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PROFESSIONAL APPOINTMENTS

Harvard University

John L. Loeb Associate Professor of the Natural Sciences

2024–current

Faculty Associate, The Salata Institute for Climate and Sustainability

Member, Harvard Quantum Initiative

Assistant Professor of Chemistry & Chemical Biology

2018–2023

Northwestern University

Postdoctoral Associate (Advisor: Chad A. Mirkin)

2015–2017

Research focus: DNA-mediated assembly of plasmonic nanoparticles

EDUCATION

University of California, Berkeley

2010–2015

Ph.D. in Chemistry (Advisor: Jeffrey R. Long)

Thesis: Metal-Organic Frameworks for Gas Storage and Separation

University of Pennsylvania

2005–2009

M.S. in Chemistry (Advisor: Larry G. Sneddon)

Thesis: The Development of Novel Borate Anions for Use as Electrolytes
in Lithium-Ion Batteries

B.A. *summa cum laude* in Chemistry (minors: Mathematics and Economics)

RESEARCH INTERESTS

Synthesis of metal-organic materials with an emphasis on the development of strategies to control structure and porosity at multiple length scales; chemical approaches to manipulating entropy and phase transitions in solids; design of materials for thermal energy storage, heat management, and solid-state heat pumps; pressure-induced phase transitions; melting and crystallization phenomena, metal-organic glasses; gas adsorption in porous solids; thermal transport; porosity and gas absorption in liquids; physiological gas transport; nanomaterials.

AWARDS AND HONORS

Alfred P. Sloan Research Fellow

2024

ACS Award in Pure Chemistry

2024

Camille Dreyfus Teacher-Scholar Award

2023

NSF CAREER Award

2022

NETZSCH International Scientist Award

2022

Presidential Early Career Award for Scientists and Engineers (PECASE)

2022

Moore Inventor Fellow

2022

Ono Pharma Breakthrough Science Initiative Award	2022
Dream Chemistry Award	2021
Department of Energy Early Career Award	2020
George W. Merck Fellow	2020
Beckman Young Investigator Award	2019
Office of Naval Research Young Investigator Award	2019
Omar Farha Award for Research Leadership, Northwestern University	2016
International Institute for Nanotechnology Outstanding Research Award	2016
Reaxys PhD Prize Finalist	2016
Dan David Prize Postdoctoral Scholarship	2016
ACS Division of Inorganic Chemistry Young Investigator Award	2016
International Institute for Nanotechnology Postdoctoral Fellowship	2015
Chevron Research Fellowship	2014
Graduate Student Gold Award, Materials Research Society	2014
Glenn Award for the Division of Fuel Chemistry, American Chemical Society	2011
International Center for Materials Research Fellowship, Università Dell’Insubria	2011
National Science Foundation Graduate Research Fellowship	2009
Priestley Club Award, University of Pennsylvania	2009
Vagelos Science Challenge Award, University of Pennsylvania	2008
Phi Beta Kappa, University of Pennsylvania	2008
Hypercube Award for Computational Chemistry, University of Pennsylvania	2007

SCIENTIFIC PUBLICATIONS (ORCID: 0000-0003-0328-7775)

- (70) Calvin, J. J.; DelRe, C.; Erdosy, D. P.; Cho, J.; Hong, H.; Mason, J. A. “Thermodynamics of Polyethylene Glycol Intrusion in Microporous Water” *Nano Lett.* Accepted.
- (69) Carrizales, D. C.; Wang, R. K. C.; Nordlander, J.; Pan, G. A.; Ortega Ortiz, E. V.; Little, L.; McClelland, A.; Macomber, E.; Akey, A. J.; Mason, J. A.; Brooks, C. M.; Mundy, J. A.; Turkiewicz, A. B. “Transparent Superconductivity in Lithiated Indium Tin Oxide Thin Film” *Phys. Rev. Mater.* Accepted.
- (70) Li, Y.;[†] Stec, G. J.;[†] Kim, H. K.; Thapa, S.; Zhang, S.-L.; McClelland, A.; Mason, J. A. “Chiroptical Nanocluster–Organic Cocrystals” *Nat. Chem.* DOI: 10.1038/s41557-024-01696-6. [†]Equal author contribution.
- (67) Goodwin, Z.; Wenny, M.; Yang, J.; Cepellotti, A.; Ding, J.; Bystrom, K.; Dushatko, B.; Johansson, A.; Sun, L.; Batzner, S.; Musaelian, A.; Mason, J. A.; Kozinsky, B.; Molinari, N. “Transferability and Accuracy of Ionic Liquid Simulations with Equivariant Machine Learning Interatomic Potentials” *J. Phys. Chem. Lett.* **2024**, *15*, 7539–7547.
- (66) Seo, J.; Ukani, R.; Zheng, J.; Braun, J. D.; Wang, S.; Chen, F. E.; Kim, H. K.; Zhang, S.; Thai, C.; McGillicuddy, R. D.; Yan, H.; Vlassak, J. J.; Mason, J. A. “Barocaloric Effects in Dialkylammonium Halide Salts” *J. Am. Chem. Soc.* **2024**, *146*, 2736–2747.

