

## Miguel A. Modestino

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### SUMMARY OF CAREER HIGHLIGHTS

- Named Director of NYU Sustainable Engineering Initiative (2022-current) and Donald F. Othmer Associate Professor of Chemical Engineering at NYU (2022-current).
- Named Distinguished Visiting Professor of Industrial Decarbonization at Tecnologico de Monterrey, Mexico, Faculty of Excellence Program (2025-current).
- Research advisor for **83** students and researchers, including **9** postdoctoral researchers (3 current, 6 past), **11** Ph.D. students (4 current, 7 past), **11** M.S. students, **35** B.S. students (3 current, 32 past), and **17** K-12 students at NYU.
- **National Science Foundation CAREER** Award 2019.
- Named **MIT Technology Review Innovator Under 35** in Latin America (2017) and Globally (2020), won Doctoral New Investigator ACS Petroleum Research Fund Award, H&M Foundation Global Change Award, Energy and Environmental Science Reader's Choice Award, the inaugural NYU Tandon Junior Faculty Research Award.
- Raised **\$4.78M** in funding from national and international foundations, companies, and government agencies for my research group, as part of a total of **\$14.20M** in funded projects, including collaborations.
- Authored **68** publications in peer-reviewed scientific journals. Articles published in leading journals in Energy (Joule/Energy and Environmental Science), Polymers (Macromolecules/ACS Macro Letters), Reaction Engineering (Reaction Chemistry and Engineering/Lab on a Chip), and Interdisciplinary Journals (Proceedings of the National Academy of Science/Angew. Chem./JACS/Nature).
- **84** invited presentations in national and international conferences, universities, and research institutions.
- Co-inventor in **10** patent applications or invention disclosures.
- Co-founder of NYU spin-off company, Sunthetics Inc. Awarded the first prize at the NYU 300K Entrepreneurship Challenge Technology Venture Competition, the first prize in the University Startup Worldcup Green Tech Track, and a Powerbridge NY Grant, among others. Company was highlighted in the **documentary "Own the Room" by National Geographic for Disney+** and has raised **>\$5M** in seed funding.
- Work featured in **66** press releases in national and international media outlets including Brooklyn Daily Eagle, PBS, Forbes, and Vogue.
- Founding Co-organizer of AIChE Topical Conference: Decarbonization of the Chemical Industry through Electrification (2023-2025) and Co-organizer of AIChE Chemical Ventures Conference at NYU Tandon (2025).
- Lead PI on invited proposal for NSF Engineering Research Center (ERC) for Plastics Lifecycle Sustainability, Technology Innovation, and Circularity (PLSTIC) (2025).

## **EDUCATION**

### **University of California, Berkeley, CA**

Ph.D. in Chemical Engineering (2013).

Ph.D. Advisor: Prof. Rachel A. Segalman.

Management of Technology Certificate.

### **Massachusetts Institute of Technology, Cambridge, MA**

Master in Science in Chemical Engineering Practice (2008).

Bachelor of Science in Chemical Engineering (2007), Minors in Chemistry and Economics.

## **EMPLOYMENT HISTORY**

### **New York University, New York, NY, USA (January 2017 – current)**

- Director, Sustainable Engineering Initiative (Sept 2022 – current).
- Donald F. Othmer Associate Professor of Chemical Engineering (Sept 2022 – current).
- Assistant Professor of Chemical and Biomolecular Engineering (Jan 2017 – Sept 2022).

### **Instituto Tecnológico y de Estudios Superiores de Monterrey, México (Jan 2025 – current)**

- Distinguished Visiting Professor of Industrial Decarbonization. Faculty of Excellence Program. School of Sciences and Engineering.

### **HAX/SOSV, Newark, NJ, USA (Jan - March 2024)**

- Scientist-in-Residence: HAX is SOSV's program for hard tech startups that provides multi-stage investment and support to deep tech founders focusing on sustainability across climate, industrial automation, and human health. SOSV is a global venture capital firm that offers multi-stage investment, starting with pre-seed startup development programs designed for founders with breakthrough technologies.

### **Ayrton Energy, Inc., Calgary, Alberta, Canada (Remote. Fall 2022 – Spring 2025)**

- Technical Consultant: Ayrton develops an e-LOHC™ system, a practical solution for the hydrogen supply chain using a proprietary liquid organic hydrogen carrier (LOHC) and electrochemistry.

### **Sunthetics Inc, New York, NY, USA (Summer 2018 – current)**

- Co-founder of NYU spin-off company focused on developing sustainable electrochemical manufacturing processes and equipment. (Company currently active and has raised >\$5M in seed funding)

### **ReactPower Inc, New York, NY, USA (Spring 2019 – Summer 2019)**

- Co-founder and Technology Advisor of NYU spin-off company focused on developing Aluminum-based nanomaterial for thermal enhanced oil recovery. (Company no longer in operation)

### **École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland (Summer 2013 – Fall 2016)**

- Postdoctoral Researcher at the Laboratory of Optics (Prof. Demetri Psaltis) and Laboratory of Applied Photonics Devices (Prof. Christophe Moser). Project manager of the Nanotera – SHINE project (<http://shine.epfl.ch>).

**University of California and Lawrence Berkeley National Laboratory, Berkeley, CA, USA (Fall 2008-Spring 2013)**

- Graduate student research assistant under the supervision of Prof. Rachel Segalman. Work on the self-assembly of nanocrystal in polymer matrices and characterization of transport and structural properties of hybrid inorganic/polymer membranes for solar-fuels applications.
- Teaching Assistant for Chemical Kinetics and Reactor Design (Spring 2010) and Polymer Science and Technology (Fall 2011).

**Massachusetts Institute of Technology, Cambridge, MA, USA (Fall 2003-Spring 2008)**

- Teaching Assistant in the Chemical Engineering Department for Chemical Engineering Projects Laboratory. (Spring 2008)
- Research Assistant in the Department of Chemical Engineering, under the supervision of Prof. Paula Hammond. Work related with the application of layer-by-layer film assembly method to build novel materials for optical, catalytic, and biomedical applications. (Fall 2003-Spring 2007).
- Teaching Assistant in the Chemistry Department for Organic Chemistry (Fall 2006).
- Tutor in the Chemical Engineering Department for Introduction to Chemical Engineering (Fall 2005).

**TechActivator, Berkeley, CA, USA (Spring 2011-Fall 2012)**

- Co-founder and director of this start-up in UC Berkeley that focuses on accelerating the commercialization of technology developed in top research institutions.

**British Petroleum Company, Naperville, IL, USA (Summer 2008)**

- One-month internship as part of the David H. Koch School of Chemical Engineering Practice. Worked in small teams to develop thermodynamic models to predict the stability of fuel formulations.

**Novartis Pharma AG, Basel, Switzerland (Summer 2008)**

- Two-month internship as part of the David H. Koch School of Chemical Engineering Practice. Worked in small teams to analyze potential avenues for optimizing Novartis packaging strategy and perform technical and economic feasibility analyses of continuous manufacturing processes within the company.

**LEADERSHIP POSITIONS**

**New York University, New York, NY, USA**

- **Director, Sustainable Engineering Initiative** (Sept 2022 -- current). Lead interdisciplinary research and education initiatives focused on sustainable engineering

solutions across NYU Tandon. Led faculty searches for 5 sustainable engineering faculty members: Dharik Mallapragada, Justin Bui, Pavel Kots, Juanita Hidalgo, and Philip Rauschner. Organized internal and external events including the annual SEI Summit, led curricular changes in the first-year engineering curriculum, and built strategic partnerships with Urban Future Labs to establish connections between faculty and startup companies. Coordinate faculty collaboration, manage strategic partnerships with industry and government agencies, and oversee development of new sustainable engineering programs.

- **Member, NYU Climate Change Initiative Executive Committee** (Fall 2024 -- current). Provide strategic leadership for university-wide climate initiatives and coordinate interdisciplinary research efforts addressing climate challenges.
- **Member, Inclusion@Tandon Committee** (2019-2023). Co-led Strategic Foci 2: Student recruitment sub-committee and served as ad-hoc committee leader on Future Leaders Fellowship program to enhance diversity and inclusion within the school.
- **Lead PI**, Invited NSF Engineering Research Center Proposal for Plastics Lifecycle Sustainability, Technology Innovation, and Circularity (PLSTIC) (2024-2025). Led development of \$26M proposal involving multiple institutions to establish a national center focused on sustainable plastics innovation.

### **Instituto Tecnológico y de Estudios Superiores de Monterrey, México**

- **Distinguished Visiting Professor of Industrial Decarbonization** (Jan 2025 -- current). Faculty of Excellence Program, School of Sciences and Engineering. Provide strategic advice to the Sustainable Energy team composed of 50+ faculty members across all Tec de Monterrey campuses in Mexico to increase their research capacity, visibility, and establish connections with leading international researchers. Establish research collaborations and expand research capacity in energy transition research

### **HAX/SOSV, Newark, NJ, USA**

- **Scientist-in-Residence** (Jan - March 2024). Provided technical expertise and mentorship to hard tech startups in SOSV's accelerator program focusing on sustainability, climate solutions, industrial automation, and human health technologies. Key responsibilities included: providing advice on investment options for deep tech companies, exploring technology gaps in critical minerals for emerging technologies, and technical advising HAX portfolio startups.

### **Professional Organizations**

- **Member, Diversity, Equity and Inclusion Committee**, Chemical and Reaction Engineering (CRE) Division, AIChE (2024 - 2025). Work to promote inclusive practices and enhance diversity within the catalysis and reaction engineering community.
- **Founding Co-organizer**, AIChE Topical Conference on Decarbonization of the Chemical Industry through Electrification (2023 - current). Lead organization of this specialized conference addressing critical challenges in industrial decarbonization.
- **Co-organizer**, AIChE Chemical Ventures Conference at NYU Tandon (2025). Coordinate this conference focused on entrepreneurship and innovation in chemical engineering.

## AWARDS AND HONORS

1. Named Distinguished Visiting Professor of Industrial Decarbonization at Tecnológico de Monterrey, as part of the Faculty of Excellence Program (2025)
2. Member of the Editorial Board of Journal of Applied Electrochemistry (2025)
3. Inducted into the Order of the Engineer (2024)
4. Best presentation Award at Electrochemical Cell Concepts Colloquium – E3C (2023)
5. Reaction Chemistry and Engineering Emerging Investigator (2023)
6. AIChE Journal Futures Speaker (2022)
7. ACS Energy & Fuels Raising Star (2022)
8. TED Countdown Speaker (2022) ([https://www.ted.com/speakers/miguel\\_modestino](https://www.ted.com/speakers/miguel_modestino))
9. Named Donald F. Othmer Associate Professor of Chemical Engineering (2022)
10. TED Idea Search Latin America Winner (2021)
11. World Laureates Young Scientists Forum Speaker (2021)
12. MIT Technology Review Innovators Under 35 Award, Global List (2020).
13. NYU Tandon Junior Faculty Research Award (2020).
14. NYU Goddard Junior Faculty Fellowship Award (2020).
15. National Science Foundation, CAREER Award (2019).
16. Doctoral New Investigator Award, ACS Petroleum Research Fund (2018).
17. MIT Technology Review Innovators Under 35 Award, Latin America (2017).
18. Global Change Award (2016). Awarded by the H&M Foundation for game-changing ideas that can make the fashion industry circular.
19. Energy and Environmental Science Readers' Choice Lectureship award (2015). This prize is awarded annually to an outstanding young scientist (within 10 years of receiving their PhD) who has published in the journal.
20. Arkema Graduate Fellowship to outstanding graduate students with high promise in the polymer field (2010).
21. Power Top-Off Award to the most competitive prospective student from the Dept. of Chemical Engineering, UC Berkeley (2008).
22. Jose Felix Ribas Order - Highest academic honor from the Venezuelan Government for young people (2002).
23. Silver Medal on the 35<sup>th</sup> International Chemistry Olympiad (Greece, 2003).
24. Bronze Medal on the 34<sup>th</sup> International Chemistry Olympiad (Netherlands, 2002).
25. Silver Medal on the VII Iberoamerican Chemistry Olympiad (Argentina, 2002).

## SCHOLARLY WORK

*Citation Metrics (as of 09/02/2025):* 5,492 citations, h-index = 35. (updated metrics available at google scholar profile: <https://scholar.google.ch/citations?user=0zfdancAAA&hl=en>)

*Journal publications at NYU († co-first authorship, \*corresponding author, and names of students from my group at NYU in bold):*

1. **Mathison R., Rani E., Rose A., Prendi F., Bloomquist C., Modestino M.\*** Controlling Selectivity in Electrochemical Conversion of Organic Mixtures through Dynamic Control of Electrode Microenvironments. ChemRxiv. 2025; DOI: <https://10.26434/chemrxiv-2025-9p1v7>
2. Beatty M, Herring M, Llewellyn N, Cohen L, Haley A, Lin Z, **Modestino M.**, Esposito D.\* Trends in C1-C4 Alcohol Oxidation Activity Enhancement for Tunable Silicon Oxide

- Encapsulated Platinum Electrocatalysts. ChemRxiv. 2024; DOI: <https://10.26434/chemrxiv-2024-z1lw1>
- Bloomquist, C., Naumov, D., Yang, A., Mathison, R., Herzog, B., Tenn, W., Modestino, M.\*, Aydil, E.\*.** [Understanding the Role of Energy Transfer Processes in Chemical Reactions at Plasma-Liquid Interfaces.](#) *J. Am. Chem. Soc.* 2025, 147, 16, 13937–13947; DOI: <https://doi.org/10.1021/jacs.5c02740>
  - Modestino, M. A.\*; Rivas, D. F.\*; Murnen, H.\*; Rose, A.\*; Schofer, S.\*; Sheehan, S. W.\*; Wang, R.\*,** [Chemical ventures from ideas to scaled solutions.](#) *Nature Chemical Engineering*, 2025, 2, 14–18. DOI: <https://doi.org/10.1038/s44286-024-00169-4>
  - Mathison, R., Atwi, R., McConnell, H., Ochoa, E., Rani, E., Akashige, T., Röhr, J., Taylor, A., Avalos, C., Aydil, E., Modestino, M.\*,** [Molecular Processes That Control Organic Electrosynthesis in Near-Electrode Microenvironments.](#) *J. Am. Chem. Soc.* 2025, 147, 5, 4296–4307. DOI: <https://doi.org/10.1021/jacs.4c14420>
  - Akashige T, Vemuri R, Urbina Blanco C, Modestino M.\*** [Understanding Electrochemically Induced Olefin Complexation: Towards Electrochemical Olefin-Paraffin Separations.](#) *React. Chem. Eng.*, 9, 2171-2179, DOI: <https://doi.org/10.1039/D4RE00145A>
  - Mathison R, Rani E, Patel MK, Bloomquist CK, Lopez Cerrato A, Modestino MA.** [Accelerated Analysis of the Electrochemical Production Route for Biomass-derived Adiponitrile.](#) *Chem Catalysis.* 4, 5, 2024, 100998; DOI: <https://doi.org/10.1016/j.checat.2024.100998>. (Invited Journal Cover)
    - Highlighted in Chem Catalysis Preview: [When bio- and electrocatalysis meet: A leap forward in the sustainable production of adiponitrile.](#) DOI: <https://doi.org/10.1016/j.checat.2024.101008>
  - Akashige, T., Katzenberg, A., Frey, D., Mukherjee, D., Urbina-Blanco, C., Chen, B., Okamoto, Y. and Modestino, M.A.\*** [Electrochemically Modulated Separation of Olefin-Paraffin Gas Mixtures in Membrane Electrode Assemblies.](#) *Energy Advances*, 2024,3, 790-799. DOI: <https://doi.org/10.1039/D3YA00508A>. (Emerging Investigator Series)
  - C. K. Bloomquist, M. Dogan, J. S. Harris, B. D. Herzog, W. J. Tenn III, E. S. Aydil and M. A. Modestino,** [Understanding the effects of forced and bubble-induced convection in transport-limited organic electrosynthesis,](#) *Reaction Chemistry & Engineering*, 2024, 9, 930-939, DOI: <https://doi.org/10.1039/D3RE00579H>
  - Mathison, Ricardo, Ramos Figueroa, Alexandra L., Bloomquist, Casey, & Modestino, Miguel. A.\*** [Electrochemical Manufacturing Routes for Organic Chemical Commodities.](#) *Annual Review of Chemical and Biomolecular Engineering*, 2023, 14. DOI: <https://doi.org/10.1146/annurev-chembioeng-101121-090840>.
  - Dharik S. Mallapragada\*, Yury Dvorkin\*, Miguel Modestino\*, Daniel V. Esposito, Wilson Smith, Bri-Mathias Hodge, Michael P. Harold, Vincent M. Donnelly, Alice Nuz, Casey Bloomquist, Kyri Baker, Lars C. Grabow, Yushan Yan, Nav Nidhi Rajput, Ryan Hartman, Elizabeth J. Biddinger, Eray Aydil, and Andre Taylor.** [Decarbonization of the Chemical Industry through Electrification: Barriers and Opportunities.](#) *Joule* 2023, 7, 1, 23-41. DOI: <https://doi.org/10.1016/j.joule.2022.12.008>.
  - Daniel Frey, Kenneth C. Neyerlin, Miguel A. Modestino\*, M. A.,** [Bayesian optimization of electrochemical devices for electrons-to-molecules conversions: the case of pulsed CO2 electroreduction.](#) *Reaction Chemistry & Engineering* 2023, 8, 323-331. DOI: <https://doi.org/10.1039/D2RE00285J>.

