Conference*, Boulder, CO. Poster presentation. May 2, 2023.
21. Nguyen, D.T.; **Straub, A.P.** "Pressure-driven distillation for ultra-selective and oxidation-resistant water purification" *2023 WateReuse Colorado Conference*, Boulder, CO. Poster presentation. May 2, 2023.
22. Lopez, K.; Nguyen, D. Hjelvik, E.; Lee, S.; **Straub, A.P.** "Pressure-driven membrane distillation for high efficiency, selectivity, and oxidation resistance in desalination and wastewater reuse" *Membrane Science Engineering and Technology Center Spring 2023 Meeting*, State College, PA. Oral presentation. April 3, 2023.
23. Lopez, K.; **Straub, A.P.** "Electrochemical characterization and oxidation to mitigate failure in pressure-driven distillation" *AMTA/AWWA Membrane Technology Exposition (MTC23)*, Knoxville, TN. Oral presentation. February 21, 2023.
24. Lopez, K.; Nguyen, D. Hjelvik, E.; Lee, S.; **Straub, A.P.** "Pressure-driven membrane distillation for high efficiency, selectivity, and oxidation resistance in desalination and wastewater reuse" *Membrane Science Engineering and Technology Center Fall 2022 Meeting*, Boulder, CO. Oral presentation. October 24, 2022.
25. **Straub, A.P.**, "Putting bubbles to work: Next-generation water treatment systems using air-trapping membranes" *Texas Tech*, Lubbock, Texas. Invited Virtual Seminar. October 10, 2022.
26. Nguyen, D.; Lee, S.; Lopez, K.L.; Hernandez, M.; Lee, J.; **Straub, A.P.** "Next-generation Water Purification Systems: Pressure-driven Vapor Transport across Air-trapping Membranes" *263rd American Chemical Society National Meeting*, Chicago, IL. Oral presentation. August 23, 2022.
27. Lopez, K.; Nguyen, D.; Lee, S.; Hjelvik, E.; **Straub, A.P.** "Pressure-driven membrane distillation for high efficiency, selectivity, and oxidation resistance in desalination and wastewater reuse" *Membrane*

Science Engineering and Technology Center Fall 2022 Meeting, Boulder, CO. Oral presentation. October 24, 2022.

28. Lee, S.; **Straub, A.P.** "Data-driven models learning molecular features to predict organic solute rejection in reverse osmosis and nanofiltration" *2022 Gordon Research Conference: Membrane Materials and Processes*, New London, NH. Poster presentation. July 30-August 5, 2022.
29. Nguyen, D.; Lee, S.; Lopez, K.L.; Hernandez, M.; Lee, J.; **Straub, A.P.** "Pressure-driven Distillation for Water Purification with Ultrahigh Selectivity and Oxidation Tolerance" *2022 Gordon Research Seminar: Membrane Materials and Processes*, New London, NH. Oral presentation. July 30, 2022.
30. Lee, S.; **Straub, A.P.** "Omniphobic membranes with high liquid entry pressure for separating organic solvents in pressure-driven distillation" *2022 Association of Environmental Engineering and Science Professors (AEESP) Conference*, St. Louis, MO. Poster presentation. June 28, 2022
31. **Straub, A.P.**, "Putting bubbles to work: Next-generation reverse osmosis systems using air-trapping membranes" *Association of Environmental Engineering & Science Professors (AEESP) 2022*, St. Louis, Missouri. Oral presentation. June 27, 2022.
32. Lopez, K.; Nguyen, D. Hjelvik, E.; Lee, S.;; **Straub, A.P.** "Pressure-driven membrane distillation for high efficiency, selectivity, and oxidation resistance in desalination and wastewater reuse" *Membrane Science Engineering and Technology Center Spring 2022 Meeting*, Newark, NJ. Oral presentation. June 6, 2022.
33. **Straub, A.P.**, "Ultraselective and oxidation-resistant pressure-driven desalination using nanobubble trapping membranes" *Tahoe Nanofluidics Conference*, Tahoe, California. Oral presentation. May 24, 2022.
34. **Straub, A.P.**, "Putting bubbles to work: Next-generation water treatment systems using air-trapping membranes" *North American Membrane Society 2021 Conference*, Phoenix, Arizona. Oral presentation. May 18, 2022.
    Part of a special session for NAMS Awards
35. Hjelvik, E.; Lopez, K.L.; **Straub, A.P.** "High Flux Vapor-Gap Membranes for Reverse Osmosis Via Informed Design Of Membrane Pore Structures" *North American Membrane Society 2022 Conference*, Phoenix, AZ. Poster presentation. May 18, 2022.
36. Hjelvik, E.; Lopez, K.L.; **Straub, A.P.** "High Flux Vapor-Gap Membranes for Reverse Osmosis Via Informed Design Of Membrane Pore Structures" *North American Membrane Society 2022 Conference*, Phoenix, AZ. Oral presentation. May 18, 2022.
37. Hjelvik, E.; Cairney, H.; Nguyen, D.; Karanikola, V.; **Straub, A.P.** "Impact Of Oxidative Chemicals On The Performance And Materials Properties Of Hydrophobic Porous Membranes Used In Membrane Distillation" *North American Membrane Society 2022 Conference*, Phoenix, AZ. Oral presentation. May 17, 2022.
38. Lopez, K.; Wang, R.; Hjelvik, E.; Lin, S.; **Straub, A.P**. "Towards a universal framework for evaluating mass transport in pressure, concentration, and temperature driven membrane-based desalination systems" *North American Membrane Society 2022 Conference*, Phoenix, AZ. Oral presentation. May 17, 2022.
39. Hjelvik, E.; Lopez, K.L.; **Straub, A.P.** "Increasing water supplies using novel distillation-based membrane technologies" *American Water Resources Association Conference*, Denver, CO. Oral presentation. February 20, 2022.
40. **Straub, A.P.**, "Putting bubbles to work: Next-generation water treatment systems using air-trapping membranes" *Colorado School of Mines*, Golden, Colorado. Invited Seminar. October 22, 2021.
41. Nguyen, D.T.; Lee, S.; Lopez, K.; Hernandez, M.; Lee, J.; **Straub, A.P** "Ultra-selective and oxidation-resistant membranes for desalination and water reuse" *North American Membrane Society 2021*

