

Mark D. Allendorf, Ph.D., ECS Fellow

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Research Profile Summary

Dr. Mark Allendorf is an Honorary Senior Visiting Scholar in the Dept. of Chemistry of Washington University in St. Louis, where teaches scientific writing, assists with program development, and mentors early-career scientists. Formerly, he was a Senior Scientist at Sandia National Laboratories (CA), where he was Co-Director and founder of the DOE Hydrogen Materials Advanced Research Consortium (HyMARC), involving >60 researchers and five DOE National Laboratories. His current research interests include hydrogen storage and hydrogen-material interactions; properties and applications of metal-organic frameworks (MOFs) for electronic devices; geological hydrogen; and machine learning for materials discovery. He has also lead projects focused on the kinetics of chemical vapor deposition, high-temperature gas-phase thermochemistry, and catalytic combustion. He has published 195 peer-reviewed journal articles (>40,000 citations; h-index: 81), 14 patents, given 145 invited lectures, and taught materials chemistry and technical writing to undergraduate and graduate chemistry students.

Professional Appointments

2023 – present	Honorary Senior Visiting Scholar , Dept. of Chemistry, Washington University, St. Louis, MO
Spring 2022	Benedict Distinguished Visiting Professor , Dept. of Chemistry, Carleton College, Northfield, MN
2015 – 2025	Co-Director , Hydrogen Advanced Materials Research Consortium (HyMARC)
2015 – 2017	Visiting International Professorship , Ruhr Universität Bochum, Germany
2012 – 2025	Senior Scientist , Materials Research, Sandia National Laboratories
2007 – 2010	Distinguished Visiting Scholar , Nanoscience and Nanoengineering Institute, University of California, Berkeley
2008 – 2011	Research Group Leader , Energy Nanomaterials Dept. Sandia National Laboratories
2004 – 2007	Research Group Leader , Microfluidics Dept., Sandia National Laboratories
1999 – 2012	Distinguished Member of Technical Staff , Sandia National Laboratories
1993 – 1999	Principal Member of Technical Staff/Project Lead , Industrial & Applied Combustion Department, Sandia National Laboratories
1986 – 1993	Senior Member of Technical Staff , Combustion Research Facility, Sandia National Laboratories

Education

1982 – 1986	Stanford University, Ph.D., Inorganic Chemistry. Thesis Title: “Magneto-Optical Studies of Laccase and a Small-Molecule Spectral Analogue” (thesis advisor Prof. E. I. Solomon)
1980 – 1981	Massachusetts Institute of Technology, graduate student, Prof. E. I. Solomon
1976 – 1980	Washington University, A.B. Chemistry, Magna cum Laude, Phi Beta Kappa

Appointments, Professional Service, and Affiliations

2018 – 2022	Vice Chair, International MOF Commission of the International Zeolite Association
2016 – 2024	International Energy Agency Expert for Hydrogen Storage Tasks 32 and 40.
2013 – 2015	Chair, Sandia Truman Distinguished Lecturer committee
2006 – 2007	President, The Electrochemical Society

Appointments, Professional Service, and Affiliations (Continued)

2004 – 2006	Vice President, The Electrochemical Society
2002 – 2005	Chair, Sandia Truman Distinguished Lecturer committee
1997 – 1999	Chair, High-Temperature Materials Division, The Electrochemical Society
1995 – 1997	Senior Vice-Chair, High-Temperature Materials Division, The Electrochemical Society
1993 – 1995	Junior Vice-Chair, High-Temperature Materials Division, The Electrochemical Society
1991 – 1993	Treasurer, High-Temperature Materials Division, The Electrochemical Society
1995 – 2005	Member, International Advisory Board, EUROCVF Conference

Honors, Awards, and Recognition

Honorary Senior Visiting Scholar, Dept. of Chemistry, Washington Univ. St. Louis	2023-2024
Benedict Distinguished Visiting Professor of Chemistry, Carleton College	2022
Dresden Senior Fellowship, Chair of Inorganic Chemistry, Technical University Dresden	2018
R&D100 Award “Triplet Harvesting Plastic Scintillators”	2014
Sandia Employee Recognition Award for Teamwork	2014
Sandia Employee Recognition Award for Teamwork	2010
Sandia Award for Excellence in Research	2008
Sandia Employee Recognition Award for Teamwork	2008
President, The Electrochemical Society	2006-2007
Sandia Employee Recognition Award for Teamwork	2003
NASA/Glenn Research Center Award, best journal publication in materials science	2007
Best paper award, ASME Solar 2006 Conference	2006
Fellow, The Electrochemical Society	2002
Sandia E. Karl Bastress Award for Applied Combustion Research	1997
Sandia Employee Recognition Award for Leadership	1997
Sandia Employee Recognition Award for Teamwork	1995

Reviewing and Editorial Activities

2021 – 2025	Sandia LDRD Program Materials Science Investment Area Team
2015	Reviewer, National Science Foundation (USA) Hybrid Materials Proposal Review Panel
2013	DOE Molecular Foundry Proposal Study Panel
2008 – 2013	COINS National Science Foundation (USA) Engineering Center, UC Berkeley, External Scientific Advisory Panel
2000 – 2007	Editorial Board Member, <i>Advanced Materials/CVD</i>
2000 – 2005	German Research Foundation (DFG) Focus Program International Advisory Panel
Recent (2017 – present) journal reviewing: <i>ACS Adv. Energy Mater.</i> , <i>ACS Adv. Mater. Interfaces</i> , <i>Adv. Energy Mater.</i> , <i>Adv. Funct. Mater.</i> , <i>Adv. Mater.</i> , <i>Adv. Opt. Mater.</i> , <i>Angew. Chem.</i> , <i>Appl. Phys. Lett.</i> , <i>Catal. Sci. Tech.</i> , <i>Chem. Eur. J.</i> , <i>Chem. Commun.</i> , <i>Chem. Mater.</i> , <i>Chem. Phys. Phys. Chem.</i> , <i>Chem. Rev.</i> , <i>Int. J. Hydrogen Energy</i> , <i>J. Amer. Chem. Soc.</i> , <i>J. Phys. Chem. A</i> , <i>J. Phys. Chem. C</i> , <i>J. Phys. Chem. Lett.</i> , <i>Nano Lett.</i> , <i>Nat. 2D Mater.</i> , <i>Nat. Chem.</i> , <i>Nat. Commun.</i> , <i>Nat. Mater.</i> , <i>Nature</i> , <i>PNAS</i> , <i>Science</i> .	