13. **Andrea E. Angulo, Daniel Frey, Miguel A. Modestino\***. [Understanding Bubble-Induced Overpotential Losses in Multiphase Flow Electrochemical Reactors](#). *Energy & Fuels* **2022**, 36 (14), 7908-7914. (Invited paper for Energy & Fuels Rising Stars issue). DOI: <https://doi.org/10.1021/acs.energyfuels.2c01543>.
14. **Daniel Frey, Juhee Shin, Adeola Akin, Xinshu Zhang, Miguel A. Modestino\***. [Bayesian optimization of dynamic Ce\(III\) electrooxidation](#). *AIChE Journal* **2022**, 68 (12), e17930. (Invited paper for AIChE Futures Issue). DOI: <https://doi.org/10.1002/aic.17930>.
15. Emma C. Lovell\*, Joel W. Ager\*, Yu Seung Kim\*, and Miguel A. Modestino\*. "[Energy Spotlight: Emergence of Membrane Electrode Assembly in Electrocatalysis](#)". *ACS Energy Letters*, 2022, 7, 4, 1574-76. DOI: <https://doi.org/10.1021/acsenergylett.2c00706>.
16. **Andrea Angulo, Lankun Yang, Eray Aydil and Miguel A. Modestino\***. [Machine Learning Enhanced Spectroscopic Analysis: Towards Autonomous Chemical Mixture Characterization for Rapid Process Optimization](#). *Digital Discovery*, 2022, 1, 35-44. DOI: <https://doi.org/10.1039/D1DD00027F>.
17. **Daniel Frey, Juhee Shin, Christopher Musco and Miguel A. Modestino\***. [Chemically-informed data-driven optimization \(ChIDDO\): Leveraging physical models and Bayesian learning to accelerate chemical research](#). *React. Chem. Eng.*, 2022, 7(4), 855-865. DOI: <https://doi.org/10.1039/D2RE00005A>.
18. **Ricardo Mathison, Miguel A. Modestino\***, [Electrocatalytic hydrogenation of nitriles: A step toward electrification of amine production](#). *Chem Catalysis* 2021, 1 (2), 246-248. DOI: <https://doi.org/10.1016/j.checat.2021.06.003>.
19. Juan Menga, Jason A. Röhr, Hang Wang, Ed Sartor, Dandan Song, **Adlai Katzenberg, Miguel A. Modestino**, Zheng Xu\*, Jaemin Kong\*, and André D. Taylor\*. [A compact electron transport layer using a heated tin-oxide colloidal solution for efficient perovskite solar cells](#). *Sol. RRL* 2021, 2100794. DOI: <https://doi.org/10.1002/solr.202100794>.
20. Jaemin Kong, Yongwoo Shin, Jason A. Röhr, Hang Wang, Juan Meng, Yueshen Wu, **Adlai Katzenberg**, Geunjin Kim, Dong Young Kim, Tai-De Li, Edward Chau, Francisco Antonio, **Tana Siboonruang**, Sooncheol Kwon, Kwanghee Lee, Jin Ryoum Kim, **Miguel A. Modestino**, Hailiang Wang and André D. Taylor\*. [CO<sub>2</sub> doping of organic interlayers for perovskite solar cells](#). *Nature*, 2021, **594**, 51–56, (June 2021), DOI: <https://doi.org/10.1038/s41586-021-03518-y>.
21. **Adlai Katzenberg, Andrea Angulo, Ahmet Kusoglu\***, and **Miguel Modestino\***. [Impacts of Organic Sorbates on Ionic Conductivity and Nanostructure of Perfluorinated Sulfonic-Acid Ionomers](#). *Macromolecules*, 2021, **54**, 5187-5195, (May 2021), DOI: <https://doi.org/10.1021/acs.macromol.1c00494>.
22. **Daniela E. Blanco, Ratsha Atwi, Sandya Sethuraman, Anne Lasri, Julian Morales, Nav Nidhi Rajput and Miguel A. Modestino\***. [Effect of Electrolyte Cations on Organic Electrosynthesis: The Case of Adiponitrile Electrochemical Production](#). *Journal of The Electrochemical Society*, 2020, **167**, 155526, (November 2020), (Invited Article, Focus Issue on Organic and inorganic Molecular Electrochemistry), DOI: <https://doi.org/10.1149/1945-7111/abc766>.
23. Yury Dvorkin, **Miguel A. Modestino**, and Andrea I. Silverman. [Engineering an Interdisciplinary Connection: Bridging Gaps between Chemical, Electrical, and Environmental Engineers](#). *iScience*, 2020, **23**, 101337, (July 2020), (Backstory Article), DOI: <https://doi.org/10.1016/j.isci.2020.101337>.

24. **Daniel Frey**, Jip Kim, Yury Dvorkin and **Miguel A. Modestino\***. [Spatiotemporal Decoupling of Water Electrolysis for Dual-Use Grid Energy Storage and Hydrogen Generation](#). *Cell Reports Physical Science*, 2020, **1**, 100226, (October 2020), DOI: <https://doi.org/10.1016/j.xcrp.2020.100226>.
25. Elizabeth J. Biddinger\* and **Miguel A. Modestino\***. [Electro-organic Syntheses for Green Chemical Manufacturing](#). *Electrochemical Society Interface*, 2020, **29**, 43-47, (September 2020), DOI: <https://doi.org/10.1149/2.F062031F>.
26. **Adlai Katzenberg**, **Debdyuti Mukherjee**, Peter J. Dudenas, Yoshiyuki Okamoto, Ahmet Kusoglu, and **Miguel A. Modestino\***. [Dynamic Emergence of Nanostructure and Transport Properties in Perfluorinated Sulfonic Acid Ionomers](#). *Macromolecules*, 2020, **53**, 8519–8528, (September 2020), DOI: <https://doi.org/10.1021/acs.macromol.0c01213>.
27. **Adlai Katzenberg**, **Cesar Muñoz Davila**, **Brian Chen**, **Tana Siboonruang**, and **Miguel A. Modestino\***. [Acid-Doped Hydrogel Electrolytes for Electrocatalyst Interfaces](#). *ACS Applied Polymer Materials*, 2020, **2**, 2046–2054, (April 2020), DOI: <https://doi.org/10.1021/acsapm.0c00214>.
28. **Daniela E. Blanco**, **Aaliyah Z. Dookhith** and **Miguel A. Modestino\***. [Controlling Selectivity in the Electrocatalytic Hydrogenation of Adiponitrile through Electrolyte Design](#). *ACS Sustainable Chemistry & Engineering*, 2020, **8**, 9027-9034, (June 2020), DOI: <https://doi.org/10.1021/acssuschemeng.0c01789>.
29. **Andrea Angulo**, Peter van der Linde, Han Gardeniers, **Miguel Modestino\*** and David Fernández Rivas\*. [Influence of Bubbles on the Energy Conversion Efficiency of Electrochemical Reactors](#). *Joule*, 2020, **4**, 555-579, (March 2020), (Invited Review), DOI: <https://doi.org/10.1016/j.joule.2020.01.005>.
30. **Adlai Katzenberg**, Anamika Chowdhury, Minfeng Fang, Adam Z. Weber, Yoshiyuki Okamoto, Ahmet Kusoglu, and **Miguel A. Modestino\***. [Highly Permeable Perfluorinated Sulfonic Acid Ionomers for Improved Electrochemical Devices: Insights into Structure–Property Relationships](#). *Journal of the American Chemical Society*, 2020, **142**, **8**, 3742–3752, (January 2020), (Journal Cover), DOI: <https://doi.org/10.1021/jacs.9b09170>.
31. **Adlai Katzenberg**, **Akash Raman**, **Nicole L. Schnabel**, **Andrea L. Quispe**, Andrea I. Silverman and **Miguel A. Modestino\***. [Photocatalytic hydrogels for removal of organic contaminants from aqueous solution in continuous flow reactors](#). *Reaction Chemistry & Engineering*. 2020. **5**, 377-386, DOI: <https://doi.org/10.1039/C9RE00456D>.
32. Mark T. Spitler,\* **Miguel A. Modestino**, Todd G. Deutsch, Chengxiang X. Xiang, James R. Durrant, Daniel V. Esposito, Sophia Haussener, Stephen Maldonado, Ian D. Sharp, Bruce A. Parkinson, David S. Ginley, Frances A. Houle, Thomas Hannappel, Nathan R. Neale, Daniel G. Nocera, and Paul C. McIntyre. [Practical challenges in the development of photoelectrochemical solar fuels production](#). *Sustainable Energy & Fuels*, 2020, **4**, 985.
33. **Daniela E. Blanco**, **Purnima A. Prasad**, **Kaylee Dunningan**, and **Miguel A. Modestino\***. [Insights into membrane-separated organic electrosynthesis: the case of adiponitrile electrochemical production](#). *Reaction Chemistry & Engineering*, 2020, **5**, 136-144, DOI: <https://doi.org/10.1039/C9RE00389D>.
34. Pablo Peñas, Peter van der Linde, Wouter Visselaar, Devaraj van der Meer, Detlef Lohse, Jurriaan Huskens, Han Gardeniers, **Miguel A. Modestino**, and David Fernandez Rivas\*. [Decoupling gas evolution from water-splitting electrodes](#). *Journal of The Electrochemical Society*, 2019, **166**, H769-H776, (October 2019), DOI: <https://doi.org/10.1149/2.1381914jes>.

35. Daniela. Blanco, Bryan Lee, Miguel A. Modestino\*. [Optimizing Organic Electrosynthesis through Controlled Voltage Dosing and Artificial Intelligence](#). *PNAS*, 2019, **116**, 17683-17689, (August 2019), DOI: <https://doi.org/10.1073/pnas.1909985116>.
36. E. Chinello,\* M. A. Modestino, J.W. Schüttauf, L. Coulot, M. Ackermann, F. Gerlich, A. Faes, D. Psaltis and C. Moser. [A comparative performance analysis of stand-alone, off-grid solar-powered sodium hypochlorite generators](#). *RSC Advances*, 2019, 9, 14432-14442, (May 2019), DOI: <https://doi.org/10.1039/C9RA02221J>.
37. John Dwyer, Elizabeth Juarez Diaz, Thomas E. Webber, Adlai Katzenberg, Miguel Modestino and Eray Aydil\*. [Quantum confinement in few layer SnS nanosheets](#). *Nanotechnology*, 2019, **30**, 245705, (April 2019), DOI: <https://doi.org/10.1088/1361-6528/ab0e3e>.
38. Daniela E. Blanco and Miguel A. Modestino\*. [Organic Electrosynthesis for Sustainable Chemical Manufacturing](#). *Trends in Chemistry*, 2019, 1, 8-10, (February 2019), (Invited perspective in inaugural issues), DOI: <https://doi.org/10.1016/j.trechm.2019.01.001>.
39. Daniela E. Blanco, Aaliyah Z. Dookhith and Miguel A. Modestino\*. [Enhancing selectivity and efficiency in the electrochemical synthesis of adiponitrile](#). *Reaction Chemistry & Engineering*, 2019, 4, 8-16, (November 2018), (Journal Cover), DOI: <https://doi.org/10.1039/C8RE00262B>.
40. Shane Ardo,\* David Fernandez Rivas,\* Miguel Modestino,\* Verena Schulze Greiving,\* Fatwa F. Abdi, Esther Alarcon llado, Vincent Artero, Katherine Ayers, Corsin Battaglia, Jan-Philipp Becker, Dmytro Bederak, Alan Berger, Francesco Buda, Enrico Chinello, Bernard Dam, Valerio Di Palma, Tomas Edvinsson, Katsushi Fujii, Han Gardeniers, Hans Geerlings, S. Mohammad H. Hashemi, Sophia Haussener, Frances Houle, Jurriaan Huskens, Brian D. James, Kornelia Konrad, Pramod Patil Kunturu, Detlef Lohse, Bastian Mei, Eric L. Miller, Gary Moore, Jiri Muller, Katherine L. Orchard, Timothy E. Rosser, Fadl Saadi, Jan-Willem Schüttauf, Brian Seger, Stafford W. Sheehan, Wilson A. Smith, Joshua Spurgeon, Maureen Tang, Roel van de Krol, Peter C.K. Vesborg, and Pieter Westerik. [Pathways to Electrochemical Solar-Hydrogen Technologies](#). *Energy & Environmental Science*, 2018, **11**, 2768-2783, (June 2018), (Journal Cover), DOI: <https://doi.org/10.1039/C7EE03639F>.
41. P. Hadikhani, S.M.H. Hashemi, G. Balestra, M.A. Modestino, F. Gallaire, and D. Psaltis\*. [Inertial manipulation of bubbles in rectangular microfluidic channels](#). *Lab on a Chip*, 2018, **18**, 1035-1046, (March 2018), (Journal Cover), DOI: <https://doi.org/10.1039/C7LC01283G>.
42. Enrico Chinello,\* Miguel A. Modestino, Laurent Coulot, Mathieu Ackermann, Florian Gerlich, Demetri Psaltis, and Christophe Moser. [A 25.1% efficient stand-alone solar chlor-alkali generator employing a micro-tracking solar concentrator](#). *Global Challenges*, 2017, **1**, 1700095, (November 2017), DOI: <https://doi.org/10.1002/gch2.201700095>.

*Journal publications prior to NYU:*

43. Seyyed Mohammad Hosseini Hashemi,\* Matthias Neuenschwander, Pooria Hadikhani, Miguel Modestino, and Demetri Psaltis. [Membrane-less micro fuel cell based on two phase flow](#). *Journal of Power Sources*, 2017, **348**, 212–218, (April 2017), DOI: <https://doi.org/10.1016/j.jpowsour.2017.02.079>.
44. Miguel A. Modestino,\* David Fernandez-Rivas,\* Mohammad Hashemi, Han Gardeniers, and Demetri Psaltis. [The potential for microfluidics in electrochemical energy systems](#).

