

Michael J. Zdilla, Ph.D., Professor

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Education	Princeton University Ph.D. and Master of Arts, Inorganic Chemistry Department of Chemistry Thesis: Exploration of Weak-Field Iron-Nitrogen Clusters: Nitrogenase-inspired Synthetic Inorganic Chemistry	Princeton, NJ September 2000 – May 2005
	Millersville University B.S., Chemistry/Biochemistry Magna Cum Laude Departmental Honors University Honors Program Thesis: Synthesis and Characterization of Novel Molybdenum-Diphenylphosphine Complexes	Millersville, PA September 1996 – May 2000
Awards	Temple Univ. College of Science and Technology Mentoring Award	2017
	Millersville University Distinguished Alumni Award	2017
	Camille Dreyfus Teacher Scholar	2014
	Robert L. Smith Early Career Chair in Chemistry	2013
	Office of Naval Research Young Investigator	2013
	National Science Foundation CAREER Award	2013
	Gordon Research Conferences Travel Grant	2007
	Hubert Alyea '24 Teaching Award	2004
	Miles Pickering Teaching Award	2003
	American Institute of Chemists Award	2000
	A. G. Breidenstine Scholarship	2000
	ACS POLYED Polymer Education Award	1999
	Gerald S. Weiss Inorganic Chemistry Scholarship	1998
Polymer Science Award	1998	
CRC Freshman Chemistry Award	1997	
Professional Experience	Professor	July 2019- present
	Associate Professor	July 2015- July 2019
	Robert L. Smith Early Career Professor	July 2013- July 2016
	Assistant Professor	July 2009- July 2015
	Temple University Department of Chemistry Philadelphia, PA Preparation of novel unchelated, low-coordinate manganese clusters, design of metallocluster and catalyst scaffolds, nanomaterials by design, catalytic and ion-conducting materials, synthesis of novel energetic materials.	
	Research Assistant, Purdue University Department of Chemistry (postdoctoral) West Lafayette, IN	May 2005 – July 2009
	Advisor: Mahdi M. Abu-Omar, Exploration of biomimetic metalloporphyrin and corrole chemistry.	
	Research Assistant, Princeton University Department of Chemistry (doctoral) Princeton, NJ	June 2001 – May 2005
	Advisor: Sonny C. Lee, Synthesis of bio-inspired Fe-N-S clusters	
	Summer Research Assistant, Millersville University Department of Chemistry (undergraduate) Millersville, PA	May 1999 – May 2000
Advisor: R. Edward Rajaseelan, Synthesis of molybdenum and tungsten complexes of synthetic interest.		

Professional Teaching Activities:**Experience (cont.)****Practical X-Ray Diffraction**

A theory and user course for grad students desiring certification for use of the department's X-ray diffractometer

Temple Univ, PA
Fall, '12-present

Crystallography and Diffraction

A laboratory course on theory and practice of X-ray diffraction

Temple Univ., PA
Spring '10-'16

Bioinorganic Chemistry

Graduate level class on roles and trafficking of metals in biology.

Temple Univ., PA
Fall '09, '11, '13

Inorganic Chemistry

Developed and taught Temple's sophomore level Inorganic Course

Temple Univ., PA
Summer II, '11, '12

Honors General Chemistry I

Taught 2 sections of Honors General Chemistry I

Temple Univ., PA
Fall, '16-'18

Honors General Chemistry II

Taught 2 sections of Honors General Chemistry II

Temple Univ., PA
Spring, '18

General Chemistry

Taught 4 sections of General Chemistry I

Temple Univ., PA
Summer I, '11

Independent Research

Continually advising independent research by Grads and Undergrads

Temple Univ., PA
Fall, '09 - present

Inorganic Chemistry. – Pickering Award, '03

Taught two sections of precept (recitation class of 5-15 students)

Princeton Univ., NJ
Fall '01/'02, '02/'03, '03/'04

Organic Chemistry.

Taught two sections of organic laboratory

Princeton Univ., NJ
Spring '00/'01, '01/'02

General Chemistry I and II. Teaching Assistant - Alyea Award, '04

Taught three sections of precept (class of 7-20 students)

Princeton Univ., NJ
Fall '00/'01, Spring '03/'04

General Biology. Teacher, Upward Bound summer program,

Taught pre-college biology to high school freshmen

Millersville Univ., PA
Summer, 2000

Intro to Scientific Research. Teacher, Upward Bound summer program

Taught a pre-college scientific research for H.S. seniors in physics, chemistry, or biology

Millersville Univ., PA
Summer, 2000

Academic Tutor. Millersville University/Upward Bound

Tutored Millersville undergraduates (during the academic year) and Upward Bound high school students (summer)

Millersville Univ., PA
1997-2000

Research Interests

Synthesis of biologically inspired metal clusters for energy transduction, storage, and release. Metal clusters are used by biological systems to carry out some of the most difficult reactions on earth, including the reduction of dinitrogen to ammonia, and the oxidation of water to O₂. The preparation of labile, reactive synthetic clusters is a primary focus of the Zdilla Lab.

Energetic Materials. The Zdilla lab is exploring new approaches for the generation of high energy density materials for military, construction, and aeronautic applications. Explosives and propellants with higher energy density hold promise for decreased collateral damage and greater rocket range for military and space exploration applications. Our approach explores the inclusion of inorganic elements (metals, p-block elements) containing greater oxidizing or reducing power than traditional N-rich molecules.

Design of novel redox active ligands for catalysis. The Zdilla group is exploring the use of N-heterocyclic and imine-based redox active ligands in chemical transformations. One particular focus is the use of metal complexes of such ligands for the activation of CO, as redox active ligands exhibit a flexible electronic structure which may lower the activation barrier for the hard-to-soft molecular transformations involved.

Collaborations

Layered Materials for Water Oxidation. As part of Temple's DOE-funded Energy Frontiers Research Center: The Center for Complex Materials (CCM), we are preparing modified layered metal oxides for water oxidation catalysis. In collaboration with experimentalists (Strongin, Borguet) and theorists (Perdew, Klein), we are identifying the defect features responsible for catalysis, and enriching these materials with those sites, leading to orders of magnitude improvement of the activity of these inexpensive catalysts.

Ligand Design for Small Molecule Activation. In a DOE and DTRA funded collaboration with the Schafmeister group, we are aiding in the design, preparation, and metallation of a novel class of artificial enzymes via a new macromolecular design framework called spirooligomers: ladder oligomers with functionalizable shape and controllable display of functional groups in three dimensions. These scaffolds permit the design of enzyme-like active sites for the templating of metal cofactors and the preorganization of substrates for catalytic activation. This technology has led to artificial enzymes for hydrocarbon oxidation and hydrolysis of nerve agent simulants.