Conference, Estes Park, Colorado. Oral presentation. September 2, 2021.
Part of special session for student awards

42. Lopez, K.; Nguyen, D.; **Straub, A.P** "Fouling behavior and mitigation in vapor-gap reverse osmosis using nanoporous hydrophobic membranes" *North American Membrane Society 2021 Conference*, Estes Park, Colorado. Poster presentation. September 2, 2021.
43. Lee, S.; **Straub, A.P** "Evaluation of volatile and semi-volatile organic compound transport across membrane distillation modules" *North American Membrane Society 2021 Conference*, Estes Park, Colorado. Poster presentation. September 2, 2021.
44. Cairney, H.; Nguyen, D.; Hjelvik, E.; Lopez, K.; **Straub, A.P** "Oxidation resistance of hydrophobic porous membranes used in membrane distillation" *North American Membrane Society 2021 Conference*, Estes Park, Colorado. Poster presentation. September 2, 2021.
45. Nguyen, D.T.; Lee, S.; Lopez, K.; Hernandez, M.; Lee, J.; **Straub, A.P** "Ultra-selective and oxidation-resistant Pressure-Driven Desalination using Entrapped Nanobubble Membranes" *American Chemical Society Fall 2021 Meeting*, Remote. Oral presentation. August 22, 2021.
Part of a student award
46. Nguyen, D.T.; Lee, S.; Lopez, K.; Hernandez, M.; Lee, J.; **Straub, A.P** "Ultra-selective and oxidation-resistant membranes for desalination and water reuse" *AWWA/AMTA Membrane Technology Conference and Exposition*, West Palm Beach, Florida. Oral presentation. July 20, 2021.
Part of special session for AMTA student fellowship awardees
47. Nguyen, D.T.; Lee, S.; Lopez, K.; Hernandez, M.; Lee, J.; **Straub, A.P** "Ultra-selective and oxidation-resistant membranes for desalination and water reuse" *AWWA/AMTA Webinar*, Remote. Oral presentation. March 25, 2021.
Part of special session for AMTA student fellowship awardees
48. **Straub, A.P.**, "Putting bubbles to work: Emerging applications of hydrophobic membranes in water treatment and power generation" *WESTalks Seminar*, Remote. Invited Seminar. February 18, 2021.
49. Lee, S.; **Straub, A.P** "Opportunities for high productivity and selectivity desalination via osmotic distillation with improved membrane design" *North American Membrane Society 2020 Conference.* Virtual meeting. Oral presentation. May 21, 2020.
50. **Straub, A.P.**, "Nano-enabled Membrane Materials for Water Treatment and Power Generation" *University of British Columbia*, Vancouver, Canada. Invited Seminar. June 14, 2019.
51. **Straub, A.P.**; Bergsman, D.; Getachew, B.; Leahy, L.; Patel, J.; Ferralis, N.; and Grossman, J.C, "Electrically Conductive and Highly Permeable Nanocomposite Ultrafiltration Membranes Using Laser-Reduced Graphene Oxide" *Association of Environmental Engineering & Science Professors (AEESP) 2019*, Tempe, Arizona. Poster Presentation. May 15, 2019.
52. **Straub, A.P.** "Putting Bubbles to Work: Emerging Applications of Hydrophobic Membrane Materials in Power Generation and Desalination" *Ben-Gurion University of the Negev*, Midreshet Ben-Gurion, Israel. Invited Seminar. February 11, 2019.
53. **Straub, A.P.**, Grossman, J.E. "Functionalized graphene materials for membrane separations" *Gordon Research Conference, Membranes: Materials and Processes*, New London, NH. Poster Presentation. August 13, 2018.
54. **Straub, A.P.**, Elimelech, M. "Energy Efficiency and Performance Limiting Effects in Thermo-Osmotic Energy Conversion from Low-Grade Heat" *Association of Environmental Engineering & Science Professors (AEESP) 2017 Conference*, Ann Arbor, MI. Oral Presentation. June 22, 2017.