Organization of Scientific Meetings and Conferences

2024	Co-organizer “Electronic, Thermal, and Electrochemical Properties of Metal-Organic Frameworks (MOFs): Technology, Applications, and Emerging Devices” Pacific Rim Meeting (PRiME), Honolulu, HI Oct. 6 – 11, 2024.
2017	Organizer , “Surmounting Fundamental Challenges to Vehicular Hydrogen Storage Using Soft X-ray Techniques,” workshop held at Advanced Light Source Annual Users Meeting, Berkeley, CA
2016	Chair , 5 th <i>Int. Conf. Metal-Organic Frameworks & Open-Framework Compounds (MOF2016)</i> (>500 participants)
2014 – 2022	Member, International Advisory Committee , <i>International Conference on Metal-Organic Frameworks</i>
2007	Chair , <i>Nanoporous Materials</i> , Electrochemical Society Spring Meeting, Chicago, USA

2003 **Co-Chair**, *ECS Int. Conf. CVD/EUROCVD* Paris, France (350 participants)
2000 **Co-Chair**, *ECS Int. Conf. CVD/EUROCVD* Toronto, Canada (350 participants)
1997 **Co-Chair**, *ECS Int. Conf. CVD/EUROCVD* Paris, France (350 participants)
1996 **Co-Chair**, *ECS Int. Conf. CVD*, Los Angeles, USA (250 participants)
1996 – 2005 **International Advisory Board Member**, *EUROCVD Conference*

Major collaborations (2013 – present)

Prof. Chihaya Adachi (Kyushu Univ., Japan)
 Dr. F. Patrick Doty (Sandia National Laboratories, Livermore, CA)
 Prof. David Fairen-Jimenez (University of Cambridge, U.K.)
 Prof. Roland Fischer (Technical University of Munich)
 Prof. Tom Gennett (Colorado School of Mines and National Renewable Energy Laboratory)
 Prof. Stefan Kaskel (Technical University Dresden, Germany)
 Prof. Sanliang Ling (Univ. Nottingham, U.K.)
 Prof. Bettina Lotsch (Max Planck Institute for Solid-State Research and Univ. of Munich)
 Dr. David Prendergast (Lawrence Berkeley National Laboratory)
 Prof. Martin Sahlberg (Uppsala Univ., Sweden)
 Prof. Gabor Somorjai (Univ. California Berkeley)
 Dr. Vitalie Stavila (Sandia National Laboratories, Livermore, CA)
 Dr. A. Alec Talin (Sandia National Laboratories, Livermore, CA)
 Dr. Jeffery Urban (Lawrence Berkeley National Laboratory)
 Dr. Brandon Wood (Lawrence Livermore National Laboratory)

Supervision of Graduate Students, Postdoctoral Fellows, Professional Mentoring, and Teaching

2015 – present **Senior mentor** for Early Career Sandia Employees

1989 – present Postdoctoral advising (29 total)

Elizabeth Blanquet (1989); Thomas H. Osterheld (1993 – 1995); Michelle T. Schulberg (1995 – 1996); Anthony H. McDaniel (1996 – 1998); J. W. Medlin (2002 – 2003); Yongkee Chae (2004 – 2006); Andrew J. Skulan (2006 – 2008); Christina A. Bauer (2006 – 2008); Ronald J. T. Houk (2008 – 2010); Raghunandan K. Bahkta (2009 – 2011); Benjamin W. Jacobs (2009 – 2010); Patrick L. Feng (2010 – 2012); John J. Perry IV (2011 – 2013); Scott T. Meek (2010 – 2012); Kirsty Leong (2014 – 2016); Ryan Zarkesh (2019); Jonathan W. Brown (2016 – 2017); Andrew Ullman (2016 – 2018); Nicholas C. Burtch (2017 – 2018); Timothy C. Wang (2019 – 2020); James White (2018 – 2020); Andreas Schneeman (2020 – 2021); Jonathon L. Snider (2019 – 2021); Matthew Witman (2019 – 2021); Joseph E. Reynolds (2020 – 2022); Ashley Hellman (2021 – 2023); Liam Taylor (2023-present); Nicole Torquato (2023-present); Mohana Shivanna (2022 – present).

Ph. D. student advising

2013 – 2015 Min Tu, Institute for Inorganic Chemistry II, Ruhr Universität Bochum (Germany)
2017 – 2019 Christian Schneider, Technical Universität Munich (Germany)
2024 – 2026 Ashlynn Berry, Dept. of Chemistry, Washington University in St. Louis

Teaching

Materials Chemistry for a Sustainable Energy Economy, Carleton College, Chem 363, Spring Term March – June, 2022.

Introduction to Scientific Writing, guest lectures in Chem 5110 “Thriving in Grad School” class, Dept. of Chemistry, Washington University in St. Louis, February 18 – 20, 2025, St. Louis, MO.

Introduction to Scientific Writing, guest lectures in Advanced Inorganic Chemistry class, Dept. of Chemistry, Oregon State University, November 12 – 14, 2025.

Memberships in Scientific Societies

2016 – present Member, American Chemical Society (ACS), USA
1992 – present Member, Materials Research Society (MRS), USA
1988 – present Member, The Electrochemical Society (ECS), USA

Publications

195 journal articles; **60** conference proceeding papers; H-index **81**; i10 index **208**; **>40,000** citations (Google Scholar); **36** articles with ≥ 200 citations; **11** articles featured on journal covers; **7** edited books.

Referred Journal Publications

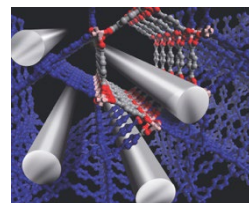
1. M. D. Allendorf, D. J. Spira, E. I. Solomon "Low-Temperature Magnetic Circular Dichroism Studies of Native Laccase: Spectroscopic Evidence for Exogenous Ligand Bridging at a Trinuclear Copper Active Site," *Proc. Natl. Acad. Sci. USA* **82** (1985), 3063.
2. D. J. Spira-Solomon, M. D. Allendorf, E. I. Solomon "Low-Temperature Magnetic Circular Dichroism Studies of Native Laccase: Confirmation of a Trinuclear Copper Active Site," *J. Am. Chem. Soc.* **108** (1986), 5318.
3. M. D. Allendorf, R. E. Palmer "Spontaneous Raman Spectroscopy in Flames Containing High Concentrations of Silica Particles," *High Temp Sci.* **26** (1989), 45.
4. P. K. Ross, M. D. Allendorf, E. I. Solomon "Detailed Spectral Studies of Copper Acetate: Excited-State Interactions in Copper Dimers," *J. Amer. Chem. Soc.* **111** (1989), 4009.
5. M. D. Allendorf, J. R. Bautista, E. Potkay, "Temperature Measurements in a Vapor Axial Deposition Flame by Spontaneous Raman Spectroscopy," *J. Appl. Phys.* **66** (1989), 5046.
6. M. D. Allendorf, R. J. Kee, "A Model of Silicon Carbide Chemical Vapor Deposition," *J. Electrochem Soc.* **138** (1991), 841.
7. R. H. Hurt, M. D. Allendorf "Model of Particle-Vapor Codeposition with Application to Ceramic Materials Synthesis," *AIChE J.* **37** (1991), 1485.
8. M. D. Allendorf, D. A. Outka "The Adsorption of H-Atoms on Polycrystalline-Silicon Carbide," *Surf. Sci.* **258** (1991), 177.
9. M. D. Allendorf, C. F. Melius "Theoretical Study of the Thermochemistry of Molecules in the Si-C-H Systems," *J. Phys. Chem.* **96** (1992), 428.
10. M. D. Allendorf, C. F. Melius "Theoretical Study of the Thermochemistry of Compounds in the Si-C-Cl-H System," *J. Phys. Chem.* **97** (1992), 720.
11. M. D. Allendorf, "Equilibrium Predictions of the Role of Organosilicon Compounds in the Chemical Vapor Deposition of Silicon Carbide," *J. Electrochem. Soc.* **140** (1993), 747.
12. M. D. Allendorf, R. H. Hurt, N. Yang, P. Reagan, M. Robbins "Deposition of Silicon Carbide Using the Chemical Vapor Composites Process: Process Characterization and Comparison with the RASSPVDN Model Predictions" *J. Mater. Sci.* **8** (1992), 1651.
13. J. Warnatz, M. D. Allendorf, R. J. Kee, M. E. Coltrin "A Model of Elementary Chemistry and Fluid Mechanics in the Combustion of Hydrogen on Platinum Surfaces," *Comb. Flame* **96** (1994), 393.
14. T. H. Osterheld, M. D. Allendorf, C. F. Melius "Unimolecular Decomposition of Methyltrichlorosilane: RRKM Calculations," *J. Phys. Chem.* **98** (1994), 6995.
15. L. N. Krasnoperov, J. T. Niiranen, D. Gutman, C. F. Melius, M. D. Allendorf "Kinetics and thermochemistry of $\text{Si}(\text{CH}_3)_3 + \text{NO}$ reaction: direct determination of a Si-N bond energy," *J. Phys. Chem.* **99** (1995), 14347.

