

## DIANNE J. XIAO

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Department of Chemistry  
University of Washington  
Box 351700  
Seattle, WA 98195-1700

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### PROFESSIONAL EXPERIENCE

University of Washington

Assistant Professor, Department of Chemistry

2019–present

Klaus and Mary Ann Saegebarth Endowed Faculty Fellow

Affiliate Faculty, Clean Energy Institute

Member, Molecular Engineering & Science Institute

Stanford University

Postdoctoral Scholar (Advisor: Matthew W. Kanan)

2016–2019

Research focus: *CO<sub>2</sub> Insertion into C–H Bonds for Carboxylic Acid Synthesis*

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### 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*

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### AWARDS AND HONORS

Packard Fellow

2022

Beckman Young Investigator Award

2022

NSF CAREER Award

2022

DOE Early Career Award

2021

ACS PRF Doctoral New Investigator Award

2021

GCEP and Precourt Student Energy Lecture Series, Distinguished Student Lecturer

2018

Arnold O. Beckman Postdoctoral Fellowship

2017–2019

Camille and Henry Dreyfus Postdoctoral Fellowship

2016–2017

National Science Foundation Graduate Research Fellowship

2012–2015

UC Berkeley Outstanding Graduate Student Instructor Award

2012

Thomas T. Hoopes Thesis Prize

2011

Phi Beta Kappa

2010

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### SCIENTIFIC PUBLICATIONS

At the University of Washington († = co-first author,   = undergraduate author, \* = corresponding author):

- (31) Geary, J.; **Xiao, D. J.**\* “Engineering bimetallic active sites in metal–organic frameworks.” *Chem. Mater.* *In preparation.*
- Part of the “Up-and-Coming” series of invited perspectives.

- (30) Le, P. H.; Zasada, L. B.; Geary, J.; Hill, A.; **Xiao, D. J.**\* “Self-assembly of nitrogen-rich conjugated metal–organic and organic macrocycles.” *In preparation*.
- (29) Geary, J.; Aalto, J. P.; **Xiao, D. J.**\* “Modular synthesis of templated bimetallic sites in metal–organic frameworks.” *Submitted*.
- (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 nano hoops derived from fluorocycloparaphenylenes.” *Chem. Sci.* **2023**, *accepted*.
- *Selected by editors as a “ChemSci Pick of the Week”*
  - *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.
- (26) Rollins, D. S.;<sup>†</sup> Geary, J.;<sup>†</sup> 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.
- *Invited article as part of the “2022 Emerging investigators” themed collection.*
- (25) Snook, K. M.; Zasada, L. B.; Chehada, D.; **Xiao, D. J.**\* “Oxidative control over the morphology of Cu<sub>3</sub>(HHTP)<sub>2</sub>, a 2D conductive metal–organic framework.” *Chem. Sci.* **2022**, *13*, 10472–10478.
- *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.
- *Highlighted on Twitter as an editor’s pick of the week by @NatureSynthesis.*
  - *Research highlight in Nature Reviews Materials.*
- (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.
- (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.

*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 O<sub>2</sub> Adsorption in an Iron Metal–Organic Framework for Air Separation.” *Chem. Sci.* **2020**, *11*, 1698–1702.
- (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 CO<sub>2</sub> and Alcohol.” *Nat. Chem.* **2019**, *11*, 940–947.
- (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.
- (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.
- (17) **Xiao, D. J.**; Oktawiec, J.; Milner, P. J.; Long, J. R. “Pore Environment Effects on Catalytic Cyclohexane Oxidation in Expanded Fe<sub>2</sub>(dobdc) Analogues.” *J. Am. Chem. Soc.* **2016**, *138*, 14371–14379.
- (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.
- (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.
- (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 O<sub>2</sub> Adsorption in a Metal–Organic Framework with Open Chromium(II) Sites.” *Angew. Chem. Int. Ed.* **2016**, *55*, 8605–8609.
- (13) Mercado, R.; Vlasisavljevich, 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.