55. **Straub, A.P.**, Deshmukh, A., Elimelech, M. "Net Energy Output of Salinity Gradient Power Generation with Pressure-Retarded Osmosis: What Configurations Are Feasible?" *American Chemical Society (ACS) National Conference*, Philadelphia, PA. Oral Presentation. August 24, 2016.
Received Best Presentation Award
56. **Straub, A.P.**, Yip, N.Y., Lin, S., Lee, J., Elimelech, M. "Harvesting Low-Grade Heat Using Thermo-Osmotic Vapor Transport Through Nanoporous Membranes" *Gordon Research Seminar, Membranes: Materials and Processes*, New London, NH. Oral Presentation. July 30, 2016.
57. **Straub, A.P.**, Deshmukh, A., Elimelech, M. "Power Generation from Salinity Gradients by Pressure-Retarded Osmosis: Is It Viable?" *INES Network for Salinity Gradient Energy Webinar*. Oral Presentation. January 25, 2016.
58. **Straub, A.P.**, Lin, S., Elimelech, M. "Power Generation from Salinity Gradients by Pressure-Retarded Osmosis: Is It Viable?" *New England Graduate Student Water Symposium*, Amherst, MA. Oral Presentation. September 12, 2015
59. **Straub, A.P.**, Lin, S., Elimelech, M. "Power Generation from Salinity Gradients by Pressure-Retarded Osmosis: How Much Energy Can We Extract?" *Association of Environmental Engineering & Science Professors (AEESP) 2015 Conference*, New Haven, CT. Oral Presentation. June 15, 2015
Received Best Presentation Award
60. **Straub, A.P.**, Lin, S., Elimelech, M. "Performance Limitations of Pressure-Retarded Osmosis: Experimental Characterization and Module-Scale Analysis" *North American Membrane Society 25th Annual Meeting*, Boston, MA. Oral Presentation. June 1, 2015
61. **Straub, A.P.**, Lin, S., Elimelech, M. "Power Generation by Pressure-Retarded Osmosis: How Much Energy Can We Extract?" *International Forward Osmosis Association World Summit*, Lisbon, Portugal. Oral Presentation. September 18-19, 2014.
62. **Straub, A.P.**, Yip, N.Y., Elimelech, M. "Realizing High Power Density in Pressure-Retarded Osmosis with Increased Hydraulic Pressure." Gordon Research Conference, Membranes: Materials and Processes, New London, NH. Poster Presentation. July 6-11, 2014.
63. **Straub, A.P.**, Lin, S., Yip, N.Y., Elimelech, M. "Limits of Extractable Energy and Power Density in Pressure-Retarded Osmosis." *INES Network for Salinity Gradient Energy Meeting*, Montreal, Canada. Oral Presentation. June 10, 2014.
64. **Straub, A.P.**, Yip, N.Y., Elimelech, M. "Realizing High Power Density in Pressure-Retarded Osmosis with Increased Hydraulic Pressure." *North American Membrane Society 24rd Annual Meeting*, Houston, TX. Oral Presentation. June 4, 2014.
65. **Straub, A.P.**, Yip, N.Y., Elimelech, M. "Realizing High Power Density in Pressure-Retarded Osmosis with Increased Hydraulic Pressure." *11th Annual Robert M. Langer Symposium*, New Haven, CT. Oral Presentation. December 6, 2013.
Received Best Presentation Award
66. Tirafferi, A., Yip, N.Y., **Straub, A.P.**, Romero-Vargas Castrillon, S., Elimelech, M. "Novel Characterization Method for Determination of Transport and Structural Parameters of Forward Osmosis Membranes." North American Membrane Society 23rd Annual Meeting, Boise, ID. Oral Presentation. June 11, 2013.
67. Bradley, I., **Straub, A.P.**, Sohn, A., Folwarski, P., and Nguyen, T.H. "Iron Amended Biosand Filters for Virus Removal." WEFTEC 2010 Design Competition, New Orleans, LA. Oral Presentation. October 3, 2010.
68. **Straub, A.P.**, Sohn A., Bradley, I., and Nguyen, T.H., "Virus Removal in Iron Amended Biosand Filters." *UIUC Environmental Engineering and Sciences Symposium,* Champaign, IL. Oral Presentation. April 2, 2010

