

DIANNE J. XIAO

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Department of Chemistry
University of Washington
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PROFESSIONAL EXPERIENCE

University of Washington

Assistant Professor, Department of Chemistry **2019–present**
Klaus and Mary Ann Saegbarth Endowed Faculty Fellow
Affiliate Faculty, Clean Energy Institute
Member, Molecular Engineering & Science Institute
Research interests: *Design of new porous materials for applications in clean energy and sustainability, including conjugated porous materials for electronics, electrocatalysis, and electrochemical separations; bio-inspired heterogeneous and supramolecular catalysts for biomass upgrading and electrocatalysis; and solution processable porous materials for membrane-based separations.*

Stanford University

Postdoctoral Scholar (Advisor: Matthew W. Kanan) **2016–2019**
Research focus: *CO₂ Insertion into C–H Bonds for Carboxylic Acid Synthesis.*

EDUCATION

University of California, Berkeley

Ph.D. in Chemistry (Advisor: Jeffrey R. Long) **2016**
Thesis: *Metal–Oxo and Dioxygen Chemistry in Metal–Organic Frameworks: Applications in Catalysis and Gas Separations.*

Harvard University

A.B. summa cum laude in Chemistry (Advisor: Theodore Betley) **2011**
Thesis: *Taming Manganese: Synthesis and Characterization of Trinuclear and Hexanuclear Manganese Clusters.*

AWARDS AND HONORS

Sloan Research Fellow (**one of twenty-three** in Chemistry) **2025**
Camille Dreyfus Teacher-Scholar Award (**one of eighteen**) **2024**
Kavli Frontiers of Science Fellow **2024**
Packard Fellow (**one of twenty**) **2022**
Beckman Young Investigator Award (**one of ten**) **2022**
NSF CAREER Award **2022**
DOE Early Career Award **2021**
GCEP and Precourt Student Energy Lecture Series, Distinguished Student Lecturer **2018**
Arnold O. Beckman Postdoctoral Fellowship **2017**
Camille and Henry Dreyfus Postdoctoral Fellowship **2016**
National Science Foundation Graduate Research Fellowship **2012**
UC Berkeley Outstanding Graduate Student Instructor Award **2012**
Thomas T. Hoopes Thesis Prize **2011**
Phi Beta Kappa **2010**

SCIENTIFIC PUBLICATIONS

Total citations: 3324, h-index = 22 (per Google Scholar, date last updated March 12, 2025).

See [Google Scholar page](#) for full publications list.

At the University of Washington:

(† = co-first author, underlined = undergraduate author, * = corresponding author)