- Energy & Environmental Science*, 2016, **9**, 3381-3391, (September 2016), DOI: <https://doi.org/10.1039/C6EE01884J>.
45. J.W. Schüttauf,<sup>‡\*</sup> M.A. Modestino,<sup>‡\*</sup> E. Chinello, D. Lambelet, D. Dominé, A. Faes, M. Despeisse, J. Bailat, D. Psaltis, C. Moser, C. Ballif. [Solar-to-hydrogen production at 14.2% efficiency with silicon photovoltaics and earth abundant electrocatalysts](#). *Journal of Electrochemical Society*, 2016, **163**, F1177-F1181, (August 2016), DOI: <https://doi.org/10.1149/2.0541610jes>.
  46. Paul Delrot,\* Miguel A. Modestino, François Gallaire, Demetri Psaltis and Christophe Moser. [Inkjet printing of viscous monodisperse micro-droplets by laser-induced flow focusing](#). *Physical Review Applied*, 2016, **6**, 024003, (August 2016), (Editor's selection article), DOI: <http://dx.doi.org/10.1103/PhysRevApplied.6.024003>.
  47. Miguel A. Modestino\*, Mohammad Hashemi, Sophia Haussener. [Mass transport aspects of electrochemical solar-hydrogen generation](#). *Energy & Environmental Science*, 2016, **9**, 1533-1551, (March 2016), DOI: <https://doi.org/10.1039/C5EE03698D>.
  48. Adam Weber,\* Chengxiang Xiang, Miguel Modestino, Shane Ardo, Sophia Haussener, Kate Fountain, John Stevens, Meenesh Singh, Katie Chen, Shu Hu, Matthew Shaner. [Modeling, Simulation, and Implementation of Solar-Driven Water-Splitting Devices](#). *Angewandte Chemie*, 2016, **128**, 13168-13183, (October 2016), DOI: <https://doi.org/10.1002/anie.201510463>.
  49. Marcin S. Zielinski, Jae-Woo Choi, Thomas LaGrange, Miguel A. Modestino, S. Mohammad H. Hashemi, Ye Pu, Susanne Birkhold, Jeffrey A. Hubbell, and Demetri Psaltis\*. [Hollow Mesoporous Plasmonic Nanoshells Enhancing Solar Vapor Generation](#). *Nano Letters*, 2016, **16**, 2159-2167, (February 2016), DOI: <https://doi.org/10.1021/acs.nanolett.5b03901>.
  50. Miguel A. Modestino\*, Mikael Dumortier, Mohammad Hashemi, Sophia Haussener, Demetri Psaltis, Christophe Moser. [Vapor-fed microfluidic hydrogen generator](#). *Lab on a Chip*, 2015, **15**, 2287-2296, (April 2015), DOI: <https://doi.org/10.1039/C5LC00259A>.
  51. Mohammad Hashemi, Miguel A. Modestino, Demetri Psaltis\*. [A membrane-less electrolyzer for hydrogen production across the pH scale](#). *Energy & Environmental Science*, 2015, **8**, 2003-2009, (April 2015), (Invited cover and top scoring article in Energy and Environmental Science), DOI: <https://doi.org/10.1039/C5EE00083A>.
  52. Claudia A. Rodriguez, <sup>‡</sup> Miguel A. Modestino\*, <sup>‡</sup> Demetri Psaltis, Christophe Moser. [Design and cost considerations of practical solar-hydrogen generators](#). *Energy & Environmental Science*, 2014, **7**, 3828-3835, (April 2015), (EES Readers' Choice Award), DOI: <https://doi.org/10.1039/C4EE01453G>.
  53. Miguel A. Modestino\*, Sophia Haussener\*. [An Integrated Device View on Photo-Electrochemical Solar-Hydrogen Generation](#). *Annual Review of Chemical & Biomolecular Engineering*, 2015, **6**, 13-34, (January 2015), (Invited Review), DOI: <https://doi.org/10.1146/annurev-chembioeng-061114-123357>.
  54. Frances Allen, Luis Comolli, Ahmet Kusoglu, Miguel A. Modestino, Andrew Minor, Adam Weber\*. [Morphology of Hydrated As-Cast Nafion Revealed through Cryo Electron Tomography](#). *ACS Macro Letters*, 2015, **4**, 1-5, (December 2014), (Journal Cover), DOI: <https://doi.org/10.1021/mz500606h>.
  55. Eun Cho, Christopher M. Evans, Emily C. Davidson, Megan L. Hoarfrost, Miguel A. Modestino, Rachel A. Segalman, and Jeffrey J. Urban\*. [Enhanced Water Vapor Blocking](#)

- [in Transparent Hybrid Polymer–Nanocrystal Films](#). *ACS Macro Letters*, 2015, **4**, 70–74, (December 2014), DOI: <https://doi.org/10.1021/mz500765y>.
56. Pepa Cotanda, Guillaume Sudre, Miguel A. Modestino, Xi Chen, Balsara, Nitash\*. [High Anion Conductivity and Low Water Uptake of Phosphonium Containing Diblock Copolymer Membranes](#). *Macromolecules*, 2014, **47**, 7540–7547, (October 2014), DOI: <https://doi.org/10.1021/ma501744w>.
57. Miguel A. Modestino, Karl A. Walczak, Alan Berger, Christopher Evans, Sophia Haussener, Carl Koval, John S. Newman, Joel Ager, Rachel A. Segalman\*. [Robust production of purified H<sub>2</sub> in a stable, self-regulating, and continuously operating solar fuel generator](#). *Energy & Environmental Science*, 2014, **7**, 297–301, (November 2013), DOI: <https://doi.org/10.1039/C3EE43214A>.
58. Miguel A. Modestino, Rachel A. Segalman\*. [Artificial Solar Fuel Generators](#). *Winter Issue of The Bridge on Frontiers of Engineering - National Academy of Engineering*, 2013, **43**, 23–30, (December 2013). DOI: <https://doi.org/10.17226/885>.
59. Miguel A. Modestino,<sup>‡</sup> Camilo Diaz-Botia,<sup>‡</sup> Tyler S. Matthews, Rafael Gomez-Sjoberg, Joel Ager\*, Rachel A. Segalman\*. [Integrated microfluidic test-bed for energy conversion devices](#). *Physical Chemistry Chemical Physics*, 2013, **15**, 7050–7054, (March 2013), DOI: <https://doi.org/10.1039/C3CP51302E>.
60. Miguel A. Modestino,\* Frances I. Allen, Devproshad K. Paul, Shudipto Dishari, Stephanie A. Petrina, Michael A. Hickner, Kunal Karan, Andy M. Minor, Adam Z. Weber and Rachel A. Segalman. [Self-Assembly and Transport Limitations in Confined Nafion Films](#). *Macromolecules*, 2013, **46**, 867–873, (January 2013), DOI: <https://doi.org/10.1021/ma301999a>.
61. Yanika Schneider, Miguel A. Modestino, Robert W. Hess, Bryan McCulloch, Rachel A. Segalman\*. [Ionic Conduction in Nanostructured Membranes based on Polymerized Protic Ionic Liquids](#). *Macromolecules*, 2013, **46**, 1543–1548, (February 2013), DOI: <https://doi.org/10.1021/ma3024624>.
62. Frances I. Allen, Peter Ercius, Miguel A. Modestino, Rachel A. Segalman, Nitash P. Balsara, Andrew M. Minor\*. [Deciphering the three-dimensional morphology of free-standing block copolymer thin films by transmission electron microscopy](#). *Micron*, 2013, **44**, 442–450, (January 2013), DOI: <https://doi.org/10.1016/j.micron.2012.09.010>.
63. Miguel A. Modestino,<sup>‡</sup> Ahmet Kusoglu,<sup>‡</sup> Alexander Hexemer, Adam Z. Weber\*, Rachel A. Segalman\*. [Controlling Nafion Structure and Properties via Wetting Interactions](#). *Macromolecules*, 2012, **45**, 4681–4688, (May 2012), DOI: <https://doi.org/10.1021/ma300212f>.
64. Gang Chen, Miguel A. Modestino, Billy K. Poon, Andre Schrotzek, Stefano Marchesini, Rachel A. Segalman\*, Alexander Hexemer, Peter H. Zwart. [Structure Determination of Pt-coated Au Dumbbells via Fluctuation X-ray Scattering](#). *Journal of Synchrotron Radiation*, 2012, **19**, 695–700, (September 2012), DOI: <https://doi.org/10.1107/S0909049512023801>.
65. Ahmet Kusoglu,<sup>‡</sup> Miguel A. Modestino,<sup>‡</sup> Alexander Hexemer, Adam Z. Weber\*, Rachel A. Segalman\*. [Subsecond Morphological Changes in Nafion during Water Uptake Detected by Small-Angle X-ray Scattering](#). *ACS Macro Letters*, 2012, **1**, 33–36, (November 2011), DOI: <https://doi.org/10.1021/mz200015c>.
66. Miguel A. Modestino, Elaine R. Chan, Alexander Hexemer, Jeff J. Urban, Rachel A. Segalman\*. [Controlling Nanorod Self-Assembly in Polymer Thin Films](#). *Macromolecules*, 2011, **44**, 7364–7371, (September 2011), DOI: <https://doi.org/10.1021/ma201252d>.

67. Nicole S. Zacharia, Miguel A. Modestino, Paula T. Hammond\*. [Factors Influencing the Interdiffusion of Weak Polycations in Multilayers](#). *Macromolecules*, 2007, **40**, 9523–9528, (November 2007), DOI: <https://doi.org/10.1021/ma071828+>.
68. Nicole S. Zacharia, Dean M. DeLongchamp, Miguel A. Modestino, Paula T. Hammond\*. [Controlling Diffusion and Exchange in Layer-by-Layer Assemblies](#). *Macromolecules*, 2007, **40**, 1598–1603, (February 2007), DOI: <https://doi.org/10.1021/ma061080f>.

## PATENTS

### Patent applications at NYU:

1. Miguel Modestino. *Systems and Methods and Computer Accessible Medium for Providing Syneristic Hydrogen Redox Energy Storage (SHRXES)*. Patent pending, NYU, 2022 (Internal Disclosure: MOD01-11).
2. Miguel Modestino, Christopher Musco, Daniel Frey, Juhee Shin. *Chemically-informed data-driven optimization (ChIDDO) Leveraging physical models and Bayesian learning to accelerate chemical research*. Patent pending, NYU, 2022. (US 63/310,256)
3. Miguel Modestino, Eray Aydil, Andrea Angulo, Lankun Yan. *Methods and apparatus for machine learning enhanced infrared spectroscopy and analysis*. Patent pending, NYU, 2021. (US 63/290,111)
4. Miguel A. Modestino, Aaliyah Dookhit, Daniela E. Blanco. *Electrohydrogenation of Nitriles*. Patent granted, NYU, 2020. (US20210348283A1)
5. Miguel A. Modestino, Daniela E. Blanco. *Electrohydrodimerization of Aliphatic Olefins with Electrochemical Potential Pulses*. Patent granted, NYU, 2019. (US 62/827,021)
6. Miguel A. Modestino, Daniel Frey, Daniela Blanco, Yury Dvorkin. *Methods and electrochemical cells for redox mediated hydrogen production*. Patent granted, NYU, 2019. (US20200270755A1)
7. S. Ardo, E. Schwartz, J. Liu, J. Cardon, W. White, K. Tkacz, L. Renna, M. Modestino, D. Blanco. *Systems and methods for integrated solar photodialysis*. UC Irvine/NYU, 2018. Patent Granted. (US20190217255A1)
8. Miguel A. Modestino, Sophia Haussener. *Solar production of Nylon polymers and precursors for Nylon production*. Patent pending, NYU/EPFL, 2018. (PCT/IB2018/051852)

### Patent applications prior to NYU:

9. S. Mohammad H. Hashemi, Miguel A. Modestino, Jae-Woo Choi, Demetri Psaltis. *Membraneless electrolyzer*. Patent granted, EPFL, 2015. (US10907262B2)
10. Miguel A. Modestino, S. Mohammad H. Hashemi, Christophe Moser, Demetri Psaltis. *Vapor-Fed Microelectrolysis Cells*. Patent application, EPFL, 2014. (US20160289848A1)

## GRANTS AND CONTRACTS

### Funded Projects: (Total fund granted: \$14.20M. Modestino research group's share: \$4.78M)

#### 1. **Sloan Foundation**

Title: Continuation of Decarbonizing Chemical Manufacturing Using Sustainable Electrification (DC-MUSE) Center

Total Funds Granted: \$100,000 (my share = \$33,333\*)

Dates: 09/01/2025 – 05/31/2026

Role: Co-PI in collaboration with Andre Taylor (NYU Tandon), and Elizabeth Biddinger (CCNY).

Contribution: As one of the research leaders for the center, I contributed to the write-up of this proposal, and will work with the managing director in center forming activities with the aim to develop a self-supporting center that will contribute towards the electrification of chemical manufacturing. \*My share is calculated as the total divided by the 3 PIs involved in the proposal, but these funds are to be used by the whole DC-MUSE network.

2. **Technology Acceleration & Commercialization Fund (NYU)**

Title: Synergistic Hydrogen Redox Energy Storage System (TAC2025)

Total Funds Granted: \$70,000 (my share = \$70,000)

Dates: 09/01/2025 – 08/31/2026

Role: Single PI

Contribution: Identifying commercialization pathways for decoupled water electrolysis technology

3. **Instituto Tecnológico y de Estudios Superiores de Monterrey, Mexico**

Title: Research Collaboration with Tecnológico de Monterrey

Total Funds Granted: \$244,393 (my share = \$244,393)

Dates: 01/01/2025 – 12/31/2026

Role: Single PI

Contribution: Establish research collaborations with the Sustainable Energy team at Tec de Monterrey and help the group expand their research capacity. This collaboration is part of the Tec de Monterrey's Faculty of Excellence program which I was selected to participate in the capacity of Distinguished Visiting Professor of Industrial Decarbonization.

4. **U.S. Department of Energy, Office of Science**

Title: Investigating Plasma-Liquid Interactions using Attenuated Total Internal Reflection Spectroscopy to Elucidate the Roles of Plasma Species in Inducing Chemical Reactions at the Interface

Total Funds Granted: \$769,750 (my share = \$384,875)

Dates: 09/01/2024 – 08/31/2027

Role: Co-PI in collaboration with PI Aydil (NYU)

Contribution: Elucidation of relationships between plasma properties and reactive species

5. **U.S. Department of Energy, Advanced Research Projects Agency – Energy (ARPA-E)**

Title: The RENEWTHANOL Process:: CO<sub>2</sub>-derived ethanol production via tandem electro- and thermo-catalytic conversions

Total Funds Granted: \$1,112,836.80 (my share = \$400,000)

Dates: 01/01/2025 – 12/31/2026

Role: PI in collaboration with Dharik Mallapragada (NYU) and D.J. Liu (Argonne National Laboratory).

Contribution: Electrolyzer product distribution control using potential pulses.

6. **U.S. Department of Energy (DOE)**

Title: Durable, Ultra-Thin Diaphragms for Liquid Alkaline Water Electrolysis

Total Funds Granted: \$4,800,000 (my share = \$757,843)\*

Dates: 06/01/2024 – 05/31/2027

Role: Co-PI in Collaboration with W.L. Gore (prime), Thyssen Krup Nucera, and DeNora

Contribution: Investigation of bubble induced losses during electrolysis.

\* This grant is in process of being cancelled because of changes at DOE and the relationship with the prime recipient.

7. **National Science Foundation**

Title: EAGER: CET: Decarbonizing Steel Manufacturing via High-Temperature Plasma Electrochemistry

Funds Granted: \$300,000 (my share = \$150,000, Tandon's share = \$300,000)

Dates: 01/01/2025 – 12/31/2026

Role: PI in collaboration with Co-PI Eray Aydil (NYU Tandon)

8. **National Science Foundation (NSF)**

Title: STTR Phase II: Earth-abundant catalyst for power-to-liquids chemical production at the kiloton scale

Total Funds Granted: \$997,743 (my share = \$300,000)

Dates: 04/15/2024 – 03/31/2025

Role: Co-PI in Collaboration with Staff Sheehan (Air Company)

Contribution: Materials characterization and mechanistic investigation of Air Company catalysts.

9. **National Aeronautics and Space Administration (NASA)**

Title: STTR PHASE II Single-step production of kerosene-based fuels from carbon dioxide and hydrogen

Total Funds Granted: \$849,936 (my share = \$255,000)

Dates: 02/01/2024 – 01/31/2026

Role: Co-PI in Collaboration with Staff Sheehan (Air Company)

Contribution: Modeling of kerosene-based fuel production process.

10. **New York State Energy Research and Development Agency (NYSERDA)/Columbia Carbontech Initiative**

Title: To optimize the operation of CO<sub>2</sub> electrolyzers with active learning algorithms

Total Funds Granted: \$114,265

Dates: 11/01/2023 – 10/31/2025

Role: Single PI

11. **Sloan Foundation**

Title: Continuation of Development of Center for Decarbonizing Chemical Manufacturing via Sustainable Electrification

Total Funds Granted: \$500,970 (my share = \$166,990\*)

Dates: 09/01/2023 – 08/31/2025

Role: Co-PI in collaboration with Andre Taylor (NYU Tandon), and Elizabeth Biddinger (CCNY).

Contribution: As research co-director for the center, I coordinated the write-up of this proposal, and will work with the managing director in center forming activities with the aim to develop a self-supporting center that will contribute towards the electrification of chemical manufacturing. \*My share is calculated as the total divided by the 3 PIs involved in the proposal, but these funds are to be distributed amongst the DC-MUSE network.

## 12. National Science Foundation

Title: IUCRC Planning Grant New York University: Center for Decarbonizing Chemical Manufacturing Using Sustainable Electrification (DC-MUSE)

Funds Granted: \$20,000 (my share = \$5,000, Tandon's share = \$20,000)

Dates: 02/01/2023 – 01/31/2024

Role: Co-PI in collaboration with Eray Aydil (NYU Tandon), Andre Taylor (NYU Tandon), and Ryan Hartman (NYU Tandon)

Contribution: Served as the lead coordinator for the planning of a DC-MUSE Industry-University Cooperative Research Center (IUCRC).

## 13. National Aeronautics and Space Administration (NASA)

Title: STTR PHASE I Single-step production of kerosene-based fuels from carbon dioxide and hydrogen

Total Funds Granted: \$149,928 (my share = \$50,000)

Dates: 08/24/2022 – 08/25/2023

Role: Co-PI in Collaboration with Staff Sheehan (Air Company)

Contribution: Modeling of kerosene-based fuel production process.

