

Jiixin (Dawn) Duan

Beamline Scientist · Center for Photon Science, MX Group · Paul Scherrer Institut

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Education & Professional Appointments

2025–Present	Paul Scherrer Institut · Villigen, Switzerland Beamline Scientist, Center for Photon Science, MX Group Group Leader: Meitian Wang Research area: Develop, maintain and support software for automated and reliable MX beamline operation at SLS with the MX Applications, Instrumentations, and Samples groups. Explore AI/ML-based instrument monitoring and data analysis methods.
2023–2025	Paul Scherrer Institut · Villigen, Switzerland Postdoctoral Fellow, Center for Photon Science, MX Group Group Leader: Meitian Wang · Supervisor: Filip Leonarski Research area: Detector and data processing workflow commissioning in macromolecular crystallography at 4th generation synchrotron (MAX IV) and SwissFEL.
2018–2023	Northwestern University · Illinois, United States Ph.D. in Chemistry (Master included) Advisor: Joseph T. Hupp Thesis: Metal–Organic Frameworks in Electrochemistry and Electrocatalysis
2014–2018	University of Minnesota–Twin Cities · Minnesota, United States B.S. in Chemistry Minor in Mathematics Advisor: Andreas Stein Research topic: Enhancing thermal stability of Metal–Organic Frameworks via Nanocasting

Honors & Awards

2022	GLCACS Outstanding Student Research Award
2022	NUBonD Travel Grant, Northwestern University
2014–2018	Dean's List, University of Minnesota (all terms)
2018	Travel grant for American Chemical Society 255th National Meeting
2017	Dr. Paul F. and Patricia Guehler Chemistry Scholarship
2017	J. Lewis Maynard Memorial Prize in Advanced Inorganic Chemistry
2016	Thomas DuBruil Undergraduate Research Award
2016	Undergraduate Research Opportunities Program
2015	McGraw Hill's Book Prize for Student Achievement in Introductory Chemistry

Leadership & Service

2026–2027	feM-LEAD (female Mentoring – Leadership for Equity And Diversity), ETH Domain Mentee, 2026–2027 cohort. Competitive year-long mentoring programme for women at PSI, Empa, Eawag and WSL preparing for leadership roles (https://www.psi.ch/en/chancengleichheit/fem-lead)
2025–Present	Swiss Young Academy 5-year term member promoting interdisciplinary and crossdisciplinary research
2025–2026	FLP (Foster. Lead. Promote.) Peer Mentoring Program, PSI Co-lead of "Discover Diverse Career Paths and Resources at PSI" with Zarina Turtayeva, connecting 8 female peers and 4 female mentors within PSI
2023–2024	Swiss Women in Chemistry Mentor–Mentee Program Mentee. Mentor: Prof. Natalie Banerji

2022–2024	Electrochemical Society Student Committee Member, Individual Membership Committee
2022–2023	Great Lakes Chinese American Chemical Society Student Committee Member
2020–2023	Phi Lambda Upsilon – The National Chemistry Honor Society (Northwestern chapter) Vice President (2022–2023), President (2021–2022), Secretary (2020–2021) - Organized career development workshops - Led organization meetings year round and organized the annual Marple-Schweitzer lecture - Handled logistics, meeting notes, and website updates
2022–2023	Northwestern University Building on Diversity (NUBonD) - Built Google Scripts and a system to manage the department internal library initiated by NUBonD - Invited speakers and facilitated workshops promoting inclusion, equality and diversity across the NU Chemistry department
2022	Graduate out in STEM (GoSTEM) Founding board member Built the GoSTEM website and helped bring GoSTEM into existence
2021–2022	The Tinker Program, The Garage (Northwestern's home for student entrepreneurs) Brewed non-profit idea TediFlow: a smart interactive assistant to automate tedious steps in research life (data processing, migrating, plotting, backing up)
2021–2022	Graduate International Student Association (G-ISA) Website manager (https://sites.northwestern.edu/gisa/) Revamped the website to increase public exposure among international graduate students
2019–2023	Climate Tech Club (formerly Northwestern Energy and Technology Group) Secretary (2022–2023), External Vice President (2021–2022), Webmaster (2020–2021), General Board Member (2019–2021) - Planned and hosted climate, sustainability and energy talks (avg. attendance 15–20): 50 years of battery innovation (Prof. Jeff Lopez); Advanced battery technology and current market (Dr. Venkat Srinivasan); Thermal batteries and HVAC via Black Ice technology (Prof. Said Al-Hallaj); Deep Sustainability Solutions for Northwestern (Prof. Patricia A. Beddows); Climate change, air quality and EVs (Prof. Daniel Ethan Horton) - Revamped official website and migrated it from Weebly to WordPress (https://sites.northwestern.edu/netg0/) - Built the alumni page and alumni network with consent outreach