- (35) Kamin, A. A.;[†] Brannan, E.J.[†]; Snook, K. M.; Krajewski, S.; Gannon, P. M.; Kaminsky, W.; **Xiao, D. J.*** “Solvation and Oxidation Effects on the Crystal Structure and Morphology of Tetraoxolene-Based Materials.” *CrystEngComm*, **2024**, *26*, 6396–6402.
- (34) Le, P. H.; Liu, A.; Zasada, L. B.; Geary, J.; Kamin, A. A.; Rollins, D. S.; Nguyen, H.; Hill, A. M.; Liu, Y.; **Xiao, D. J.*** “Nitrogen-rich conjugated macrocycles: Synthesis, conductivity, and application in electrochemical CO₂ capture.” *Angew. Chem. Int. Ed.* **2024**, e202421822. [Link](#).
- (33) Zasada, L. B.; Le, P. H.; Hill, A. M.; Shafraneck, R. T.; **Xiao, D. J.*** “Controlling the crystal packing and morphology of metal–organic macrocycles through side chain modification.” *ACS Materials Lett.* **2024**, *6*, 3043–3049. [Link](#).
- (32) Rollins, D. S.; Geary, J.; Ronning, K.; Snook, K. M.; **Xiao, D. J.*** “Cooperative catalysis in a crystalline porous framework with templated acid–base sites.” *Chem. Mater.* **2024**, *36*, 5250–5256. [Link](#).
- *Selected as an “ACS Editors’ Choice” article*
- (31) Geary, J.; **Xiao, D. J.*** “Engineering bimetallic active sites in metal–organic frameworks.” *Chem. Mater.* **2024**, *36*, 4916–4928. [Link](#).
- *Part of the “Up-and-Coming” series of invited perspectives*
- (30) Geary, J.; Aalto, J. P.; **Xiao, D. J.*** “Modular synthesis of templated bimetallic sites in metal–organic frameworks.” *Chem. Mater.* **2024**, *36*, 3949–3956. [Link](#).
- (29) Snook, K. M.; **Xiao, D. J.*** “Macrocyclic ligands open new channels in electrically conductive metal–organic frameworks.” *Chem.* **2024**, *10*, 24–25. [Link](#).
- *Invited Preview article*
- (28) Kamin, A. A.; Clayton, T.; Otteson, C.; Gannon, P. M.; Krajewski, S.; Kaminsky, W.; Jasti, R.; **Xiao, D. J.*** “Synthesis and metalation of polycatechol nanohoops derived from fluorocycloparaphenylenes.” *Chem. Sci.* **2023**, *14*, 9724–9732. [Link](#).
- *Selected as a “ChemSci Pick of the Week” article*
 - *Part of “2023 Chemical Science HOT Article Collection”*
- (27) Kamin, A. A.; Moseley, I. P.; Oh, J.; Brannan, E. J.; Gannon, P. M.; Kaminsky, W.; Zadrozny, J. M.; **Xiao, D. J.*** “Geometry-dependent valence tautomerism, magnetism, and electrical conductivity in 1D iron–tetraoxolene chains.” *Chem. Sci.* **2023**, *14*, 4083–4090. [Link](#).
- (26) Rollins, D. S.;[†] Geary, J.;[†] Wong, A. H.; **Xiao, D. J.*** “Stabilizing large pores in a flexible metal–organic framework via chemical cross-linking.” *Chem Commun.* **2022**, *58*, 12361–12364. [Link](#).
- *Invited article for the “2022 Emerging investigators” themed collection*
- (25) Snook, K. M.; Zasada, L. B.; Chehada, D.; **Xiao, D. J.*** “Oxidative control over the morphology of Cu₃(HHTP)₂, a 2D conductive metal–organic framework.” *Chem. Sci.* **2022**, *13*, 10472–10478. [Link](#).
- *Part of “Most Popular 2022 Materials and Energy Articles” themed collection*
- (24) Zasada, L. B.; Guio, L.; Kamin, A. A.; Dhakal, D.; Monahan, M.; Seidler, G. T.; Luscombe, C. K.; **Xiao, D. J.*** “Conjugated metal–organic macrocycles: Synthesis, characterization, and electrical conductivity.” *J. Am. Chem. Soc.* **2022**, *144*, 4515–4521. [Link](#).
- *Highlighted as an editor’s pick of the week by @NatureSynthesis*
 - *Research highlight in Nature Reviews Materials ([Link](#))*

- (23) Geary, J.; **Wong, A. H.**; **Xiao, D. J.*** “Thermolabile cross-linkers for templating precise multicomponent metal–organic framework pores.” *J. Am. Chem. Soc.* **2021**, *143*, 10317–10323. [Link](#).
- (22) **Do, M.**; Rogers, D.; Kaminsky, W.; **Xiao, D. J.*** “A robust synthetic route towards anisotropic metal–organic cages with tunable surface chemistry.” *Inorg. Chem.* **2021**, *60*, 7602–7606. [Link](#).

Prior to the University of Washington:

