# Arpita Iddya

**POSTDOCTORAL ASSOCIATE**

@ArpitaIddya ArpitaIddya

## EDUCATION

| | |
|---|---|
| Mar 2022 | **University of California, Los Angeles**<br>Ph.D., Environmental Engineering (Minor: Chemical Engineering)<br>Thesis: "Facilitating Interfacial Processes for Specific Ion/Molecule Recovery"<br>Advisor: Prof. David Jassby |
| Dec 2015 | **Carnegie Mellon University**<br>M.Sc., Chemical Engineering |
| Aug 2013 | **Visveswaraya Technological University**<br>*First Class with Distinction*<br>B.E. Chemical Engineering, B.M.S. College of Engineering |

## RESEARCH EXPERIENCE

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|---|---|
| 2025- Present | **Postdoctoral Associate, Rice University**<br>Advised by: Prof. Menachem Elimelech |
| 2023- 2024 | **Postdoctoral Associate, Yale University**<br>Advised by: Prof. Menachem Elimelech |
| 2018- 2022 | **Graduate Student Researcher, University of California, LA**<br>Advised by: Prof. David Jassby |
| 2014- 2015 | **Graduate Student Researcher, Carnegie Mellon University**<br>Advised by: Prof. Meagan Mauter |
| 2012- 2013 | **Undergraduate Researcher, B.M.S. College of Engineering, VTU**<br>Advised by: Dr. Srivatsa Bettahalli |

## PUBLICATIONS

***(* = first co-authored)***

**In preparation**

1. **Iddya, A.***; Shocron, A.*; Pan, W.; Patel, S.; Elimelech, M.; Mechanistic model for boron electrosorption in a bipolar membrane assisted process.
2. **Iddya, A.**; Duan, Yanghua; Shocron, A.; Elimelech, M.; Dynamics of ion transport and stability in solid state electrolytes.

**First author publications**

3. **Iddya, A.**; Elezi, G.; Hembade, S.V.; Whitelegge, J.; Schwabe, K.; Jassby, D. An Integrated Electrochemical Treatment Process for Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), Hexavalent Chromium, and Ammonia using Electroactive Membranes. Industrial and Engineering Chemistry Research. 2024, 63, 4, 1941–1952 https://doi.org/10.1021/acs.iecr.3c03772.

4. **Iddya, A**.; Zarzycki, P.; Kingsbury, R.; Khor, C.M.; Ma, S.; Wang, J.; Wheeldon, I.; Ren, Z.; Hoek, E.; Jassby, D. A reverse-selective ion exchange membrane for the selective transport of phosphates via an outer-sphere complexation–diffusion pathway. Nature Nanotechnology. 2022, 5 (1), 47–55. https://doi.org/10.1038/s41565-022-01209-x.

5. **Iddya, A.**; Hou, D.; Khor, C.M.; Ren, Z.; Tester, J.; Posmanik, R.; Gross, A.; Jassby. D. Efficient ammonia recovery from wastewater using electrically conducting gas stripping membranes.Environmental Science: Nano 2020, 7 (6), 1759–1771. https://doi.org/10.1039/c9en01303b.

6. Tang, L.; **Iddya, A.***; Zhu, X.; Dudchenko, A. V; Duan, W.; Turchi, C.; Vanneste, J.; Cath, T. Y.; Jassby, D. Enhanced flux and electrochemical cleaning of silicate scaling on carbon nanotube-coated membrane distillation membranes treating geothermal brines. ACS Appl. Mater. Interfaces 2017, 9 (44). https://doi.org/10.1021/acsami.7b12615.

**Contributing author publications**

7. Patel, S.; **Iddya, A.**; Pan, W.; Qian, J.;Elimelech, M. Approaching Infinite Selectivity in Membrane Based Aqueous Lithium Extraction via Solid-State Ion Transport (Submitted-*Science Advances*).

8. Pan, W.; Roy, D.; Uralcan, B.; Patel, S.; **Iddya, A.**; Ahn, E.; Haji-Akbari,A.; Kamcev,J.; Elimelech,M. A Highly Selective and Energy Efficient Approach to Boron Removal Overcomes the Achilles Heel of Seawater Desalination. *Nature Water* 2024.