Skills

Programming	Linux, Python, Git, VM, Ansible, Puppet, some DevOps-related things, and many things assisted by Claude and other AI, Zig (learning), AI/ML tools, prompting human intelligence
Characterization	Crystallography, Microscopy, Macro and Nanofabrication, Physical and Chemical Characterization Methods, Electrochemistry Methods, Scattering Methods
Languages	Fluent in Mandarin, Cantonese, English. B1 level in French and German (actively learning and improving both)

Teaching & Working Experience

2019–2023	Northwestern University Laboratory Assistant, Micro/Nano Fabrication Facility (Cleanroom)
2023 Winter	Northwestern University Teaching Assistant – Crystallography (CHEM 432), ~30 students
2021–2022 Winter	Northwestern University Teaching Assistant – Advanced Physical and Analytical Chemistry (CHEM 435/445), ~30–40 students/term
2021 Spring	Northwestern University Teaching Assistant – Organic Chemistry (SPS) (CHEM 230), 5 students
2019–2020 Winter	Northwestern University Teaching Assistant – Advanced Laboratory 2 (CHEM 350), ~15–20 students/term

2018 Fall –	Northwestern University
2020 Fall	Teaching Assistant – General Chemistry Labs (CHEM 142, 151, 181, 182), ~40–50 students/term
2017 Summer	University of Minnesota-Twin Cities
	Teaching Assistant – Advanced Inorganic Chemistry Laboratory (CHEM 4711W), ~30–40 students
2016 Fall –	University of Minnesota-Twin Cities
2018 Spring	Teaching Assistant – General Chemistry Laboratory (CHEM 1065, 1066, 1075H), ~40–50 students/term
2015 Fall –	University of Minnesota-Twin Cities
2016 Spring	Teaching Assistant – General Chemistry Discussion (CHEM 1061, 1062), ~20 students/term

Supervised & Supported Students

2022 Summer	Dereck Lefcort – Northwestern University IIN REU Summer Intern
	Project: qualitative and quantitative compositional analysis of Metal–Organic Frameworks (MOFs). Accepted to Northwestern as a graduate student in 2023.
2021–2023	Hupp group
	Supported and mentored 2 junior students on instrumentation, experimentation, and data analysis
2019	Undergraduate mentee
	Wrote letters of recommendation for summer research and internship applications

Community Service & Outreach

2022	STEM outreach at the Bloc (a boxing gym)
	Taught students how to build a remote-control car
2022 Summer	Expand Your Horizons Chicago
	IT
2022 Spring	Splash teaching
	Hydrogen fuel cell
2021–2022	Letters to a Pre-Scientist program
	Letters with 7th grade
2021–2022	Science in the classroom
	In-classroom science experiments/demos with 3rd or 4th grade
2021	Electrochemistry demo video
	https://youtu.be/qb-WW-nXaqU
2020–2021	Books & Breakfast
	Tutor for middle schoolers
2020–2021	Expand Your Horizons Chicago
	Workshop assistant and social media assistant
2019 Spring	ACS Great Lakes Regional Meeting
	Session presider
2014–2016	Minnesota Science Museum
	Activity leader presenting demos to children

Publications (24)

24. Duan, J.; Stadler, H. C.; Nan, J.; Matěj, Z.; Gotthard, G.; Dworkowski, F.; Bjelcic, M.; Aurelius, O.; Mozzanica, A.; Grimm, S.; Burian, M.; Ursby, T.; Wang, M.; Leonarski, F. JungfrauJoch: 38 GB s⁻¹ real-time serial crystallography – data acquisition and live indexing feedback. *J. Appl. Cryst.*, **2026**, *59*, 1668–1677.
23. Beavers, C.; Bernstein, H. J.; Brewster, A. S.; Burian, M.; Devenish, N.; Duan, J. D.; Eriksson, D.; Gämperle, D.; Ha, Y.; Hall, D. R.; Holton, J.; Keller, P.; Kroon-Batenburg, L.; Mittan-Moreau, D. W.; Nakaye, Y.; Paley, D. W.; Peisach, E.; Sauter, N. K.; Trampari, S.; Vonnrhein, C.; Waterman, D. G.; White, T. A.; Winter, G. Report of high data rate macromolecular crystallography (HDRMX) meeting, 23 July 2025. *Struct. Dyn.*, **2026**, *13*, 034301.