- (65) Li, Y.;[†] Stec, G. J.;[†] Thorarinsdottir, A. E.; McGillicuddy, R. D.; Zheng, S.-L.; Mason, J. A. “The Role of Metal Accessibility on Carbon Dioxide Electroreduction in Atomically Precise Nanoclusters” *Chem. Sci.* **2023**, *14*, 12283–12291. [†]Equal author contribution.
- (64) DelRe, C.; Hong, H.; Wenny, M. B.; Erdosy, D. P.; Cho, J.; Lee, B.; Mason, J. A. “Design Principles for Using Amphiphilic Polymers to Create Microporous Water” *J. Am. Chem. Soc.* **2023**, *145*, 19982–19988.
- (63) Thorarinsdottir, A. E.;[†] Erdosy, D. P.;[†] Costentin, C.; Mason, J. A.; Nocera, D. G. “Enhanced Activity for the Oxygen Reduction Reaction in Microporous Water” *Nat. Catal.* **2023**, *6*, 425–434. [†]Equal author contribution.
- (62) Li, Y.;[†] Kim, H. K.;[†] McGillicuddy, R. D.;[†] Zheng, S.-L.; Anderton, K. J.; Stec, G. J.; Lee, J.; Cui, D.; Mason, J. A. “A Double Open-Shell Au₄₃ Nanocluster with Increased Catalytic Activity and Stability” *J. Am. Chem. Soc.* **2023**, *145*, 9304–9312. [†]Equal author contribution.
- (61) Pappas, N. S.; Mason, J. A. “Effect of Modulator Ligands on the Growth of Co₂(dobdc) Nanorods” *Chem. Sci.* **2023**, *14*, 4647–4652.
- (60) Segedin, D. F.; Goodge, B. H.; Pan, G. A.; Song, Q.; El-Sherif, H.; Doyle, S.; Turkiewicz, A.; Taylor, N. K.; Mason, J. A.; Paik, H.; El Baggari, I.; Kourkoutis, L. F.; Brooks, C. M.; Mundy, J. A. “Limits to the Strain Engineering of Layered Square-Planar Nickelate Thin Films” *Nat. Commun.* **2023**, *14*, 1468.
- (59) Wenny, M. B.; Walter, M. V.; Slavney, A. H.; Mason, J. A. “Generalizable Synthesis of Highly Fluorinated Ionic Liquids” *J. Phys. Chem. B* **2023**, *127*, 2028–2033.
- (58) Liu, M.; Slavney, A. H.; Tao, S.; McGillicuddy, R. D.; Lee, C. C.; Wenny, M. B.; Billinge, S. J. L.; Mason, J. A. “Designing Glass and Crystalline Phases of Metal–Bis(acetamide) Networks to Promote High Optical Contrast” *J. Am. Chem. Soc.* **2022**, *144*, 22262–22271.
- (57) Siegelman, R. L.; Thompson, J. A.; Mason, J. A.; McDonald, T. M.; Long, J. R. “A Cooperative Adsorbent for the Switch-Like Capture of Carbon Dioxide from Crude Natural Gas” *Chem. Sci.* **2022**, *13*, 11772–11784.
- (56) Erdosy, D. P.;[†] Wenny, M. B.;[†] Cho, J.;[†] DelRe, C.; Walter, M. V.; Jiménez-Ángeles, F.; Qiao, B.; Sanchez, R.; Peng, Y.; Polizzotti, B. D.; Olvera de la Cruz, M.; Mason, J. A. “Microporous Water with High Gas Solubilities” *Nature* **2022**, *608*, 712–718. [†]Equal author contribution.
- Featured on the cover of *Nature* and highlighted in the Harvard Gazette, *Nature* podcasts, and *NewScientist*.
- (55) Slavney, A. H.; Kim, H. K.; Tao, S.; Liu, M.; Billinge, S. J. L.; Mason, J. A. “Liquid and Glass Phases of an Alkylguanidinium Sulfonate Hydrogen-Bonded Organic Framework” *J. Am. Chem. Soc.* **2022**, *144*, 11064–11068.