Teaching

Courses Taught

Course	Semester	Level	Type	Enrollment
CVEN 3414: Fundamentals of Environmental Engineering	Fall 2019	Sophomore	Required	93
CVEN 3414: Fundamentals of Environmental Engineering	Spring 2020	Sophomore	Required	20
CVEN 5464: Environmental Engineering Processes	Fall 2020	Graduate	Required	32
CVEN 3414: Fundamentals of Environmental Engineering	Spring 2021	Sophomore	Required	67
CVEN 5464: Environmental Engineering Processes	Fall 2021	Graduate	Required	39
CVEN 5834: Advanced Physical-Chemical Processes for Water Treatment*	Fall 2021	Graduate	Elective	12
CVEN 3414: Fundamentals of Environmental Engineering	Spring 2022	Sophomore	Required	60
CVEN 5464: Environmental Engineering Processes	Fall 2022	Graduate	Required	25
CVEN 3414: Fundamentals of Environmental Engineering	Spring 2023	Sophomore	Required	41
CVEN 5464: Environmental Engineering Processes	Fall 2023	Graduate	Required	39
CVEN 6504: Advanced Physical-Chemical Processes for Water Treatment*	Fall 2023	Graduate	Elective	13
CVEN 3414: Fundamentals of Environmental Engineering	Spring 2024	Sophomore	Required	45
CVEN 5464: Environmental Engineering Processes	Fall 2024	Graduate	Required	30

*Co-taught between four instructors

Course Descriptions

CVEN 3414: Fundamentals of Environmental Engineering

3 credit hour junior-level undergraduate course covering broad topics related to environmental engineering. Course is required for all environmental engineering undergraduate students.

CVEN 5464: Environmental Engineering Processes

3 credit hour graduate course covering reactor design and mass transfer. Course is required for all environmental engineering graduate students.

CVEN 5834/6504: Advanced Physical-Chemical Processes for Water and Water Reuse Treatment

3 credit hour graduate course covering ion exchange, advanced oxidation process, membranes, and sorption processes. Enrollment ranges from 25–40 students.

Other Teaching

University of Colorado Water Reuse Short Course

Taught a module on membrane processes for a University of Colorado Water Reuse short course held virtually. The course was attended to by water industry professionals and academics.

Leadership Training and Teaching Certificates

Research and Innovation Faculty Fellows Program 2024

Selective leadership training workshop run by the University of Colorado. Includes three two-day workshops on leadership, communication, and mentorship.

MIT Postdoc Leadership Program 2019

Two-day offsite workshop for postdoctoral scholars at MIT to learn leadership skills.

MIT Kaufman Teaching Certificate 2019

Semester-long training program designed at developing skills in teaching and course planning. Includes eight workshops and additional teaching sessions.