- (21) Reed, D. A.; **Xiao, D. J.**; Jiang, H. Z. H.; Chakarawet, K.; Oktawiec, J.; Long, J. R. “Biomimetic O₂ Adsorption in an Iron Metal–Organic Framework for Air Separation.” *Chem. Sci.* **2020**, *11*, 1698–1702. [Link](#).
- (20) **Xiao, D. J.**; Chant, E. D.; Frankhouser, A. D.; Chen, Y.; Yau, A.; Washton, N. M.; Kanan, M. W. “A Closed Cycle for Esterifying Aromatic Hydrocarbons with CO₂ and Alcohol.” *Nat. Chem.* **2019**, *11*, 940–947. [Link](#).
- (19) Reed, D. A.; Keitz, B. K.; Oktawiec, J.; Mason, J. A.; Runčevski, T.; **Xiao, D. J.**; Darago, L. E.; Crocellà, V.; Bordiga, S.; Long, J. R. “A Spin Transition Mechanism for Cooperative Adsorption in Metal–Organic Frameworks.” *Nature* **2017**, *550*, 96–100. [Link](#).
- (18) Grosso-Giordano, N. A.; Yeh, A. J.; Okrut, A.; **Xiao, D. J.**; Grandjean, F.; Long, G. J.; Zones, S. I.; Katz, A. “Effect of Defect Site Preorganization on Fe(III) Grafting and Stability: A Comparative Study of Delaminated Zeolite vs Amorphous Silica Supports.” *Chem. Mater.* **2017**, *29*, 6480–6492. [Link](#).
- (17) **Xiao, D. J.**; Oktawiec, J.; Milner, P. J.; Long, J. R. “Pore Environment Effects on Catalytic Cyclohexane Oxidation in Expanded Fe₂(dobdc) Analogues.” *J. Am. Chem. Soc.* **2016**, *138*, 14371–14379. [Link](#).
- (16) Zhang, W.; Kauer, M.; Halbherr, O.; Epp, K.; Guo, P.; Gonzalez, M. I.; **Xiao, D. J.**; Wiktor, C.; Xamena, L.; Francesc, X.; Woll, C.; Wang, Y.; Muhler, M.; Fischer, R. A. “Ruthenium Metal–Organic Frameworks with Different Defect Types: Influence on Porosity, Sorption, and Catalytic Properties.” *Chem. Eur. J.* **2016**, *22*, 14297–14307. [Link](#).
- (15) Vogiatzis, K. D.; Haldoupis, E.; **Xiao, D. J.**; Long, J. R.; Siepmann, J. I.; Gagliardi, L. “Accelerated Computational Analysis of Metal–Organic Frameworks for Oxidation Catalysis.” *J. Phys. Chem. C.* **2016**, *120*, 18707–18712. [Link](#).
- (14) Bloch, E. D.; Queen, W. L.; Hudson, M. R.; Mason, J. A.; **Xiao, D. J.**; Murray, L. J.; Flacau, R.; Brown, C. M.; Long, J. R. “Hydrogen Storage and Selective, Reversible O₂ Adsorption in a Metal–Organic Framework with Open Chromium(II) Sites.” *Angew. Chem. Int. Ed.* **2016**, *55*, 8605–8609. [Link](#).
- (13) Mercado, R.; Vlaisavljevich, B.; Lin, L. –C.; Lee, K.; Lee, Y.; Mason, J. A.; **Xiao, D. J.**; Gonzalez, M.; Kapelewski, M. T.; Neaton, J. B.; Smit, B. “Force Field Development from Periodic Density Functional Theory Calculations for Gas Separation Applications Using Metal–Organic Frameworks.” *J. Phys. Chem. C.* **2016**, *120*, 12590–12604. [Link](#).
- (12) Borycz, J.; Paier, J.; Verma, P.; Darago, L. E.; **Xiao, D. J.**; Truhlar, D. G.; Long, J. R.; Gagliardi, L. “Structural and Electronic Effects on the Properties of Fe₂(dobdc) upon Oxidation with N₂O.” *Inorg. Chem.* **2016**, *55*, 4924–4934. [Link](#).
- (11) **Xiao, D. J.**; Gonzalez, M. I.; Darago, L. E.; Vogiatzis, K.; Gagliardi, L.; Long, J. R. “Selective, Tunable O₂ Binding in Cobalt(II)–Triazolate/Pyrazolate Metal–Organic Frameworks.” *J. Am. Chem. Soc.* **2016**, *138*, 7161–7170. [Link](#).
- (10) Reed, D. A.; **Xiao, D. J.**; Gonzalez, M. I.; Darago, L. E.; Long, J. R. “Reversible CO Scavenging via Adsorbate-Dependent Spin State Transitions in an Iron(II)–Triazolate Metal–Organic Framework.” *J. Am. Chem. Soc.* **2016**, *138*, 5594–5602. [Link](#).
- (9) Verma, P.; Vogiatzis, K.; Planas, N.; Borycz, J.; **Xiao, D. J.**; Long, J. R.; Gagliardi, L.; Truhlar, D. “Mechanism of Oxidation of Ethane to Ethanol at Iron(IV)–Oxo Sites in Magnesium-Diluted Fe₂(dobdc).” *J. Am. Chem. Soc.* **2015**, *137*, 5770–5781. [Link](#).
- (8) Saeed, A.; Maya, F.; **Xiao, D. J.**; Najam-ul-Haq, M.; Svec, F.; Britt, D. K. “Growth of a Highly Porous Coordination Polymer on a Macroporous Polymer Monolith Support for Enhanced Immobilized Metal Ion