- (54) Seo, J.; McGillicuddy, R. D.; Slavney, A. H.; Zhang, S.; Ukani, R.; Yakovenko, A. A.; Zheng, S.-L.; Mason, J. A. “Colossal Barocaloric Effects with Ultralow Hysteresis in Two-Dimensional Metal–Halide Perovskites” *Nat. Commun.* **2022**, *13*, 2536.
- Highlighted in the Harvard Gazette and the Advanced Photon Source Science Highlights.
- (53) Seo, J.;[†] Braun, J. D.;[†] Dev, V. M.; Mason, J. A. “Driving Barocaloric Effects in a Molecular Spin-Crossover Complex at Low Pressures” *J. Am. Chem. Soc.* **2022**, *144*, 6493–6503. [†]Equal author contribution.
- Featured in *JACS* Spotlights.
- (52) Wenny, M. B.; Molinari, N.; Slavney, A. H.; Thapa, S.; Lee, B.; Kozinsky, B.; Mason, J. A. “Understanding Relationships Between Free Volume and Oxygen Absorption in Ionic Liquids” *J. Phys. Chem. B* **2022**, *126*, 1268–1274.
- (51) Pan, G. A.; Segedin, D. F.; LaBollita, H.; Song, Q.; Nica, E. M.; Goodge, B. H.; Pierce, A. T.; Doyle, S.; Novakov, S.; Carrizales, D. C.; N’Diaye, A. T.; Shafer, P.; Paik, H.; Heron, J. T.; Mason, J. A.; Yacoby, A.; Kourkoutis, L. F.; Erten, O.; Brooks, C. M.; Botana, A. S.; Mundy, J. A. “Superconductivity in a Quintuple-Layer Square-Planar Nickelate” *Nat. Mater.* **2022**, *21*, 160–164.
- (50) Carsch, K. M.; Iliescu, A.; McGillicuddy, R. D.; Mason, J. A.; Betley, T. A. “Reversible Scavenging of Dioxygen from Air by a Copper Complex” *J. Am. Chem. Soc.* **2021**, *143*, 18346–18352.
- (49) Liu, M.; McGillicuddy, R. D.; Vuong, H.; Tao, S.; Slavney, A. H.; Gonzalez, M. I.; Billinge, S. J. L.; Mason, J. A. “Network-Forming Liquids from Metal-Bis(acetamide) Frameworks with Low Melting Temperatures” *J. Am. Chem. Soc.* **2021**, *143*, 2801–2811.
- (48) McGillicuddy, R. D.; Thapa, S.; Wenny, M. B.; Gonzalez, M. I.; Mason, J. A. “Metal–Organic Phase-Change Materials for Thermal Energy Storage” *J. Am. Chem. Soc.* **2020**, *142*, 19170–19180.
- Featured in *JACS* Spotlights.
- (47) Zhou, W.; Lin, Q.-Y.; Mason, J. A.; Dravid, V. P.; Mirkin, C. A. “Design Rules for Template-Confined DNA-Mediated Nanoparticle Assembly” *Small* **2018**, *14*, 1802742.
- (46) Taylor, M. K.; Runčevski, T.; Oktawiec, J.; Bachman, J. E.; Siegelman, R. L.; Jiang, H. Z. H.; Mason, J. A.; Tarver, J. D.; Long, J. R. “Near-Perfect CO₂/CH₄ Selectivity Achieved through Reversible Guest Templating in the Flexible Metal-Organic Framework Co(bdp)” *J. Am. Chem. Soc.* **2018**, *140*, 10324–10331.
- (45) Aubrey, M. L.; Wiers, B. M.; Andrews, S. C.; Sakurai, T.; Reyes-Lillo, S. E.; Hamed, S. M.; Yu, C.-J.; Darago, L. E.; Mason, J. A.; Baeg, J.-O.; Grandjean, F.; Long, G. J.; Seki, S.; Neaton, J. B.; Yang, P.; Long, J. R. “Electron Delocalization and Charge Mobility as a Function of Reduction in a Metal-Organic Framework” *Nat. Mater.* **2018**, *17*, 625–632.
- (44) Wang, S.; McGuirk, M.; d’Aquino, A.; Mason, J. A.; Mirkin, C. A. “Metal-Organic Framework Nanoparticles” *Adv. Mater.* **2018**, *30*, 1800202.

- (43) Lin, Q.-Y.; Palacios, E.; Zhou, W.; Li, Z.; Mason, J. A.; Liu, Z.; Lin, H.; Chen, P.-C.; Dravid, V. P.; Aydin, K.; Mirkin, C. A. “DNA-Mediated Size-Selective Nanoparticle Assembly for Multiplexed Surface Encoding” *Nano Lett.* **2018**, *18*, 2645–2649.
- (42) Gonzalez, M. I.; Kapelewski, M. T.; Bloch, E. D.; Milner, P. J.; Reed, D. A.; Hudson, M. R.; Mason, J. A.; Barin, G.; Brown, C. M.; Long, J. R. “Separation of Xylene Isomers through Multiple Metal Site Interactions in Metal-Organic Frameworks” *J. Am. Chem. Soc.* **2018**, *140*, 3412–3422.
- (41) Lin, Q.-Y.;[†] Mason, J. A.;[†] Li, Z.;[†] Zhou, W.; O’Brien, M. N.; Brown, K. A.; Jones, M. R.; Butun, S.; Lee, B.; Dravid, V. P.; Aydin, K.; Mirkin, C. A. “Building Superlattices from Individual Nanoparticles via Template-Confined DNA-Mediated Assembly” *Science* **2018**, *359*, 669–672. [†]Equal author contribution.
- Highlighted by *Newsweek Magazine*
- (40) 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.
- Highlighted by Lawrence Berkeley National Laboratory, Department of Energy Office of Science, Advanced Photon Source at Argonne National Laboratory
- (39) Siegelman, R. L.; McDonald, T. M.; Gonzalez, M. I.; Martell, J.; Milner, P. J.; Mason, J. A.; Berger, A. H.; Bhowm, A. S.; Long, J. R. “Controlling Cooperative CO₂ Adsorption in Diamine-Appended Mg₂(dobpdc) Metal-Organic Frameworks” *J. Am. Chem. Soc.* **2017**, *139*, 10526–10538.
- (38) Vlaisavljevich, B.; Huck, J. M.; Hulvey, Z.; Lee, K.; Mason, J. A.; Neaton, J. B.; Long, J. R.; Brown, C. M.; Alfè, D.; Michaelides, A.; Smit, B. “Performance of Van der Waals Corrected Functionals for Guest Adsorption in a Series of Metal-Organic Frameworks” *J. Phys. Chem. A* **2017**, *121*, 4139–4151.
- (37) Gonzalez, M. I.; Mason, J. A.; Bloch, E. D.; Teat, S. J.; Gagnon, K. J.; Morrison, G. Y.; Queen, W. L.; Long, J. R. “Structural Characterization of Framework-Gas Interactions in the Metal-Organic Framework Co₂(dobdc) by *in situ* Single-Crystal X-ray Diffraction” *Chem. Sci.* **2017**, *8*, 4387–4398.
- (36) Gómora-Figueroa, A. P.; Mason, J. A.; Gonzalez, M. I.; Bloch, E. D.; Meihaus, K. R. “Metal Insertion in a Methylamine-Functionalized Zirconium Metal-Organic Framework” *Inorg. Chem.* **2017**, *56*, 4308–4316.
- (35) DeSantis, D.; Mason, J. A.; James, B. D.; Houchins, C.; Long, J. R.; Veenstra, M. “Techno-Economic Analysis of Metal-Organic Frameworks for Hydrogen and Natural Gas Storage” *Energy Fuels* **2017**, *31*, 2024–2032.
- (34) Taylor, M. K.; Runčevski, T.; Oktawiec, J.; Gonzalez, M. I.; Siegelman, R. L.; Mason, J. A.; Ye, J.; Brown, C. M.; Long, J. R. “Tuning the Adsorption-Induced Phase Change in the Flexible Metal-Organic Framework Co(bdp)” *J. Am. Chem. Soc.* **2016**, *138*, 15019–15026.