Design of Contrast Agents for Cardiovascular imaging. A relatively new collaboration with Steve Phillips (Temple Medical School) seeks to design heavy-element based contrast agents for nano-CT imaging that bind directly to the glycocalyx of heart myocytes. This technology will enable selective labelling of the vasculature of the heart for high-resolution, high-contrast imaging that has not been previously achieved. Such technology has implications for fundamental understanding of heart structure and function, and potential future application for diagnostics.

**Grants
Awarded**

Thermal and Sensitivity Analysis Facility for Next-Generation Defense Materials. 04/01/2022-03/31/2023. Office of Naval Research. N00014-22-1-2266. Total amount of award: \$482,704

Judicious Use of Metal Ion Components in New Energetic Materials as Linkers Between Redox-Frustrated Components and as Magnetically activated Sensitivity Switches. 12/15/2021-12/14/2025. Office of Naval Research. N00014-22-1-2060. Total Amount of Award: \$601,483.

Moldable, self-healing, highly conductive organic co-crystalline solid electrolytes for safer lithium ion batteries. 02/01/2022-01/31/2025. National Science Foundation. DMR2138432. Total Amount of Award: \$480,000.

Conformationally-Flexible, Reactive Manganese Clusters to Probe Possible Mechanisms of O-O Bond Formation in Photosystem II--Supplement. 09/01/2021 – 08/31/2022. National Science Foundation. CHE-1800105. Total Amount of Award: \$498,221

Maximizing Redox Frustration In Hybrid Organic-Inorganic Energetic Materials To Pursue New Realms Of Energy Density. 02/01/2019 – 01/31/2021 Office of Naval Research. N00014-19-1-2087 Total Amount of Award: \$497,521

Conformationally-Flexible, Reactive Manganese Clusters to Probe Possible Mechanisms of O-O Bond Formation in Photosystem II. 09/01/2018 – 08/31/2021. National Science Foundation. CHE-1800105. Total Amount of Award: \$498,221

Center for the Complex Materials (co-PI). 09/01/2018-08/31/2020. Department of Energy/Energy Frontiers Research Center. Amount of Award: \$2,000,000. Award to Zdilla lab total (annual): \$207,731 (\$103,866).

Synthetic Chemistry for the Improvement of Human Health by Fostering a Cleaner Earth (Lead PI). 09/01/2016-09/01/2017. Pennsylvania Department of Health. Total Amount of Award: \$200,000. (instrumentation grant).

Molecular Lego Based Organophosphatase Mimics (co-PI) Summary: Molecular Lego Based Organophosphatase Mimics. Defense Threat Reduction Agency, HDTRA1-16-1-0047. 07/31/2017-07/31/2021. Total Amount Awarded Total: \$1,576,812. Amount Awarded to Zdilla lab: \$200,000.

Exploration of Energetic Manganese Metal-nitrogen-oxygen Complexes and Clusters. 01/01/2016 – 12/31/2018 Office of Naval Research. N00014-16-1-2055 Amount total (annual) \$450,000 (\$150,000).

Design and Synthesis of Bio-inspired Macromolecules Containing Atomically Precise Catalytic Active Sites (subcontractee). 06/13/2016 to 03/12/2017. Department of Energy SBIR/STTR (PI: Ted Amundsen,

Mainstream Engineering Corporation). Amount Awarded Total: \$149,829 Amount Awarded to Zdilla lab: \$40,000

Suschem: Molecular organic frameworks for solid state ion channels with exceedingly simple design: Toward barrier-less ion migration (lead PI). 07/15/2014-06/30/2017 National Science Foundation (PRE). Amount of Award: \$594,981. Award to Zdilla lab Total (Annual): \$297,490 (\$99,163).

Center for the Computational Design of Layered Functional Materials (co-PI). 9/1/2013-8/31/2017 Department of Energy/Energy Frontiers Research Center. Amount of Award: \$12,000,000. Award to Zdilla lab total (annual): \$621,821 (\$155,455).

Synthesis and Reactivity of Multimetal Systems Inspired by Biology. 4/25/2014-4/24/2019. Camille and Henry Dreyfus Foundation. Amount total (annual) \$75,000 (\$15,000).

CAREER: Bio-inspired synthesis of conformationally flexible analogues of the biological oxygen evolving complex: A redesigned approach to manganese cluster molecules. 9/1/2013-8/31/2018. National Science Foundation. Amount total (annual) \$500,000 (\$100,000).

Exploration of Energetic Manganese Metal-nitrogen-oxygen Complexes and Clusters. 5/15/13-5/14/2016 Office of Naval Research. Amount total (annual) \$593,595 (\$197,865).

Nanomaterials by Design. (Co-PI). 1/1/2013-12/31/2016. Army Research Laboratory, 2012. Amount of Award: 1,800,000. Amount to Zdilla Lab total (annual) \$150,000 (\$50,000).

EPR and X-Ray Structures grant 3/1/2013-2/28/2014. Lightwave Logic, Inc. \$7000.

Publications

80. Prakash, P.; Shylendran, A.; Fall, B.; Zdilla, M. J.; Wunder, S. L.; Venkatnathan, A. Mechanism of Ion Conduction and Dynamics in Tris(*N,N*-dimethylformamide) Perchloratosodium Solid Electrolytes. **2022**, *126*, 4744–4750. <https://doi.org/10.1021/acs.jpcc.1c09005>
79. Koellner, C. A.; Gau, M. R.; Polyak, A.; Bayana, M.; Zdilla, M. J. Hemicubane topological analogs of the oxygen-evolving complex of photosystem II mediating water-assisted propylene carbonate oxidation. **2022**, *58*, 2532-2535. <https://doi.org/10.1039/D1CC05825H>
78. Bigness, A.; Vaddypally, S.; Zdilla, M. J.; Mendoza-Cortés, J. L. “Ubiquity of cubanes in bioinorganic relevant compounds. *Corrd. Chem. Rev.* **2022**, *450*, 214168. <https://doi.org/10.1016/j.ccr.2021.214168>
77. Ding, R.; Yasini, P.; Peng, H.; Perdew, J. P.; Borguet, E.; Zdilla, M. J. Reimagining the e_g^1 Electronic State in Oxygen Evolution Catalysis: Oxidation-State-Modulated Superlattices as a New Type of Heterostructure for Maximizing Catalysis. *Adv. Energ. Mater.* **2021**, *11*, 2101636. <https://doi.org/10.1002/aenm.202101636>
76. Sybin, S. V.; Morozov, S. I.; Prakash, P.; Zdilla, M. J.; Goddard, W. A. Reaction Mechanism and Energetics of Decomposition of Tetrakis(1,3-dimethyltetrazol-5-imidoperchloratomanganese(II)) from Quantum-Mechanics-based Reactive Dynamics. *J. Am. Chem. Soc.* **2021**, *143*, 16960-16975. <https://doi.org/10.1021/jacs.1c04847>
75. Prakash, P. Ardhra, S Fall, B; Zdilla, M.J.; Wunder, S. L.; Venkatnathan, A. Solvate sponge crystals of (DMF)₃NaClO₄: reversible pressure/temperature controlled juicing in a melt/press-castable sodium-ion conductor. *Chem. Sci.* **2021**, *12*, 5574-5581. <https://doi.org/10.1039/D0SC06455F>
74. Northrup, J. D.; Wiener, J. A.; Hurley, M. F. D.; Hou, C.-F. D.; Keller, T. M.; Baxter, R. H. G.; Zdilla, M. J.; Voelz, V. A.; Schafmeister, C. E. Metal-Binding Q-Proline Macrocycles. *J. Org. Chem.* **2021**, *86*, 4867–4876 <http://doi.org/10.1021/acs.joc.1c00116>