9. Khor, C.M.; Liao, M.E.; **Iddya, A.**; Ma, S.; Yang, F.; Liu, YH; Bootwala, Y.Z.; Jang, G.G.; Goorsky, M.S.; Hoek, E.M.V.; Tsouris, C.; Mothersbaugh, J.; Hatzell, M.C.; and Jassby, D. Physical and Electrochemical Characterization of Aluminum Electrodes during Electrocoagulation. ACS ES&T Water 2023. https://doi.org/10.1021/acsestwater.3c00263

10. Yang, F.; Ma, S.; Khor, CM.; Su, Y.; Barani, Z.; Xu, Z.; Boyko, A; **Iddya, A.**; Segev-Mark, N.; Zheng, XR.; Kargar, F.; Balandin, A.; Ramon, G.; Rosa, I.; Hoek, E.; Jassby, D. One-step method for the fabrication of pure and metal-decorated densified CNT films for effective electromagnetic interference shielding. Carbon. N. Y. 2023, 214 (August), 118370. https://doi.org/10.1016/j.carbon.2023.118370

11. Im, S.; Jung, B.; Wang, X.; Wu, J.; Xiao, M.; Chen, X.; Javier, QR.; **Iddya, A.**; Dlamini, D.; Lu, S.; Maravelias, C.; Ren, ZJ.; Hoek, E.M.V.; Jassby, D. High-Efficiency Recovery of Acetic Acid from Water Using Electroactive Gas-Stripping Membranes. Environmental Science & Technology. 2023, 57 (27), 10096–10106. https://doi.org/10.1021/acs.est.3c01357.

12. Wang, X.; Im, S.; Jung, B.; Wu, J.; **Iddya, A.**; Javier, QR.; Xiao, M.; Ma, S.; Lu, S.; Jaewon, B.; Zhang, J.; Ren, ZJ.; Maravelias, C.; Hoek, E.M.V.; Jassby, D. Simple and Low-Cost Electroactive Membranes for Ammonia Recovery. Environmental Science & Technology. 2023, 57 (25), 9405–9415. https://doi.org/10.1021/acs.est.3c01470

13. Ma, S.; Yang, F.; Chen, X.; Khor, C.M.; Jung, B.; **Iddya, A.**; Sant, G.; Jassby, D. Water Research. 2021, 204 (Iii), 117592. https://doi.org/10.1016/j.watres.2021.117592
14. Belete, Y.Z.; Mau, V.; Spitzer, R.Y.; Posmanik, R.; Jassby, D.; **Iddya, A.**;, Kassem, N.; Tester, J.; Gross, A. Hydrothermal carbonization of anaerobic digestate and manure from a dairy farm on energy recovery and the fate of nutrients. Bioreseource Technology. 2021 https://doi.org/10.1016/j.biortech.2021.125164
15. Rao, U.; **Iddya, A.**; Jung, B.; Khor, C. M.; Hendren, Z.; Turchi, C.; Cath, T.; Hoek, E.; Ramon, G.; Jassby, D. Mineral scale prevention on electrically conducting membrane distillation membranes using induced electrophoretic mixing. Environ. Sci. Technol. 2020, 54 (6), 3678–3690. https://doi.org/10.1021/acs.est.9b07806
16. Hou, D.; Li, T.; Chen, X.; He, S.; Dai, J.; Mofid, S. A.; Hou, D.; **Iddya, A.**; Jassby, D.; Yang, R.; Hu, L.; Ren, Z. Hydrophobic nanostructured wood membrane for thermally efficient distillation. Science Advances. Vol 5 no.8 2019, 5 (8). https://doi.org/10.1126/sciadv.aaw3203.
17. Hou, D.; **Iddya, A.**; Chen, X.; Wang, M.; Zhang, W.; Ding, Y.; Jassby, D.; Ren, Z. Nickel-based membrane electrodes enable high-rate electrochemical ammonia recovery. Environmental Science & Technology 2018, 52 (15), 8930–8938. https://doi.org/10.1021/acs.est.8b01349.
18. Duan, W.; Chen, G.; Chen, C.; Sanghvi, R.; **Iddya, A**.; Walker, S.; Liu, H.; Ronen, A.; Jassby, D. Electrochemical removal of hexavalent chromium using electrically conducting carbon nanotube/polymer composite ultrafiltration membranes. J. Memb. Sci. 2017, 531 (March), 160–171. https://doi.org/10.1016/j.memsci.2017.02.050

**Book Chapters**

1. Iddya, A.; Rao, U.; Wang, J.; Su, Y.; Jassby, D. Advances in Water Desalination Technologies. 2021, 529-581. https://doi.org/10.1142/9789811253829_0015