- (33) Levine, D. J.; Runčevski, T.; Kapelewski, M. T.; Keitz, B. K.; Oktawiec, J.; Reed, D. A.; Mason, J. A.; Jiang, H. Z. H.; Colwell, K. A.; Legendre, C.; FitzGerald, S. A.; Long, J. R. "Olsalazine-Based Metal-Organic Frameworks as Biocompatible Platforms for H₂ Adsorption and Drug Delivery" *J. Am. Chem. Soc.* **2016**, *138*, 10143–10150.
- (32) Ashley, M. J.; O'Brien, M. N.; Hedderick, K. R.; Mason, J. A.; Ross, M. B.; Mirkin, C. A. "Templated Synthesis of Uniform Perovskite Nanowire Arrays" *J. Am. Chem. Soc.* **2016**, *138*, 10096–10099.
- (31) Mason, J. A.; Laramy, C. R.; Lai, C.-T.; O'Brien, M. N.; Lin, Q.-Y.; Dravid, V. P.; Schatz, G. C.; Mirkin, C. A. "Contraction and Expansion of Stimuli-Responsive DNA Bonds in Flexible Colloidal Crystals" *J. Am. Chem. Soc.* **2016**, *138*, 8722–8725.
- (30) 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.
- (29) 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.
- (28) Demir, S.; Brune, N. K.; Van Humbeck, J. F.; Mason, J. A.; Plakhova, T. V.; Wang, S.; Tian, G.; Minasian, S. G.; Tyliczszak, T.; Yaita, T.; Kobayashi, T.; Kalmykov, S. N.; Shiwaku, H.; Shuh, D. K.; Long, J. R. "Extraction of Lanthanide and Actinide Ions from Aqueous Mixtures Using a Carboxylic Acid-Functionalized Porous Aromatic Framework" *ACS Cent. Sci.* **2016**, *2*, 253–265.
- (27) Tsivion, E.; Mason, J. A.; Gonzalez, M. I.; Long, J. R.; Head-Gordon, M. "A Computational Study of CH₄ Storage in Porous Framework Materials with Metalated Linkers: Connecting the Atomistic Character of CH₄ Binding Sites to Usable Capacity" *Chem. Sci.* **2016**, *7*, 4503–4518.
- (26) Gygi, D.; Bloch, E. D.; Mason, J. A.; Hudson, M. R.; Gonzalez, M. I.; Siegelman, R. L.; Darwish, T. A.; Queen, W. L.; Brown, C. M.; Long, J. R. "Hydrogen Storage in the Expanded Pore Metal-Organic Frameworks M₂(dobpdc) (M = Mg, Mn, Fe, Co, Ni, Zn)" *Chem. Mater.* **2016**, *28*, 1128–1138.
- (25) Gallagher, A. T.; Kelty, M. L.; Park, J. G.; Anderson, J. S.; Mason, J. A.; Collins, S. L.; Harris, T. D. "Dioxygen Binding at a Four-Coordinate Cobaltous Porphyrin Site in a Metal-Organic Framework" *Inorg. Chem. Front.* **2016**, *3*, 536–540.
- (24) Mason, J. A.; Oktawiec, J.; Taylor, M. K.; Hudson, M. R.; Rodriguez, J.; Bachman, J. E.; Gonzalez, M. I.; Cervellino, A.; Guagliardi, A.; Brown, C. M.; Llewellyn, P. L.; Masciocchi, N.; Long, J. R. "Methane Storage in Flexible Metal-Organic Frameworks with Intrinsic Thermal Management" *Nature* **2015**, *527*, 357–361.
- Highlighted by *MIT Technology Review*, *The Wall Street Journal*, Hart Energy *Downstream Business*, Lawrence Berkeley National Laboratory, the Society of Tribologists and Lubrication Engineers