73. Bhullar, R. K.; Zdilla, M. J.; Klein, M. K.; Remsing, R. C. Effect of water frustration on water oxidation catalysis in the nanoconfined interlayers of layered manganese oxides birnessite and busserite. *J. Mat. Chem. A.* **2021**, *9*, 6924-6932. <http://doi.org/10.1039/D0TA09635K>
72. Gau, M. R.; Zdilla, M. J. "Multinuclear Clusters of Manganese and Lithium with Silsesquioxane-Derived Ligands: Synthesis and Ligand Rearrangement by Dioxygen- and Base-Mediated Si-O Bond Cleavage." *Inorg. Chem.* **2021**, *5*, 2866-2871. <http://doi.org/10.1021/acs.inorgchem.0c03225>
71. Vaddypally, S.; Kiselev, V. G.; Byrne, A. N.; Goldsmith, F. C.; Zdilla, M. J. Transition-metal-mediated reduction and reversible double-cyclization of cyanuric triazide to an asymmetric bitetrazolate involving cleavage of the six-membered aromatic ring. *Chem. Sci.* **2021**, *12*, 2268-2275. <http://doi.org/10.1039/d0sc04949b>
70. O'Sullivan, O. T.; Zdilla, M. J. Properties and Promise of Catenated Nitrogen Systems as High-Energy-Density Materials. *Chem. Rev.* **2020**, *120*, 5682-5744. (<http://doi.org/10.1021/acs.chemrev.9b00804>).
69. Fall, B.; Prakash, P.; Gau, M. R.; Wunder, S. L.; Venkatnathan, A.; Zdilla, M. J. Experimental and Theoretical Investigation of the Ion Conduction Mechanism of Tris (adiponitrile) perchloratosodium, a Self-Binding, Melt-Castable Crystalline Sodium Electrolyte. *Chem. Mater.* **2019**, *31*, 8850-8863. (<http://doi.org/10.1021/acs.chemmater.9b02853>)
68. Vaddypally, S.; Tomlinson, W.; O'Sullivan, O. T.; Ding, R.; Van Vliet, M; Wayland, B. B.; Hooper, J. P.; Zdilla, M. J. Activation of CH, NH, and OH bonds via proton-coupled electron transfer to a Mn (III) complex of redox-noninnocent octaazacyclotetradecadiene, a catenated-nitrogen macrocyclic ligand. *J. Am. Chem. Soc.* **2019**, *141*, 5699-5709. (<https://pubs.acs.org/doi/abs/10.1021/jacs.8b10250>)
67. Dey, S.; Wayland, B. B.; Zdilla, M. J. Solution and Solid State Properties for Low-Spin Cobalt (II) Dibenzotetramethyltetraaza [14] annulene [(tmtaa) CoII] and the Monopyridine Complex. *Inorg. Chem.* **2019**, *58*, 1224-1233. (<https://pubs.acs.org/doi/10.1021/acs.inorgchem.8b02644>)
66. Zhao, S; Teijaro, C. N.; Chen, H.; Sirasani, G.; Vaddypally, S.; O'Sullivan, O.; Zdilla, M. J.; Dobereiner, G. E.; Andrade, R. B. "Synthesis of Bis-Strychnos Alkaloids (-)-Sungucine, (-)-Isosungucine, and (-)-Strychnogucine B from (-)-Strychnine" *Braz. J. Chem.* **2019**, *30*, 436-453. (<http://dx.doi.org/10.21577/0103-5053.20180217>)
65. Yennawar, H. P. : Silverberg, L. J.; Cannon, K.; Gandla, D.; Kondaveeti, S. K.; Zdilla, M. J.; Nuriye, A. Crystal structures of two 1,3-thia-zolidin-4-one derivatives featuring sulfide and sulfone functional groups. *Acta Cryst. E.* **2018**, *74*, 1695-1699. (<https://doi.org/10.1107/S2056989018015098>)
64. Ho, D. M.; Zdilla, M. J. "The solid-state conformation of the topical antifungal agent O-naphthalen-2-yl N-methyl-N-(3-methylphenyl)carbamothioate." *Acta Cryst. C.* **2018**, *74*, 1495-1501. (<http://scripts.iucr.org/cgi-bin/paper?yp3169>)
63. Dey, S.; Dewey, J. R.; Wayland, B. B.; Zdilla, M. J. "Synthesis of a tethered dibenzotetramethyl- Q1 tetraaza[14]annulene macrocycle and the di-nickel(II) derivative." *New. J. Chem.* **2018**, *42*, 19369-19376. (<https://pubs.rsc.org/en/content/articlelanding/2018/nj/c8nj03154a#!divAbstract>)
62. McKendry, I. G.; Mohamad, L. J.; Thenuwara, A. C.; Marshall, T.; Borguet, E.; Strongin, D. R.; Zdilla, M. J. "Synergistic In-layer Cobalt Doping and Interlayer Iron Intercalation Into Layered MnO2 Produces an Efficient Water Oxidation Electrocatalyst." *ACS Energy Letters.* **2018**, *3*, 2280-2285. (<https://pubs.acs.org/doi/abs/10.1021/acsenerylett.8b01217>)
61. Herbst-Gervasoni, C. J.; Gau, M. R.; Zdilla, M. J.; Valentine, A. M. "Crystal structures of sodium-, lithium-, and ammonium 4,5-di-hydroxy-benzene-1,3-di-sulfonate (tiron) hydrates." *Acta Cryst. E.* **2018**, *74*, 918-925. (<https://journals.iucr.org/e/issues/2018/07/00/z12730/>)