22. Chen, Z.; Rabbani, S. M. G., A.; Liu, Q.; Bi, W.; **Duan, J.**; Lu, Z.; Schweitzer, N. M.; Getman, R. B.; Hupp, J. T.; Chapman, K. W. Atomically Precise Single-Site Catalysts via Exsolution in a Polyoxometalate-Metal-Organic-Framework Architecture. *J. Am. Chem. Soc.*, **2024**, *146*, 7950-7955.
21. Campitelli, P.; Tombesi, A.; Nicola, C. D.; Pettinari, C.; Mauri, A.; Galli, S.; Yan, T.; Liu, D.; **Duan, J.**; Goswami, S.; Tuci, G.; Giambastiani, G.; Hupp, J. T.; Rossin, A. CO₂ Capture and Conversion to C1 Chemicals with Mixed-Metal Copper/Nickel Bis(amino)bipyrazolate Metal-Organic Frameworks. *ACS Appl. Energy Mater.*, **2023**, *6*, 9231-9242.
20. Wang, R.; Bukowski, B. C.; **Duan, J.**; Zhang, K.; Snurr, R. Q.; Hupp, J. T. Geometry and Chemistry: Influence of Pore Functionalization on Molecular Transport and Diffusion in Solvent-Filled Zirconium Metal-Organic Frameworks. *ACS Appl. Mater. Interfaces*, **2023**, *15*, 51854-51862.
19. Wang, Q.; **Duan, J.**; Goetjen, T.; Hupp, J. T.; Notestein, J. B. Bimetallic NiCu catalysts supported on a Metal-Organic framework for Non-oxidative ethanol dehydrogenation. *J. Catal.*, **2023**, *422*, 86-98.
18. Lu, Z.; **Duan, J.**; Tan, H.; Du, L.; Zhao, X.; Wang, R.; Kato, S.; Yang, S.; Hupp, J. T. Isomer of NU-1000 with a Blocking c-pore Exhibits High Water-Vapor Uptake Capacity and Greatly Enhanced Cycle Stability. *J. Am. Chem. Soc.*, **2023**, *145*, 4150-4157.
17. **Duan, J.**; Shabbir, H.; Chen, Z.; Bi, W.; Liu, Q.; Sui, J.; Đorđević, L.; Stupp, S. I.; Chapman, K. W.; Martinson, A. B.; Li, A.; Schaller, R. D.; Goswami, S.; Getman, R. B.; Hupp, J. T. Synthetic Access to a Framework-Stabilized and Fully Sulfided Analogue of an Anderson Polyoxometalate that is Catalytically Competent for Reduction Reactions. *J. Am. Chem. Soc.*, **2023**, *145*, 7268-7277.
16. Liu, Q.; Chen, Z.; Shabbir, H.; **Duan, J.**; Bi, W.; Lu, Z.; Schweitzer, N.; Alayoglu, S.; Goswami, S.; Chapman, K. W.; Getman, R. B.; Wang, Q.; Notestein, J. M.; Hupp, J. T. Presentation of gas-phase-reactant-accessible single-rhodium-atom catalysts for CO oxidation, via MOF confinement of an Anderson polyoxometalate. *J. Mater. Chem. A*, **2022**, *10*, 18226-18234.
15. Wang, X.; Ma, K.; Goh, T.; Mian, M. R.; Xie, H.; Mao, H.; **Duan, J.**; Kirlikovali, K. O.; Stone, A. E. B. S.; Ray, D.; Wasielewski, M. R.; Gagliardi, L.; Farha, O. K. Photocatalytic Biocidal Coatings Featuring Zr₆Ti₄-Based Metal-Organic Frameworks. *J. Am. Chem. Soc.*, **2022**, *144*, 12192-12201.
internal collaboration at Northwestern, published without Ph.D. advisor
14. Lu, Z.; **Duan, J.**; Du, L.; Liu, Q.; Schweitzer, N.; Hupp, J. T. Incorporation of Free Halide Ions Stabilizes Metal-Organic Frameworks (MOFs) Against Pore Collapse and Renders Large-pore Zr-MOFs Functional for Water Harvesting. *J. Mater. Chem. A*, **2022**, *10*, 6442-6447.