- (23) Mason, J. A.; Darago, L. E.; Lukens, W. W. Jr.; Long, J. R. "Synthesis and O₂ Reactivity of a Titanium(III) Metal-Organic Framework" *Inorg. Chem.* **2015**, *54*, 10096–10104.
- (22) Hulvey, Z.; Vlasisavljevich, B.; Mason, J. A.; Tsivion, E.; Dougherty, T. P.; Bloch, E. D.; Head-Gordon, M.; Smit, B.; Long, J. R.; Brown, C. M. "Critical Factors Driving the High Volumetric Uptake of Methane in Cu₃(btc)₂" *J. Am. Chem. Soc.* **2015**, *137*, 10816–10825.
- (21) Mason, J. A.; McDonald, T. M.; Bae, T.-H.; Bachman, J. E.; Sumida, K.; Dutton, J. J.; Kaye, S. S.; Long, J. R. "Application of a High-Throughput Analyzer in Evaluating Solid Adsorbents for Post-Combustion Carbon Capture via Multicomponent Adsorption of CO₂, N₂, and H₂O" *J. Am. Chem. Soc.* **2015**, *137*, 4787–4803.
- (20) McDonald, T. M.; Mason, J. A.; Kong, X.; Bloch, E. D.; Gygi, D.; Dani, A.; Crocellà, V.; Giordanino, F.; Odoh, S. O.; Drisdell, W. S.; Vlasisavljevich, B.; Dzubak, A. L.; Poloni, R.; Schnell, S. K.; Planas, N.; Lee, K.; Pascal, T.; Wan, L. F.; Prendergast, D.; Neaton, J. B.; Smit, B.; Kortright, J. B.; Gagliardi, L.; Bordiga, S.; Reimer, J. A.; Long, J. R. "Cooperative Insertion of CO₂ in Diamine-Appended Metal-Organic Frameworks" *Nature* **2015**, *519*, 303–308.
- Highlighted by a *Nature* perspective, *Industria Quimica*, Department of Energy Basic Energy Sciences
- (19) Gonzalez, M. I.; Bloch, E. D.; Mason, J. A.; Teat, S. J.; Long, J. R. "Single-Crystal-to-Single-Crystal Metalation of a Metal-Organic Framework: A Route Toward Structurally Well-Defined Catalysts" *Inorg. Chem.* **2015**, *54*, 2995–3005.
- (18) Chen, J. J.; Mason, J. A.; Bloch, E. D.; Gygi, D.; Long, J. R.; Reimer, J. A. "NMR Relaxation and Exchange in Metal-Organic Frameworks for Surface Area Screening" *Microporous Mesoporous Mater.* **2015**, *205*, 65–69.
- (17) Anderson, J. S.; Gallagher, A. T.; Mason, J. A.; Harris, T. D. "A Five-Coordinate Heme Dioxygen Adduct Isolated within a Metal-Organic Framework" *J. Am. Chem. Soc.* **2014**, *136*, 16489–16492.
- (16) Queen, W. L.; Hudson, M. R.; Bloch, E. D.; Mason, J. A.; Gonzalez, M.; Lee, J. S.; Gygi, D.; Howe, J. D.; Lee, K.; Darwish, T. A.; James, M.; Peterson, V. K.; Teat, S. J.; Smit, B.; Neaton, J. B.; Long, J. R.; Brown, C. M. "Comprehensive Study of Carbon Dioxide Adsorption in the Metal-Organic Frameworks M₂(dobdc) (M = Mg, Mn, Fe, Co, Ni, Cu, Zn)" *Chem. Sci.* **2014**, *5*, 4569–4581.
- (15) 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 Sites" *J. Am. Chem. Soc.* **2014**, *136*, 10752–10761.
- (14) Bloch, E. D.; Hudson, M. R.; Mason, J. A.; Chavan, S.; Crocellà, V.; Howe, J. D.; Lee, K.; Dzubak, A. L.; Queen, W. L.; Zadrozny, J. M.; Geier, S. J.; Lin, L.-C.; Gagliardi, L.; Smit, B.; Neaton, J. B.; Bordiga, S.; Brown, C. M.; Long, J. R. "Reversible CO Binding Enables Tunable CO/H₂ and CO/N₂ Separations in Metal-Organic Frameworks with Exposed Divalent Metal Cations" *J. Am. Chem. Soc.* **2014**, *136*, 10752–10761.

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- Highlighted by NIST, *Scientific American*
- (12) Mason, J. A.; Veenstra, M.; Long, J. R. "Evaluating Metal-Organic Frameworks for Natural Gas Storage" *Chem. Sci.* **2014**, *5*, 32–51.
- (11) FitzGerald, S. A.; Pierce, C. J.; Rowsell, J. L. C.; Bloch, E. D.; Mason, J. A. "Highly Selective Quantum Sieving of D₂ from H₂ by a Metal-Organic Framework as Determined by Gas Manometry and Infrared Spectroscopy" *J. Am. Chem. Soc.* **2013**, *135*, 9458–9464.
- (10) Herm, Z. R.; Wiers, B. M.; Mason, J. A.; van Baten, J. M.; Hudson, M. R.; Zajdel, P.; Brown, C. M.; Masciocchi, N.; Krishna, R.; Long, J. R. "Separation of Hexane Isomers in a Metal-Organic Framework with Triangular Channels" *Science* **2013**, *340*, 960–964.
- Highlighted by NIST, *MIT Technology Review*
- (9) Das, A.; Choucair, M.; Southon, P. D.; Mason, J. A.; Zhao, M.; Kepert, C. J.; Harris, A. D.; D'Alessandro, D. M. "Application of the Piperazine Grafted CuBTri Metal-Organic Framework in Postcombustion Carbon Dioxide Capture" *Microporous Mesoporous Mater.* **2013**, *174*, 74–80.
- (8) Geier, S. J.; Mason, J. A.; Bloch, E. D.; Queen, W. L.; Hudson, M. R.; Brown, C. M.; Long, J. R. "Selective Adsorption of Ethylene over Ethane and Propylene over Propane in the Metal-Organic Frameworks M₂(dobdc) (M = Mg, Mn, Fe, Co, Ni, Zn)" *Chem. Sci.* **2013**, *4*, 2054–2061.
- (7) Bae, T.-H.; Hudson, M. R.; Mason, J. A.; Queen, W. L.; Dutton, J. J.; Sumida, K.; Micklash, K. J.; Kaye, S. S.; Brown, C. M.; Long, J. R. "Evaluation of Cation-Exchanged Zeolite Adsorbents for Post-Combustion Carbon Dioxide Capture" *Energy Environ. Sci.* **2013**, *6*, 128–138.
- (6) Kong, X.; Scott, E.; Ding, W.; Mason, J. A.; Long, J. R.; Reimer, J. A. "CO₂ Dynamics in a Metal-Organic Framework with Open Metal Sites" *J. Am. Chem. Soc.* **2012**, *134*, 14341–14344.
- (5) McDonald, T. M.; Lee, W. R.; Mason, J. A.; Wiers, B. M.; Hong, C. S.; Long, J. R. "Capture of Carbon Dioxide from Air and Flue Gas in the Alkylamine-Appended Metal-Organic Framework mmen-Mg₂(dobpdc)" *J. Am. Chem. Soc.* **2012**, *134*, 7056–7065.
- (4) Queen, W. L.; Bloch, E. D.; Brown, C. M.; Hudson, M. R.; Mason, J. A.; Murray, L. J.; Ramirez-Cuesta, A. J.; Peterson, V. K.; Long, J. R. "Hydrogen Adsorption in the Metal-Organic Frameworks Fe₂(dobdc) and Fe₂(O₂)(dobdc)" *Dalton Trans.* **2012**, *41*, 4180–4187.
- (3) Hudson, M. R.; Queen, W. L.; Mason, J. A.; Fickel, D. W.; Lobo, R. F.; Brown, C. M. "Unconventional, Highly Selective CO₂ Adsorption in Zeolite SSZ-13" *J. Am. Chem. Soc.* **2012**, *134*, 1970–1973.