## 14. Invista (Koch Industries)

Title: A Hybrid Plasma-Electrochemical Process for Enhanced Production of Adiponitrile

Total Funds Granted: \$155,000 (my share = \$77,500)

Dates: 09/01/2021 – 08/31/2022

Role: Lead-PI in collaboration with Eray Aydil (NYU Tandon)

Contribution: Built the relationship with the company, the write-up of the electrochemical component of the proposal, and my group will perform all the electrochemical experiments.

## 15. Sloan Foundation

Title: Center for Decarbonizing Chemical Manufacturing via Sustainable Electrification

Total Funds Granted: \$700,000 (my share = \$93,442, Tandon's share = \$456,000, other institutions share = \$246,000)

Dates: 09/01/2021 – 08/31/2023

Role: Co-PI in collaboration with Andre Taylor (NYU Tandon), Eray Aydil (NYU Tandon), Yury Dvorkin (NYU Tandon), Ryan Hartman (NYU Tandon), Elizabeth Biddinger (CCNY), Daniel Esposito (Columbia University), Yushan Yan (University of

Deleware), Mike Harold (University of Houston), Lars Grabow (University of Houston), Vincent Donnelly (University of Houston), Bri-Mathias Hodge (Colorado University, Boulder), Kyri Baker (Colorado University, Boulder).

Contribution: As research co-director for the center, I coordinated the write-up of this proposal, led the preparation of the proposed thrust on electrochemical manufacturing, will lead experimental work on high-throughput screening of electrolytes for electrochemical production of ethylene from propionic acid, and will work with the managing director in center forming activities with the aim to develop a self-supporting center that will contribute towards the electrification of chemical manufacturing.

**16. National Science Foundation**

Title: CAREER: Understanding Multiscale Mass Transport in Organic Electrosynthesis: Towards a Sustainable Pathway to Nylon Precursors

Funds Granted: \$ 634,650

Dates: 04/01/2020 – 03/31/2025

Role: Single PI

**17. National Science Foundation**

Title: Planning Grant: Engineering Research Center for the Electrification of the Chemical Industry (CECI)

Funds Granted: \$90,457 (my share = \$22,614, Tandon's share = \$90,457)

Dates: 11/01/2019 – 10/31/2020

Role: Co-PI in collaboration with Eray Aydil (NYU Tandon), Yury Dvorkin (NYU Tandon), and Sanat Kumar (Columbia University)

**18. PowerBridge New York:**

Title: Improved manufacturing process for adiponitrile

Funds Granted: \$150,000

Dates: 05/01/2019 – 05/14/2020

Role: Single PI

**19. University Research Challenge Fund, NYU:**

Title: Hybrid photocatalytic materials for light-driven water treatment.

Funds Granted: \$15,000.

Dates: 6/01/2019-11/30/2019

Role: Lead-PI in collaboration with Andrea Silverman (NYU Tandon)

Contribution: Led the proposal write-up and my group performed all the experimental work.

**20. Empire State Development, NYSTAR Technology Transfer Program:**

Title: Scale-up and Optimization of Adiponitrile Electrosynthesis Reactors.

Funds Granted: \$62,500

Dates: 06/01/2019 – 12/31/2020

Role: Single PI

21. **ACS Petroleum Research Fund, Doctoral New Investigator Award:**  
Title: Ionic Liquid-Polymer Gel Electrolytes for Electrochemical Olefin Separations.  
Funds Granted: \$110,000.  
Dates: 09/01/2019 – 08/31/2021  
Role: Single PI
22. **VentureWell:**  
Title: Sunthetics.  
Funds Granted: \$25,000.  
Dates: 03/01/2018 – 12/31/2019  
Role: Single PI
23. **MD5 Launch:**  
Title: H2POWdER Project.  
Funds Granted: \$190,000.  
Dates: 05/01/2018 – 04/31/2019  
Role: Single PI (Part of the NYU MD5 Program to develop and commercialize a nanostructured Aluminum powder technology for hydrogen production)
24. **ExxonMobile:**  
Title: N/A (Unrestricted Research Grant)  
Funds Granted: \$20,000  
Dates: 01/09/2018 – Indefinite  
Role: Single PI
25. **Swiss National Science Foundation:**  
Title: Multiphase Flow Electrochemical Reactors  
Funds Granted: \$1,645,000 (my share: \$256,937)  
Dates: 01/01/2018 – 12/31/2021  
Role: Co-PI in collaboration with Demetri Psaltis (EPFL) and Petros Koumatsakos (ETHZ)  
Contribution: Contributed to the preparation of the proposal write-up, led the electrochemical engineering component of it, and my group performed all the microfluidic electrochemical experiments of the project.
26. **National Science Foundation:**  
Title: RAPID: Transportable Energy Storage for Enhancing Power Grid Resiliency to Natural Disasters  
Funds Granted: \$61,902 (my share = \$30,951).  
Dates: 10/01/2017 – 09/30/2018  
Role: Co-PI in collaboration with Yury Dvorkin (NYU Tandon)  
Contribution: Contributed to the preparation of the proposal write-up, led the electrochemical engineering component of it, and my group performed all the experimental work of the project.

**27. H&M Foundation, Global Change Award:**

Title: SolarTextiles.

Funds Granted: \$310,000 (my share = \$155,000)

Dates: 07/01/2017 – Indefinite.

Role: Lead-PI in collaboration with Sophia Haussener (EPFL).

Contribution: Led the write-up of the proposal and my group performed all the electrochemical engineering work of the project.

Pending Projects:

**1. National Science Foundation**

Title: NSF Engineering Research Center for Plastics Lifecycle Sustainability, Technology Innovation, and Circularity (PLSTIC)

Total Funds Granted: \$26,000,000

Dates: 09/01/2027 – 05/31/2031

Role: Lead-PI in collaboration with Andre Taylor (NYU Tandon), Elizabeth Biddinger (CCNY), Michael Harold (UHouston) as Co-PIs.

**PRESENTATIONS**

Invited presentations after joining NYU:

1. Miguel A. Modestino. Engineering Electrochemical Reactions: From Management of Gas Evolution in Water Electrolysis to Electrochemical Manufacturing of Organic Commodities. HYPOTHESIS Conference. September 12th, 2025. Queretaro, Mexico.
2. Miguel A. Modestino. Hydrogen: Challenges and Opportunities. RELIEVE Conference. Polytechnic School of Chimborazo. July 24<sup>th</sup>, 2025. Riobamba, Ecuador
3. Miguel A. Modestino. Electrifying Chemical Reactions for Sustainable Manufacturing. Seminar at Tecnologico de Monterrey, Campus Santa Fe. May 22<sup>st</sup>, 2025. Mexico City, Mexico.
4. Miguel A. Modestino. Electrifying Chemical Reactions for Sustainable Manufacturing. Seminar at Tecnologico de Monterrey, Campus Puebla. May 21<sup>st</sup>, 2025. Puebla, Mexico.
5. Miguel A. Modestino. Understanding and Controlling Reaction Pathways in Organic Electrosynthesis. Chemical and Biomolecular Engineering Seminar, University of California, Irvine. May 9<sup>th</sup>, 2025. Irvine, CA, USA.
6. Miguel A. Modestino. Leveraging Machine Learning to Accelerate Sustainability in Chemical Engineering. Computer Science Seminar at CUNY City Tech. March 27<sup>th</sup>, 2025. Brooklyn, NY, USA.
7. Miguel A. Modestino. Understanding and Controlling Reaction Pathways in Organic Electrosynthesis. Catalysis Society of Metropolitan New York Spring Symposium. March 12<sup>th</sup>, 2025. Lehigh University, USA.
8. Miguel A. Modestino. Engineering Electrochemical Reactions for Sustainable Chemical Manufacturing. Chemical and Biological Engineering Seminar, Iowa State University. February 27<sup>th</sup>, 2025. Ames, Iowa, USA.

9. Miguel A. Modestino. Engineering Electrochemical Reactions for Sustainable Chemical Manufacturing. Seminar University of Wisconsin (Special Topics in Engineering Professional Development Series). Jan 29<sup>th</sup>, 2025. (Remote)
10. Miguel A. Modestino. Advancing Sustainable Nylon Production through Electrosynthesis: Elucidating Reaction Mechanisms at Electrode Interfaces and Enabling Bio-Derived Polymer Precursors. MRS Fall Meeting. Dec 5<sup>th</sup>, 2024. Boston, MA, USA.
11. Miguel A. Modestino. Electrochemical Engineering for Sustainable Chemical Manufacturing. Commonwealth Scientific and Industrial Research Organisation (CSIRO) Seminar. October 23<sup>rd</sup>, 2024. Melbourne, Australia.
12. Miguel A. Modestino. Electrochemical Manufacturing for Circularity. Royal Melbourne Institute of Technology Seminar. October 21<sup>st</sup>, 2024. Melbourne, Australia.
13. Miguel A. Modestino. The REnewthanol Process. ARPA-E GREENWELLS Kick-off Meeting. October 17<sup>th</sup>, 2024. Houston, Texas, USA.
14. Miguel A. Modestino. Decarbonization of the chemical industry through electrification: Barriers and opportunities. Iberoamerican Conference on Advanced Oxidation Processes (CIPOA). October 10<sup>th</sup>, 2024. Florianapolis, Brazil.
15. Miguel A. Modestino. Decarbonization of the chemical industry through electrification: Barriers and opportunities. Iberoamerican Conference on Advanced Oxidation Processes (CIPOA). October 10<sup>th</sup>, 2024. Florianapolis, Brazil.
16. Miguel A. Modestino. Enabling Electrochemical Manufacturing Pathways for Biomass-Derived Nylon Precursors via High-Throughput Research Workflows. ACS Fall Meeting, August 18<sup>th</sup>, 2024. Denver, Colorado, USA.
17. Miguel A. Modestino. Engineering Electrochemical Reactions for Sustainable Chemical Manufacturing. Department of Applied Science and Technology, Politecnico di Torino. July 8<sup>th</sup>, 2024. Torino, Italy.
18. Miguel A. Modestino. Electrochemical Engineering Approaches for High-Performing Electrosynthesis of Polymer Precursors. Electrochemical Society Spring Meeting. May 28<sup>th</sup>, 2024. San Francisco, CA, USA.
19. Miguel A. Modestino. Engineering Electrochemical Reactions for Sustainable Chemical Manufacturing. RWTH Aachen University Research Seminar. April 10<sup>th</sup>, 2024. Aachen, Germany.
20. Miguel A. Modestino. Electrochemistry for a clean economy. IndieBio NY Panel Discussion. February 21<sup>st</sup>, 2024. New York, NY, USA. (Panel)
21. Miguel A. Modestino. Engineering Electrochemical Reactions for Sustainable Chemical Manufacturing. Texas Tech ECS Chapter, February 7<sup>th</sup>, 2024. (Virtual)
22. Miguel A. Modestino. An Electrochemical Engineering Journey Towards Sustainable Nylon Precursors. American Institute of Chemical Engineers (AIChE) Fall Meeting. November 7<sup>th</sup>, 2023. Orlando, FL, USA.
23. Miguel A. Modestino. Engineering Electrochemical Reactions for Sustainable Chemical Manufacturing. University of Pennsylvania, Chemical and Biomolecular Engineering Seminar. September 6<sup>th</sup>, 2023. Philadelphia, PA, USA.

24. Miguel A. Modestino. Engineering Electrochemical Reactions for Sustainable Chemical Manufacturing. KAIST-Postech-NYU-UNSW Chemical Engineering Conference. July 10<sup>th</sup>, 2023. Postech University, Pohang, South Korea.
25. Miguel A. Modestino. Engineering Electrochemical Reactions for Sustainable Chemical Manufacturing. Monterrey Institute of Technology, Advanced Materials for Sustainable Manufacturing Seminar. June 8<sup>th</sup>, 2023. Monterrey, Mexico.
26. Miguel A. Modestino. Engineering Electro-organic Reactions for Sustainable Chemical Manufacturing. University of Washington, Chemical Engineering Seminar. May 15<sup>th</sup>, 2023. Seattle, WA, USA.
27. Miguel A. Modestino. Influence of bubbles on the energy conversion efficiency of electrochemical reactors. Electrochemical Cell Concepts Colloquium – E3C 2023, May 5<sup>th</sup>, 2023. Fraunhofer Institute for Environmental, Safety and Energy Technology UMSICHT, Oberhausen, Germany. (Virtual)
28. Miguel A. Modestino. Structure-Property Relationships in Highly Permeable Dioxolane-Based Perfluorinated Ionomers with Tunable Transport Properties. Brookhaven National Laboratory NSLS User Meeting, April 26<sup>th</sup>, 2023. Brooklyn, NY, USA.
29. Miguel A. Modestino. Engineering Electro-organic Reactions for Sustainable Chemical Manufacturing. Center for Urban Science and Progress (CUSP) Seminar, New York University, April 20<sup>th</sup>, 2023. Brooklyn, NY, USA.
30. Miguel A. Modestino. Understanding bubble-induced energy losses in multiphase electrochemical reactors. ACS Spring Meeting, Indianapolis, USA. March 28<sup>th</sup>, 2023.
31. Miguel A. Modestino. Engineering electrode/electrolyte interfaces for high-performing organic electrosynthesis. ACS Spring Meeting, Indianapolis, USA. March 27<sup>th</sup>, 2023.
32. Miguel A. Modestino. Engineering Electro-organic Reactions for Sustainable Chemical Manufacturing. University of Notre Dame, Chemical Engineering Seminar. March 2<sup>nd</sup>, 2023. South Bend, IN, USA.
33. Miguel A. Modestino. Accelerating the Development of High-Performing Dynamic Electrochemical Processes via Bayesian Optimization. American Institute of Chemical Engineers (AIChE) Fall Meeting. November 15<sup>th</sup>, 2022. Phoenix, AZ, USA.
34. Miguel A. Modestino. Supporting Sustainability on an Individual and Global Scale (Panel). NYU West Coast Alumni Conference. November 13<sup>th</sup>, 2022. San Francisco, CA, USA.
35. Miguel A. Modestino. Engineering Electro-organic Reactions for Sustainable Chemical Manufacturing. Stanford University Chemical Engineering Seminar. October 31<sup>st</sup>, 2022. Stanford, CA, USA.
36. Miguel A. Modestino. Structure-Property Relationships in Highly Permeable Dioxolane-based Perfluorinated Ionomers. Electrochemical Society Fall Meeting. October 11<sup>th</sup>, 2022. Atlanta, GA, USA.
37. Miguel A. Modestino. Panel Discussion on Adoption of Electrification and Efficiency in Facilities - Enhancing Equity and Energy Security in the Built Environment. September 8<sup>th</sup>, 2022. New York, NY, USA.