16. M. D. Allendorf, C. F. Melius, P. Ho, M. R. Zachariah "Theoretical Study of the Thermochemistry of Molecules in the Si-O-H System," *J. Phys. Chem.* **99** (1995), 15285.
17. M. T. Schulberg, M. D. Allendorf, D. A. Outka "The Adsorption of Hydrogen Chloride on Polycrystalline-Silicon Carbide," *Surf. Sci.* **341** (1995), 262.
18. M. T. Schulberg, M. D. Allendorf, D. A. Outka "Aspects of Nitrogen Surface Chemistry Relevant to TiN Chemical Vapor Deposition," *J. Vac. Sci. Tech. A.* **14** (1996), 3228.
19. M. D. Allendorf, C. F. Melius "Thermochemistry of Molecules in the B-N-H-Cl System: *Ab initio* Predictions Using the BAC-MP4 Method," *J. Phys. Chem. A* **101** (1997), 2670.
20. F. Teyssandier, M. D. Allendorf "Thermodynamics and Kinetics of Gas-Phase Reactions in the Ti-Cl-H System," *J. Electrochem. Soc.* **145** (1998), 2167.
21. A. H. McDaniel, M. D. Allendorf "A Flow-Tube Investigation of the High-Temperature Reaction between BCl₃ and NH₃," *J. Phys. Chem.* **102** (1998), 7804.
22. M. D. Allendorf, C. F. Melius "Understanding Gas-Phase Reactions in the Thermal CVD of Hard Coatings Using Computational Methods," *Surf. Coatings Technol.* **108** (1998), 191-199.
23. C. W. Bauschlicher Jr., C. F. Melius, M. D. Allendorf "Gallium compounds, a possible problem for the G2 approaches," *J. Chem. Phys.* **110** (1999), 1.
24. M. D. Allendorf, C. F. Melius, C. W. Bauschlicher, Jr. "Heats of Formation and Bond Energies in Group III Compounds," *J. de Physique IV France* **9** (1999), 23-31.
25. C. Raffy E. Blanquet, M. Pons, C. Bernard, C. F. Melius, M. D. Allendorf "Contribution to the Modeling of CVD Silicon Carbide Growth," *J. de Physique IV France* **9** (1999), 205-212.
26. D. K. Zerkle, M. D. Allendorf, M. Wolf, O. Deutschmann "Modeling of On-Line Catalyst Addition Effects in a Short Contact Time Reactor," *Twenty-Eighth Symp. (Int.) Comb.* **28** (pt.1) (2000), 1365-1372.
27. A. H. McDaniel, M. D. Allendorf "The Autocatalytic Behavior of Trimethylindium During Thermal Decomposition," *Mat. Chem.* **12** (2000), 450.
28. C. F. Melius, M. D. Allendorf "Bond Additivity Corrections for Quantum-Chemistry Methods," *J. Phys. Chem. A* **104** (2000), 2168.
29. D. K. Zerkle, M. D. Allendorf, M. Wolf, O. Deutschmann "Understanding Homogeneous and Heterogeneous Contributions to the Partial Oxidation of Ethane in a Short Contact Time Reactor," *J. Catal.* **196** (2000), 18.
30. M. D. Allendorf, K. E. Spear "Thermodynamic Analysis of Refractory Corrosion in Glass Melting Furnaces," *J. Electrochem. Soc.* **148** (2001), B59.
31. M. D. Allendorf "Research Needs for Coatings on Glass. Summary of the U.S. Department of Energy Roadmapping Workshop," *Thin Solid Films* **392** (2001), 155.
32. R. S. Tranter, R. Sivaramakrishnan, K. Brezinsky, M. D. Allendorf "High Pressure, High Temperature Shock Tube Studies of Ethane Pyrolysis and Oxidation," *Phys. Chem. Chem. Phys.* **4** (2002), 2001.
33. S. de Persis, F. Teyssandier, A. H. McDaniel, M. D. Allendorf "Influence of Carbon Precursor on the Gas-Phase Chemistry of Titanium Carbide Chemical Vapor Deposition," *Adv. Mater./CVD* **8** (2002), 63.
34. M. D. Allendorf, C. F. Melius, B. Cosic, A. Fontijn "BAC-G2 Predictions of Thermochemistry for Gas-Phase Aluminum Compounds," *J. Phys. Chem. A* **106** (2002), 2629.

