

# JONATHAN MELVILLE

SCIENCE & TECHNOLOGY POLICY FELLOW, UNITED STATES DEPARTMENT OF ENERGY  
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## SUMMARY

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- Science policy fellow with experience with technology development & federal research project management
- Ph.D. in inorganic chemistry, specializing in innovative electrolytic routes for industrial decarbonization
- Compelling scientific communicator with presentations at prestigious international conferences, publications in high-impact peer-reviewed scientific journals, and passion for accessible chemical pedagogy
- Extensive and successful volunteer history in student advocacy, leadership, and diversity & inclusion

## WORK EXPERIENCE

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**ORISE Science, Technology, & Policy Fellow**, U.S. Department of Energy *Washington, DC*  
*Office of Energy Efficiency and Renewable Energy, Solar Energy Technologies Office* **Sep. 2021—present**  
→ Worked on Concentrating Solar Power team managing \$241mil of federal awards across 48 projects.  
→ Drafted FOAs, digested RFIs, and managed awardees from selection to closing tech-to-market analysis.  
→ Formulated funding policy on emerging technologies for solar-to-fuels and industrial decarbonization.

## EDUCATION

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**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

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**Graduate Researcher**, Massachusetts Institute of Technology *Cambridge, MA*  
*Adviser: Prof. Yogesh SURENDRANATH* **Oct. 2016—Jul. 2021**  
→ Optimized and explicated high-temperature electroreduction of metaphosphates to white phosphorus.  
→ Discovered high-efficiency copper nitride catalyst activity for electroreduction of nitrogen to ammonia.  
→ Innovated industrial product separations scheme for electrochemical methane gas-to-liquid reactors.

**Undergraduate Researcher**, University of California, Berkeley *Berkeley, CA*  
*Adviser: Prof. Jeffrey R. LONG* **Nov. 2014—Jun. 2016**  
→ Synthesized novel photoconductive MOF for chemiresistive detection of gaseous hydrocarbons.  
→ Applied rational design principles to augment MOF CH<sub>4</sub> storage capacity by alkyl functionalization.  
→ Enhanced MOF synthetic yield, framework porosity, and crystal structure using air-free techniques.

## SELECTED ACADEMIC PUBLICATIONS

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Melville, J.F.<sup>†</sup>; Licini, A.J.<sup>†</sup>; Surendranath, Y. Efficient Electrosynthesis of White Phosphorus from Molten Condensed Phosphate Salts. *Science*, **under revision for invited resubmission**, 10.33774/chemrxiv-2021-zjcs8.

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)<sub>2</sub>] by gas adsorption. *J. Am. Chem. Soc.*, **2019**, *141*, 5005-5013, 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*, 14160-14167, 10.1021/jacs.9b04981.

## SELECTED ACADEMIC PRESENTATIONS

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“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 P<sub>4</sub>” *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.

“Electrochemical Phosphorus Processing” *African Sustainable Development Workshop*, Université Mohammed VI Polytechnique—MIT Research Program, Cambridge, MA, October 2019.

“Electrocatalytic Ammonia Synthesis for Distributed Agriculture” *Annual Research Symposium*, MIT Tata Center, Cambridge, MA, April 2019.

## LEADERSHIP, PEDAGOGY, & COMMUNITY ADVOCACY

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**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.
- Hosted events, counseled individual students, and provided community care through various hall crises.
- Appointed to student advocacy positions on Title IX oversight and mental health reform committees.

**Member, Committee for Student Life**, MIT Division of Student Life **Aug. 2018—June 2020**

- Advised upon and oversaw implementation of institute-wide student mindfulness initiatives.

**Chair, Housing & Community Affairs**, MIT Graduate Student Council **Jul. 2018—Jun. 2019**

- Implemented pilot programs to increase student housing stability and reduce dorm vacancy rates.

**Teaching Assistant**, MIT Department of Chemistry **Aug. 2016—Jun. 2017**

- Led recitation sections for 5.112 (advanced general chemistry) and 5.12 (organic chemistry).

## VOLUNTEERISM & EXTRACURRICULAR WORK

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**Alumni Volunteer**, Department of Energy National Science Bowl **Apr. 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**

- Worked with clients to design accessible research websites for recruitment and science communication.
- Syncretized dynamic front-end frameworks to build unique & responsive virtual scientific profiles.

### Portfolio:

Schreier Group	UW Madison	<a href="http://engineered-interfaces.org">engineered-interfaces.org</a>
Pai Lab	UMass Medical School	<a href="http://pai-lab.org">pai-lab.org</a>
Surendranath Group	MIT	<a href="http://interphases.org">interphases.org</a>
Center for Gas Separations	Department of Energy	<a href="http://cchem.berkeley.edu/co2efrc/">cchem.berkeley.edu/co2efrc/</a>
Long Group	UC Berkeley	<a href="http://alchemy.cchem.berkeley.edu">alchemy.cchem.berkeley.edu</a>

## AWARDS & HONORS

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2020	<b>Diversity, Equity, and Inclusion Fellow</b> , MIT Office of Graduate Education	<i>Cambridge, MA</i>
2019	<b>J-WAFS Seed Grant Winner</b> , Abdul Latif Jameel Water and Food Systems Lab	<i>Cambridge, MA</i>
2018	<b>Tata Fellow</b> , MIT Tata Center for Technology and Design	<i>Cambridge, MA</i>
2016	<b>Senior Undergraduate Research Award</b> , UC Berkeley College of Chemistry	<i>Berkeley, CA</i>
2016	<b>Dean’s Honor List</b> , UC Berkeley College of Chemistry	<i>Berkeley, CA</i>
2013	<b>Dean’s Honor List</b> , UC Berkeley College of Chemistry	<i>Berkeley, CA</i>
2012	<b>Eagle Scout</b> , San Francisco Bay Area Council	<i>Fremont, CA</i>