**Publications
(cont.)**

60. Noss, M. E.; Wieder, N. L.; Carroll, P. J.; Zdilla, M. J.; Berry, D. H. "Magnetism and EPR Studies of Binuclear Ruthenium Hydride Binuclear Species Bearing Redox-Active Ligands." *Inorg. Chem.* **2018**, *57*, 7063-7043. (<https://pubs.acs.org/doi/10.1021/acs.inorgchem.8b00735>)
59. Prakash, P.; Aguirre, J.; Van Vliet, M. M.; Chinnam, P. R.; Dikin, D. A.; Zdilla, M. J.; Wunder, S. L.; Venkatnathan, A. "Unravelling the structural and dynamical complexity of the equilibrium liquid grain-binding layer in highly conductive organic crystalline electrolytes." *J. Mater. Chem. A*, **2018**, *6*, 4394-4404. (<https://pubs.rsc.org/en/content/articlelanding/2018/ta/c7ta10367k#!divAbstract>)
58. McKendry, I. G.; Thenuwara, A. C.; Shumlas, S. L.; Peng, H.; Aulin, Y. V.; Chinnam, P. R.; Borguet, E.; Strongin, D. R.; Zdilla, M. J. "Systematic Doping of Cobalt into Layered Manganese Oxide Sheets Substantially Enhances Water Oxidation Catalysis." *Inorg. Chem.*, **2018**, *57*, 557-564. (<https://pubs.acs.org/doi/abs/10.1021/acs.inorgchem.7b01592>)
57. Lundell, C. E.; O'Sullivan, O. T.; Gau, M. R.; Zdilla, M. J. "Synthesis of Two Lead Complexes of Propellant Stabilizer Compounds: In Pursuit of Novel Propellant Additives." *ChemistrySelect* **2017**, *2*, 11673–11676. (<http://onlinelibrary.wiley.com/doi/10.1002/slct.201701791/full>)
56. O'Sullivan, O. T.; Zdilla, M. J. "Manganese-mediated linkage of perchlorate to aminotetrazoles gives twice the energy density of the unmetallated salt." *Chem. Eur. J.* **2017**, *23*, 14138-14142. (<http://onlinelibrary.wiley.com/doi/10.1002/chem.201702696/abstract>)
55. Peng, H.; McKendry, I. G.; Ding, R.; Thenuwara, A. C.; Kang, Q.; Shumlas, S. L.; Strongin, D. R.; Zdilla, M. J.; Perdew, J. P. "Redox properties of birnessite from a defect perspective. *Proc. Natl. Acad. Sci. U.S.A.* **2017**, *114*, 9523-9528. (<https://doi.org/10.1073/pnas.1706836114>)
54. Austin, A.; Hestand, N. J.; McKendry, I. G.; Zhong, C.; Zhu, X.; Zdilla, M. J.; Spano, F. C.; Szarko, J. M. "Enhanced Davydov Splitting in Crystals of a Perylene Diimide Derivative." *J. Phys. Chem. Lett.* **2017**, *8*, 1118–1123. (<https://pubs.acs.org/doi/abs/10.1021/acs.jpcclett.7b00283#>)
53. Fall, B.; Jalil, A.; Gau, M.; Chereddy, S.; Zdilla, M. J.; Wunder, S. L.; Chinnam, P. R. "Crystal structure and ionic conductivity of the soft solid crystal: isoquinoline •(LiCl)." *Ionics*. **2017**, *24*, 343-349 (<https://link.springer.com/article/10.1007%2Fs11581-017-2206-7>)
52. Vaddypally, S.; Kondaveeti, S. K.; Karki, S.; Van Vliet, M. M.; Levis, R. J.; Zdilla, M. J. "Reactive Pendant Mn=O in a Synthetic Structural Model of a Proposed S₄ State in the Photosynthetic Oxygen Evolving Complex" *J. Am. Chem. Soc.* **2017**, *139*, 4675-4681. (<http://pubs.acs.org/doi/abs/10.1021/jacs.6b05906>)
51. Vaddypally, S.; Jovinelli, D. J.; McKendry, I. G.; Zdilla, M. J. "Covalent Metal–Metal-Bonded Mn⁴ Tetrahedron Inscribed within a Four-Coordinate Manganese Cubane Cluster, As Evidenced by Unexpected Temperature-Independent Diamagnetism" *Inorg. Chem.* **2017**, *56*, 3733–3737. (<http://pubs.acs.org/doi/abs/10.1021/acs.inorgchem.7b00152>)
50. Jalil, A.; Clymer, R. N.; Hamilton, C. R.; Vaddypally, S.; Gau, M. R.; Zdilla, M. J. "Structure of salts of lithium chloride and lithium hexafluorophosphate as solvates with pyridine and vinylpyridine and structural comparisons: (C₅H₅N)LiPF₆, [p-(CH₂CH)C₅H₅N]LiPF₆, [(C₅H₅N)LiCl]_n, and [p-(CH₂CH)C₅H₅N]₂-Li(μ-Cl)₂Li[p-(CH₂CH)C₅H₅N]₂" *Acta Cryst. C* **2017**, *73*, 264-269. (<http://scripts.iucr.org/cgi-bin/paper?S205322961700064X>)
49. Hamilton, C. R.; Zdilla, M. J. "Structure of a pentamanganese(II)–phenoxide cluster with a central five-coordinate oxide: Mn^{II}₅(μ-OPh)₆(μ₃-OPh)₂(μ₅-O)(Py)₆·Py (Py is pyridine)[Mn₅(C₆H₅O)₈O(C₅H₅N)₆]·C₅H₅N." *Acta Cryst. C* **2017**, *73*, 270-275 (<http://scripts.iucr.org/cgi-bin/paper?S2053229617000663>)