35. A. H. McDaniel, A. E. Lutz, M. D. Allendorf, S. F. Rice "Effects of Methane and Ethane on the Heterogeneous Production of Water from Hydrogen and Oxygen in Stagnation Flow," *J. Catalysis* **208** (2002), 21.
36. M. D. Allendorf, C. F. Melius "BAC-MP4 Predictions of Thermochemistry for Gas-Phase Compounds in the Si-H-O-Cl System," *J. Phys. Chem. A* **106** (2002), 6370.
37. K. E. Spear, M. D. Allendorf "Thermodynamic Analysis of Alumina Refractory Corrosion by sodium or potassium hydroxide in glass melting furnaces," *J. Electrochem. Soc.* **149** (2002), B551.
38. J. W. Medlin, M. D. Allendorf, "A theoretical study of the adsorption of acetylene and hydrogen on the (111) surfaces of Pd, Pt, Ni, and Rh", *J. Phys. Chem. B.* **107** (2003), 217.
39. J. W. Medlin, A. H. McDaniel, M. D. Allendorf, R. Bastasz, "Effects of Competitive carbon monoxide adsorption on the hydrogen response of Metal-Insulator-Semiconductor Hydrogen Sensors: the role of metal film morphology", *J. Appl. Phys.* **93** (2003), 2267.
40. R. H. Nilson, S. K. Griffiths, N. Yang, P. M. Walsh, M. D. Allendorf, B. Bugeat, O. Marin, K. E. Spear, G. A. Pecoraro, "Analytical Models for High-Temperature Corrosion of Silica Refractories in Glass-Melting Furnaces," *Glass Sci. Technol.* **76** (2003), 136.
41. I. M. B. Nielsen, C. L. Janssen, M. D. Allendorf "Ab initio predictions for thermochemical parameters for tin-oxygen compounds," *J. Phys. Chem. A.* **107** (2003), 5122.
42. J. D. Taylor; M. D. Allendorf; A. H. McDaniel, S. F. Rice "In-Situ Diagnostics and Modeling of Methane Catalytic Partial Oxidation on Pt in a Stagnation-Flow Reactor," *Indust. Eng. Chem. Res.* **42** (2003), 6559.
43. Y. Chae, A. H. McDaniel, W. G. Houf, M. D. Allendorf "Stagnation-Flow Reactor Investigation of the Deposition of Tin Oxide from Monobutyltintrichloride," *J. Electrochem. Soc.* **151** (2004), C527.
44. I. M. B. Nielsen, M. D. Allendorf "High-level ab initio thermochemical data for halides of chromium, manganese, and iron," *J. Phys. Chem. A* **109** (2005), 928.
45. A. M. B. van Mol, G. R. Alcott, M. D. Allendorf "Tin oxide precursor chemistry and its link to coating properties," *Amer. Ceram. Soc. Bull.*, **84** (2005), 37.
46. S. F. Rice, M. D. Allendorf "Detection of NaOH vapor in glass furnaces using excimer laser photofragmentation spectroscopy," *Glass Sci. Technol.* **78** (2005), 45.
47. M. D. Allendorf, C. F. Melius "BAC-MP4 Predictions of Thermochemistry for Gas-Phase Tin Compounds in the Sn-H-C-Cl System," *J. Phys. Chem. A.* **109** (2005), 4939.
48. Y. Chae, W. G. Houf, A. H. McDaniel, M. D. Allendorf "Models for the Chemical Vapor Deposition of Tin Oxide from Monobutyltintrichloride," *J. Electrochem. Soc.* **153** (2006), C309.
49. A. J. Skulan, I. M. B. Nielsen, C. F. Melius, M. D. Allendorf "BAC-MP4 Predictions of Thermochemistry for Gas-Phase Indium Compounds in the In-H-C-O-Cl System," *J. Phys. Chem. A* **110** (2006), 281.
50. I. M. B. Nielsen, M. D. Allendorf, "Thermochemistry of the chromium hydroxides $\text{Cr}(\text{OH})_n$, $n = 2-6$, and the oxyhydroxide $\text{CrO}(\text{OH})_4$: Ab initio predictions," *J. Phys. Chem. A* **110** (2006), no.11, 4093-4099.
51. A. M. B. van Mol, Y. Chae, A. H. McDaniel, M. D. Allendorf "Chemical vapor deposition of tin oxide: Fundamentals and applications," *Thin Solid Films* **502** (2006), 72-78.

52. A. J. Skulan, I. M. B. Nielsen, C. F. Melius, and M. D. Allendorf "BAC-MP4 Predictions of Thermochemistry for Gas-Phase Antimony Compounds in the Sb-H-C-O-Cl System," *J. Phys. Chem. A* **110** (2006), 5919.
53. J. A. Greathouse, M. D. Allendorf "The interaction of water with MOF-5 simulated by molecular dynamics," *J. Amer. Chem. Soc.*, **128** (2006), 10678.
54. E. J. Opila, D. L. Myers, N. S. Jacobson, I. M.B. Nielsen, D. F. Johnson, J. K. Olminky, M. D. Allendorf "Theoretical and Experimental Investigation of the Thermochemistry of $\text{CrO}_2(\text{OH})_2(\text{g})$," *J. Phys. Chem. A* **111** (2007), 1971, [NASA Glenn Research Center – Materials & Structures Division 2007 Paper of the Year](#).
55. C. Bauer, T. Settersten, B. Patterson, T. Timofeeva, V. Liu, B. Simmons, M. D. Allendorf "Influence of connectivity and porosity on ligand-based luminescence in zinc MOFs," *J. Amer. Chem. Soc.* **129** (2007), 7136.
56. D. F. Bahr, J. A. Reid, W. M. Mook, C. A. Bauer, R. Stumpf, A. J. Skulan, N. R. Moody, B. A. Simmons, M. M. Shindel, M. D. Allendorf "Mechanical properties of IRMOF-1 metal-organic framework crystals," *Phys. Rev. B* **76** (2007), 184106.
57. J. A. Greathouse, M. D. Allendorf "Force field validation for molecular dynamics simulations of IRMOF-1 and other isorecticular zinc carboxylate coordination polymers," *J. Phys. Chem. C* **112** (2008), 5795.
58. J. E. Miller, M. D. Allendorf, R. B. Diver, L. R. Evans, N. P. Siegel, J. N. Stuecker "Metal oxide composites and structures for ultra-high temperature solar thermochemical cycles," *J. Mater. Sci.* **43** (2008), 4714.
59. M. D. Allendorf, R. B. Diver, N. P. Siegel, J. E. Miller "Two-Step Water Splitting Using Mixed-Metal Ferrites: Thermodynamic Analysis and Characterization of Synthesized Materials," *Energy & Fuels* **22** (2008), 4115.
60. R. B. Diver, J. E. Miller, M. D. Allendorf, N. P. Siegel, R. E. Hogan "Solar Thermochemical Water-Splitting Ferrite-Cycle Heat Engines," *J. Solar En. Eng.* **30** (2008), 041001-1.
61. M. D. Allendorf, R. J. T. Houk, L. Andruszkiewicz, A. A. Talin, J. Pikarsky, A. Choudhury, K. A. Gall, P. J. Hesketh "Stress-Induced Chemical Detection Using Flexible Metal-Organic Frameworks," *J. Amer. Chem. Soc.* **130** (2008), 14404.
62. B. Dai, R. B. Rees, J. K. Johnson, M. D. Allendorf, D. S. Sholl, N. Zarkevich, D. D. Johnson "Influence of Surface Reactions on Complex Hydride Reversibility," *J. Phys. Chem. C*, **112** (2008), 18270.
63. M. D. Allendorf, C. A. Bauer, R. Bhakta, R. J. T. Houk "Luminescent Metal-Organic Frameworks," *Chem. Soc. Rev.* **38** (2009), 1330. [Invited Review article](#).
64. F. P. Doty, C. A. Bauer, A. J. Skulan, P. G. Grant, M. D. Allendorf "Scintillating Metal Organic Frameworks: A New Class of Radiation Detection Materials," *Adv. Mater.* **21** (2009), 95.
65. J. A. Greathouse, T. L. Kinnibrugh, M. D. Allendorf "Adsorption and Separation of Noble Gases by IRMOF-1: Grand Canonical Monte Carlo Simulations," *Ind. Eng. Chem. Res.* **48** (2009), 3425.
66. R. K. Bhakta, J. L. Herberg, B. Jacobs, A. Highley, R. Behrens, Jr., N. W. Ockwig, J. A. Greathouse, and M. D. Allendorf "Metal-Organic Frameworks As Templates for Nanoscale NaAlH_4 ," *J. Amer. Chem. Soc.* **131** (2009), 13198.
67. R. J. T. Houk, B. W. Jacobs, F. El Gabaly, N. N. Chang, A. A. Talin, D. D. Graham, S. D. House, I. M. Robertson, M. D. Allendorf "Silver Cluster Formation, Dynamics, and Chemistry in Metal-Organic Frameworks," *Nano Lett.* **9** (2009), 3413.