Affinity Chromatographic Enrichment of Phosphopeptides.” *Adv. Funct. Mater.* **2014**, *24*, 5790–5797. [Link](#).

- (7) Kapelewski, M. T.; Geier, S. J.; Hudson, M. R.; Stück, D.; Mason, J. A.; Nelson, J. N.; **Xiao, D. J.**; Hulvey, Z.; Gilmour, E.; FitzGerald, S. A.; Head-Gordon, M.; Brown, C. M.; Long, J. R. “M₂(*m*-dobdc) (M = Mg, Mn, Fe, Co, Ni) Metal–Organic Frameworks Exhibiting Increased Charge Density and Enhanced H₂ Binding at the Open Metal Site.” *J. Am. Chem. Soc.* **2014**, *136*, 12119–12129. [Link](#).
- (6) **Xiao, D. J.**; Bloch, E. D.; Mason, J. A.; Queen, W. L.; Hudson, M.; Planas, N.; Borycz, J.; Dzubak, A. L.; Verma, P.; Lee, K.; Bonino, F.; Crocellà, V.; Yano, J.; Bordiga, S.; Truhlar, D. G.; Gagliardi, L.; Brown, C. M.; Long, J. R. “Oxidation of Ethane to Ethanol by N₂O in a Metal–Organic Framework with Coordinatively Unsaturated Iron(II) Sites.” *Nat. Chem.* **2014**, *6*, 590–595. [Link](#).
- (5) Zadrozny, J. M.; **Xiao, D. J.**; Long, J. R.; Atanasov, M.; Neese, F.; Grandjean, F.; Long, G. J. “Mössbauer Spectroscopy as a Probe of Magnetization Dynamics in the Linear Iron(I) and Iron(II) Complexes [Fe(C(SiMe₃)₃)₂]^{1–0}.” *Inorg. Chem.* **2013**, *52*, 13123–13131. [Link](#).
- (4) Jeon, I. –R.; Park, J. G.; **Xiao, D. J.**; Harris, T. D. “An Azophenine Radical-Bridged Fe₂ Single-Molecule Magnet with Record Magnetic Exchange Coupling.” *J. Am. Chem. Soc.* **2013**, *135*, 16845–16848. [Link](#).
- (3) Zadrozny, J. M.; **Xiao, D. J.**; Atanasov, M.; Long, G. J.; Grandjean, F.; Neese, F.; Long, J. R. “Magnetic blocking in a linear iron(I) complex.” *Nat. Chem.* **2013**, *5*, 577–581. [Link](#).
- (2) Fout, A. R.; **Xiao, D. J.**; Zhao, Q.; Harris, D. T.; King, E. R.; Eames, E. V.; Zheng, S. –L.; Betley, T. A. “Trigonal Mn₃ and Co₃ Clusters Supported by Weak-Field Ligands: A Structural, Spectroscopic, Magnetic, and Computational Investigation into the Correlation of Molecular and Electronic Structure.” *Inorg. Chem.* **2012**, *51*, 10290–10299. [Link](#).
- (1) Fout, A. R.; Zhao, Q.; **Xiao, D. J.**; Betley, T. A. “Oxidative Atom-Transfer to a Trimanganese Complex To Form Mn₆(μ⁶-E) (E = O, N) Clusters Featuring Interstitial Oxide and Nitride Functionalities.” *J. Am. Chem. Soc.* **2011**, *133*, 16750–16753. [Link](#).