Publications

- (cont.) 48. Peters, G. M.; Winegrad, J. B.; Gau, M. R.; Imler, G. H.; Xu, B.; Ren, S.; Wayland, B. B.; Zdilla, M. J. "Synthesis and Structure of 2,5-Bis[N-(2,6-mesityl)iminomethyl]pyrrolylcobalt(II): Evidence for One-Electron-Oxidized, Redox Noninnocent Ligand Behavior". *Inorg. Chem.* **2017**, *56* 3377–3385. (<http://pubs.acs.org/doi/abs/10.1021/acs.inorgchem.6b02898>)
47. Kang, Q.; Vernisse, L.; Remsing, R. C.; Thenuwara, A. C.; Shumlas, S. L.; McKendry, I. G.; Klein, M. L.; Borguet, E.; Zdilla, M. J.; Strongin, D. R. "Effect of Interlayer Spacing on the Activity of Layered Manganese Oxide Bilayer Catalysts for the Oxygen Evolution Reaction." *J. Am. Chem. Soc.* **2017**, *139*, 1863–1870. (<http://pubs.acs.org/doi/abs/10.1021/jacs.6b09184>)
46. Chinnam, P. R.; Fall, B.; Dikin, D. A.; Jalil, A.; Hamilton, C. R.; Wunder, S. L.; Zdilla, M. J. "A Self-Binding, Melt-Castable, Crystalline Organic Electrolyte for Sodium Ion Conduction." *Angew. Chem.* **2016**, *55*, 15254–15257 (<http://onlinelibrary.wiley.com/doi/10.1002/ange.201606363/abstract>)
45. Thenuwara, A. C.; Shumlas, S. L.; Attanayake, N. H.; Aulin, Y. V.; McKendry, I. G.; Qiao, Q.; Zhu, Y.; Borguet, E.; Zdilla, M. J.; Strongin, D. R. "Intercalation of Cobalt into the Interlayer of Birnessite Improves Oxygen Evolution Catalysis." *ACS Catal.* **2016**, *6*, 7739–7743. (<http://pubs.acs.org/doi/abs/10.1021/acscatal.6b01980>)
44. McKendry, I. G.; Thenuwara, A. C.; Sun, J.; Peng, H.; Perdew, J. P.; Strongin, D. R.; Zdilla, M. J. "Water Oxidation Catalyzed by Cobalt Oxide Supported on the Mattagamite Phase of CoTe₂." *ACS Catal.* **2016**, *6*, 7393–7397. (<http://pubs.acs.org/doi/abs/10.1021/acscatal.6b01878>)
43. Michael R. Gau and Michael J. Zdilla. "A Protocol for Safe Lithiation Reactions Using Organolithium Reagents." *Journal of Visualized Experiments.* **2016**, e54705–e54705. (<https://www.jove.com/video/54705/a-protocol-for-safe-lithiation-reactions-using-organolithium-reagents>)
42. Senzhi Zhao, Christiana N. Teijaro, Heng Chen, Gopal Sirasani, Shivaiah Vaddypally, Michael J. Zdilla, Graham E. Dobereiner, and Rodrigo B. Andrade "Concise Syntheses of bis-Strychnos Alkaloids (—)-Sungucine, (—)-Isosungucine, and (—)-Strychnogucine B from (—)-Strychnine." *Chem. Eur. J.* **2016**, *22*, 11593–11596. (<https://onlinelibrary.wiley.com/doi/pdf/10.1002/chem.201602663>)
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Invited Talks

Gordon Research Conference on Metallocofactors. Biomimetic (and other) reactivity of manganese and manganese-calcium clusters with no (or low) chelation, and context for proposed mechanisms of water oxidation by photosystem II. Providence, RI 2022.

ACS Spring 2022 National Meeting, Multimetallic Molecular and Extended Platforms for Energy Applications. Flexible ligand fields for reactive manganese clusters: Toward structural and functional mimics of the oxygen evolving complex. San Diego, CA 2022.

ACS Spring 2022 National Meeting, ACS Award for Affordable Green Chemistry: Symposium in Honor of Mahdi M. Abu-Omar. Soft salt-organic solvate cocrystals as a new class of solid electrolyte for lithium and sodium batteries. San Diego, CA 2022.

North American Thermal Analysis Society. **2021**. Breaching the CHNO ceiling for Energetic Materials using redox-frustrated hybrid organic-inorganic molecules. Remote meeting.

North American Thermal Analysis Society. **2021**. Salt-organic cocrystalline materials as promising solid-state electrolytes for solid lithium ion batteries. Remote meeting.

American Crystallographic Association Annual Meeting. **2020**. Measurement of partial atomic charges by least-squares refinement of variable electron density crystallographic models. Remote meeting.

American Crystallographic Association Annual Meeting. **2020**. DECOR: The Database of Educational Crystallographic Online Resources, Updates and Prospectus. Remote meeting.

University of California Santa Barbara Catalysis Seminar Series. **2020**. Turning a cheap, poor catalyst into a cheap, excellent catalyst. Optimizing layered MnO-based materials for water oxidation using experiment and theory. Santa Barbara, CA (remote).

American Chemical Society National Meeting and Expo. **2020**. Geometrically flexible synthetic manganese-oxygen and calcium-manganese-oxygen cubane clusters as reactive biomimics of the oxygen evolving complex of photosystem II. SciMeetings.

American Chemical Society National Meeting and Expo. **2020**. Electronic Structure Effects on Catalytic Water Oxidation Activity by Layered Manganese Oxide phases. SciMeetings.

Materials Research Society Spring Meeting and Exhibit. **2019**. Turning a Cheap, Poor Catalyst into a Cheap, Excellent Catalyst—Optimizing Layered MnO-Based Materials for Water Oxidation Using Experiment and Theory. Phoenix, AZ.

ONR Collaborative Exchange. **2019**. Ideas for Increasing Energy Density of Energetic Materials by Inclusion of Inorganic Atoms. Santa Barbara, CA.

ONR Triservice Review, **2019**. Annual Progress on Exploration of energetic manganese metal-nitrogen-oxygen complexes and clusters. Arlington, VA.

ONR Collaborative Exchange. **2018**. Ideas for Increasing Energy Density of Energetic Materials by Inclusion of Inorganic Atoms. West Lafayette IN.

256th National Meeting of the American Chemical Society. **2018**. Layer-by-layer assembly of colloidal nanosheets with individually differing properties to generate improved water oxidation catalysts. Boston, MA

Chemistry and Physics of Advanced Materials-III. **2018**. Multimetal systems for energy storage and transduction. Pune, India.

14th JNC Research Conference on Chemistry of Materials. **2018**, Turning a cheap, poor catalyst into a cheap, excellent catalyst. Optimizing layered MnO-based materials for water oxidation using experiment and theory. Trivandrum, Kerala, India.

Juniata College Department of Chemistry Colloquium Series. **2018**, Multimetal synthetic systems for energy applications. Huntingdon, PA.

256th Meeting of the American Chemical Society. **2018**, Turning a cheap, poor catalyst into a cheap, excellent catalyst. Optimizing layered MnO-based materials for water oxidation using experiment and theory. Boston, MA

Philadelphia Inorganic Colloquium, University of Pennsylvania, Philadelphia, PA, **2018**, Toward Breaching the CHNO Ceiling in Energetic Materials. Philadelphia, PA.

Materials Science and Engineering Departmental Colloquium, Drexel University, **2018**, Turning a cheap, poor catalyst into a cheap, excellent catalyst. Optimizing layered MnO-based materials for water oxidation using experiment and theory. Philadelphia, PA

Materials Science and Engineering Colloquium, Boston University, **2017**. “Turning a cheap, poor catalyst into a cheap, excellent catalyst. Optimizing layered MnO-based materials for water oxidation using experiment and theory.” Boston, MA.

Lehigh Valley Chapter of the American Chemical Society November Meeting, **2016**. “Cocrystals of salts with “soft” organic molecules as a new class of solid electrolytes for safer batteries.” Bethlehem, PA.

Drexel University Chemistry Department Seminar Series, **2016**. “Cocrystals of salts with “soft” organic molecules as a new class of solid electrolytes for safer batteries.” Philadelphia, PA

Bucknell University Chemistry Department Seminar Series, **2016** “Multimetal Synthetic Systems for Energy Applications.” Lewisburg, PA.