38. Miguel A. Modestino. Understanding Structure and Transport Property Relationships in Membranes for Organic Electrosynthesis. Polymer Physics Gordon Conference. July 30<sup>th</sup>, 2022. Mt. Holyoke College, Holyoke, MA, USA.
39. Miguel A. Modestino. How to transform the chemical industry -- one reaction at a time. TED Countdown Conference. June 14<sup>th</sup>, 2022. New York, NY, USA.
40. Miguel A. Modestino, Andrea Angulo. Accelerating the Development of Electrochemical Technologies for Sustainable Chemical Manufacturing. Royal Society of Chemistry, Digital Discovery Webinar. March 29<sup>th</sup>, 2022. (Virtual)
41. Miguel A. Modestino. Accelerating the Development of Electrochemical Technologies for Sustainable Chemical Manufacturing. A3MD Seminar, University of Toronto. March 8<sup>th</sup>, 2022. (Virtual)
42. Miguel A. Modestino. Engineering Organic Electrosynthesis Processes for Sustainable Chemical Manufacturing. Joint UC Berkeley-Lawrence Berkeley National Lab Seminar, January 10<sup>th</sup>, 2022. (Virtual)
43. Miguel A. Modestino. Engineering Organic Electrosynthesis Processes for Sustainable Chemical Manufacturing. Chemical Engineering and Materials Science Seminar, University of Minnesota. October 12<sup>th</sup>, 2021. Minneapolis, MN, USA.
44. Miguel A. Modestino. Engineering Organic Electrosynthesis Processes for Sustainable Chemical Manufacturing. Chemical Engineering Seminar, University of California, Santa Barbara. September 29<sup>th</sup>, 2021. Santa Barbara, CA, USA.
45. Miguel A. Modestino. Electrochemical Engineering Approaches to Chemical Manufacturing. World Laurates Young Scientist Forum. October 31<sup>st</sup>, 2021. (Virtual)
46. Miguel A. Modestino. Process Intensification Approaches in Organic Electrosynthesis of Nylon Intermediates. International Society of Electrochemistry Conference, August 30<sup>th</sup>, 2021. (Virtual)
47. Miguel A. Modestino. Challenges and Opportunities in Electrochemical Reactor Design and Scale-up. DOE Advanced Manufacturing Office Workshop on Electrochemical Manufacturing. June 29<sup>th</sup>, 2021. (Virtual)
48. Miguel A. Modestino. Controlling Transport Processes in Multiphase Flow Electrochemical Devices. Microfluidics & Energy Symposium. University of Toronto, April 30<sup>th</sup>, 2021. (Virtual)
49. Miguel A. Modestino. Optimizing Organic Electrosynthesis Through Electrochemical Engineering Approaches and Bayesian Machine Learning. MRS Virtual Spring Meeting, April 22<sup>th</sup>, 2021. (Virtual)
50. Miguel A. Modestino. Designing Organic Electrosynthesis Processes for Sustainable Chemical Manufacturing. Chemical Engineering Seminar at University of California, Santa Barbara, USA. April 14<sup>th</sup>, 2021. (Virtual) (Departmental Colloquium)
51. Miguel A. Modestino. Designing Electrochemical Processes for Sustainable Chemical Manufacturing. Center for Catalytic Science and Technology, Chemical and Biomolecular Engineering Seminar at University of Delaware, USA. March 10<sup>th</sup>, 2021. (Virtual) (Departmental Colloquium)

52. Miguel A. Modestino. Designing Electrochemical Processes for Sustainable Chemical Manufacturing. Chemical Engineering Seminar at University of Texas, Austin, USA. November 10<sup>th</sup>, 2020. (Virtual) (Departmental Colloquium)
53. Miguel A. Modestino. Designing Electrochemical Processes for Sustainable Chemical Manufacturing. Chemical Engineering Seminar at Colorado University, Boulder, USA. October 27<sup>th</sup>, 2020. (Virtual) (Departmental Colloquium)
54. Miguel A. Modestino. Decarbonizing Chemical Manufacturing. EmTech 2020 Conference, MIT Technology Review. October 21<sup>st</sup>, 2020. (Virtual) (Keynote)
55. Miguel A. Modestino. Designing Electrochemical Processes for Sustainable Chemical Manufacturing. Chemical Engineering Seminar at University of Arizona, Tucson, USA. October 12<sup>th</sup>, 2020. (Virtual) (Departmental Colloquium)
56. Miguel A. Modestino. Designing Electrochemical Processes for Sustainable Chemical Manufacturing. Seminar at Bristol Myers Squibb, USA. July 9<sup>th</sup>, 2020. (Virtual)
57. Miguel A. Modestino. Designing Electrochemical Processes for Sustainable Chemical Manufacturing. Seminar at Lawrence Berkeley National Lab, USA. July 6<sup>th</sup>, 2020. (Virtual)
58. Miguel A. Modestino. Designing Electrochemical Materials and Processes for Clean Transportation and Sustainable Chemical Manufacturing. Seminar at Technical University of Eindhoven, The Netherlands. April 23<sup>rd</sup>, 2020. (Virtual)
59. Miguel A. Modestino. Designing Electrochemical Materials and Processes for Clean Transportation and Sustainable Chemical Manufacturing. Seminar at Center for Nanofunctional Materials, Brookhaven National Laboratory, USA. February 3<sup>rd</sup>, 2020. (Departmental Colloquium)
60. Miguel A. Modestino. Designing Electrochemical Materials and Processes for Clean Transportation and Sustainable Chemical Manufacturing. Chemical Engineering Department Seminar, Stevens Institute of Technology, Hoboken, NJ, USA. January 31<sup>st</sup>, 2020. (Departmental Colloquium)
61. Miguel A. Modestino. Designing Electrochemical Materials and Processes for Clean Transportation and Sustainable Chemical Manufacturing. Seminar at Solar Fuels Institute, Helmholtz Zentrum Berlin, Germany. January 8<sup>th</sup>, 2020. (Departmental Colloquium)
62. Miguel A. Modestino. Engineering Electrochemical Manufacturing: From High-Performing Reactors to Separation Processes. Advances, Challenges, and Long-term Opportunities for Electrochemistry. Chemical Science Roundtable Workshop, National Academy of Science, Washington, DC, USA. November 19<sup>th</sup>, 2019.
63. Miguel A. Modestino. Artificial Photosynthesis Engineering: Designing solar-driven electrochemical reactors for the production of clean fuels and high-value materials. Chemical Engineering Department Seminar, City College of New York, NY, USA. November 4<sup>th</sup>, 2019. (Departmental Colloquium)
64. Miguel A. Modestino, Daniela E. Blanco. Engineering Organic Electrosynthesis: The Case of Nylon Precursors. Seminar at Invista/Koch Industries. Orange, TX, USA. August 13<sup>th</sup>, 2019.
65. Miguel A. Modestino. Design considerations of sunlight-driven organic electrosynthetic processes. ACS Spring Meeting, Orlando, FL, USA. April 3<sup>rd</sup>, 2019.

66. Miguel A. Modestino. Advice for Pursuing Traditional and Nontraditional Careers in Science (Panelist). Energy Nanomaterials, Gordon Research Seminar, Ventura, CA, USA. February 24<sup>th</sup>, 2019.
67. Miguel A. Modestino. The potential of solar-chemical manufacturing: from clean fuels to fast fashion. University of Oxford's Energy Society, Oxford, UK. November 20<sup>th</sup>, 2018.
68. Miguel A. Modestino. Engineering a sustainable chemical industry. University of Oxford's Climate Society, Oxford, UK. November 19<sup>th</sup>, 2018.
69. Miguel A. Modestino. Novel ionomer materials for electrochemical energy conversion devices. Center for Soft Matter Research, Department of Physics, New York University, New York, NY, USA. November 14<sup>th</sup>, 2018.
70. Miguel A. Modestino. How can startups and corporates collaborate (Panelist). Innovate 46, Swedish Chamber of Commerce. New York, NY, USA. October 10<sup>th</sup>, 2018.
71. Miguel A. Modestino. Controlling mass transport at electrocatalytic interfaces: Towards air-based water splitting devices. ACS Fall Meeting, Boston, MA, USA. August 22<sup>nd</sup>, 2018.
72. Miguel A. Modestino. Solar-Fuels Analytical Facility: Required Prototype Formats. Workshop on Photoelectrochemical Solar Fuels Production. Gerischer Electrochemistry Today. Boulder, CO. August 13<sup>th</sup>, 2018.
73. Miguel A. Modestino. SolarTextiles: Manufacturing textiles with energy from the sun. MIT Technology Review EmTech Caribbean 2018. Santo Domingo, Dominican Republic. May 11<sup>th</sup>, 2018. (Keynote)
74. Miguel A. Modestino. Controlling Self Assembly and Mass Transport in Artificial Photosynthesis Materials and Devices. University of Oxford's Department of Materials Colloquium, Oxford, UK. April 26<sup>th</sup>, 2018. (Departmental Colloquium)
75. Miguel A. Modestino. Artificial Photosynthesis Engineering: Towards Solar-Chemical Reactors. Chemical Engineering Department Seminar, New Jersey Institute of Technology, NJ, USA. April 2<sup>nd</sup>, 2018. (Departmental Colloquium)
76. Miguel A. Modestino. Artificial Photosynthesis Engineering: Towards Solar-Chemical Reactors. Chemistry Department Seminar, Lehman College, Bronx, NY, USA. February 21<sup>th</sup>, 2018. (Departmental Colloquium)
77. Miguel A. Modestino. Artificial Photosynthesis Engineering: Towards Solar-Chemical Reactors. New York Nanoscience Discussion Group. Department of Chemistry, New York University, New York, NY, USA. January 30<sup>th</sup>, 2018.
78. Miguel A. Modestino. SolarTextiles: Manufacturing textiles with energy from the sun. MIT Technology Review Innovators under 35 LATAM 2017. November 16<sup>th</sup>, Mexico City, Mexico. (Keynote)
79. Miguel A. Modestino. SolarTextiles: Harvesting the sun's energy to make textiles and clean the environment, all at once. Fashion Now and Then Conference, October 20<sup>th</sup>, 2017, LIM College, New York, NY, USA.
80. Miguel A. Modestino. Artificial Photosynthesis Engineering: Towards Solar-Chemical Reactors. MRS Stevens Chapter Guest Lecture. Department of Chemical Engineering, Stevens Institute of Technology, Hoboken, NJ. April 26<sup>th</sup>, 2017. (Departmental Colloquium)

*Invited presentations prior to joining NYU:*

1. Miguel A. Modestino. Unconventional water splitting approaches towards scalable solar-hydrogen generators. Laboratory for Chemical Technology Seminar. Gent University, Gent, Belgium. September 30<sup>th</sup>, 2016. (Departmental Colloquium)
2. Miguel A. Modestino. Unconventional water splitting approaches towards scalable solar-hydrogen generators. EPFL Valais Seminar. Sion, Switzerland. April 12<sup>th</sup>, 2016.
3. Miguel A. Modestino. Unconventional water splitting approaches towards scalable solar-hydrogen generators. Chemical and Biomolecular Engineering Seminar. New York University, Brooklyn, NY, USA. February 22<sup>nd</sup>, 2016. (Departmental Colloquium)
4. Miguel A. Modestino. Self-Assembly and Transport in Artificial Photosynthesis Membranes. Symposium on the Future of Polymer Nanotechnology. University of Applied Sciences and Arts of Northwestern Switzerland and Paul Scherrer Institute, Windisch, Switzerland. December 18<sup>th</sup>, 2015. (Departmental Colloquium)
5. Miguel A. Modestino. Unconventional water splitting approaches towards scalable solar-hydrogen generators. Energy and Environmental Science Readers' Choice Award Lecture. International Symposium on Energy Conversion and Storage. Beijing, China. June 1<sup>st</sup>, 2015. (Distinguished Seminar)
6. Miguel A. Modestino. Artificial Photosynthesis Engineering. Process Intensification Seminar at ETH, Zurich, Switzerland. March 24<sup>th</sup>, 2015. (Departmental Colloquium)
7. Miguel A. Modestino, Claudia A. Rodriguez, Demetri Psaltis, Christophe Moser. Design Principles of Deployable Solar-Hydrogen Generators. IEEE Photonics Conference, San Diego, CA. October 15<sup>th</sup>, 2014.
8. Miguel A. Modestino. Self-Assembly and Mass Transport in Artificial Photosynthesis Systems. Seminar at Chalmers University of Technology, Göteborg, Sweden. October 2<sup>nd</sup>, 2014. (Departmental Colloquium)
9. Miguel A. Modestino. Systems engineering solutions for the development of cost effective solar-fuel generators. Seminar at University of Twente, Enschede, Netherlands. February 18<sup>th</sup>, 2014. (Departmental Colloquium)
10. Miguel A. Modestino. Self-Assembly and Mass Transport in Artificial Photosynthesis Systems. Seminar at EMPA Dübendorf. August 2013. (Departmental Colloquium)
11. Miguel A. Modestino, Augusta E. Modestino. Promoting Development from the Lab. TEDxUSB (March 2012), Universidad Simon Bolivar, Caracas, Venezuela. (<http://www.youtube.com/watch?v=GDNCqosmVLA>)
12. Miguel A. Modestino, Ahmet Kusoglu, Alexander Hexemer, Adam Z. Weber, and Rachel A. Segalman. Understanding Hierarchical Structure in Membranes and Assemblies for Artificial Photosynthesis. Synchrotron Radiation in Polymer Science, 2012. San Francisco, CA.
13. Miguel A. Modestino, Ahmet Kusoglu, Alexander Hexemer, Adam Z. Weber, and Rachel A. Segalman. Understanding Hierarchical Structure in Solar Fuel Membranes and Assemblies. ALS Users Meeting 2011. Lawrence Berkeley National Lab, Berkeley, CA.

Contributed presentations after joining NYU (Presenter listed as first author, and names of students from my group at NYU **bolded**):

1. **Ricardo Mathison**, Miguel A. Modestino. *Selective organic electrosynthesis: From molecular understanding to data-driven sustainable manufacturing*. 2025 Next Generation Electrochemistry Workshop. Lemont, IL, USA. June 2025. (Poster).
2. **Casey Bloomquist, Melisa Dogan, James S. Harris**, Eray S. Aydil & Miguel A. Modestino. *Understanding the Effects of Forced and Bubble-Induced Convection in Transport-Limited Organic Electrosynthesis*. ECS Meeting 2024. San Francisco, CA, USA. May 2024. (Oral)
3. **Casey Bloomquist, Daniel Naumov, Ahrin Yang**, Eray S. Aydil & Miguel A. Modestino. *Is Plasma Electrochemistry Just Electrochemistry at Plasma-Liquid Interfaces? Learnings from Organic Reactions*. AVS International Symposium & Exhibition 2024. Tampa, FL, USA. November 2024. (Oral)
4. **Ricardo Mathison** & Miguel A. Modestino. *Advancing Sustainable Nylon Production Through Electrosynthesis – Elucidating Reaction Mechanisms at Electrode Interfaces and Enabling Bio-Derived Polymers*. MRS Fall Meeting & Exhibit 2024. Boston, MA, USA. December 2024. (Oral).
5. **Ricardo Mathison, Meera Patel, Elina Rani**, & Miguel A. Modestino. *Accelerated Development and Optimization of Adiponitrile Production via Kolbe Electrolysis of Biomass-Derived Precursors*. ECS Meeting 2024. San Francisco, CA, USA. May 2024. (Oral).
6. **Ricardo Mathison, Hannah McConnell, Emilio Ochoa, Toshihiro Akashige**, & Miguel A. Modestino. *Understanding Near-Electrode Microenvironments in Acrylonitrile Electrohydrodimerization*. ECS Meeting 2024. San Francisco, CA, USA. May 2024. (Oral).
7. **Ricardo Mathison** & Miguel A. Modestino. *Engineering Electro-Organic Reactions for Decarbonized Chemical Manufacturing*. Innovations in Climate Resilience 2024. Washington, DC, USA. April 2024. (Poster).
8. **Ricardo Mathison, Emilio Ochoa, Toshihiro Akashige**, & Miguel Modestino. *In Situ Analysis of the Effect of Tetraalkylammonium Salts on the Selectivity and Efficiency of Acrylonitrile Electrohydrodimerization*. DC MUSE Conference 2023. Brooklyn, NY, USA. September 2023. (Poster).
9. **Ricardo Mathison, Meera Patel, Elina Rani**, & Miguel Modestino. *Understanding the Electrochemical Synthesis of Adiponitrile from Renewable Biomass Feedstocks*. DC MUSE Conference 2023. Brooklyn, NY, USA. September 2023. (Poster).
10. **Ricardo Mathison, Toshihiro Akashige**, & Miguel A. Modestino. *In Situ Analysis of the Effect of Tetraalkylammonium Salts on the Selectivity and Efficiency of Acrylonitrile Electrohydrodimerization*. ECS Meeting 2023. Boston, MA, USA. May 2023. (Poster).
11. **Toshihiro Akashige**, Adlai B. Katzenberg, Daniel M. Frey, Debdyuti Merkhaji, Cesar A. Urbina-Blanco, Brian Chen, Yoshiyuki Okamoto, & Miguel A. Modestino. *Electrochemically Modulated Separation of Olefin-Paraffin Gas Mixtures in Membrane Electrode Assemblies*. ECS Conference 2023. Boston, MA, USA. May 2023. (Oral)
12. **Toshihiro Akashige**, Adlai B. Katzenberg, Daniel M. Frey, Debdyuti Merkhaji, Cesar A. Urbina-Blanco, Brian Chen, Yoshiyuki Okamoto, & Miguel A.