- (2) Sumida, K.; Rogow, D. L.; Mason, J. A.; McDonald, T. M.; Bloch, E. D.; Herm, Z. R.; Bae, T.-H.; Long, J. R. “Carbon Dioxide Capture in Metal-Organic Frameworks” *Chem. Rev.* **2012**, *112*, 724–781.
- (1) Mason, J. A.; Sumida, K.; Herm, Z. R.; Krishna, R.; Long, J. R. “Evaluating Metal-Organic Frameworks for Post-Combustion Carbon Dioxide Capture via Temperature Swing Adsorption” *Energy Environ. Sci.* **2011**, *4*, 3030–3040.

PATENTS

- (12) “Systems and Methods for Treating And/Or Preventing Decompression Sickness” Mason, J. A.; Erdosy, D. P.; Peng, Y. Provisional patent application filed September 2024.
- (11) “Methods, Compositions, and Systems for Solvocaloric Applications” Mason, J. A.; Chen, F. E.; Laorenza, D. W.; Seo, J. Provisional patent application filed July 26, 2024, 63/676,062.
- (10) “Microporous Hydrogels” Mason, J. A.; Cho, J.; Kim, H. K. Provisional patent application filed October 31, 2023, 63/546,709.
- (9) “Vapor-Swing Refrigeration Cycle” Mason, J. A.; Seo, J.; Slavney, A. H. Provisional patent application filed September 22, 2023, 63/546,709.
- (8) “Microporous Particles to Enhance Gas Transport in Membranes” Mason, J. A.; Nocera, D. G. Thorarinsdottir, A. E.; Erdosy, D. P. Patent application filed April 17, 2024, PCT/US24/24916.
- (7) “Inverted Barocaloric Effects” Mason, J. A.; Seo, J.; Slavney, A. H. Patent application filed October 12, 2023, PCT/US23/35046.
- (6) “Soft Organic Salts for Barocaloric Heat Transfer and Storage” Mason, J. A.; Seo, J.; Chen, F. E.; Braun, J. D. Patent application filed October 12, 2023, PCT/US23/35051.
- (5) “Devices, Methods, and Systems for Regenerative Barocaloric Heat Transfer” Mason, J. A.; Slavney, A. H.; Seo, J.; Dev, V. M. Patent application filed August 16, 2023, PCT/US23/30349.
- (4) “Methods, Devices, and Systems for Control of Heat Transfer Using Spin Crossover” Mason, J. A.; Seo, J.; McGillicuddy, R. D.; Braun, J. D.; Ukani, R. Patent application filed August 30, 2022, US 18/687,928.
- (3) “Methods, Compositions and Systems for Solid-State Barocaloric Applications” Mason, J. A.; Seo, J. Patent application filed April 7, 2022, US 18/285,899.
- (2) “Polar Liquids with High Porosity and Uses Thereof” Mason, J. A.; Erdosy, D. P.; Wenny, M. B.; Cho, J.; DelRe, C. Patent application filed October 8, 2021, US 18/030,858.
- (1) “Adsorbents with Stepped Isotherms for Gas Storage Applications” Long, J. R.; Mason, J. A.; Taylor, M. K.; Oktawiec, J. July 7, 2020, US 10/702,850 B2.