Student Advising

Primary Graduate Research Mentor

9 current graduate students (8 Ph.D. students and 1 M.S. student); 1 Ph.D. graduated; 1 M.S. graduated

Current Graduate Students

Ph.D. Kian Lopez, Chem. Eng., *NASA NSTGRO Fellowship Awardee*
Trisha Nickerson, Chem. Eng., Co-advised with Michael Toney, *NSF GRFP Awardee*
Elizabeth Hjelvik, Mat. Sci., *NSF GRFP Awardee*
Omar Laris, Mat. Sci.
Sasha Neefe, Chem. Eng., Co-advised with Michael Toney
Mohammad Allouzi, Env. Eng.
Yukai Tomsovic, Mat. Sci.
Max Saffer-Meng, Chem. Eng.

M.S. Jacqueline Hall, Env. Eng.

Graduate Student Alumni

Ph.D. Sangsuk Lee, Ph.D., Env. Eng. 2023
Current position: Postdoctoral Researcher at University of California Los Angeles

M.S. Hannah Cairney, Env. Eng.
Current position: Process Engineer, Black & Veatch

Undergraduate Research Mentor

Joshua Sherrit, Chem. Eng., Co-advised with Karl Linden (January 2024 – present)
Matteo Campbell, Biomedical Eng (Summer 2024 – present)
Austin Herbel, Chem. Eng., Co-advised with Mike Toney (May 2024 – present)
Zoe Katres, Env. Eng (Summer 2024)
Jacqueline Hall, Env. Eng. (May 2022 – May 2024)
Maggie Holland, Env. Eng. (May 2023 – Dec. 2023)
Divyanshi Mishra, Mech. Eng. (Jan. 2023 – May 2023)
Teo Hueske-Vanceylon, Mech. Eng. (Jan. 2023 – May 2023)
Lewis Salveson, Env. Eng. (Nov. 2021 – May 2023)
Sonrisa Macharia, Env. Eng. (Sept. 2019 – May 2020)
Hannah Cairney, Env. Eng. (Sept. 2019 – May 2022)

Committee Member (outside of primary research group)

Served on 16 Ph.D. thesis committees (2 Env. Eng; 4 Mat. Sci.; 8 Mech. Eng.; 2 Chem. Eng.)
Served on 14 preliminary exam or M.S. thesis committees.

Professional Service

Reviewer for Scholarly Journals (20–30 per year)

ACS Applied Materials & Interfaces, ACS Energy Letters, ACS Nano, Applied Energy, Desalination, Environmental Science & Technology, Environmental Science & Technology Letters, Environmental Science & Technology Engineering, Environmental Science: Water Research & Technology, Joule, Journal of Chemical Physics, Journal of the Electrochemical Society, Journal of Membrane Science, Journal of Water Process Engineering, Nano Letters, Nature Communications, Nature Nanotechnology, Nature Water, Nature Sustainability, Physics of Fluids, Science Advances, Separation & Purification Technology, Sustainable Energy & Fuels

Grant Review and Panels

Small Business Innovation Research (SBIR) ad-hoc reviewer. October 2024.

U.S.-Egypt Science and Technology Joint Fund. May 2022.

University of Colorado Research & Innovation Office Seed Grant Program. Spring 2022 and 2023

BARD: The US-Israel Agricultural Research & Development Fund. November 2021.

NSF CBET Molecular Separations Panel, Washington, D.C. September 2019.

Professional Memberships

American Chemical Society (ACS), American Institute of Chemical Engineers (AIChE), Association of Environmental Engineering & Sciences Professors (AEESP), North American Membrane Society (NAMS), Water Environment Foundation (WEF)

Conference Organizing

2024 Gordon Membrane Conference: Membrane Materials and Processes, Session chair
2024 American Chemical Society Fall Meeting, Presider for Polymers in Water and Gas Session
2023 International Congress on Membranes, Session Chair for Desalination Session
2023 Association of Environmental Engineering and Sciences Professors Conference, Moderator for Desalination Session
2022 North American Membrane Society Conference: Session Chair for “Osmotic Processes”
2021 North American Membrane Society Conference: Social media coordinator
2021 North American Membrane Society Conference: Session Chair for “Osmotically Driven Processes”
2020 North American Membrane Society Conference: Session Chair for “Osmotically Driven Processes”
2019 North American Membrane Society Conference: Session Chair for “Osmotically Driven Processes”