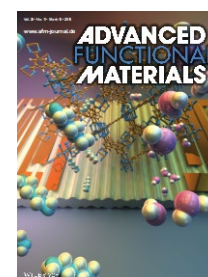
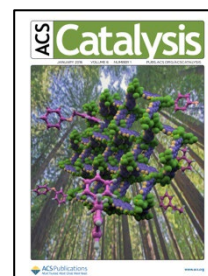
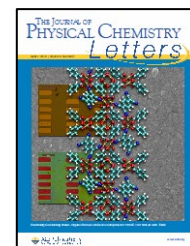
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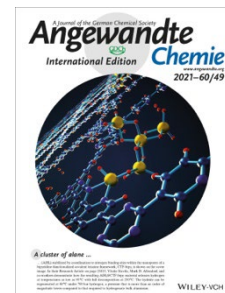
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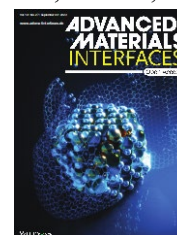
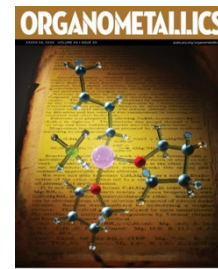
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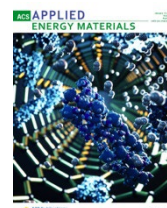
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34. J. E. Miller, M. D. Allendorf, R. B. Diver, L. R. Evans, N. P. Siegel, J. N. Stuecker “Metal Oxide Composites and Structures for Ultra-High Temperature Solar Thermochemical Cycles,” plenary lecture, *Int. Symp. Reactivity of Solids*, Minneapolis, MN, June 3–6, 2007.
35. M.D. Allendorf “Metal Organic Frameworks: Novel Nanoporous Materials for Sensing Applications,” Dept. of Electrical Engineering and Computer Science, University of California, Berkeley, April 18, 2008.
36. J. E. Miller, R. B. Diver, N. P. Siegel, M. D. Allendorf, E. B. Stechel “Sunshine to petrol: Solar thermochemical splitting of carbon dioxide and water,” *ACS 2009 Spring meeting*, Salt Lake City, March 23–26, 2009.
37. M. D. Allendorf “Chemical Detection using Flexible Metal-Organic Frameworks,” *SPIE Defense, Security, and Sensing Conference*, Orlando, FL April 12 – 16, 2009.
38. M. D. Allendorf, R. J. T. Houk, R. J. Bhakta, I. M. B. Nielsen, F. P. Doty “Scintillating Metal Organic Frameworks: A New Class of Radiation Detection Materials,” *MRS 2009 Spring Meeting*, San Francisco, April 13 – 17, 2009.
39. M. Allendorf, R. Houk, P. Doty, N. Chang, R. Bhakta, B. Jacobs, P. Hesketh “Chemical and radiation sensing using metal-organic frameworks,” Opening Plenary, *MOFCATS Workshop*, Oslo, Norway, June 17–19, 2009.
40. M. D. Allendorf “Applications of Metal-Organic Frameworks Beyond Hydrogen Storage: Way Beyond,” National Institutes of Standards and Technology, August 19, 2009.
41. M. D. Allendorf “Applications of Metal-Organic Frameworks to Chemical and Radiation Detection, Nanoscale Cluster Templating, and Beyond,” *Inorganic Chemistry Lecture Series*, University of California, Berkeley, October 2, 2009.

42. J. Miller, R. Diver, N. Siegel, E. Coker, A. Ambrosini, D. Dedrick, M. Allendorf, G. Kellogg, R. Hogan, E. Stechel, K. Chen "Sunshine to Petrol: A Metal Oxide-Based Thermochemical Route to Solar Fuels," *Energy Symposiums 2010 of TMS Annual Meeting*, Seattle, February, 2010, Best Paper award.
43. M. Allendorf, V. Stavila, K. C. Kim, D. Sholl "Combining First Principles and Thermodynamic Calculations to Predict Evolution of Impurity Gases from Metal Hydrides," *2010 ACS Spring Meeting*, San Francisco, CA, March 21-25, 2010.
44. M. D. Allendorf "Metal-Organic Frameworks: Versatile Materials for Chemical and Radiation Detection Nanoscale Cluster Templating, and More," *MESA Technology series*, Sandia National Laboratories, May 6, 2010.
45. M. D. Allendorf "Metal-Organic Frameworks: Versatile Materials for Chemical and Radiation Detection, Nanoscale Cluster Templating, and More," Dept. of Chemistry, University of California, San Diego, May 14, 2010.
46. M. D. Allendorf, G. H. Evans, B. W. Jacobs, A. H. McDaniel, J. E. Miller, J. Scheffe, A. W. Weimer "Thermodynamic and Kinetic Investigations of Thermochemical Gas Splitting," ETH, Zurich, Switzerland, July 1, 2010.
47. M. D. Allendorf, G. H. Evans, B. W. Jacobs, A. H. McDaniel, J. E. Miller, J. Scheffe, A. W. Weimer "Kinetics of CO₂ and H₂O splitting by mixed-metal ferrites: an experimental and computational investigation," *1st International Conference on Materials for Energy*, Karlsruhe, Germany, July 5–8, 2010.
48. P. L Feng, F. P. Doty, J. J. Perry, S. T. Meek, M. D. Allendorf "MOF-based Scintillators," *X-Ray, Gamma-Ray, and Particle Technologies; Penetrating Radiation Systems and Applications XI (Conference 7806)*, SPIE Conference, San Diego, August 2–6, 2010.
49. M. D. Allendorf, B. W. Jacobs, R. J. T. Houk, Y. Kobayashi, B. Wiers, J. R. Long, A. A. Talin, P. J. Hesketh, J. H. Lee, A. Venkatasubramanian "Manipulation of MOFs for Device Fabrication," Plenary Lecture, *MOF2010 -- Second Int. Conf. Metal Organic Frameworks and Open Framework Compounds*, August 5-8, 2010.
50. M. D. Allendorf "Integration of MOF Thin Films with Mechanical Sensors for Chemical Detection," *PITTCON*, Atlanta, GA, March 13–18, 2011.
51. M. D. Allendorf and J. E. Miller "Solar fuel production using thermochemical cycles: a challenging materials problem," Harvard University School of Engineering and Applied Science, April 21, 2011.
52. A.H. McDaniel, J.R. Scheffe, V.J. Aston, D. Arifin, E.N. Coker, J.E. Miller, M.D. Allendorf, and A.W. Weimer "High Temperature Splitting of Water and Carbon Dioxide Using Complex Oxides as a Route to Solar Fuels", 242nd Annual Meeting of the American Chemical Society, Denver CO, August 2011.
53. M. D. Allendorf "Chemical and Radiation Detection Using Metal-Organic Frameworks," Gordon Research Conference on Nanoporous Materials, Holderness School, Aug. 7-12, 2011.
54. M. D. Allendorf "Manipulation of MOFs for Device Fabrication," UOP LLC Invitational Lecture Series, Des Plains, IL, May 4, 2011.
55. M. D. Allendorf "Chemical and Radiation Detection Using Metal-Organic Frameworks," GE Global Research Center June 7-8, 2011, Niskayuna, NY.
56. M. D. Allendorf "Metal-Organic Frameworks (MOFs): Charting a course to device integration," SPIE Nanoepitaxy symposium, San Diego, CA, Aug. 24, 2011.