INVITED PRESENTATIONS

- (83) *Nanoporous Materials and Their Applications, Gordon Research Conference – Andover, NH, August 2025*

- (82) *Self-Assembly and Supramolecular Chemistry, Gorgon Research Conference* – Les Diablerets, Switzerland, May **2025**
- (81) *University of Oregon, Department of Chemistry* – Eugene, OR, April **2025**
- (80) *Spring MRS Meeting “Solid Materials for Sustainable Cooling: Caloric Effects and Devices” Symposium* – Seattle, WA, April **2025**
- (79) *Northwestern University, Frontiers in Nanotechnology Seminar Series* – Evanston, IL, January **2025**
- (78) *University of California, Berkeley, College of Chemistry* – Berkeley, CA, December **2024**
- (77) *Fall MRS Meeting “Atomic Precision in Nanocluster Engineering” Symposium* – Boston, MA, December **2024**
- (76) *Cornell University, Department of Chemistry* – Ithaca, NY, November **2024**
- (75) *University of Chicago, Department of Chemistry* – Chicago, IL, November **2024**
- (74) *University of Washington, Department of Chemistry* – Seattle, WA, October **2024**
- (73) *University of North Texas, Department of Chemistry* – Denton, TX, October **2024**
- (72) *Texas A&M University, Department of Chemistry* – College Station, TX, October **2024**
- (71) *Calorics 2024* – Cambridge, UK, September **2024**
- (70) *John Hopkins University, Department of Chemistry* – Baltimore, MD, September **2024**
- (69) *9th International Conference on Metal–Organic Frameworks and Open Framework Compounds* – Singapore, July **2024**
- (68) *Hong Kong University, Department of Chemistry* – Hong Kong, July **2024**
- (67) *California Institute of Technology, Department of Chemistry* – Pasadena, CA, May **2024**
- (66) *Stanford University, Department of Chemistry* – Stanford, CA, May **2024**
- (66) *IEA EBC Annex 92 - Smart Materials for Energy-Efficient Heating, Cooling, and IAQ Control in Residential Buildings, Kickoff Meeting (Keynote Lecture)* – Syracuse, NY, May **2024**
- (65) *University of Rochester, Department of Chemistry* – Rochester, NY, May **2024**
- (64) *UCLA, Department of Chemistry* – Los Angeles, CA, April **2024**
- (63) *Columbia University, Department of Chemistry* – New York, NY, April **2024**
- (62) *ACS “Global Virtual Symposium: Metal–Organic Frameworks and Metal Nanoclusters” Symposium* – Virtual, March **2024**
- (61) *ACS “Division of Inorganic Chemistry National Awards Plenary” Symposium* – New Orleans, LA, March **2024**
- (60) *Gordon Research Seminar on Atomically Precise Nanochemistry (Keynote Lecture)* – Galveston, TX, February **2024**
- (59) *Massachusetts Institute of Technology, Department of Chemistry* – Cambridge, MA, January **2024**
- (58) *Brown University, Department of Chemistry* – Providence, RI, January **2024**
- (57) *University of California San Diego, Department of Chemistry* – San Diego, CA, December **2023**
- (56) *Michigan State University, Department of Chemistry* – East Lansing, MI, November **2023**
- (55) *European Conference on Metal–Organic Frameworks and Porous Polymers* – Granada, Spain, September **2023**
- (54) *Brandeis University, Department of Chemistry* – Waltham, MA, September **2023**

- (53) *ACS “Henkel Award for Outstanding Graduate Research in Polymer Science and Engineering” Symposium* – San Francisco, CA, August **2023**
- (52) *MIT Lincoln Laboratory, Structural and Thermal-Fluids Engineering Group* – Lexington, MA, August **2023**
- (51) *ONO Pharma Foundation Annual Symposium 2023* – San Francisco, CA, June **2023**
- (50) *Northeast Regional Meeting of the American Chemical Society* – Boston, MA, June **2023**
- (49) *Telluride Workshop “Returning to the Molecule: Thinking at the Chemical Level to Advance Understanding and Function in Synthetic Porous Frameworks”* – Telluride, CO, June **2023**
- (48) *Rice University, Department of Chemistry* – Houston, TX, May **2023**
- (47) *University of Houston, Department of Chemistry* – Houston, TX, May **2023**
- (46) *Spring MRS Meeting “Caloric Materials for Heating and Cooling” Symposium* – San Francisco, CA, April **2023**
- (46) *Dream Chemistry Award Symposium (Institute of Physical Chemistry of the Polish Academy of Sciences)* – Warsaw, PL, December **2022**
- (45) *New England Complex Fluids Workshop* – Cambridge, MA, December **2022**
- (44) *Draper* – Cambridge, MA, November **2022**
- (43) *Every Breath Counts Coalition* – Virtual, October **2022**
- (42) *Bosch Thermotechnology* – Watertown, MA, October **2022**
- (41) *US Department of Defense Basic Research Forum* – Virtual, September **2022**
- (40) *35th International Thermal Conductivity Conference (Plenary Speaker)* – Lowell, MA, September **2022**
- (39) *University of Oxford, Department of Chemistry* – Oxford, UK, June **2022**
- (38) *University of Glasgow, Department of Chemistry* – Glasgow, UK, June **2022**
- (37) *University of Cambridge, Department of Chemistry* – Cambridge, UK, June **2022**
- (36) *Boston University, Department of Chemistry* – Boston, MA, May **2022**
- (35) *Harvard University, Department of Molecular and Cellular Biology* – Cambridge, MA, April **2022**
- (34) *Harvard Medical School, Bridges to Industry Program* – Virtual, March **2022**
- (33) *BASF Special Seminar* – Virtual, February **2022**
- (32) *PacifiChem 2021 Congress “Electric/Ionic Transport in Metal Organic Frameworks for Energy Device Applications”* – Virtual, December **2021**
- (31) *Dream Chemistry Award (Institute Biochemistry and Organic Chemistry of the Czech Academy of Sciences)* – Prague, CZ, December **2021**
- (30) *Brooklyn College, City University of New York (Physics Department)* – virtual, November **2021**
- (29) *NORA Meets BASF Challenges Meeting* – Cambridge, MA, November **2021**
- (28) *Fall MRS Meeting “Solid-State Chemistry of New Materials” Symposium* – Boston, MA, November **2021**
- (27) *ACS “Hybrid Functional Materials from Controlled Assembly of Polymer and Inorganic Nanoparticles” Symposium* – Virtual, August **2021**
- (26) *NETZSCH Digital Sales Meeting* – Virtual, July **2021**
- (25) *ACS “Harry Gray Award for Creative Work in Inorganic Chemistry by a Young Investigator” Symposium* – Virtual, April **2021**
- (24) *UMass Lowell* – Lowell, MA, December **2019**