## PATENTS

1. Jassby, D.; **Iddya, A.**; Hoek, E. Membranes for the targeted extraction of phosphate. US Patent application #17/903567

## GRANT PROPOSAL EXPERIENCE

1. *Infinite Selectivity of Lithium Extraction from Aqueous Solutions with Solid State Electrolyte*. Proposal submitted to Department of Energy. November 2024. Principal Investigator: Menachem Elimelech. Pending. Contributions: Developed proposal, performed 40% of the writing, prepared key figures, and performed edits and revisions.
2. *Infinite Selectivity of Lithium Extraction from Aqueous Solutions with Solid State Electrolyte*. Pre-proposal submitted to Department of Energy. July 2024. Principal Investigator: Menachem Elimelech. **Accepted** Contributions: Developed proposal, performed 70% of the writing, and prepared key figures.
3. *Simultaneous Carbon Capture and Utilization Using a Bipolar Membrane-Assisted Electrochemical Cell*. Submitted to Yale Planetary Solutions Seed Grant. April 2024. Principal Investigator: Menachem Elimelech. **Funded,** $100,000. Contributions: Performed 20% of the writing and conducted editing and proofreading.

## FELLOWSHIPS & AWARDS

1. **STEM Catalyst Proposal Writing Award** 2024
   STEM Writing Workshop, Unwritten Curricula
2. **University Fellowship** 2020-2021
   Graduate Division, University of California, Los Angeles

## CONFERENCES

### Oral presentations

1. "Leveraging Materials Chemistry, Membranes, and Electrochemistry for Sustainability" Advancing Sustainability with Materials, Membranes & Electrochemistry - IWA Network Webinar, *International Water,* Apr 2025

2. (**Invited**) "Leveraging Materials Chemistry and Membrane Structure for Strategic Ion Separations" *University of California, Santa Barbara, Department of Chemical Engineering,* Feb 2025

3. (**Invited**) "Membranes for Environmental Sustainability and a Circular Economy" *University of Utah, Department of Civil and Environmental Engineering,* Jan 2025

4. (**Invited**) "Membranes for Environmental Sustainability and a Circular Economy" *Nanyang Technological University, School of Chemistry, Chemical Engineering, and Biotechnology,* Dec 2024

5. (**Invited**) "Membranes for Environmental Sustainability and a Circular Economy", *Future Faculty Seminar Series 2024-2025, Association of Environmental Engineering and Science Professors*, Nov 2024

6. **Iddya, A.**; Zarzycki, P.; Kingsbury, R.; Khor, C.M.; Ma, S.; Wang, J.; Wheeldon, I.; Ren, Z.; Hoek, E.; Jassby, D. A reverse-selective ion exchange membrane for the selective transport of phosphates via an outer-sphere complexation–diffusion pathway. *American Chemical Society Spring Meeting*; August 2022; San Diego, CA.

7. **Iddya, A.**; Hou, D.; Khor, C.M.; Ren, Z.; Tester, J.; Posmanik, R.; Gross, A.; Jassby. D. Highly Efficient Ammonia Recovery from Wastewater using Electrically Conducting Gas Stripping Membranes. *American Chemical Society Spring Meeting*; August 2019; San Diego, CA.

### Poster presentations

1. **Iddya, A.**; Shocron, A.; Pan, W.; Patel, S.; Elimelech, M. Modeling and Optimization of Boron Removal in a Bipolar Membrane Assisted Electrosorption. Gordon Research Conference, July 2024; New London, NH.

2. **Iddya, A.**; Shocron, A.; Pan, W.; Patel, S.; Elimelech, M. Modeling and Optimization of Boron Removal in a Bipolar Membrane Assisted Electrosorption. Gordon Research Seminar, July 2024; New London, NH., PA.

3. **Iddya, A.**; Schwabe, K.; Jassby, D. Electrochemical transformation of ANSOL using electrically conductive membranes. SERDP, ESTCP & OE-Innovation Symposium; December 2022; Arlington, VA.

4. **Iddya, A.**; Shanbhag, S.; Mauter, M. Modeling convective and diffusive mass transport in capacitive deionization electrodes. American Chemical Society Fall Meeting; August 2016; Pittsburgh, PA.

### Session Moderator

1. Career Panel Discussion; "Membrane Researchers Within Academia, Industry, and Government Discuss Career Paths" Gordon Research Seminar; July 2024; New London, NH.
2. Wastewater emissions; Association of Environmental Engineers & Science Professors; June 2023; Boston, MA.