- Modestino. *Electrochemically Modulated Separation of Olefin-Paraffin Gas Mixtures in Membrane Electrode Assemblies*. DC MUSE IUCRC Conference 2023. Brooklyn, NY, USA. September 2023. (Poster)
13. **Andrea Angulo, Lankun Yan, Eray Aydil, Miguel A. Modestino.** *Machine Learning Models for Rapid Compositional Quantification of Complex Multicomponent Mixtures Using Vibrational Spectroscopy*. AIChE Annual Meeting 2021. Boston, MA, USA. November 2021. (Oral)
  14. **Andrea Angulo, Miguel A. Modestino.** *Understanding the Interactions between Bubble Dynamics and Electrochemical Energy Losses in Flow Electrolyzers*. AIChE Annual Meeting 2021. Boston, MA, USA. November 2021. (Poster)
  15. **Daniel Frey, Xinshu Shang, Juhee Shin, Miguel A. Modestino.** *Chemically-informed data-driven optimization (ChIDDO): Leveraging physical models and Bayesian learning to accelerate chemical research*. AIChE Annual Meeting 2021. Boston, MA, USA. November 2021. (Poster)
  16. **Daniel Frey, Juhee Shin, Miguel A. Modestino.** *Spatiotemporal decoupling of Cerium-mediated water electrolysis for grid energy storage and hydrogen generation*. AIChE Annual Meeting 2021. Boston, MA, USA. November 2021. (Oral)
  17. **Andrea Angulo, Miguel A. Modestino.** *Understanding the Interactions Between Bubble Dynamics and Electrochemical Energy Losses in Flow Electrolyzers*. International Society of Electrochemistry Conference, August 30<sup>th</sup>, 2021. (Virtual)
  18. **Daniel Frey, Jip Kim, Yury Dvorkin, and Miguel A. Modestino.** *Spatio-temporal decoupling of water electrolysis for dual-use grid energy storage and hydrogen generation*. Microfluidics and Energy Symposium, Online, April 30<sup>th</sup>, 2021. (Poster)
  19. **Andrea Angulo and Miguel A. Modestino.** *Understanding bubble-induced energy losses in gas evolving electrodes*. Microfluidics & Energy Symposium, Online, April 29<sup>th</sup>, 2021. (Poster)
  20. **Adlai Katzenberg, Debdyuti Mukherjee, Peter Dudenias, Yoshi Okamoto, Ahmet Kusoglu and Miguel A. Modestino.** *In Situ Characterization of the Dynamic Emergence of Nanostructure and Transport Properties in Perfluorinated Sulfonic Acid Ionomer Thin Films*. 2020 Virtual AIChE Annual Meeting, Online, November, 19<sup>th</sup>, 2020. (Poster)
  21. **Adlai Katzenberg, Toshihiro Akashige, Debdyuti Mukherjee, Yoshi Okamoto, Miguel Modestino.** *Ionic Liquid-Polymer Gel Electrolytes for Electrochemical Olefin Separations in Gas-Diffusion Electrodes*. 2020 Virtual AIChE Annual Meeting, Online, November, 18<sup>th</sup>, 2020. (Poster)
  22. **Adlai Katzenberg, Anamika Chowdhury, Minfeng Fang, Adam Weber, Yoshi Okamoto, Ahmet Kusoglu and Miguel A. Modestino.** *Elucidating Structure-Property Relationships in Highly Permeable Perfluorinated Sulfonic Acid Ionomers*. 2020 Virtual AIChE Annual Meeting, Online, November, 17<sup>th</sup>, 2020. (Oral)
  23. **Daniel Frey, Jip Kim, Yury Dvorkin, and Miguel A. Modestino.** *Spatio-temporal decoupling of water electrolysis for dual-use grid energy storage and hydrogen generation*. AIChE 2nd Battery and Energy Conference, Online, October 23<sup>rd</sup>, 2020. (Poster)
  24. **Adlai Katzenberg, Cesar Munoz, Brian Chen, Tana Siboonruang, Miguel A. Modestino.** *Acid-Doped Hydrogels for Robust Ion Transport in Electrochemical Catalytic Layers*. 237<sup>th</sup> ECS Meeting, Online, May, 2020. (Oral)

25. **Adlai Katzenberg**, Anamika Chowdhury, Minfeng Fang, Adam Z Weber, Yoshiyuki Okamoto, Ahmet Kusoglu, Miguel A. Modestino. *Elucidating Structure-Property Relationships in Highly Permeable Perfluorinated Sulfonic Acid Ionomers*. 237th ECS Meeting, Online, May, 2020. (Oral)
26. **Daniel Frey** and Miguel A. Modestino. *Cerium-mediated hydrogen production and energy storage system*. 237th ECS Meeting, Online, May 10th, 2020. (Oral)
27. M.A. Modestino, **D.E. Blanco**. Enhancing Organic Electrosynthesis through Artificial Intelligence: The Case of Adiponitrile Electrohydrodimerization. 2019 AIChE Annual Meeting. Orlando, FL, USA. (Poster)
28. M.A. Modestino, **A. Katzenberg**, M Fang, Y Okamoto, A Kusoglu. *Beyond Nafion: Structure-Property Relationships in Novel Perfluorinated Ionomers with Tunable Transport Properties*. ECS Fall Meeting 2019. Atlanta, GA, USA. (Oral)
29. **Daniela E. Blanco**, Miguel Modestino, Bryan Lee. *Optimizing Organic Electrosynthesis through Artificial Intelligence: the Case of Adiponitrile Production*, ECS 360<sup>th</sup> annual meeting, The Electrochemical Society, Atlanta, USA, October 14<sup>th</sup>, 2019. (Oral)
30. **Daniela E. Blanco**, Miguel Modestino. *Optimizing Organic Electrosynthesis: The Case of Adiponitrile Production*. AIChE, Annual Meeting. Orlando, FL, USA, November, 2019. (Oral)
31. M.A. Modestino, **D.E. Blanco**. Process Intensification Approaches to Organic Electrosynthesis: Towards Sustainable Nylon Production. ECS Fall Meeting 2019. Atlanta, GA, USA. (Oral)
32. **D.E. Blanco**, M.A. Modestino. *Enhancing Organic Electrosynthesis through Artificial Intelligence: The Case of Adiponitrile Electrohydrodimerization*. ECS Fall Meeting 2019. Atlanta, GA, USA. (Oral)
33. **Adlai Katzenberg**, Minfeng Fang, Yoshiyuki Okamoto, Ahmet Kusoglu, and Miguel A. Modestino. *Beyond Nafion<sup>®</sup>: Exploring Structure-Property Relationships in Novel Perfluorinated Ionomers with Tunable Chemical Composition*. Gordon Research Conference: Nanomaterials for Applications in Energy Technology, Ventura, CA, February 26<sup>th</sup>-27<sup>th</sup>, 2019. (Poster)
34. **Adlai Katzenberg**, Minfeng Fang, Yoshiyuki Okamoto, Ahmet Kusoglu, and Miguel A. Modestino. *Beyond Nafion<sup>®</sup>: Exploring Structure-Property Relationships in Novel Perfluorinated Ionomers with Tunable Chemical Composition*. Gordon Research Seminar: Nanomaterials for Applications in Energy Technology, Ventura, CA, February 24<sup>th</sup>, 2019. (Oral)
35. **Daniela E. Blanco**, Aaliyah Dookhith, Miguel A. Modestino. *Controlling selectivity in the electrochemical reduction of acrylonitrile: Towards a solar-driven Nylon 6,6 production process*. ECS and SMEQ Biannual Meeting, Cancun, Mexico. September 30<sup>th</sup>, 2018. (Oral)
36. **Adlai Katzenberg**, Miguel Modestino. *Electrolyte-Swollen PAA/PVA Hydrogel Thin Films for Improved Transport at Catalyst-Electrolyte Interfaces*. 17<sup>th</sup> International Conference on Organized Molecular Films, Brooklyn, NY, USA. July, 2018. (Poster)
37. **Daniela E. Blanco**, Miguel Modestino, Sophia Haussener. *Solar Textiles - Global Change Award Winner*, Circular Fashion Salon, H&M Foundation, Accenture and KTH Royal Institute of Technology, Shanghai, China. December 6<sup>th</sup>, 2017. (Oral)

Contributed presentations prior to joining NYU:

1. Miguel A. Modestino, E. Chinello, L. Coulot, M. Ackermann, F. Gerlich, C. Moser, D. Psaltis. High-Efficiency Photo-Electrochemical Chloro-Alkali Production. AIChE 2017 Meeting, October 29<sup>th</sup>, 2017, Minneapolis, MN, USA.
2. Miguel A. Modestino, S. Mohammad H. Hashemi, M. Neuenschwander, D. Gregory, C. Moser, Demetri Psaltis. *Developing Microfluidic Air-Based Solar-Hydrogen Generators*. Materials Research Society, Spring Meeting 2017, Phoenix, AZ, USA.
3. Enrico Chinello, Miguel A Modestino, Jan-Willem Schüttauf, David Lambelet, Antonio Delfino, Didier Dominé, Antonin Faes, Matthieu Despeisse, Julien Bailat, Demetri Psaltis, David Fernandez Rivas, Christophe Ballif, Christophe Moser. *SPIE Optics+ Photonics for Sustainable Energy*. November 2<sup>nd</sup>, 2016, San Diego, CA, USA.
4. Miguel A Modestino, Jan-Willem Schuettauf, Enrico Chinello, Claudia A Rodriguez, David Lambelet, Antonio Delfino, Didier Dominé, Antonin Faes, Matthieu Despeisse, Julien Bailat, Christophe Ballif, Demetri Psaltis, Christophe Moser. *Towards the Development of Practical Solar-Fuels Devices: Silicon-Based Solar-Hydrogen Generators with 14.2% Solar-to-Hydrogen Efficiency*. 230<sup>th</sup> Electrochemical Society Meeting, September, 2016. Honolulu, HI, USA.
5. Miguel A. Modestino, S. Mohammad H. Hashemi, Demetri Psaltis. *Splitting Water from Vapor Feeds: Towards Air-Based Solar-Hydrogen Generators*. 229<sup>th</sup> Electrochemical Society Meeting, Jun 2<sup>nd</sup>, 2016. San Diego, CA, USA.
6. S. Mohammad H. Hashemi, Miguel A. Modestino, Demetri Psaltis. *Towards High Efficiency Membrane-less Electrolysis*. MRS Spring Meeting. March 30<sup>th</sup>, 2016. Phoenix, AZ, USA.
7. Christophe Moser, Paul Delrot, Damien Loterie, Edgar Morales Delgado, Miguel Modestino, Demetri Psaltis. *Complex light in 3D printing*. SPIE Photonics West Conference. February 18<sup>th</sup>, 2016. San Francisco, CA, USA.
8. Paul Delrot, Miguel A. Modestino, Demetri Psaltis, Christophe Moser. *Laser-assisted inkjet printing of highly viscous fluids with sub-nozzle resolution*. SPIE Photonics West Conference. February 15<sup>th</sup>, 2016. San Francisco, CA, USA.
9. Miguel A. Modestino, Mohammad Hashemi, Christophe Moser, Demetri Psaltis. *Next-generation microstructured water-splitting devices*. AIChE 2015 Meeting, November 10<sup>th</sup>, 2015, Salt Lake City, UT, USA.
10. Miguel A. Modestino, S. Mohammad H. Hashemi, Demetri Psaltis. *Unconventional water splitting platforms*. 228<sup>th</sup> Electrochemical Society Meeting, October 14<sup>th</sup>, 2015, Phoenix, AZ, USA.
11. Miguel A. Modestino, Claudia A. Rodriguez, Demetri Psaltis, Christophe Moser. *Design and cost considerations of Solar-Fuel Devices*. 227<sup>th</sup> Electrochemical Society Meeting, May 28<sup>th</sup>, 2015, Chicago, IL, USA.
12. Miguel A. Modestino, Claudia A. Rodriguez, Demetri Psaltis, Christophe Moser. *Design Considerations of Cost Effective Solar-Hydrogen Generators*. Materials Research Society, Spring Meeting 2015, San Francisco, CA, USA.

13. Miguel A. Modestino, Claudia A. Rodriguez, Demetri Psaltis, Christophe Moser. *Design Considerations of Deployable Solar-Hydrogen Generators*. AIChE 2014 Meeting, November 18<sup>th</sup>, 2014, Atlanta, GA, USA.
14. Miguel A. Modestino, C. Moser, D. Psaltis, S. Haussener, A. Braun, J. Bailat. *Engineering Approaches Towards Cost Effective Solar-Hydrogen Generators*, Materials Research Society, Spring Meeting 2014, San Francisco, CA, USA.
15. Christopher Evans, Gabriel Sanoja, Yanika Schneider, Miguel Modestino, Rachel Segalman. *Ionic Conductivity and Gas Permeability of Polymerized Ionic Liquid Block Copolymer Membranes*. American Physical Society, March Meeting 2014. Denver, CO, USA.
16. Miguel A. Modestino, and Rachel A. Segalman. *Understanding Hierarchical Structure in Solar Fuel Membranes and Assemblies*. Materials Research Society, Spring Meeting 2013, San Francisco, CA, USA.
17. Miguel A. Modestino, and Rachel A. Segalman. *Understanding Hierarchical Structure in Solar Fuel Membranes and Assemblies*. American Physical Society, March Meeting 2013. Baltimore, MD, USA
18. Miguel A. Modestino, Rachel A. Segalman. *Polymer mediated solution self-assembly of nanorods*. American Physical Society, March Meeting 2012. Boston, MA, USA.
19. Miguel A. Modestino, Jeff J. Urban, Rachel A. Segalman. *Controlling Nanorod Self-Assembly in Polymer Thin-Films*. American Physical Society, March Meeting 2011. Dallas, TX, USA.
20. Miguel A. Modestino, Jeff J. Urban, Rachel A. Segalman. *Vertical Alignment of Nanorods in Thin Film Polymer Nanocomposites*. American Physical Society, March Meeting 2010. Portland, OR, USA.
21. Miguel A. Modestino, Nicole Zacharia, Paula T. Hammond. *Dendrimer Encapsulated Metallic Nanoparticles Immobilized in Polyelectrolyte Thin-Films*. VIII Venezuelan Chemistry Congress (2007). Caracas, Venezuela.
22. Nicole S. Zacharia, Miguel A. Modestino, Paula T. Hammond. *Nanoparticles in PAMAM dendrimer containing polyelectrolyte multilayers*. 232<sup>nd</sup> ACS National Meeting (2006), San Francisco, CA, USA.

## MEDIA COVERAGE

1. [Right There At the Electrode](#). Science. Chemical News (01/30/2025)
2. [The years-long quest to make an ‘artificial leaf’ as a promising fuel alternative](#). WHYY, The Pulse. NPR (11/11/2024)
3. [Office Hours with Miguel Modestino: Decarbonizing the Chemical Manufacturing Industry](#). NYU Tandon Media Team – YouTube. (09/26/2025)
4. [A speedy but thorough interregation](#). Nature Review Chemistry, Research Highlight. (06/17/2024)
5. [When bio- and electrocatalysis meet: A leap forward in the sustainable production of adiponitrile](#). Chem Catalysis Preview (06/20/2024)
6. [Why Heat Pumps Are the Future, and How Your Home Could Use One](#). New York Times. (04/14/2024)

7. [Raising a toast to Joseph Owades, the inventor of light beer](#). NYU Tandon Press Release. (04/10/2024)
8. [Lab in Downtown Brooklyn supports tech industry in New York City](#). PIX 11 News. (04/02/2024)
9. [NASA-backed firm to tap into photosynthesis for CO2-fueled rockets](#). Interesting Engineering. (03/29/2024)
10. [A clean energy solution for getting to Mars and back!](#). NYU Tandon Press Release. (03/27/2024)
11. [When an engineer's academic sabbatical takes him to HAX](#). HAX Press Release. (03/27/2024)
12. [Inside the Brooklyn start-up making clean jet fuel with captured CO2](#). New Scientist. (02/15/2024)
13. [A promising energy start-up gets a boost from NYU Tandon](#). NYU Tandon Press Release. Brooklyn, NY. (02/04/2024)
14. [Researchers Aim to Decarbonize Chemical Industry by Electrifying It](#). IEEE Spectrum (12/04/2023)
15. [Reaction Chemistry and Engineering Emerging Investigator: Miguel Modestino](#). Reaction Chemistry and Engineering Blog, RSC Publishing (03/03/2023)
16. [Hard tech lab space can be hard to find. NYU Tandon is helping with a new kind of collaboration](#). NYU Tandon Press Release. Brooklyn, NY. (03/02/2023)
17. [Electrical grid requires investments if natural gas use decreases](#). PolitiFact (01/20/2023)
18. [Tandon Agents of Optimism](#). NYU Tandon. (12/15/2022)
19. [Climate risks are a major business threat – here's how AI can help](#). The Next Web! (10/04/2022)
20. [Op-Ed: Goodbye Stick, Hello Carrot. The Federal Government Can Still Lead Industry to Fight Climate Change](#). Sustainable Plastics. (07/27/2022)
21. [What's next for climate action? The talks from the TED Countdown New York Session 2022](#). Ted Blog. New York, NY (06/14/2022)
22. [Avoidance, Mitigation, Remediation, and Adaptation: The keys to tackling climate change and environmental contamination](#). Tandon Press Release. Brooklyn, USA (02/28/2022)
23. [Fixing the Chemical Industry's Sustainability Problem](#). IEEE Spectrum, USA. (06/2021)
24. [Innovative process that removes key hurdle for next-generation solar cells is also a lockbox for greenhouse gases](#). Tandon Press Release. Brooklyn, USA (06/02/2021)
25. [Daniela Blanco and Sunthetics are ready for their close-up now](#). Tandon Press Release. Brooklyn, USA. (04/05/2021)
26. [Own the Room](#). Disney+ Documentary. (03/2021).
27. [NYU Spearheads project to help chemical industry go green](#). IEEE Spectrum, USA. (12/2020)
28. [Electrolysis in Flux](#). Joule Preview (12/2020)
29. [Starting a science business during a pandemic](#). Chemical & Engineering News (07/27/2020)
30. [NYU Tandon sustainable energy researcher named a top young innovator by MIT Technology Review](#). Tandon Press Release. Brooklyn, USA. (06/17/2020)
31. [MIT Technology Review Innovators Under 35](#). MIT Technology Review, USA (06/2020)
32. [Chemical and Biomolecular Engineering student Daniel Frey heads to NREL](#). NYU Tandon Press Release. Brooklyn, USA. (05/18/2020)