- (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 Fe<sub>2</sub>(dobdc) upon Oxidation with N<sub>2</sub>O." *Inorg. Chem.* **2016**, *55*, 4924–4934.
- (11) **Xiao, D. J.**; Gonzalez, M. I.; Darago, L. E.; Vogiatzis, K.; Gagliardi, L.; Long, J. R. "Selective, Tunable O<sub>2</sub> Binding in Cobalt(II)–Triazolate/Pyrazolate Metal–Organic Frameworks." *J. Am. Chem. Soc.* **2016**, *138*, 7161–7170.
- (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.
- (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 Fe<sub>2</sub>(dobdc)." *J. Am. Chem. Soc.* **2015**, *137*, 5770–5781.
- (8) Saeed, A.; Maya, F.; **Xiao, D. J.**; Najam-ul-Haqq, 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.
- (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. "M<sub>2</sub>(*m*-dobdc) (M = Mg, Mn, Fe, Co, Ni) Metal–Organic Frameworks Exhibiting Increased Charge Density and Enhanced H<sub>2</sub> Binding at the Open Metal Site." *J. Am. Chem. Soc.* **2014**, *136*, 12119–12129.
- (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 N<sub>2</sub>O in a Metal–Organic Framework with Coordinatively Unsaturated Iron(II) Sites." *Nat. Chem.* **2014**, *6*, 590–595.
- (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(SiMe<sub>3</sub>)<sub>3</sub>)<sub>2</sub>]<sup>1–0</sup>." *Inorg. Chem.* **2013**, *52*, 13123–13131.
- (4) Jeon, I. –R.; Park, J. G.; **Xiao, D. J.**; Harris, T. D. "An Azophenine Radical-Bridged Fe<sub>2</sub> Single-Molecule Magnet with Record Magnetic Exchange Coupling." *J. Am. Chem. Soc.* **2013**, *135*, 16845–16848.
- (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.
- (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 Mn<sub>3</sub> and Co<sub>3</sub> 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.
- (1) Fout, A. R.; Zhao, Q.; **Xiao, D. J.**; Betley, T. A. "Oxidative Atom-Transfer to a Trimanganese Complex To Form Mn<sub>6</sub>(μ<sup>6</sup>-E) (E = O, N) Clusters Featuring Interstitial Oxide and Nitride Functionalities." *J. Am. Chem. Soc.* **2011**, *133*, 16750–16753.

## PATENTS

Long, J. R.; Xiao, D. J. "Redox-Active Metal-Organic Frameworks for the Catalytic Oxidation of Hydrocarbons." US10058855B2, 2018.

## INVITED PRESENTATIONS (DEPARTMENTAL SEMINARS):

At the University of Washington:

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|--|-----------------|
| (22) Department of Chemistry, University of Wisconsin Madison, WI                  | <b>Nov 2023</b> |
| (21) Department of Chemistry, University of Colorado Boulder, CO                   | <b>Oct 2023</b> |
| (20) Department of Chemistry, UC San Diego, CA                                     | <b>Oct 2023</b> |
| (19) Department of Chemistry, University of Oregon, OR                             | <b>Oct 2023</b> |
| (18) Department of Chemistry, UC Irvine, CA  | <b>Oct 2023</b> |
| (17) Department of Chemistry, Texas A&M University, TX                             | <b>Sep 2023</b> |
| (16) Department of Materials Science and Engineering, University of Washington, WA | <b>Apr 2023</b> |
| (15) Molecular Engineering & Sciences Institute, University of Washington, WA      | <b>Jan 2023</b> |

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

*Prior to the University of Washington:*

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

**INVITED PRESENTATIONS (CONFERENCES AND SCIENTIFIC MEETINGS):**

*At the University of Washington:*

(11)	9th International Conference on Metal-Organic Frameworks and Open Framework Compounds (MOF 2024), Singapore ( <i>scheduled</i> )	<b>July 2024</b>
(10)	RSC Porous Materials Interest Group, virtual seminar ( <i>scheduled</i> )	<b>Jan 2024</b>
(9)	ACS DIC Periodic Table Talk, Sustainable Energy and Environment Subdivision ( <i>virtual</i> )	<b>Oct 2023</b>
(8)	Packard Fellows 35th Anniversary Reunion, CO	<b>Sep 2023</b>
(7)	Nanocrystals Northwest Meeting, WA	<b>Jul 2023</b>
(6)	ACS Northwest Regional Meeting, Bozeman, MT	<b>Jun 2023</b>
(5)	Catalysis in Confined Spaces, Telluride Science Research Center Workshop, CO	<b>Jun 2023</b>
(4)	8th International Conference on Metal-Organic Frameworks and Open Framework Compounds (MOF 2022), Dresden, Germany	<b>Sep 2022</b>
(3)	Electrochemical Society Pacific Northwest Section, virtual seminar	<b>Aug 2022</b>