252nd ACS National Meeting, **2016**, Paper ID INOR 227. Symposium on Understanding Cluster Cofactors Through Biomimetic Models. Lecture Title: “Studies of high-oxidation state Mn(IV/V) and Mn(IV/VII) cubane clusters: Electronic structure and reactivity of models of proposed S₄ states of photosystem II.” Philadelphia, PA.

Gordon Research Conference on Energetic Materials. “Expedition to Breach the CHNO Ceiling by the Introduction of Varied-Oxidation-State Manganese into Energetic Materials.” Stowe, VT, **2016**.

Thermal Analysis Forum of the Delaware Valley. **2016**. “Salt-organic co-crystalline electrolytes.” Philadelphia, PA.

Jawaharlal Nehru Centre for Advanced Scientific Research. International Centre for Materials Research (ICMS) Winter School. Bengaluru, India. **2015**. “Organic and Inorganic Synthetic Approaches to Energy Storage: From Battery Materials to Water Splitting Catalysts”

Tata Institute for Fundamental Research. **2015**. “Synthetic Molecules and Materials as Models of the Oxygen Evolving Complex of Photosystem II.” Mumbai, India.

North Carolina State University Inorganic seminar series. **2015**. “Synthetic Molecules and Materials as Models of the Oxygen Evolving Complex of Photosystem II.” Raleigh, NC.

University of California Riverside Organic/Inorganic seminar series. **2015**. “Synthetic Exploration of Unchelated Manganese Clusters of Reduced Coordination Number: A reinvention of Photosynthetic Water Oxidation Models.” Riverside, CA.

University of Rochester Department of Chemistry seminar series. **2014**. “Synthetic Exploration of Unchelated Manganese Clusters of Reduced Coordination Number: A reinvention of Photosynthetic Water Oxidation Models.” Rochester, NY

Purdue University Chemistry Department, Inorganic Division seminar series. **2014**. “Flexible approaches to coordination chemistry for enhanced reactivity.” West Lafayette, IN.

Notre Dame Chemistry Department, Inorganic Division seminar series. **2014**. “Flexible approaches to coordination chemistry for enhanced reactivity.” South Bend, IN.

Indiana University Chemistry Department, Inorganic Division seminar series. **2014**. “Flexible approaches to coordination chemistry for enhanced reactivity.” Bloomington, IN.

**Invited Talks
(cont.)**

248th ACS National Meeting, **2014**, INORG. Young Investigator Awardee Forum. Lecture Title: "If you love something, let it go: Dynamic behavior in two weakly ligated metal systems." San Francisco, CA.

Millersville University, Department of Chemistry, Retirement Symposium for Dr. Sandra Turchi. **2014**. "Nature's Solar Power Plant." Millersville, PA.

Osaka University, Department of Chemistry, **2013**, Lecture Title: "Synthetic Exploration of Unchelated Manganese Clusters of Reduced Coordination Number: A reinvention of Photosynthetic Water Oxidation Models." Osaka, Japan.

Ewha Womens University, Center for Biomimetic Systems, **2013**, Lecture Title: "Synthetic Exploration of Unchelated Manganese Clusters of Reduced Coordination Number: A reinvention of Photosynthetic Water Oxidation Models." Seoul, Korea.

University of Pennsylvania Department of Chemistry, Inorganic Chemistry Seminar Series, **2012**, Lecture Title: "Synthetic Exploration of Unchelated Manganese Clusters of Reduced Coordination Number: A Reinvention of Photosynthetic Water Oxidation Models." Philadelphia, PA.

Juniata College, Department of Chemistry, Inorganic Chemistry Seminar Series, **2012**, Lecture Title: "Synthetic Exploration of Unchelated Manganese Clusters of Reduced Coordination Number: A reinvention of Photosynthetic Water Oxidation Models." Hunting don, PA.

University of Delaware, Department of Chemistry, Inorganic Chemistry Seminar Series, **2012**, Lecture Title: "Synthetic Exploration of Unchelated Manganese Clusters of Reduced Coordination Number: A reinvention of Photosynthetic Water Oxidation Models." Newark, DE.

St. Joseph's University Department of Chemistry Seminar Series, **2011**, Lecture Title: Exploration of low coordinate Manganese Cluster Chemistry: Reactive clusters inspired by the tetramanganese water oxidation catalyst of Photosystem II." Philadelphia, PA.

Bryn Mawr College Department of Chemistry Seminar Series, **2011**, Lecture Title: Exploration of low coordinate Manganese Cluster Chemistry: Reactive clusters inspired by the tetramanganese water oxidation catalyst of Photosystem II." Bryn Mawr, PA.

Army Research Laboratory: Invited Talk, **2011**, Lecture Title: Exploration of Manganese Clusters as High Energy Materials." Aberdeen, MD.

Lebanon Valley College Department of Chemistry Seminar Series, **2011**, Lecture Title: Exploration of low coordinate Manganese Cluster Chemistry: Reactive clusters inspired by the tetramanganese water oxidation catalyst of Photosystem II." Annville, PA.

LaSalle Department of Chemistry Seminar Series, **2009**, Lecture Title: "Mechanism of chlorite dismutation: Studies of recombinant Cld and synthetic iron-porphyrin catalysts." LaSalle University, Philadelphia, PA.

Other

American Crystallographic Association Annual Meeting, **2020**. DECOR: The Database of Educational Crystallographic Online Resources, Updates and Prospectus. Remote Meeting.

American Crystallographic Association Annual Meeting. **2020**. Measurement of partial atomic charges by least-squares refinement of variable electron density crystallographic models. Remote meeting.

Gordon Research Conference on Inorganic Reaction Mechanisms. **2019**. Synthesis and mechanism of detonation of novel, nitrogen-rich hybrid organic-inorganic energetic materials. Galveston, TX.

American Crystallographic Association Annual Meeting, **2018**, Poster Title: DECOR: The Database of

Educational Crystallographic Online Resources. Toronto, ON

Gordon Research Conference on Metallocofactors, **2018**, Poster title: Reactive models of the Oxygen Evolving Complex Through Synthesis of Geometrically Flexible Manganese Cores. South Hadley, MA

Gordon Research Conference on Energetic Materials, **2018**, Poster title: Hybrid Organic/Inorganic High Energy Materials with Increased Redox Frustration. Newry, ME

255th ACS National Meeting, **2018**, Lecture title: Advances in modeling the photosynthetic oxygen evolving complex with geometrically flexible manganese clusters. New Orleans, LA.

255th ACS National Meeting, **2018**, Poster title: Inherent directional order of methylammonium cations in lead-iodide perovskite. New Orleans, LA.

255th ACS National Meeting, **2018**, Lecture title: Breaching the CHNO ceiling in energetic materials by the inclusion of redox-frustrated inorganic elements. New Orleans, LA.