- (23) *Harvard Science Research Conference* – Cambridge, MA, October **2019**
- (22) *ACS “Award in Pure Chemistry” Symposium* – San Diego, CA, August **2019**
- (21) *ACS “F. Albert Cotton Award in Synthetic Inorganic Chemistry” Symposium* – Orlando, FL, April **2019**
- (20) *Harvard Center for Green Buildings and Cities* – Cambridge, MA, September **2018**
- (19) *MRS Biomolecular Self-Assembly for Materials Design Symposium* – Boston, MA, November **2017**
- (18) *MOF Young Investigator Symposium* – Delft, Netherland, October **2017**
- (17) *The 6th International Conference on DNA Nanotechnology* – Beijing, China, August **2017**
- (16) *SPIE-MRSEC Student Seminar Series at Northwestern University* – Evanston, IL August **2017**
- (15) *ACS “Applications of X-Ray and Neutron Scattering Techniques in Energy Technologies” Symposium* – San Francisco, CA, April **2016**
- (14) *University of California, Berkeley* – Berkeley, CA, February **2016**
- (13) *University of Wisconsin–Madison* – Madison, WI, January **2016**
- (12) *University of Washington at Seattle* – Seattle, WA, January **2016**
- (11) *California Institute of Technology* – Pasadena, CA, January **2016**
- (10) *Harvard University* – Cambridge, MA, January **2016**
- (9) *Princeton University* – Princeton, NJ, January **2016**
- (8) *University of Texas at Austin* – Austin, Texas, January **2016**
- (7) *École Polytechnique Fédérale de Lausanne* – Lausanne, Switzerland, December **2016**
- (6) *University of Pennsylvania* – Philadelphia, PA, December **2016**
- (5) *Reaxys PhD Prize Symposium* – London, United Kingdom, September **2016**
- (4) *ACS Division of Inorganic Chemistry Young Investigators Award Symposium* – Philadelphia, PA, August **2016**
- (3) *US-Korea Symposium on Programmable Materials & Manufacturing Science* – Seoul, Korea, July **2016**
- (2) *Chevron USA Inc.* – Richmond, CA, April **2015**
- (1) *MRS Graduate Student Award Finalists’ Special Talk Session* – San Francisco, CA, April **2014**

TEACHING

Inorganic Chemistry, Chem 40	Spring 2022 , Spring 2023
Materials Chemistry, Chem 156	Fall 2018 , Fall 2019 , Fall 2021 , Fall 2023

UNIVERSITY SERVICE

Department of Chemistry, Graduate Admissions Committee, Chair	2024–current
Undergraduate Chemistry Club, Faculty Advisor	2024–current
Harvard Quantum Initiative Undergraduate Research Fellowship Program Selection Committee	2023–current
Reviewer for Harvard College Research Program (HCRP)	2021–2024
Herchel Smith-Harvard Summer Undergraduate Research Program Selection Committee	2020–2024
William F. Milton Fund Faculty Reviewer	2019

Nomination Committee for the Eben Fiske Studentship	2019–2020
Division of Science, Core Facility Steering Committee	2019–current
Hoopes Thesis Prize Natural Sciences Committee	2019, 2020
Department of Chemistry, Senior Faculty Search Committee	2024
Department of Chemistry, Junior Faculty Search Committee	2018, 2019, 2021, 2024
Department of Chemistry, Graduate Admissions Committee	2018–2024
Department of Chemistry, Colloquia Planning Committee, Co-chair	2018–current
Department of Chemistry, Future Faculty Symposium Committee	2018

PROFESSIONAL ACTIVITIES

Peer Reviewer: *Chemical Science, Nature Energy, Nature Chemistry, Nature Materials, Nature Communications, Coordination Chemistry Reviews, Journal of the American Chemical Society, ACS Applied Nano Materials, Matter, ACS Central Science, ACS Materials Letters, ACS Omega, Chemistry of Materials, Angewandte Chemie International Edition, Advanced Materials, Inorganic Chemistry, Inorganic Chemistry Frontiers, ACS Central Science, Acta Materialia, Joule, Journal Of Materials Chemistry C, Proceedings of the National Academy of Sciences, Journal of Chemical Physics, ACS Petroleum Research Fund, US Department of Energy, NIST Center for Neutron Research, Oak Ridge National Laboratory, National Science Foundation, Army Research Office, Arnold and Mabel Beckman Foundation, International Space Station National Laboratory, United Kingdom Research and Innovation*

Member: American Chemical Society Division of Inorganic Chemistry, Materials Research Society

Participant, International Energy Agency, Energy in Buildings and Communities Program, Annex 92	2024–current
Early Career Advisory Board, Inorganic Chemistry Frontiers	2024–current
Co-Founder and Chief Scientific Officer, PasCal Technologies	2023–current
Co-Founder and President, TransPore Bio	2024–current