*Prior to the University of Washington:*

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

**SELECTED CONTRIBUTED PRESENTATIONS**

*At the University of Washington:*

(12)	Nanoporous Materials Gordon Research Conference, NH	<b>2023</b>
(11)	Atomically Precise Nanochemistry Gordon Research Conference, CA	<b>2022</b>
(10)	Crystal Engineering Gordon Research Conference, ME	<b>2022</b>
(9)	ACS Spring National Meeting, San Diego, CA	<b>2022</b>
(8)	Pacificchem 2021 ( <i>cancelled due to COVID-19</i> )	<b>2021</b>
(7)	ACS Spring National Meeting, Virtual Meeting	<b>2021</b>

*Prior to the University of Washington:*

(6)	ACS Spring National Meeting, Orlando, FL	<b>2019</b>
(5)	Inorganic Chemistry Gordon Research Conference, ME	<b>2018</b>
(4)	ACS Spring National Meeting, New Orleans, LA	<b>2018</b>

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| (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 |
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## PROFESSIONAL ACTIVITIES

### Conference Organization

Organizing Committee of the Young Investigator Symposium, 8<sup>th</sup> International Conference on Metal–Organic Frameworks and Open Framework Compounds (2022)  
CEI Orcas Conference (2022)

### Editorial Roles

Editorial Advisory Board, *Nano Letters* (2023–)

### Journal Review

*Journal of the American Chemical Society, ACS Central Science, ACS Catalysis, ACS Sustainable Chemistry & Engineering, Inorganic Chemistry, Accounts of Materials Research, 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)  
Ad hoc reviewer for the ACS Petroleum Research Fund (DNI, ND, UR)  
Ad hoc reviewer for the Department of Energy (DOE BES)  
Ad hoc reviewer for the Army Research Office  
Review panel for NSF MPS-Ascend Postdoctoral Research Fellowship  
Review panel for Arnold O. Beckman Postdoctoral Fellowship  
Review panel for NSF GRFP

### Department Service

Inorganic Seminars (2020)  
Chemistry Web Committee (2020–present)  
Graduate Admissions and Recruiting Committee (2019–present)  
Molecular Engineering Graduate School Interdisciplinary Committee, Rotating member (2023, 2024)

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## TEACHING EXPERIENCE

### *At the University of Washington:*

Chem 165: Honors General Chemistry	2020–present
Adjusted median course evaluations: Spring 2023, 4.5/5.0; Spring 2022, 4.6/5.0; Spring 2021, 5.0/5.0; Spring 2020, 4.6/5.0	
Chem 312: Inorganic Chemistry	2019–present
Adjusted median course evaluations: Winter 2023, 4.7/5.0; Winter 2022, 4.7/5.0; Autumn 2020, 4.4/5.0; Autumn 2019, 3.8/5.0	
Chem 500: Grant Proposal and Scientific Writing	2021, 2022

### *Before the University of Washington:*

Graduate Student Instructor, Chem 104B: Advanced Inorganic Chemistry, UC Berkeley	2013, 2014
Graduate Student Instructor, Chem 4A: General Chemistry, UC Berkeley	2011
Received Outstanding Graduate Student Instructor award	
Laboratory Teaching Fellow, Chem S-20: Organic Chemistry, Harvard University	2010

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**OUTREACH AND MENTORING ACTIVITIES**

Mentor, NSF/CHE Early Career Investigator Workshop	<b>May 2023</b>
Guest speaker, UW Math Science Upward Bound	<b>Aug 2022</b>
Panelist, "From There to Here: My Asian American Journey," ACS Webinar	<b>May 2022</b>
Workshop leader, Inclusive Future Faculty Symposium, Arizona State University	<b>Mar 2022</b>
Panelist, UW Women in Science Society Q&A Panel	<b>Sep 2021</b>
Guest speaker, Shorewood High School AP Environmental Science	<b>Jan 2021</b>
Mentor, the Chemistry Women Mentorship Network (Chem WMN)	<b>2019–present</b>
Stanford Science Sunday	<b>2019</b>
Bay Area Scientists in Schools (BASIS)	<b>2011</b>

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**PROFESSIONAL DEVELOPMENT**

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

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