57. M. D. Allendorf, T. R. Zeitler, J. A. Greathouse "Metal-organic frameworks for greenhouse gas detection," *ACS Fall 2011 Meeting*, Denver, CO, Aug. 29, 2011.
58. M. D. Allendorf, A. H. McDaniel, J. E. Miller, E. N. Coker, A. Ambrosini, T. Aston, A. Weimer, J. Scheffe "Solar Fuel Production Using Thermochemical Cycles: A Challenging Materials Problem," *Fall Meeting of The Electrochemical Society*, Boston, MA, October 9-14, 2011.
59. M. D. Allendorf "Nano-to-Macro Materials Solutions to Renewable Energy Production and Storage," Dept. of Mech. Eng., Univ. Maryland, College Park, Oct. 14, 2011.
60. M. D. Allendorf "Luminescent metal-organic frameworks (MOFs): a Nanolaboratory for Photophysics," MIT Center for Excitonics Lecture Series," Cambridge, Massachusetts, February 7, 2012.
61. M. D. Allendorf, A. H. McDaniel, A. Ambrosini, E. N. Coker, J. E. Miller, E. B. Stechel "Solar-Driven Fuel Production Using Metal Oxide Thermochemical Cycles," *Materials Challenges in Alternative & Renewable Energy 2012 (MCARE)*, Clearwater, FL, February 26 – March 1, 2012.
62. M. D. Allendorf "Tuning Thermodynamics and Kinetics of Complex Metal Hydrides Using Ordered Nanoporous Templates," *Spring 2012 MRS (hydrogen storage)*, San Francisco, CA, April 9-13, 2012.
63. M. D. Allendorf "Connecting Structure with Function: MOFs for Chemical and Radiation Detection," *DFG Priority Program on MOFs, Topical Workshop for PhD Students: MOF-Based Chemical Sensors*, Munich, Germany, March 12–13, 2012.
64. M. D. Allendorf "The Power of Empty Space," *Valley Study Group*, Pleasanton, CA, June 13, 2012.
65. M. D. Allendorf "Research Connections with Sandia National Laboratories," *University-Government-Industry Micro-Nano Conference*, July 9-11, 2012, Berkeley, CA.
66. M. D. Allendorf, M. Foster, D. Gough, T. N. Lambert, K. Leong, S. T. Meek, E. D. Spoeke, B. Wong "Controlling donor-acceptor interfaces in excitonic devices using nanoporous metal-organic framework templates," *ACS Fall 2012 Meeting*, Philadelphia, PA, August 20–23, 2012.
67. M. D. Allendorf "The Power of Empty Space: Manipulating MOFs for Device Applications," Dept. of Chemistry, Washington University, St. Louis, Missouri Oct. 25, 2012.
68. M. D. Allendorf "The Power of Empty Space: Manipulating MOFs for Device Applications," Dept. of Physics, University of Missouri, St. Louis, Missouri, Oct. 26, 2012.
69. M. D. Allendorf "Creating donor-acceptor interfaces for excitonic devices using nanoporous metal-organic frameworks," *Electronic Materials and Applications 2013 Conference*, Orlando, FL, January 23-25, 2013.
70. M. D. Allendorf "Manipulating MOFs for Nanoparticle, Thin Film, and Device Fabrication," University of South Florida, Tampa, FL, January 25, 2013.
71. V. Stavila, M. D. Allendorf "Metal-Organic Frameworks as Nanoreactors for Reversible De/Re-hydrogenation Reactions," *245th ACS National Meeting*, New Orleans, LA, April 7-11, 2013.
72. M. D. Allendorf, J. M. Denning, J. A. Greathouse, A. L. Robinson, V. Stavila, T. R. Zeitler, I. Ellern, P. J. Hesketh "Integrating MOFs with MEMS devices for chemical sensing," *245th ACS National Meeting*, New Orleans, LA, April 7-11, 2013.
73. M. D. Allendorf, "Nanoporosity and the Welcome Guest: Developing Metal-Organic Frameworks for Electronic Device Applications," Dept. of Materials Science, Univ. of Cambridge, Cambridge, U.K. Sept. 9, 2013.

74. M. D. Allendorf, A. A. Talin, J. A. Greathouse, T. N. Lambert, E. D. Spörke, V. Stavila, B. M. Wong “The Power of Empty Space: Metal-Organic Frameworks as Electronic Materials,” Keynote Lecture, EuroMat 2013, Seville, Spain, Sept. 9 – 13, 2013.
75. M. D. Allendorf “The Power of Empty Space: Adventures in Chemistry at a National Laboratory,” Whittier College, Whittier, CA Feb. 21, 2014.
76. M. D. Allendorf “Emergent Properties Using the Guest@MOF Concept,” invited presentation, *Metal-Organic Frameworks: Experiments and Simulations*, Telluride, CO, July 7 – 11, 2014.
77. M. D. Allendorf “Pleasures and Pitfalls of Guest Molecules in MOFs,” invited presentation, *Characterization of Nanoporous Materials workshop*, Stanford University, Aug. 8, 2014.
78. M. D. Allendorf “Nanoporosity and the Welcome Guest: Metal-Organic Frameworks as Active Components of Electronic Devices,” invited presentation, ACS Fall 2014 meeting, San Francisco, CA, Aug. 10 – 14, 2014.
79. M. D. Allendorf, A. A. Talin, M. E. Foster, V. Stavila, F. Leonard “Molecule meets MOF: bridging the gap between organic and inorganic electronic materials,” invited presentation, SPIE Optics + Photonics conference, San Diego, CA Aug. 17 – 21, 2014.
80. M. D. Allendorf “Molecule meets MOF: bridging the gap between organic and inorganic electronic materials,” IBM Almaden Research Center, San Jose, CA, Oct. 17, 2014.
81. M. D. Allendorf “Molecule meets MOF: bridging the gap between organic and inorganic electronic materials,” Advanced Light Source Chemical Sciences Series Lecture, Lawrence Berkeley National Laboratory, Berkeley, CA, Nov. 3, 2014.
82. M. D. Allendorf “Why would we want an electrically conducting MOF?,” Dept. of Chemistry, Ruhr University, Bochum, Germany, Jan. 22, 2015.
83. M. D. Allendorf “Guest@MOF: Emergent Properties for Electronic Device Applications,” Center for Organic Photonics and Electronics Research (OPERA), Kyushu University, Fukuoka, Japan, Feb. 13, 2015.
84. M. D. Allendorf, V. Stavila, A. A. Talin, and Curtis D. Mowry “Chemical Detection Using Metal-Organic Framework Thin Films and Composites,” Pittcon, New Orleans, March 8 – 12, 2015.
85. A. A. Talin, M. E. Foster, F. Léonard, K. Leong, C. D. Spataru, V. Stavila, M. D. Allendorf, “Emergent Electrical Properties Induced by Guest Molecules in Metal-Organic Frameworks,” MRS Spring 2015, San Francisco, CA, April 6 – 9, 2015.
86. M. D. Allendorf “Molecule meets MOF: Bridging the Gap Between Organic and Inorganic Electronic Materials,” ICMAT 2015, Singapore, June 28 – July 3, 2015.
87. M. D. Allendorf “Nanoporosity and the Welcome Guest: Developing Metal-Organic Frameworks for Hydrogen Storage, Catalysis, and Sensing,” Institute of Materials Research and Engineering (IMRE), Singapore, July 2, 2015.
88. M. D. Allendorf “Nanoporosity and the Welcome Guest: Developing Metal-Organic Frameworks for Hydrogen Storage, Catalysis, and Sensing,” Dept. of Chem. Biomolec. Eng., Nat. Univ. Singapore, July 3, 2015.
89. M. D. Allendorf ““Interactions of Light and Charge with Nanoporous MetalOrganic Frameworks,” IEEE San Francisco Bay Area Nanotechnology Council Chapter Seminar, Santa Clara, CA, July 21, 2015.