255th ACS National Meeting, **2018**, Lecture title: Highly conductive molecular electrolytes for safer lithium batteries designed through use of the Pearson hard-soft acid base concept. New Orleans, LA.

255th ACS National Meeting, **2018**, Lecture title: Modifying layered manganese oxides for enhanced water oxidation: Turning a cheap, poor catalyst into a cheap, excellent catalyst. New Orleans, LA.

Gordon Research Conference on Inorganic Reaction Mechanisms, **2017**. Poster Title: "Bioinspired oxygen atom- and hydrogen atom transfer from the pendant manganese of a high-valent manganese cubane cluster: a functional mimic of a proposed S₄ state of the Oxygen Evolving Complex.." Galveston, TX.

Thermal Analysis Forum of the Delaware Valley, Rowan University. **2017**. "A pitch for the inclusion of unstable transition metal ions in energetic materials." Glassboro, NJ.

Gordon Research Conference on Metallocofactors, **2016**. Poster title: "The pendant Mn=O moiety is the reactive component of the Mn₄(N^tBu)₇(NMnO₃) cubane cluster, a synthetic model of a proposed S₄ state in the Photosynthetic Oxygen Evolving Complex." Easton, MA.

Gordon Research Conference on Metals in Biology, **2016**. Poster title: "Mechanisms at Model Clusters: Unchelated Manganese Clusters as Reactive Models of the Oxygen Evolving Complex." Ventura, CA

Jawaharlal Nehru Centre for Advanced Scientific Research. Temple/JNC Joint Symposium. **2015**. "Multimetal Synthetic Systems for Energy Applications" Bengaluru, India.

Indian Institute of Science and Educational Research, Pune. Temple/IISER Pune Joint Symposium. **2015**. "Organic and Inorganic Synthetic Approaches to Energy Storage: From Battery Materials to Water Splitting Catalysts" Pune, India

Gordon Research Conference on Inorganic Reaction Mechanisms, **2015**. Poster Title: "Synthesis and reactivity of manganese cubane clusters with terminal M=O moieties. Model reactivity of a proposed S₄ state of photosystem II." Galveston, TX.

248th ACS National Meeting, **2014**, INORG, Paper ID 19056. Symposium on Bioinorganic Chemistry, Proteins and Enzymes and Model Systems. Lecture Title: "Role of Lewis acid ions on biomimetic redox processes at flexible, unchelated manganese clusters." San Francisco, CA.

**Presentations
(cont.)**

248th ACS National Meeting, **2014**, INORG, Paper ID 248. Symposium on Electronic Structure Contributions to Physical Properties and Reactivity in Transition Metal Chemistry: “Redox active manganese-tetrazene complexes as a new type of high-energy density compound.” San Francisco, CA.

Gordon Research Conference on Energetic Materials, **2014**. Poster Title: “High-Oxidation-State Metal-Organonitrogen Compounds as a New Class of Energetic Materials.” Newry, ME.

Lunch and the Lab seminar series, Temple Undergraduate Chemical Society, **2014**. Lecture Title: “Exploration of multi-metal systems for energy transduction.” Philadelphia, PA

National Institute for Materials Science, Temple - NIMS Symposium on Advanced Materials and Nanotechnology, **2013**, Lecture Title: “Progress and problems in multi-metal chemistry with relationships to green chemistry.” Tsukuba, Japan.

Yonsei University, Temple University – Yonsei Exchange Visit Symposium, **2013**, Lecture Title: “Progress and problems in multi-metal chemistry with relationships to green chemistry.” Seoul, Korea.

246th ACS National Meeting, **2013**, INORG, Paper ID 17751. Symposium on Bioinorganic Chemistry. Lecture Title: “Role of Lewis acid ions on biomimetic redox processes at flexible, unchelated manganese clusters.” Indianapolis, IN.

246th ACS National Meeting, **2013**, INORG, Paper ID 19213. Symposium on New Ideas, Materials and Methods for Better Batteries. Lecture Title: “Preparation of organic matrices for lithium ion conduction using common, commercially available organic compounds.” Indianapolis, IN.

Gordon Research Conference on Inorganic Reaction Mechanisms, **2013**. Lecture Title: “Mechanistic interrogation of rearrangement and assembly reactions in manganese clusters with flexible cores.” Galveston, TX.

TedX, Temple University, **2013**. Lecture Title: “Uncertain Path to Renewable Fuels.” Philadelphia, PA.

244th ACS National Meeting, **2012**, INORG, Paper 694. Symposium on Coordination Chemistry, Characterization and Applications. Lecture Title: “Photosystem-II-inspired synthesis of unchelated manganese clusters of reduced coordination number.” Philadelphia, PA.

Nerd Nite Café at Frankford Hall, **2012**, Lecture Title: “Chemistry and Energy.” Philadelphia, PA.

NSF ARI Grantee’s Conference, **2011**, Poster Title: “Preliminary kinetic and mechanistic studies on the chemiluminescent reaction of a Naproxen system with hydroxyl radical.” Alexandria, VA.

241st ACS National Meeting, **2011**, INORG, Paper 49. Symposium on Coordination Chemistry, Characterization and Applications. Lecture Title: “Synthesis and reactivity of low-coordinate manganese clusters with relevance to the oxygen evolving center of photosystem II.” Anaheim, CA.

Gordon Research Conference on Inorganic Reaction Mechanisms, **2011**. Poster Title: “Hydrogen atom transfer reactions in a 4-coordinate tetranuclear manganese cluster” Galveston, TX.

Lunch and the Lab seminar series, Temple Undergraduate Chemical Society, **2009**. Lecture Title: “Exploration of Biologically Relevant Metallocluster Analogues Using Traditional and Novel Methodologies.” Philadelphia, PA

236th ACS National Meeting, **2008**, INORG, Paper 674. Symposium on Environmental Aspects of Inorganic Chemistry. Lecture Title: “Mechanism of chlorite dismutation: Studies of recombinant chlorite dismutase and bio-inspired synthetic iron-porphyrin catalysts.” Philadelphia, PA.

233rd ACS National Meeting, **2007**, INORG, Paper 1294. Symposium on Development and Studies

with Inorganic Catalysts. Lecture Title: "Mechanism of Group Transfer for Reactions Mediated by a Terminal Imido Complex of Manganese Corrole." Chicago, IL.

Gordon Research Conference on Inorganic Reaction Mechanisms, **2007**. Lecture Title: "Mechanism of Group Transfer for Reactions Mediated by a Terminal Imido Complex of Manganese Corrole." Ventura, CA. February 2007.

Purdue, Indiana, and Notre Dame Universities (PINDU) chemistry conference, **2006**. Lecture Title: "Mechanism of Catalytic Aziridination with Manganese Corrole." South Bend, IN.