PRESENTATIONS

Invited Seminars at Universities and Other Institutions

At the University of Washington:

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| (33) Department of Chemistry, Oregon State University, OR | Oct 2024 |
| (32) Department of Chemistry, UC Riverside, CA | Oct 2024 |
| (31) Department of Chemistry, UC Berkeley, CA | Sep 2024 |
| (30) Department of Chemistry, Columbia University, NY | Sep 2024 |
| (29) Department of Chemistry, Purdue University, IN | Sep 2024 |
| (28) Department of Chemistry, University of Rochester, NY | June 2024 |
| (27) Department of Chemistry and Chemical Biology, Harvard University, MA | May 2024 |
| (26) Department of Chemistry, Dartmouth, NH | May 2024 |
| (25) Department of Chemistry, Northwestern University, IL | May 2024 |
| (24) Department of Chemistry, Cornell University, NY | Apr 2024 |
| (23) Department of Chemistry, University of Michigan, MI | Feb 2024 |
| (22) Department of Chemistry, University of Wisconsin Madison, WI | Nov 2023 |
| (21) Department of Chemistry, University of Colorado Boulder, CO | Oct 2023 |
| (20) Department of Chemistry, UC San Diego, CA | Oct 2023 |
| (19) Department of Chemistry, University of Oregon, OR | Oct 2023 |
| (18) Department of Chemistry, UC Irvine, CA | Oct 2023 |
| (17) Department of Chemistry, Texas A&M University, TX | Sep 2023 |
| (16) Department of Materials Science and Engineering, University of Washington, WA | Apr 2023 |

(15)	Molecular Engineering & Sciences Institute, University of Washington, WA	Jan 2023
(14)	Department of Chemistry, Rice University, TX	Jan 2022
(13)	Department of Chemistry, University of North Carolina at Chapel Hill, NC	Jan 2022
(12)	Department of Chemistry, Indiana University Bloomington, IN	Dec 2021
(11)	School of Molecular Sciences, Arizona State University, AZ	Nov 2021
(10)	Molecular Engineering Materials Center, University of Washington, WA	Nov 2020

Prior to the University of Washington:

(9)	Department of Chemistry, University of Washington, Seattle, WA	2019
(8)	Department of Chemistry, University of California, Riverside, CA	2019
(7)	Department of Chemistry, University of Florida, FL	2018
(6)	Institute of Molecular Engineering, University of Chicago, IL	2018
(5)	Department of Chemistry, Duke University, NC	2018
(4)	Department of Chemistry and Biochemistry, University of California, San Diego, CA	2018
(3)	Department of Chemistry, University of Colorado Boulder, CO	2018
(2)	Department of Chemistry and Biochemistry, University of Notre Dame, IN	2018
(1)	Department of Chemistry, University of Michigan, MI	2018

Invited Presentations at Conferences and Scientific Meetings

At the University of Washington:

(14)	ACS Fall National Meeting, Denver, CO	Aug 2024
(13)	9 th International Conference on Metal-Organic Frameworks and Open Framework Compounds (MOF 2024), Singapore	July 2024
(12)	ACS Spring National Meeting, New Orleans, LA	Mar 2024
(11)	2024 U.S. Kavli Frontiers of Science Symposium, CA (<i>poster presentation</i>)	Mar 2024
(10)	RSC Porous Materials Interest Group, Virtual Seminar	Feb 2024
(9)	ACS DIC Periodic Table Talk, Sustainable Energy and Environment Subdivision, Virtual Seminar	Oct 2023
(8)	Packard Fellows 35th Anniversary Reunion, CO	Sep 2023
(7)	Nanocrystals Northwest Meeting, WA	July 2023
(6)	ACS Northwest Regional Meeting, Bozeman, MT	June 2023
(5)	Catalysis in Confined Spaces, Telluride Science Research Center Workshop, CO	June 2023
(4)	8 th International Conference on Metal-Organic Frameworks and Open Framework Compounds (MOF 2022), Dresden, Germany	Sep 2022
(3)	Electrochemical Society Pacific Northwest Section, Virtual Seminar	Aug 2022

Prior to the University of Washington:

(2)	Future Faculty in Chemistry Symposium, Department of Chemistry and Chemical Biology, Harvard University, Cambridge, MA	2018
(1)	ACS Spring National Meeting, Denver, CO	2015

Selected Contributed Presentations at Conferences and Scientific Meetings

At the University of Washington:

(12)	Nanoporous Materials Gordon Research Conference, NH	2023
(11)	Atomically Precise Nanochemistry Gordon Research Conference, CA	2022