### Invited Panels

1. Women in STEM Panel: "What to do after graduation?" *Apr 2021*
2. American Association of University Women: Panel and workshop *Oct 2017*

## TEACHING EXPERIENCE

**Physical and Chemical Processes for Water and Wastewater Treatment** *Winter 2018*
Teaching Assistant
Department of Civil & Environmental Engineering, UCLA

**Water Quality Engineering** *Winter 2017*
Teaching Assistant
Department of Chemical & Environmental Engineering, UC, Riverside

## MENTORING EXPERIENCE

**Clean Water Science Network** *2022-2023*
Mentored environmental engineering undergraduate students from Latin America on water-related research and different environmental issues.
Planned one-on-one zoom sessions to help students with applying to graduate school in the US.

### Graduate Student Mentee

***Fan Yang*** *Aug 2021- Dec 2022*
*Project*: One-step method for the fabrication of pure and metal-decorated densified CNT films for effective electromagnetic interference shielding

***Mark Nguyen*** *Aug 2021- Jun 2022*
*Project*: Electrochemical reduction of hexavalent chromium in ANSOL using electrically conducting polymeric membranes
*Present*: Environmental Engineering Associate, LA Sanitation & Environment

### Undergraduate Student Mentee

***Ingrid Spielbauer*** Jan *2019- Dec 2019*
*Project*: Ammonia recovery from wastewater using electrically conducting gas stripping membranes
*Present*: Civil Engineering Associate, LADWP

***Claire Ko*** *May 2019- Jun 2020*
*Project*: Ammonia recovery from wastewater using electrically conducting gas stripping membranes
*Present*: Process Engineer, Factorial Energy

## LEADERSHIP EXPERIENCE

**Graduate Student Association, UCLA** Sep 2019- May 2020
*Elections Commissioner*
Led a group of graduate students with a 13-person board and 14000+ members.
Planned and organized logistics for a social event for 5000+ students.
Increased student involvement in GSA elections by ~14%.

**Graduate Society of Women Engineers, UCLA** *Sep 2018- May 2019*
*Director*
Organized networking night with the industry and social events for 2000+ graduate students.
Facilitated 20+ annual events including discussion panels and lunch with the dean.

**Graduate Society of Women Engineers, UCLA** *Sep 2017- May 2018*
*Treasurer*
Structured budget and allocated funds for student networking and professional development.
Collaborated with other student led organizations to arrange professional and social events.

## INDUSTRY EXPERIENCE

**Shell Technology Center, Bangalore** *Feb- July 2014*
*Laboratory Research Intern*
Tested oil-water separation in ceramic membranes, in support of experiments performed on-site at Oman to implement polymer flooding in oil wells.
Designed experiments and operated pilot-plant to reduce the number and cost of experiments.

**Intellectual Ventures** *Sep 2013- Feb 2014*
*Technical Intern*
Designed experimental procedure to up-scale production of novelty chemicals.
Produced products which were marketed as prototype to targeted market.

**Himadri Chemicals** *2011*
*Laboratory Intern*
Assisted and demonstrated successful pilot-scale SNFC (sulphonated naphthalene formaldehyde condensate) production.

## SERVICE

**Professional Service**
*Journal Reviewer* *2017- Present*
Journals: Science Advances, NPJ Clean Water, Separation and Purification Technology, Water, Environmental Science: Water Research & Technology, Membranes, Processes, Sustainability

**University Service**
***Nanoscience Summer Outreach*** *2018- 2019*
Designed experiments for workshop-style instruction.
Mentored high school students on science projects.

***SACNAS Outreach*** *May 2018*

Designed and planned experiments to explain chemical and environmental engineering to high school students for Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS): Math and Science Academy Outreach.

**Department Service**

***Confluence 2013*** *2013*

Organized and coordinated the undergraduate research seminar for the Department of Chemical Engineering, B.M.S. College of Engineering, India.
Primary point of contact for several sponsors- drafted and negotiated sponsorship agreements.
Responsible for all logistics, including registration, travel, hospitality, photography, and various non-technical events.

***Confluence 2011 & 2012*** *2011-2012*

Volunteered for the undergraduate research seminar for the Department of Chemical Engineering, B.M.S. College of Engineering, India.
Planned and organized events for annual technical symposia, including poster and oral presentations.

## REFERENCES

**Prof. Menachem Elimelech**

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Department of Chemical and Environmental Engineering

Yale University, USA

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**Prof. David Jassby**

Professor

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University of California, Los Angeles, USA

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**Prof. Eric Hoek**

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