90. M. D. Allendorf, M. E. Foster, S. M. George, D. K. Lancaster, K. Leong, L. Small, E. D. Spörke, V. Stavila, J. S. Wheeler "Multifunctional Metal-Organic Frameworks for Next-Generation Dye Sensitized Solar Cells," Fall ACS National Meeting, Boston, MA, Aug. 16 – 20, 2015.
91. M. D. Allendorf, M. E. Foster, F. Léonard, C. D. Spataru, V. Stavila C. Schneider, R. A. Fischer, H. Mieno, C. Adachi "Metal-Organic Frameworks for Electronic and Photonic Device Applications," Pacifichem, Honolulu, HI, Dec. 15 – 20, 2015.
92. M. D. Allendorf "Hydrogen Materials Advanced Research Consortium," Pacific Northwest National Laboratories, Richland, WA Jan. 19, 2016.
93. M. D. Allendorf "Hydrogen Materials Advanced Research Consortium," Toyota Central Research Laboratories, Nagoya, Japan Feb. 25, 2016.
94. M. D. Allendorf, V. N Stavila, R. Parthasarathi, K. L. Sale, M. Kent, R. W. Davis "Metal-Organic Framework Catalysts for Lignin Valorization," Energy Materials Nanotechnology: Organometallic Catalysis, Kona, HI, March 21 – 24, 2016.
95. M. D. Allendorf, V. N Stavila, R. Parthasarathi, K. L. Sale, M. Kent, R. W. Davis "Metal-Organic Framework Catalysts for Lignin Valorization," National Renewable Energy Laboratory seminar series, Golden, CO May 5, 2016.
96. M. D. Allendorf, M. E. Foster, F. Léonard, V. Stavila, A. A. Talin, R. A. Fischer "Integrating Molecules, Surfaces, and Devices to Achieve Emergent Properties in Metal-Organic Frameworks," *Heterogeneous Functional Materials for Energy Conversion and Storage*, The Electrochemical Society Spring 2016 Meeting, San Diego, CA, May 29 – June 2, 2016.
97. M. D. Allendorf "Molecular and Supramolecular Aspects of Guest-Infiltrated Copper Paddlewheel MOFs," Int. Conf. Coordination Chem., Brest, France, July 3 – 8, 2016.
98. Mark Allendorf "Where Does Hydrogen Fit in a Clean Energy Economy?" Lawrence Livermore Retirees Assoc., Livermore, CA, Oct. 11, 2016.
99. M. D. Allendorf "Nanoporosity and the Welcome Guest: Metal-Organic Frameworks for Hydrogen Storage, Catalysis, and Energy Conversion," Georgetown Univ., Washington, D.C. Nov. 18, 2016.
100. M. D. Allendorf "Nanoporosity and the Welcome Guest: Metal-Organic Frameworks for Hydrogen Storage, Catalysis, and Energy Conversion," George Washington Univ., Washington, D.C. Nov. 19, 2016.
101. Mark Allendorf "Nanoporosity and the Welcome Guest: Metal-Organic Frameworks for Hydrogen Storage, Catalysis, and Energy Conversion," ASM Silicon Valley Section, Feb. 1, 2017.
102. M. D. Allendorf "Nanoporosity and the Welcome Guest: Metal-Organic Frameworks for Hydrogen Storage, Catalysis, and Energy Conversion," Washington State Univ., Pullman, WA, Feb. 6, 2017.
103. Mark D. Allendorf, Vitalie Stavila, Brandon Wood, Keith Ray, Tae-Wook Heo, Jonathan R. I. Lee, James L. White, Rob Kolasinski, Farid El Gabaly, Lennie L. Klebanoff, Tom Autrey "Enabling Reversibility in Complex Metal Hydrides," 11th International Symposium on Hydrogen and Energy, Kona, HI, Feb. 26 – Mar. 3, 2017.
104. M. D. Allendorf "Nanoporosity and the Welcome Guest: Metal-Organic Frameworks for Hydrogen Storage, Catalysis, and Energy Conversion," Johns Hopkins Univ., Baltimore, MD, Feb. 6, 2017.
105. Mark Allendorf "Where Does Hydrogen Fit in a Clean Energy Economy?" Seniors in Retirement, Livermore, CA, Mar. 28, 2017.
106. M. D. Allendorf "Nanoporosity and the Welcome Guest: Metal-Organic Frameworks for Hydrogen Storage, Catalysis, and Energy Conversion," Northwestern Univ., Evanston, IL, April 20, 2017.

107. Mark D. Allendorf, Jonathan W. Brown, James L. White, Vitalie Stavila, Leonard E. Klebanoff “Catalytically functionalized nanoporous frameworks and carbons for chemical energy storage,” ACS Fall 2017 Meeting, Washington, D.C. Aug. 23, 2017.
108. Mark D. Allendorf “Nanoporosity and the Welcome Guest: Metal-Organic Frameworks for Hydrogen Storage, Catalysis, and Energy Conversion,” Dept. of Chemistry, KU Leuven, Belgium, Oct. 26, 2017.
109. M. D. Allendorf, N. Burthc, A. A. Talin, R. Ameloot, I Stassen “A roadmap for the integration of metal-organic frameworks with electronic devices and chemical sensors,” *EuroMOF Industry Workshop*, Nov. 2, 2017.
110. Mark D. Allendorf “Designing Metal-Organic Frameworks for Optoelectronic and Thermoelectric Applications Using Guest Molecules and Structural Diversity,” Univ. of Cambridge, Cambridge, U.K. Feb. 19, 2018.
111. Mark D. Allendorf “Designing Metal-Organic Frameworks for Optoelectronic and Thermoelectric Applications Using Guest Molecules and Structural Diversity,” Queen Mary Univ., London, U.K. Feb. 21, 2018.
112. Mark D. Allendorf ““Designing Metal-Organic Frameworks for Optoelectronic and Thermoelectric Applications Using Guest Molecules & Structural Diversity” Dept. of Chemistry, Univ. Oregon, Eugene, OR April 13, 2018.
113. Mark D. Allendorf, Vitalie Stavila, Michael E. Foster “Multifunctional Metal-Organic Framework Catalysts for Hydrogen Activation,” *ACS National Meeting*, New Orleans, LA, April 18 – 22, 2018.
114. Mark D. Allendorf, M. E. Foster, K. Sohlberg, V. Stavila, Y. He, M. C. So, A. A. Talin, “The Role of Defects in the semiconducting-metallic discrepancy in Metal-Organic Graphene Analogues,” *AiMES 2018*, Cancun, Mexico Sept. 30 – Oct. 4, 2018.
115. M. D. Allendorf, F. P. Doty, A. Benin, V. Stavila, T. C. Wang, D. Haas, “Exploiting MOF luminosity and porosity for in-situ detection of xenon isotopes,” *MOF2018 – 6th Int. Conf. Metal Organic Frameworks and Open Framework Compounds*, Auckland, New Zealand Dec. 9 – 13, 2018.
116. M. D. Allendorf, Dept. of Chemistry, “Defects in MOFs: blessing or curse?” Dept. of Chemistry, Univ. Southern Cal., Los Angeles, Feb. 12, 2019.
117. M. D. Allendorf, “Defects in MOFs: friend or foe?” Institute of Physical and Theoretical Chemistry, Graz Univ. Technology, Graz, Austria, June 24, 2019.
118. M. D. Allendorf, F. P. Doty, A. Benin, V. Stavila, T. C. Wang, J. A. Greathouse, M. Nilsson, “Exploiting the tailorable nanoporosity of metal-organic frameworks for in-situ identification of radioisotopes,” *SnT2019. CTBT Science and Technol. Conf.* Vienna, Austria June 24 – 28, 2019.
119. M. D. Allendorf ““Effects of film properties, guests, and defects on MOF electronic properties,” *Nanoporous Materials and Their Applications, Gordon Research Conf.*, Andover, NH Aug. 4 – 9, 2019.
120. M. D. Allendorf, “Hybrid and Functionalized MOFs for Fuel Production, Transport, and Storage,” *Hybrid Functional Porous Materials: MOFs, Silica and Conductive Polymers symposium, ACS Fall 2019 Meeting*, San Diego, CA Aug. 25 – 30, 2019.
121. M. D. Allendorf, “Soup to Nuts: MOFs for Production, Transport, and Storage of Fuels,” Keynote Lecture, *2019 EuroMOF Conference*, Paris, France Oct. 27 – 30, 2019.
122. M. D. Allendorf, “Designing Metal-Organic Frameworks for Electronic Applications Using Guest Molecules and Structural Diversity,” 3M Technical Innovation Center, St. Paul, MN Nov. 11, 2019.