co-first author
13. **Duan, J.**; Goswami, S.; Patwardhan, S.; Hupp, J. T. Does the Mode of MOF/Electrode Adhesion Determine Rates for Redox-hopping-based Charge-Transport within Thin-film Metal-Organic Frameworks?. *J. Phys. Chem. C*, **2022**, *126*, 4601-4611.
12. **Duan, J.**; Goswami, S.; Hupp, J. T. Redox-hopping Based Charge Transport Mediated by Ru(II)-Polypyridyl Species Immobilized in a Mesoporous Metal-organic Framework. *Front. Chem. Eng.*, **2022**, *3*, 828266.
11. Wang, R.; Bukowski, B.; **Duan, J.**; Sui, J.; Snurr, R.; Hupp, J. T. Art of Architecture: Efficient Transport through Solvent-Filled Metal-Organic Frameworks Regulated by Topology. *Chem. Mater.*, **2021**, *33*, 6832-6840.
10. Li, X.; Yu, J.; Lu, Z.; **Duan, J.**; Fry, H.; Gosztola, D.; Maindan, K.; Rajasree, S.; Deria, P. Photoinduced Charge Transfer with a Small Driving Force Facilitated by Exciplex-like Complex Formation in Metal-Organic Frameworks. *J. Am. Chem. Soc.*, **2021**, *143*, 15286-15297.
external collaboration with Southern Illinois University, published without Ph.D. advisor
9. Lu, Z.; Wang, R.; Liao, Y.; Farha, O. K.; Bi, W.; Sheridan, T. R.; Zhang, K.; **Duan, J.**; Liu, J.; Hupp, J. T. Isomer of linker for NU-1000 yields a new she-type, catalytic, and hierarchically porous, Zr-based metal-organic framework. *Chem. Commun.*, **2021**, *57*, 3571-3574.
8. Ray, D.; Goswami, S.; **Duan, J.**; Hupp, J. T.; Cramer, C.; Gagliardi, L. Tuning the Conductivity of Hexa-Zirconium(IV) Metal-Organic Frameworks by Encapsulating Heterofullerenes. *Chem. Mater.*, **2021**, *33*, 1182-1189.
7. Nagatomi, H.; Gallington, L.; Goswami, S.; **Duan, J.**; Chapman, K.; Yanai, N.; Kimizuka, N.; Farha, O. K.; Hupp, J. T. Regioselective Functionalization of the Mesoporous Metal-Organic Framework, NU-1000, with Photo-Active Tris-(2,2'-bipyridine)ruthenium(II). *ACS Omega*, **2020**, *5*, 30299-30305.
6. Wang, R.; Bukowski, B. C.; **Duan, J.**; Sheridan, T. R.; Atilgan, A.; Zhang, K.; Snurr, R. Q.; Hupp, J. T. Investigating the Process and Mechanism of Molecular Transport within a Representative Solvent-Filled Metal-Organic Framework. *Langmuir*, **2020**, *36*, 10853-10859.
5. Kung, C.-W.; Goswami, S.; Hod, I.; Wang, T. C.; **Duan, J.**; Farha, O. K.; Hupp, J. T. Charge Transport in Zirconium-Based Metal-Organic Frameworks. *Acc. Chem. Res.*, **2020**, *53*, 1187-1195.
4. Goswami, S.; Hod, I.; **Duan, J.**; Kung, C.-W.; Rimoldi, M.; Malliakas, C. D.; Palmer, R. H.; Farha, O. K.; Hupp, J. T. Anisotropic Redox Conductivity within a Metal-Organic Framework Material. *J. Am. Chem. Soc.*, **2019**, *141*, 17696-17702.
3. Desai, S. P.; Ye, J.; Zheng, J.; Ferrandon, M. S.; Webber, T. E.; Platero-Prats, A. E.; **Duan, J.**; Garcia-Holley, P.; Camaioni, D. M.; Chapman, K. W.; Delferro, M.; Farha, O. K.; Fulton, J. L.; Gagliardi, L.; Lercher, J. A.; Penn, R. L.; Stein, A.; Lu, C. C. Well-Defined Rhodium-Gallium Catalytic Sites in a Metal-Organic Framework: Promoter-Controlled Selectivity in Alkyne Semihydrogenation to E-Alkenes. *J. Am. Chem. Soc.*, **2018**, *140*, 15309-15318.