33. [Avoiding Bubble Troubles](#). University of Twente Press Release. Twente, The Netherlands (04/02/2020)
34. [Novel polymer membrane could give boost to fuel cell vehicles](#). Materials Today. (02/13/2020)
35. [Researchers turbocharge hydrogen fuel cells with novel ion-conducting copolymer](#) NYU Tandon Press Release. Brooklyn, USA. (01/29/2020)
36. [NYU Tandon professor exploring greener chemical manufacturing wins NSF award for promising young researchers](#). Tandon Press Release. Brooklyn, USA. (01/13/2020)
37. [Year in Chemistry 2019: Chemists made industrial synthesis greener](#). Chemical & Engineering News (12/2019)
38. [Pulsed Electrosynthesis plus Machine Learning Equals Bigger Yields for Adiponitrile](#). Chemical & Engineering News (09/06/2019)
39. [Lego's Quest to Make Plant-Based Toy Bricks Is Met With Skepticism](#). The Wall Street Journal. New York, USA (06/21/2019)
40. [NYU Tandon chemical engineering students excel on the national, international stage](#). NYU Tandon Press Release. Brooklyn, USA. (04/15/2019)
41. [Sustainable, solar-driven chemical manufacturing](#). Science Daily. (02/21/2019)
42. [NYU Tandon Team Charts Path to Sustainable, Solar-Driven Chemical Manufacturing](#). NYU Tandon Press Release. Brooklyn, USA. (02/20/2019)
43. [NYU Tandon Ph.D. Prepares to Rock the Entrepreneurial Competition](#). NYU Tandon News. Brooklyn, USA. (01/24/2019).
44. [InnoVention Inspiration](#). NYU Tandon News. Brooklyn, USA. (11/14/2019).
45. [Another Day, Another Triumph for Sunthetics Team](#). NYU Tandon News. Brooklyn, USA. (10/17/2018).
46. [Entrepreneurial Success in Tandon's Latine Community](#). NYU Tandon News. Brooklyn, USA. (10/01/2018).
47. [The Finish Line is Just the Beginning at the NYU Summer Faculty Startup Sprint](#). NYU Tandon News. Brooklyn, USA. (09/25/2018)
48. [Come See 12 Top NYU Startups Pitch](#). NYU Entrepreneurial Institute Entrepreneurs Blog. New York, NY, USA. (09/17/2018)
49. [Tandon-bred company sustains success and the environment](#). NYU Tandon News. Brooklyn, USA. (07/18/2018)
50. [Tandon for the Win](#). NYU Tandon News. Brooklyn, USA. (05/10/2018).
51. [NYU Tandon Student Wins U.S. DOE Grant to Conduct Research at Lawrence Berkeley National Lab](#). NYU Tandon News. Brooklyn, USA. (05/07/2018).
52. [Five Tandon Teams Move on to Compete in InnoVention Semifinals](#). NYU Tandon News. Brooklyn, USA. (03/05/2018).
53. [NYU Tandon Celebrates Achievements of Our Students and Faculty](#). NYU Tandon News. Brooklyn, USA. (12/21/2017)
54. [Engineering Sustainable Synthetic Fabric](#). PBS New York Learning Media. Brooklyn, USA. (12/18/2017).
55. [NYU Tandon Sustainable Energy Researcher Named a Top Young Latin American Innovator by MIT Technology Review](#). NYU Tandon Press Release. Brooklyn, USA. (10/05/2017)
56. [Honoring Latinx Heritage Month at Tandon](#). NYU Tandon News. Brooklyn, USA. (09/18/2017).

57. [A Robust Pipeline to STEM](#). NYU Tandon News. Brooklyn, USA. (09/01/2017).
58. [Genios en el mundo](#). Diario 2001. Caracas, Venezuela. (07/28/2017)
59. [Sustainability in Action at NYU Tandon](#). NYU Tandon News. Brooklyn, USA. (04/20/2017).
60. [Tandon Professor Earns Award for Eco-Friendly Textile Manufacturing](#). Washington Square News. New York, NY, USA. (04/11/2017).
61. [Making clothes out of water and sun](#). EPFL News. Lausanne, Switzerland. (04/07/2017)
62. [NYU Tandon professor wins H&M Global Change Award](#). Brooklyn Daily Eagle. Brooklyn, USA. (04/07/2017).
63. [NYU Tandon Professor Wins H&M Global Change Award For Research Into Sustainable Clothing Manufacturing](#). NYU Tandon Press Release. Brooklyn, USA. (04/07/2017).
64. [If H&M Has Its Way, in the Future We'll All Be Wearing "Grape Leather" and "Manure Couture"](#). Vogue. New York, NY, USA. (04/06/2017).
65. [From Grapes To Cow Manure, H&M Foundation Unveils Winners Of Latest Innovation Award](#). Forbes. (04/05/2017).
66. [Tandon's Newest Faculty Members Bring Expertise in Clean Energy, Nanomaterials, Machine Learning, and More](#). NYU Tandon News. Brooklyn, USA. (09/20/2016).

## EDUCATION INNOVATION

- **Developed new class on Electrochemical Engineering (CBE GY 9413):** This class introduces students to concepts of electrochemistry applied to engineered systems. This includes thermodynamic and transport in electrochemical systems, electroanalytical techniques, applications of electrochemistry in energy conversion and manufacturing. The class also exposes students to emerging industrial electrochemical technologies developed by both startups and large corporations, with several invited speakers from industry. Lastly, the class requires students to implement concepts learned in the class to develop a research proposal on an electrochemical technology close to their research and/or interests, and to present the proposal to the class.
- **Developed graduate-level numerical methods class for chemical engineering (CBE GY 6153):** The class introduces students to numerical methods concepts in the context of chemical engineering. Theoretical concepts are first introduced in class, followed by in-class examples of implementations of numerical methods in Matlab. Students are then exposed to original chemical engineering problems in homework problems where they need to write independent Matlab codes to gain physical insights into complex systems.
- **Introduced graduate students to finite-element simulation software (CBE GY 6153):** Through a series of two lectures, students are introduced to finite-element simulations and exposed to the use of COMSOL Multiphysics® for solving complex engineering problems involving multiple coupled physical phenomena.
- **Developed a computational design project for chemical engineering graduate students (CBE GY 6153):** students are presented with an open-ended project where they have to use computational tools to optimize the design of a flow-based electrochemical reactor. The project covers topics of my group's research, which exposes students to real research applications of computational methods. Students are asked to work in groups and write a comprehensive report on their recommendation for a device design.

- **Introduced concepts of computational methods in undergraduate Heat and Mass Transport class (CBE UY 3313):** through a series of lectures, undergraduate chemical engineering students were introduced to the finite-differences numerical method for solving partial differential equations encountered in transport phenomena.
- **Introduced concepts of electrochemical engineering in undergraduate Heat and Mass Transport class (CBE UY 3313):** created a lecture and a series of exercises to introduce students to concepts related to the transport of charged species and its applications in electrochemical technologies for sustainability.

## CLASSES TAUGHT

### Numerical Methods in Chemical Engineering (CBE GY 6153):

- S2017, 14 students, 6 responded evaluation, course rating: 4.3, instructor rating: 4.5
- F2017, 25 students, 19 responded evaluation, course rating: 4.3, instructor rating: 4.2
- F2018, 21 students, 18 responded evaluation, course rating: 4.5, instructor rating: 4.7
- F2019, 16 students, 16 responded evaluation, course rating: 4.4, instructor rating: 4.6
- F2020, 16 students, 16 responded evaluation, course rating: 4.7, instructor rating: 4.8
- S2022, 24 students, 19 responded evaluation, course rating: 4.7, instructor rating: 4.9
- S2023, 11 students, 11 responded evaluation, course rating: 4.0, instructor rating: 4.2
- S2025, 28 students, 18 responded evaluation, course rating: 4.4, instructor rating: 4.8

### Transport I: Heat and Mass Transport (CBE UY 3313):

- F2018, 50 students, 40 responded evaluation, course rating: 4.3, instructor rating: 4.5
- F2019, 55 students, 37 responded evaluation, course rating: 4.2, instructor rating: 4.4
- S2021, 42 students, 26 responded evaluation, course rating: 4.6, instructor rating: 4.8
- F2021, 46 students, 29 responded evaluation, course rating: 4.4, instructor rating: 4.8
- F2022, 64 students, 43 responded evaluation, course rating: 4.6, instructor rating: 4.8
- F2023, 53 students, 33 responded evaluation, course rating: 4.4, instructor rating: 4.9

### Electrochemical Engineering (CBE GY 9413):

- F2025, 18 students, 4 responded evaluation, course rating: 5.0, instructor rating: 5.0

(Course ratings are based on a maximum score of 5.0)

## MENTORING

### Current Students and Postdoctoral Researchers:

#### *Postdoctoral Researchers:*

1. Dr. Cassey Bloomquist, Chemical Engineering Ph.D., NYU (Sep 2025 – current)
2. Dr. Ricardo Mathison, Chemical Engineering Ph.D., NYU. (Jun 2025 – current)
3. Dr. Darjan Podbevsek, Physics Ph.D., University of Slovenia (Jan 2025 – current)

#### *Ph.D.:*

1. Dania Orfali, Chemical Engineering Ph.D. student, NYU (Jan 2024 - current)
2. Canying Wang, Chemical Engineering Ph.D. student (Jan 2024 – current)

3. Cesar Arana, Chemical Engineering Ph.D. student, NYU (Jan 2025 – current) (Co-advised with Prof. Eray Aydil)
4. Sebastian Castro, Chemical Engineering Ph.D. student, NYU (Sept 2025 – current) (Co-advised with Prof. Justin Bui)

*Undergraduate:*

1. Helen Ziqi Zhang, Chemical Engineering B.S. student, NYU (2024-current)
2. Amelia Rose, Chemical Engineering B.S. student, NYU (2024-current)
3. Alexa Morales, Chemical Engineering B.S. student, NYU (2025-current)

*Past Students and Postdoctoral Researchers:*

*Post-Doctoral Researchers:*

1. Raisa Carmen Ela Andeme, Chemical Engineering Ph.D., Michigan Tech (Sept 2024 – Aug 2025)
  - Current position: Not known.
2. Cesar Urbina-Blanco, Chemistry Ph.D., St. Andrews University. (Nov 2021 – Apr 2022)
  - Current position: Business Developer/Data Scientist at Sunthetics Inc.
3. Debdyuti Mukherjee, Chemistry Ph.D., Indian Institute of Science, Bangalore, India (May 2019 – May 2021)
  - Current position: Not known.
4. Enrico Chinello, Microengineering Ph.D., EPFL, Switzerland (Fall 2020)
  - Current Position: Equity Research Ph.D. Fellow at Goldman Sachs.
5. Yasmine Hajar, Chemical and Biological Engineering Ph.D., University of Ottawa, Canada (Sep 2019 – May 2020)
  - Current position: R&D Engineer at Mitrex
6. Thomas Yu, Materials Science Ph.D., Northwestern University, (May 2018 – May 2019)
  - Current position: Senior Energy Storage Engineer at Nanoramics Laboratories

*Ph.D.:*

1. Cassey Bloomquist, Chemical Engineering Ph.D. student, NYU (Jun 2021 – Aug 2025)
  - Last known position: Postdoctoral Researcher, NYU
2. Ricardo Mathison, Chemical Engineering Ph.D. student, NYU. (Jan 2021 – May 2025)
  - Awards at NYU: **Theodore Beck Student Travel Award, ECS Industrial Electrochemistry Division Travel Award (2024), Professor Turner Alfrey Prize NYU CBE Best Paper Award (2025), Next Generation Electrochemistry (NGenE) Institute Scholar (2025).**
  - Last known position: Postdoctoral Researcher at NYU.
3. Toshihiro Akashige, Chemical Engineering Ph.D. student, NYU. (Jan 2019 – May 2024)
  - Awards at NYU: **NSF Graduate Student Researcher Fellow (2020).**
  - Last known position: Laboratory Manager, HAX/SOSV, Newark, NJ
4. Andrea Angulo, Chemical Engineering Ph.D. student, NYU. (Jan 2019 – May 2023)
  - Last known position: Postdoctoral Scientist at Merck
5. Daniel Frey, Chemical Engineering Ph.D. student, NYU. (Jan 2018 – May 2022)
  - Last known position: Research Scientist at sHYp (Water electrolysis startup)
  - Awards at NYU: **DOE Office of Science Graduate Student Research Fellow (2020).**
6. Adlai Katzenberg, Chemical Engineering Ph.D. student, NYU. (Jan 2017 – Dec 2020)

- Last known position: Member of Technical Staff at Covalent Metrology
  - Awards while at NYU: **DOE Office of Science Graduate Student Research Fellow (2018), Zuckerman Postdoctoral Fellowship (2020, declined).**
7. Daniela E. Blanco, Chemical Engineering Ph.D. student, NYU. (Jan 2017 – May 2020)
- Last known position: CEO at Sunthetics, Inc.
  - Awards while at NYU: **2019 Graduate Student Inventor by Lemelson-MIT, 2019 Brightest AI Mind by Minds & Tech and the MIT Center for Collective Intelligence, and 2019 Global Student Entrepreneur.**

*M.S.:*

1. Meera Patel, Chemical Engineering M.S. student, NYU. (2022 –2025)
  - Last known position: unknown
2. Antonio Lopez, Chemical Engineering M.S. student, NYU. (Sep 2022 – Spring 2023)
  - Last known position: Systems Engineer, Applied Materials
3. Azan Brar, Chemical Engineering, B.S. student (Summer 2019)
  - Current Position: Not Known.
4. Christopher Oyuela, M.S. Chemical Engineering Ph.D. (2022 – 2023) (co-advised with Prof. Ayash Sahu)
5. Minh Diep, Chemical Engineering B.S./M.S. student, NYU (Jan 2021 – May 2022)
  - Last known Position: Process Engineer at Procter and Gamble
6. Adeola Akin, Chemical Engineering B.S./M.S. student, NYU (Jun 2021 – Dec 2022)
7. Lankun Yang, Chemical Engineering M.S. student, NYU. (Jan 2020 – May 2021)
  - Last known position: Associate Scientist, WuXi Biologics
8. Xinshu Shang, Chemical Engineering, M.S. student, NYU (Jan 2019 – May 2020)
  - Current position: Not known.
9. Nicole Schnabel, Chemical Engineering, M.S. student, NYU (Jan 2018 – May 2019)
  - Last known position: Senior Global Product Analyst at Johnson & Johnson
10. Cesar Muñoz, Chemical Engineering M.S. student, NYU (Jan 2017 – Jun 2018)
  - Last known position: Sales Executive at Venair Group
11. Zhixiao Zhao, Chemical Engineering M.S. student, NYU (Sep 2017 – Sept 2018)
  - Last known position: M.S. student in Computer Science at NYU Courant

*Undergraduate:*

1. James Harris, Chemical Engineering B.S. student, NYU (2023)
2. Daniel Naumov, Chemical Engineering B.S. student, NYU (2023 - 2025)
3. Elina Rani, Chemical Engineering B.S. student, NYU (2023 - 2025)
4. Alexandra van Riel, Chemical Engineering B.S. student, NYU (2022 – 2023)
5. Ramraj Vemuri, Chemical Engineering B.S. student, NYU (2023 – 2024)
6. Carolina Elizarraras, Chemistry and Chem. Eng. B.S. student, NYU. (2021 – 2024)
7. Dana
- 8.
9. Jiahua Pei, Chemical Engineering B.S. student, NYU. (Jan 2023 – Jan 2024)
10. Melissa Dogan, Chemistry B.S. student, Rutgers University (Jun 2023 – Aug 2023)
11. Hannah McConnell, Mechanical Engineering B.S. student, NYU (Jun 2021 – May 2023)
12. Kaz Burns, Chemical Engineering B.S. student, NYU. (Sep 2022 – May 2023)
13. Ju Hee Shin, Chemistry and Chemical Engineering B.S. student, NYU. (Sep 2019 – May 2023)
14. Brian Chen, Applied Physics B.S. student, NYU (Sep 2017 – May 2020)

