

JONATHAN MELVILLE

U.S. DEPARTMENT OF ENERGY : ADVANCED RESEARCH PROJECTS AGENCY—ENERGY
950 L’Enfant Plaza SW | jonathan.melville@hq.doe.gov | +1 510 371 3050 | jmelville.science

SUMMARY

- Early-career technology funding expert with broad technical familiarity across the clean-energy sciences
- Experienced in technoeconomic analysis, research project management, and energy whitespace development
- Ph.D. electrochemist specializing in innovative routes for industrial decarbonization and fuels synthesis

WORK EXPERIENCE

ARPA-E Fellow, Advanced Research Projects Agency—Energy *Washington, DC*
Office of the Secretary of Energy, United States Department of Energy (DOE) **Oct. 2022—present**
→ Served as internal agency think tank for identifying underinvested high-risk technical whitespaces.
→ Analyzed diverse technologies such as geoengineering, nuclear fusion, quantum computing, & ML/AI.
→ Helped develop US\$35mil funding program ‘ROSIE’ for next-generation iron & steel decarbonization.
→ Helped develop US\$40mil funding program ‘LEAPFROG’ for renewable production of liquid fuels.
→ Managed US\$10mil open-concept funding program ‘CREATE’ for disruptive energy technologies.

Adjunct Professor, Georgetown University Walsh School of Foreign Service *Washington, DC*
Department of Science, Technology & International Affairs (STIA) **August 2023—present**
→ Taught STIA 4102 ‘Clean Energy Innovation’ for 20 master’s & upper-level undergraduate students.

Science, Technology, & Policy Fellow, Solar Energy Technologies Office *Washington, DC*
Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy **Sept. 2021—Oct. 2022**
→ Worked on concentrating solar power team as technology specialist in electrochemistry & molten salts.
→ Personally selected, negotiated, and managed 7 awardee projects totaling US\$21mil of federal awards.
→ Drafted FY23 funding opportunity language for solar fuels & industrial decarbonization technologies.

EDUCATION

MASSACHUSETTS INSTITUTE OF TECHNOLOGY *Cambridge, MA*
Ph.D. Chemistry **Aug. 2016—May 2021**
Thesis: Towards Sustainable Electrosynthesis of Industrially Valuable Small Molecules

UNIVERSITY OF CALIFORNIA, BERKELEY *Berkeley, CA*
B.S. Chemistry, magna cum laude **Aug. 2012—May 2016**
Thesis: Synthesis and Characterization of Metal-Organic Frameworks for Gas Storage & Separations

RESEARCH EXPERIENCE

Graduate Researcher, Massachusetts Institute of Technology *Cambridge, MA*
Adviser: Prof. Yogesh SURENDRANATH **Oct. 2016—July 2021**
→ Developed electrosynthetic methods for sustainable production of chemical fuels and fertilizers.

Undergraduate Researcher, University of California, Berkeley *Berkeley, CA*
Adviser: Prof. Jeffrey R. LONG **Nov. 2014—June 2016**
→ Synthesized novel porous materials for separations, storage, and sensing of valuable industrial gases.

SELECTED TECHNICAL PRESENTATIONS

“Ashes to Ashes, Coke to Coke: Drop-in Fuels for Circular Industrial Decarbonization” *Fast Pitch Panel: Industrial Processes*, ARPA-E Energy Innovation Summit, National Harbor, MD, **March 2023**,

<https://youtu.be/GwtucNt6eLc?t=1134>.

“Solar Fuels: A Roadmap to Making Everything Solar-Powered” *Solar Energy Technologies Office Ideafest*, DOE Office of Energy Efficiency and Renewable Energy, Washington, DC, **March 2022** (*virtual*).

“White Phosphorus Electrosynthesis from Molten Phosphates” *Harvard-MIT Seminar in Inorganic Chemistry*, MIT Department of Chemistry, Cambridge, MA, **March 2021** (*virtual*).

“Salt Electrolysis for Industrial Decarbonization” *Sustainable Phosphate Processing Symposium*, OCP Group S.A., Cambridge, MA & Ben Guerir, Morocco, **June 2020** (*virtual*).

“Short-circuiting the Phosphorus Economy: Electrochemical Reduction of Metaphosphate Salts to Elemental P₄” *Bridging Scales in Electrochemical Materials and Methods Applied to Organic and Inorganic Chemistry, Catalysis, Energy and Biology*, Electrochemistry Gordon Research Conference, Ventura, CA, **January 2020**.

SELECTED TECHNICAL PUBLICATIONS

Melville, J.F.[†]; Licini, A.J.[†]; Surendranath, Y. Electrolytic Synthesis of White Phosphorus Is Promoted in Oxide-Deficient Molten Salts. *ACS Cent. Sci.* **2023**, *9*, 373. doi:10.1021/acscentsci.2c01336.

Aubrey, M.L.; Kapelewski, M.T.; Melville, J.F.; Oktawiec, J.; Presti, D.; Gagliardi, L.; Long, J.R. Chemiresistive detection of gaseous hydrocarbons and interrogation of charge transport in Cu[Ni(2,3-pyrazinedithiolate)₂] by gas adsorption. *J. Am. Chem. Soc.* **2019**, *141*, 5005. doi:10.1021/jacs.9b00654.

Jackson, M.N.; Kaminsky, C.J.; Oh, S.; Melville, J.F.; Surendranath, Y.. Graphite Conjugation Eliminates Redox Intermediates in Electrocatalysis. *J. Am. Chem. Soc.* **2019**, *141*, 14160. doi:10.1021/jacs.9b04981.

LEADERSHIP, PEDAGOGY, & COMMUNITY ADVOCACY

- Graduate Resident Advisor**, MIT Division of Student Life **Aug. 2017—June 2021**
→ Supported 40 undergraduates in MIT’s East Campus dorm as a mental health paraprofessional.
- Chair, Housing & Community Affairs**, MIT Graduate Student Council **Jul. 2018—June 2019**
→ Implemented pilot programs to increase student housing stability and reduce dorm vacancy rates.
- Teaching Assistant**, MIT Department of Chemistry **Aug. 2016—June 2017**
→ Led recitation sections for 5.112 (advanced general chemistry) and 5.12 (organic chemistry).

VOLUNTEERISM & EXTRACURRICULAR WORK

- Alumni Volunteer**, U.S. Department of Energy National Science Bowl **April 2010—present**
→ Wrote & edited questions for regional & national science competitions for grade 6-12 students.
→ Engaged students and parents, providing direct academic mentorship and promoting STEM education.
- Web Developer**, Freelance **Sep. 2013—present**
Portfolio available at jmelville.science#web-dev
→ Worked with clients to design accessible research websites for recruitment and science communication.

AWARDS & HONORS

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| AAAS STPF Finalist , American Association for the Advancement of Science | <i>Washington, DC</i> | 2022 |
| Diversity, Equity, and Inclusion Fellow , MIT Office of Graduate Education | <i>Cambridge, MA</i> | 2020 |
| J-WAFS Seed Grant Winner , Abdul Latif Jameel Water & Food Systems Lab | <i>Cambridge, MA</i> | 2019 |
| Tata Fellow , MIT Tata Center for Technology and Design | <i>Cambridge, MA</i> | 2018 |
| Senior Undergraduate Research Award , UC Berkeley College of Chemistry | <i>Berkeley, CA</i> | 2016 |
| Dean’s Honor List , UC Berkeley College of Chemistry | <i>Berkeley, CA</i> | 2016 |
| Eagle Scout , Boy Scouts of America | <i>Fremont, CA</i> | 2012 |