2. Malonzo, C. D.; Wang, Z.; **Duan, J.**; Zhao, W.; Webber, T. E.; Li, Z.; Kim, I. S.; Kumar, A.; Bhan, A.; Platero-Prats, A. E.; Chapman, K. W.; Farha, O. K.; Hupp, J. T.; Martinson, A. B. F.; Penn, R. L.; Stein, A.; Lu, C. C. Application and Limitations of Nanocasting in Metal–Organic Frameworks. *Inorg. Chem.*, **2018**, *57*, 2782–2790.
1. Desai, S. P.; Malonzo, C. D.; Webber, T. E.; **Duan, J.**; Thompson, A. B.; Tereniak, S. J.; DeStefano, M. R.; Buru, C. T.; Li, Z.; Penn, R. L.; Farha, O. K.; Hupp, J. T.; Stein, A.; Lu, C. C. Assembly of dicobalt and cobalt–aluminum oxide clusters on metal–organic framework and nanocast silica supports. *Farad. Discuss.*, **2017**, *201*, 287–302.

Presentations

2026 Fall	Rhine-Knee Regiomeeting 2026 (Oral) Automation at the SLS 2.0 Macromolecular Crystallography (MX) Beamlines
2026 Summer	NOBUGS 2026 (New Opportunities for Better User Group Software) (Poster + flash presentation) Automation at the SLS 2.0 Macromolecular Crystallography (MX) Beamlines · poster
2025 Summer	American Crystallographic Association Annual Meeting (Oral) Navigating the Data Deluge at the SLS 2.0 Macromolecular Crystallography (MX) Beamlines
2024 Summer	15th International Conference on Synchrotron Radiation Instrumentation (SRI 2024) (Oral) JungfrauJoch: A System for 2 kHz Framerate Data Acquisition with Large Format Detector and Data Processing at 4th-Generation Synchrotrons and X-ray Free Electron Laser Facilities
2022 Fall	242nd Electrochemical Society Meeting (Oral, virtual recording) Suppressing the Dark Current through Interfacial Modification Using Metal–Organic Framework Thin Film Grown with Layer-By-Layer Method
2022 Fall	American Chemical Society Fall National Meeting (Oral) Does the Mode of Metal–Organic Framework/Electrode Adhesion Determine Rates for Redox-Hopping Based Charge Transport within Thin-Film Metal–Organic Frameworks?
2022 Spring	Great Lakes Chinese American Chemical Society Annual Meeting (Oral) Outstanding Student Research Award Does the Mode of Metal–Organic Framework/Electrode Adhesion Determine Rates for Redox-Hopping Based Charge Transport within Thin-Film Metal–Organic Frameworks?
2022 Spring	Gender Equity in Academic Research Symposium (Oral) Electrical Conductivity and Electrocatalytic Activity of Metal–Organic Frameworks
2021 Winter	239th Electrochemical Society Meeting with the 18th International Meeting on Chemical Sensors (Poster, virtual recording) The Balance between Conductivity and Electro-/Photo-Catalytic Performance of Guest-Incorporated Metal–Organic Frameworks · poster
2019 Fall	Nanoporous Materials Genome Center (NMGC) All-Hands Meeting (Poster) Engendering and Engineering Electrical Conductivity in Metal–Organic Frameworks
2018 Spring	American Chemical Society 255th National Meeting (Poster) Nanocasting—Introducing Secondary Supports into Metal–Organic Frameworks to Increase Their Stability

Professional Development

2025 Summer	PDB Deposition
2023 Fall	Advanced C++ (CSCS)
2022 Fall	Field-programmable Gate Array Training (NU-LED)
2022 Spring	NSF-sponsored Workshop to envision a National Facility for Automated Chemical Synthesis and Democratized Molecular Innovation
2022 Winter	M3S (Midwest Microscopy and Microanalysis Spring Meeting)
2022 Winter	2nd Annual Women in Microscopy Conference
2022 Winter	The US National Committee for Crystallography Workshop Series
2022 Summer	LabView Training (NU-LED) – equivalent to CLAD certification
2022 Summer	Kellogg certification – Management for Scientists and Engineers
2021 Fall	Laboratory Automation and Accelerated Synthesis: Empowering Tomorrow's Chemist
2021 Fall	4th US School on Total Scattering Analysis (PDFGui, RMCPProfile, DISCUS)

2021 Summer	23rd National School on Neutron and X-Ray Scattering (NXS2021)
2021 Spring	Telluride School on Fundamentals for Electrochemical Energy Conversion and Storage
2020 Fall	Rigaku School for Advanced Topics in Practical Crystallography (passed with honors)
2019 Fall	236th Electrochemical Society Meeting – Short Course on Advanced Impedance Spectroscopy