- Current Position: Research Engineer, Commonwealth Fusion Systems
- 15. Sunny Chantanakajonfung, Chemical Engineering B.S. student, NYU. (Jan 2020 – May 2020)
  - Current Position: Not Known.
- 16. Kaylee Dunnigan, Chemical Engineering, B.S. student, NYU (Sep 2018 – May 2020)
  - Current Position: Ph.D. Student in Chemical Engineering, Cornell. **NSF Graduate Student Researcher Fellow.**
- 17. Andrea Quispe, Chemical Engineering, B.S. student (Jun 2019 – May 2020)
  - Current Position: Packaging Engineer, L’Oreal.
- 18. Rhea Reyes, Chemical Engineering/Chemistry, B.S. student, NYU (Sep 2018 – May 2020)
  - Current Position: Not Known.
- 19. Bryan Lee, Chemical Engineering, B.S. student, NYU (Sep 2018 – May 2020)
  - Current Position: M.S. student at Stanford University.
- 20. Janice Lok, Chemical Engineering, B.S. student, NYU (Jun 2021 – Dec 2021)
- 21. Neha Vasudevan, Chemical Engineering, B.S. student (Summer 2019)
  - Current Position: B.S. student at NYU.
- 22. Tana Siboonruang, Chemical Engineering B.S. student, NYU (Sep 2017 – Jun 2019)
  - Current Position: Ph.D. Student in Chemical Engineering, Drexel University. **NSF Graduate Student Researcher Fellow.**
- 23. Aaliyah Dookhith, Chemical Engineering B.S. student, NYU (Sep 2017 – Jun 2019)
  - Current Position: Ph.D. Student in Chemical Engineering, UT Austin.
- 24. Andrew Hamlin, Mechanical Engineering, B.S. Visiting Student, Union College (Summer 2019).
  - Current Position: Ph.D. Student in Materials Engineering, Dartmouth College. **NSF Graduate Student Researcher Fellow.**
- 25. Kunal Miyani, Chemical Engineering, B.Eng. Visiting Student, Loughborough University (Jan 2019 – Jun 2019)
  - Current Position: M.S. Student at Loughborough University.
- 26. Sairam Ravishankar, Chemical Engineering B.S. Visiting Student, SASTRA University, India (Feb 2019 – Jul 2019)
  - Current Position: Not known.
- 27. Purnima Prasad, Chemical Engineering, B.S. student (Aug 2018 – Jan 2019)
  - Current Position: B.S. student at NYU.
- 28. Junyi Sha, Chemical Engineering, B.S. student (Jun 2018 – Aug 2018).
  - Current Position: Ph.D. Student in Computer Science at MIT.
- 29. Akash Raman, Chemical Engineering B.S. intern, SASTRA University, India (Feb 2018 – Jun 2018)
  - Current Position: Ph.D. Student in Chemical Engineering, University of Twente.
- 30. Peter van der Linde, Visiting Ph.D. student, Twente University, The Netherlands (Jan 2018 – April 2018)
  - Current Position: Engineer, VDL Enabling Technologies Group.
- 31. Alexandra Ryan, Chemical Engineering B.S. student, NYU (Sep 2017 – May 2018)
  - Current Position: General Engineer/Project Manager U.S. Army Corps of Engineers.
- 32. Myriam Sbeiti, Chemical Engineering B.S. student, NYU (Jan 2017 – May 2018)

- Current Position: Former CEO of Sunthetics.
- 33. Ricardo Mathison, Chemical Engineering B.S. student, University of Wisconsin (Jun – Aug 2017)
  - Current Position: Ph.D. Student in Chemical Engineering, NYU.
- 34. Janar Jeksen, Mechanical Engineering B.S. student, NYU Abu Dhabi, (Jun – Aug 2017)
  - Current Position: Not Known.

*K-12:*

1. Primit Acharjee (Summer 2025)
2. Ikhlaas Mohamed (Summer 2025)
3. Anna Lam (Summer 2024)
4. Jaylynn Perez (Summer 2024)
5. Darwin Jimenez-Rodriguez (Summer 2023)
6. Ayah Hajar (Summer 2023)
7. Norine Almahmud (Summer 2022)
8. Kyara Scott (Summer 2022)
9. Mia Montrose (Summer 2021)
10. Eric Gonzalez Cardona (Summer 2021)
11. Valerie Viteri (Summer 2019)
12. Sandhya Sethuraman (Summer 2018 – Spring 2021)
13. Julian Morales (Summer 2018)
14. Nathaniel Downes (Summer 2018)
15. Angela Baigorria (Summer 2018)
16. Jason Mei (Summer 2017)
17. Xue Ye Lin (Summer and Fall 2017)

*Thesis committee participation:*

1. Pulkita Jain, Ph.D. in Chemical Engineering, NYU (Expected Graduation in 2026)
2. Schlok Paul, Ph.D. in Chemical Engineering, NYU (Expected Graduation in 2025)
3. Amy Moreno, Ph.D. in Chemical Engineering, NYU (Expected Graduation in 2026)
4. Ackwei Maclean, Ph.D. in Chemical Engineering, NYU (Graduated in 2024)
5. Steven Farrell, Ph.D. in Chemical Engineering, NYU (Graduated in 2023)
6. Minh Tran, Ph.D. in Chemical Engineering, NYU (Graduated in 2023)
7. Iver Cleveland, Ph.D. in Chemical Engineering, NYU (Graduated 2023)
8. Kevin Wolf, Ph.D. in Chemical Engineering, NYU (Expected graduation: Spring 2024 - Withdraw)
9. Steven Watt, Ph.D. in Chemical Engineering, CCNY and the Graduate Center at CUNY (Expected graduation: Spring 2023 - Withdraw)
10. Shejla Pollozi, Ph.D. in Chemistry, Lehman College and the Graduate Center at CUNY (Graduated in 2022)
11. Roxana Delima, Ph.D. in Chemical and Biomolecular Engineering, University of British Columbia. (Graduated in 2021)
12. Enrico Chinello, Ph.D. in Photonics, Ecole Polytechnique Federale de Lausanne, Switzerland (Graduated in 2019)
13. Houlei Gan, Ph.D. in Engineering, Deaking University, Australia (Graduated in 2018)

14. Benjamin Riskin, Ph.D. student in Chemical Engineering, NYU (Graduated in 2020)
15. Yukun Liu, Ph.D. student in Chemical Engineering, NYU (Graduated in 2023)
16. Mersal Khwaja, M.S. student in Chemical Engineering, NYU (Graduated in 2019)

## ENTREPRENEURSHIP

SHREXS System Commercialization Strategy (Fall 2025 – current): Using the recently awarded Technology Acceleration & Commercialization Award, my team will develop prototypes and a commercialization strategy for a synergistic hydrogen redox system (SHREXS) developed and patented by my lab. Dr. Casey Bloomquist, a Ph.D. graduate from my group, will lead these efforts with the goal of creating a financially-viable startup company by the end of summer 2026.

NYU Tandon Wet-Lab Incubation Labs (Fall 2022): together with Tandon Director of Strategic Partnership (Dr. Frank Vallese) and CBE Department Chair (Prof. Eray Aydil), I co-developed a user access agreement for hard-tech startup companies to access wet-laboratory space and advanced characterization tools available at Tandon. With this agreement, NYC-based startup companies will be able to join NYU Tandon's community, leverage faculty expertise, engage with NYU's talented student population, collaborate with NYU Tandon Future Labs, and ultimately help strengthen NYC's innovation ecosystem.

Sunthetics Inc (Summer 2018 – Current): I co-founded Sunthetics Inc, a spin-off from my lab at NYU, which aims to accelerate sustainable innovation in the chemical industry via the implementation of machine learning tools.

*Summary of activities:* the company was founded by me and two of my students, Myriam Sbeiti (B.S. 2018) and Daniela Blanco (Ph.D. 2020), with the initial goal to commercialize improvements discovered in my lab on the electrochemical production of adiponitrile. Through technology development grants and prizes, the company, in collaboration with my group, was able to scale-up the technology from reactors at  $\sim 1 \text{ cm}^2$  to  $\sim 100 \text{ cm}^2$  and develop product purification protocols. The company also developed automation tools for process discovery and development and machine learning software to aid in the development of new chemical processes and products.

*Awards and Contracts:* First prize in NYU 300k Entrepreneurship Challenge (Technology Venture Competition), First prize in Innovention Competition, VentureWell Stage 1 and 2 Awardees, NYU Summer Launchpad, First prize in Green Tech track of University Startup Worldcup, Empire State Development NYSTAR Technology Transfer Grant, PowerbridgeNY Awardees, The Heritage Group x Techstar Accelerator, NSF SBIR Phase I. (Total funding raised: >\$5M)

ReactPower Inc (Fall 2018 – Summer 2019): I served as co-founder and technology advisor for ReactPower Inc, a spin-off company from my lab at NYU that focused on the development of Aluminum-based nanomaterial for hydrogen production and thermal enhanced oil recovery.

*Summary of activities:* the company was founded by me and my postdoc, Thomas Yu, to commercialize an Aluminum nanomaterial developed by the Army Research Lab (ARL). These commercialization efforts were funded through the MD5 Launch Program at NYU, with financial

resources provided by the US Department of Defense. In Fall 2018, our team characterized the reactivity of the material, its hydrogen production capabilities, and the possibility to deliver it in mixtures of hydrocarbons for enhanced oil recovery activities with energy efficiency enhancements. In Spring 2018, our team decided to incorporate a company to pursue a license agreement with ARL. The company was a finalist in the NYU 300K Entrepreneurship Challenge and obtained the best pitch award. This startup ceased operation at the end of Summer 2018.

XPrize \$100M Carbon Removal Competition (Summer 2021): I serve as an advisor for an NYU student team in the XPrize Carbon Removal competition. The team is composed of 3 NYU Tandon Chemical Engineering Students: Adeola Akin, Suryansh Kabra, and Blazej Razewski. The focus of the team is to develop an electrochemical swing absorption device that can capture CO<sub>2</sub> from the air at scale. The team is expected to submit an application for the competition in Oct 2021.

## SERVICE ACTIVITIES

### Internal Service:

- Organizer and Moderator of Roundtable Discussion on Chemical Engineering Innovation amongst national CBE leaders (Summer 2025)
- Member of CBE Faculty Tenure Committee (Fall 2025 – current)
- Lead PI on NYU-led NSF Engineering Research Center (ERC) application for the formation of a center on Plastic Lifecycle Sustainability, Technology Innovation, and Circularity (PLSTIC). Pre-proposal was invited, and a full proposal was submitted (2024-2025)
- Member of the Chemical and Biomolecular Engineering Department Chair Search Committee (Fall 2024 – Spring 2025)
- Member of the NYU Climate Change Initiative Executive Committee (Fall 2024 – current)
- Chair of the Chemical Engineering Faculty Search Committee (Fall 2024 – Spring 2025)
- Discussion Leader in Workshop for the Creation of an NYU Climate Change Initiative (Climate Responses Group) (Spring 2024)
- Member of the Environmental Engineering Search Committee (Fall 2023 – Spring 2024)
- Chair of the Chemical Engineering Faculty Search Committee (Fall 2023 – Spring 2024)
- Organizer of Activate Innovation and Entrepreneurship Workshop (Spring 2025)
- Member of Climate Change Initiative Steering Committee (Spring 2023 – current)
- Speaker at NYU Board of Trustees Tandon Meeting (Fall 2023)
- Organizer and coordinator of DC-MUSE IUCRC Planning Meeting at Tandon (Fall 2023)
- Organizer of NYU x Activate Innovation and Entrepreneurship Workshop (Fall 2023)
- Chair of Chemical Engineering Faculty Search Committee (Fall 2023 – Spring 2024)
- Organizer of NYU x SOSV Innovation and Entrepreneurship Workshop (Spring 2023)
- Organizer of 2023 NYU Sustainable Engineering Summit (Spring 2023)
- Moderator and Panelist at NYU Climate Change Initiative Symposium (Spring 2023)
- Speaker at NYU Climate Change Initiative Monthly Meeting (Spring 2023)
- Moderator and Panelist at NYU West Coast Alumni Conference (Fall 22)
- Served on NYU Tandon Vice Dean for Research Search Committee (Fall 22– Spring 23)

- Served on NYU Tandon Director of Development Search Committee (Summer 22)
- Chair of Chemical Engineering Faculty Search Committee (Fall 2022 – Spring 2022)
- Panelist at NYU Tandon Faculty First Look program (2022)
- Founding Director of Sustainable Engineering Initiative (Spring 2022 – current)
- Served on NYU Tandon Director of Nanofabrication Facility Search Committee (2021)
- Member of the Racial Justice, Inclusion and Diversity Committee, Chemical and Biomolecular Engineering Department, NYU Tandon (2020-2024)
- Member of the Inclusion@Tandon Committee, NYU Tandon (2019-2023)
  - Co-leader of Strategic Foci 2: Student recruitment sub-committee
  - Ad-hoc committee leader on Future Leaders Fellowship program
- Member of the Chemical and Biomolecular Engineering Graduate Studies Committee, NYU Tandon (2017-2024)
- Faculty Speaker, Back to School Day & Golden Jubilee Induction Ceremony, NYU Tandon (Spring 2019)

External Service:

- Co-organizer of AIChE Chemical Ventures Conference at NYU Tandon School of Engineering, Brooklyn, NY (2025)
- Participant at ARPA-E Roundtable Discussion on Plasma Manufacturing (Summer 2025)
- Speaker at Soft Matter Future Faculty Workshop, UC Irvine (Summer 2025)
- Co-chair of Industrial Electrochemistry Symposium, ECS Fall Meeting (2025)
- Member of the Diversity, Equity and Inclusion Committee, Chemical and Reaction Engineering (CRE) Division, AIChE (2024)
- Reviewer for Activate Fellowship program (2022, 2023, 2024)
- Founding Co-organizer of AIChE Topical Conference: Decarbonization of the Chemical Industry through Electrification (2023, 2024, 2025).
- Co-chair for *Electrocatalysis Symposium*, AIChE Meeting (2020, 2021, 2022, 2023).
- Co-organizer of the 2020 AIChE Battery & Energy Storage Conference. (Virtual)
- Co-organizer, ERC Planning Workshop: Center for the Electrification of the Chemical Industry. June 2020. (Virtual)
- Discussion Leader, 2020 NSF Workshop on Electroorganic Chemistry: from Synthesis to Chemical Manufacturing. Washington, DC, USA.
- Co-chair for *CO<sub>2</sub> electroreduction Symposium*, AIChE Meeting 2019, Orlando, FL, USA.
- Co-chair for *Green Chemical Reaction Engineering for Sustainability Symposium*, AIChE Meeting 2019, Orlando, FL, USA.
- Co-chair for *Green Chemical Reaction Engineering for Sustainability Symposium*, AIChE Meeting 2018, Pittsburg, PA, USA.
- Session chair of symposium on *(Photo)Electrocatalytic Materials and Integrated Assemblies for Solar Fuels Production*. MRS Spring Meeting 2017, Phoenix, AZ, USA.
- Co-organizer of international conference on *Pathways towards Solar-Hydrogen Deployment*, June 2016, Lorentz Center, The Netherlands.
- Guest editor for *Solar-Fuels Special Issue*, Journal of Physics D: Applied Physics. To be published in 2016.
- Co-chair of Special Symposium on *Optoelectronic Devices for Solar Energy Harvesting* at the 2014 IEEE Photonics Conference, San Diego, October 2014.

- Proposal Reviewer for National Science Foundation (CBET and Future Manufacturing Program), Department of Energy (DOE EERE), Netherlands Organization for Scientific Research (NWO), and Swiss National Science Foundation.
- Reviewer for ECS (J. Electrochem. Soc.), ACS (J. Phys. Chem, ACS Energy Letters, Industrial Chemistry and Engineering, ACS Macro Letters, ACS Applied Polymer Materials and Macromolecules), RSC (Green Chemistry, Reaction Chemistry and Engineering, Energy and Environmental Science), Wiley journals (Angewandte Chemie, Advanced Materials and Advanced Energy Materials), PNAS, Nature, and Cell (Joule, Chem, Chem Catalysis), amongst others.