123. M. D. Allendorf, “Nanopores, Nanoparticles, and “Molecular Hydrides” for Hydrogen Production, Transport, and Storage,” Dept. of Chemistry, Univ. Minnesota, Minneapolis, MN Nov. 12, 2019.
124. M. D. Allendorf, “Nanopores, Nanoparticles, and “Molecular Hydrides” for Hydrogen Production, Transport, and Storage,” Dept. of Chemistry, Boston College, Boston, MA Dec. 5, 2019.
125. M. D. Allendorf “From Nano to Micro and Back Again: Disruptive Science for Materials-Based Hydrogen Storage” Dept. of Chemistry, Colorado School of Mines, Golden, CO Oct. 21, 2022.
126. M. D. Allendorf “From Nano to Micro and Back Again: Disruptive Science for Materials-Based Hydrogen Storage” Dept. of Chemistry, Washington University in St. Louis, Nov. 7, 2022.
127. M. D. Allendorf “From Nano to Micro and Back Again: Disruptive Science for Materials-Based Hydrogen Storage” *15th Int. Symposium Hydrogen & Energy*, Emmetten, Switzerland, Jan. 23, 2023.
128. Mark D. Allendorf “From Nano to Macro and Back Again: Disruptive Science for Materials-Based Hydrogen Storage” *Molecular Foundry Seminar Series*, Lawrence Berkeley National Laboratory, April 25, 2023.
129. Mark D. Allendorf “Hydrogen Materials Advanced Research Consortium” *Breakthrough Energy Fellows Workshop Series: Metal Hydrides: What’s Old, What’s New and What For?* Sept. 19, 2023, Dallas, Texas.
130. Mark D. Allendorf *5th Annual Advanced Water Splitting Technology Pathways: Benchmarking and Protocols Workshop*, September 22, 2023, Scottsdale, Arizona.
131. M. D. Allendorf “Life (literally) at a National Laboratory” *Science, Leadership, and Management Lecture Series*, UC Berkeley, October 2, 2023.
132. Mark D. Allendorf “Nanoscale Metal Hydrides and Systems Analysis: Disruptive Science for Materials-Based Hydrogen Storage” Ecole Normale Supérieure (ENS) CNRS/Paris, June 3, 2024.
133. Mark D. Allendorf, “Nanoscale Metal Hydrides and Systems Analysis: Disruptive Science for Materials-Based Hydrogen Storage” East Paris Institute of Chemistry and Materials (ICMPE)/CNRS, June 4, 2024.
134. Mark D. Allendorf, “New Insights into Confinement of Metastable Hydrogen Storage Materials in Amine-Functionalized Metal-Organic Frameworks” *9th Int. Conf. Metal-Organic Frameworks and Open Framework Compounds*, Singapore, July 15 – 19, 2024.
135. Mark D. Allendorf, “Exploiting nanoconfinement, charge transfer, and entropy to design metal hydrides for hydrogen storage” *Fall ACS 2024 Meeting*, Aug. 18 – 22, 2024.
136. Mark D. Allendorf, “The Power of Empty Space: Adventures in MOF Device Chemistry” *COORNETS Closing Symposium*, Reisenburg, Germany, Sept. 29 – Oct. 1, 2024.
137. Mark D. Allendorf, “The Power of Empty Space: Adventures in the Nanoscience of Metal-Organic Frameworks” *Keynote Lecture, Midstates Consortium Physical Sciences, Mathematics and Computer Science Undergraduate Research Symposium*, Washington University, St. Louis, MO Nov. 15 – 16, 2024.
138. Mark D. Allendorf “Nanoscaling to Overcome the Limitations of Metal Hydrides for Hydrogen Storage” Oregon State University Dept. of Chemistry Seminar Series, April 10, 2025, Corvallis, OR.

139. Mark D. Allendorf, “Breaking the Rules: Using Nanoscaling to Overcome Unfavorable Thermodynamics and Kinetics of Metal Hydrides for Hydrogen Storage” Carleton College Dept. of Chemistry Seminar Series, Northfield, MN, April 28, 2025
140. Mark D. Allendorf, Matthew D Witman, Vitalie Stavila, William Taylor, Xinyi Wang and Hanna Breunig “Material-System Co-Design: An Essential Approach to the Development of Hydrogen Storage Materials” presented in Symposium I05: *Crosscutting Materials Innovation for Transformational Chemical and Electrochemical Energy Conversion Technologies 6*, 247th ECS Meeting, May 18 – 22, 2025, Montreal, Canada DOI 10.1149/MA2025-01422272mtgabs.
141. Mark D. Allendorf “Life (Literally) at a National Laboratory,” Washington University in St. Louis Dept. of Chemistry seminar, December 9, 2025, St. Louis, MO.
142. Mark D. Allendorf “Nanoscaling to Overcome the Limitations of Metal Hydrides for Hydrogen Storage,” Dept. of Chemistry Seminar Series, Washington University in St. Louis, December 11, 2025, St. Louis, MO.
143. Mark D. Allendorf “Nanoscaling to Overcome the Limitations of Metal Hydrides for Hydrogen Storage,” Presented at Spring 2026 MRS meeting, April 26 – 30, 2026.
144. Mohana Shivana, Mark D. Allendorf, Vitalie Stavila et al. “Single-Electron Transfer Mechanism to Stabilize Metastable Metal Hydrides in a Bipyridine-Functionalized MOF” presented at 10th International Conference on Metal-Organic Frameworks and Open Framework Compounds (MOF2026), May 17 – 20, 2026, New Orleans, LA.
145. Mark D. Allendorf, Norm Bartelt, Farid El Gabaly et al. “Materials Chemistry of Natural Hydrogen Production by Serpentinization” presented at 249th meeting of The Electrochemical Society, May 24 – 28, 2026, Seattle, WA.