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| (10) | Crystal Engineering Gordon Research Conference, ME | 2022 |
| (9) | ACS Spring National Meeting, San Diego, CA | 2022 |
| (8) | Pacificchem 2021 (<i>canceled due to COVID-19</i>) | 2021 |
| (7) | ACS Spring National Meeting, Virtual Meeting | 2021 |

Prior to the University of Washington:

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| (6) | ACS Spring National Meeting, Orlando, FL | 2019 |
| (5) | Inorganic Chemistry Gordon Research Conference, ME | 2018 |
| (4) | ACS Spring National Meeting, New Orleans, LA | 2018 |
| (3) | Inorganic Chemistry Gordon Research Conference, ME | 2016 |
| (2) | ACS Fall National Meeting, Boston, MA | 2015 |
| (1) | ACS Fall National Meeting, San Francisco, CA | 2014 |

PROFESSIONAL ACTIVITIES AND SERVICE

Conference Organization

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| UW Clean Energy Institute (CEI) ORCAS Conference | Sep 2022 |
| Young Investigator Symposium, 8 th International Conference on Metal–Organic Frameworks and Open Framework Compounds | Sep 2022 |

Outreach and Mentorship

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| Panelist, UW ADVANCE CAREER Workshop | May 2024 |
| Mentor, NSF/CHE Early Career Investigator Workshop | May 2023 |
| Guest speaker, UW Math Science Upward Bound | Aug 2022 |
| Panelist, “From There to Here: My Asian American Journey,” ACS Webinar | May 2022 |
| Workshop leader, Inclusive Future Faculty Symposium, Arizona State University | Mar 2022 |
| Panelist, UW Women in Science Society Q&A Panel | Sep 2021 |
| Guest speaker, Shorewood High School AP Environmental Science | Jan 2021 |
| Mentor, the Chemistry Women Mentorship Network (Chem WMN) | 2019–present |

Editorial Roles

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| Early Career Advisory Board, <i>Inorganic Chemistry Frontiers</i> | 2024–present |
| Editorial Advisory Board, <i>Nano Letters</i> | 2023–present |

Journal Review

Journal of the American Chemical Society, ACS Central Science, ACS Catalysis, ACS Materials Letters, ACS Nano, ACS Sustainable Chemistry & Engineering, Chemistry of Materials, Crystal Growth & Design, Inorganic Chemistry, Organometallics, Accounts of Materials Research, Angewandte Chemie International Edition, Nature Catalysis, Nature Chemistry, Nature Communications, Chem, Chemical Science, Chemical Communications, CrystEngComm, Catalysis Letters, Australian Journal of Chemistry, Journal of Photochemistry and Photobiology

Grant Review

- Ad hoc reviewer for the National Science Foundation (CHE-CAT, DMR-SSMC)
- Ad hoc reviewer for the Department of Energy (BES Materials Chemistry)
- Ad hoc reviewer for the Army Research Office
- Ad hoc reviewer for the ACS Petroleum Research Fund (DNI, ND, UR)
- Review panel for NSF CHE-CAT
- Review panel for Activate Fellowship
- Review panel for NSF MPS-Ascend Postdoctoral Research Fellowship

Review panel for Arnold O. Beckman Postdoctoral Fellowship
Review panel for NSF GRFP

University Service

Molecular Engineering Graduate School Interdisciplinary Committee (AY 2022-2023, 2023-24)
Reviewer for UW Clean Energy Institute (CEI) Graduate Student Fellowships (2022, 2023)
Reviewer for UW Clean Energy Institute (CEI) Collaborative Seed Grants (2022)

Department Service

Inorganic Seminars (2020)
Website and Communications Committee (2020–present)
Chemistry Graduate Exam Committees (2019–present)
Graduate Admissions and Recruiting Committee (2019–present)

PROFESSIONAL DEVELOPMENT

"Entering Mentoring" Workshop, Center for the Improvement of Mentored Experiences in Research (CIMER)	Sep 2023
“Call to Action: Becoming an Equity-Minded STEM Leader” Workshop	Aug 2020
“Understanding URM STEM Graduate Student Experiences” Workshop	Aug 2020
ACS New Faculty Workshop	July 2020
UW Faculty Fellows Program	Sep 2019