232nd ACS National meeting, **2006**. INORG, Paper 712. Poster session on Inorganic Catalysts. Poster Title: "Mechanism of Catalytic Aziridination with Manganese Corrole: The Often Postulated High-Valent Mn(V) Imido is not the Group Transfer Reagent." San Francisco, CA.

Purdue, Indiana, and Notre Dame Universities (PINDU) chemistry conference. **2006**. Poster Title: "Terminal Imides on Cr, Mn, and Fe Corroles: Synthesis and Reactivity with Olefins." Bloomington, IN.

Millersville University Chemistry Department Seminar Series. **2003**. Lecture Title: "Exploration of High-Spin Iron-Sulfur-Nitrogen Clusters: Nitrogenase-inspired Synthetic Inorganic Chemistry." Millersville University Millersville, PA.

51st ACS Southwest Regional Meeting, **1999**. Knoxville ACS Student-Affiliate Undergraduate Research Symposium. Lecture Title: "Synthesis of Novel Molybdenum-Diphenylphosphine Complexes." Knoxville, TN.

Patents

Zdilla, M. J.; Wunder, S. L.; Chinnam, P. R. "Soft-Solid Crystalline Electrolyte Compositions And Methods For Producing The Same." March 15, **2014**. Pending.

Zdilla, M. J.; Wunder, S. L.; Chinnam, P. R. "Anionic Polymers, Electrolytes Comprising the Same, and Methods of Manufacture Thereof" March 28, **2016**. Pending.

Service

Service to the Chemical Community

Manuscript Review

ACS Applied Materials and Interfaces, ACS Applied Nanomaterials, ACS Catalysis, ACS Nano, Acta Crystallographica C, Biochemistry, Bulletin of the Chemical Society of Japan, Canadian Journal of Chemistry, Catalysis Science and Technology, Chemistry: An Asian Journal, Chemical Communications, Chemistry: A European Journal, ChemistrySelect, Chemistry Letters, Chemistry of Materials, Chemical Science, Dalton Transactions, Electrochimica Acta, Environmental Science and Technology, Inorganic Chemistry, International Journal of Hydrogen Energy, Journal of Chemical Crystallography, Journal of Molecular Structure, Journal of Physical Chemistry, Journal of the American Chemical Society, Journal of Chemical Education, Magnetochemistry, Materials Science and Semiconductor Processing, Nanostructures and Nanoobjects, National Science Review, Polyhedron, Reaction Kinetics, Mechanism, and Catalysis, Research on Chemical Intermediates, RSC Advances, Small, Small Methods, Zeitschrift für anorganische und allgemeine Chemie.

Textbook Review. Descriptive Inorganic Chemistry, Sixth Edition, Rayner-Canham, G.; Overton, T.

Program Review

Millersville University Department of Chemistry 5-year Review, **2012**

Proposal Review

Army Research Office – Ad Hoc, Physical Properties of Materials program, **2016-present**

Department of Energy – Ad Hoc, BES program, **2015-present**

Department of Energy – Ad Hoc, SBIR/STTR program, **2015-present**

National Science Foundation – Ad Hoc, SYN program, **2012-present**

American Chemical Society Petroleum Research Fund – Ad Hoc, **2013**
National Science Foundation – Virtual Panel, SYN program, **2014**
National Science Foundation – Virtual Panel, CSDM-B program, **2018**

Session Organizer

ACS Spring 2022 National Meeting, ACS Award for Affordable Green Chemistry: Symposium in Honor of Mahdi M. Abu-Omar. San Diego, CA 2022.

ACS 252nd National Meeting, Symposium on Understanding Cluster Cofactors Through Biomimetic Models. Philadelphia, PA **2016**

Mid-Atlantic Seaboard Inorganic Symposium (MASIS), Philadelphia, PA **2014**

Session Moderator

ACS Spring 2022 National Meeting, ACS Award for Affordable Green Chemistry: Symposium in Honor of Mahdi M. Abu-Omar. San Diego, CA 2022.

Materials Research Society Spring Meeting and Exhibit. Advanced Materials for the Water-Energy Nexus. Phoenix, AZ **2019**

ACS 256th National Meeting, Frontiers & Challenges in Nanoparticle-Mediated Chemical Transformations. Boston, MA, **2016**.

ACS 252nd National Meeting, Symposium on Understanding Cluster Cofactors Through Biomimetic Models. Philadelphia, PA **2016**

ACS 248th National Meeting, Symposium on Electronic Structure Contributions to Physical Properties and Reactivity in Transition Metal Chemistry. San Francisco, CA. **2014**

Community Outreach

My most substantial outreach to the non-scientific community is through lay talks and demonstration performances for audiences in Philadelphia and surrounding areas, including shows for both kids and adults. These frequently include the performance of songs, including “The Elements” by Tom Leher on voice and guitar. Specific events and examples are described below.

Taste of Science. A spring science promotion event in Philadelphia at Fergie’s Pub in Philadelphia. Dr. Zdilla gave a lecture on chemistry and energy and how its relationship to climate change. The talk included demonstrations such as liquid nitrogen Leidenfrost effect, detonating a hydrogen balloon, and the thermite reaction. Photosynthesis and alternative energy were discussed, as well as explosives. The talk also included a vocal and guitar performance of Tom Lehrer’s “The Elements,” which is a common component of Dr. Zdilla’s outreach presentations.

Science Night at Swarthmore and Nether Providence Elementary Schools. **2015- present** Coorganizer and presenter. Performed chemistry demonstrations for elementary kids in these Philadelphia Suburbs, including color-changing universal indicator acidified with dry ice, liquid nitrogen demonstrations, including making “Dip ‘n’ Dots” ice cream, and demonstration of phases (solid, liquid, gas, plasma), crystallography, and the chemistry of taste.

Temple University Chemistry Society Charity Volleyball Tournament, **2013-2015**. Played in a charity volleyball tournament to raise funds to purchase supplies for chemistry and science classes in Philadelphia public schools. The tournament was hosted and organized by the undergraduate chemistry society. Dr. Zdilla played on the faculty team, The Lachrymators.

Introduction to the Research Laboratory, **2014**. Hosted 7 high-school students from Hempfield High School

Service (cont)

with aspirations for graduate school. These students visited Temple as a field trip to be exposed to graduate school life. They were introduced to synthetic, biological, and laser laboratories, had the opportunity to use a glovebox, and saw demonstrations of the X-ray diffractometer, mass spectrometer, and transmission electron microscope. A Q&A was also held on how to prepare for college and a career in the sciences.

Technology Symposium for High School Students, 2013. An outreach to urban high-school students, Dr. Zdilla participated in a TU-Teach-sponsored program to encourage interest in STEM fields in youth. Dr. Zdilla presented three lectures on energy, fuels, explosives, and performed chemical demonstrations including detonation of hydrogen balloons, and demonstrating the Liedenfrost effect using liquid nitrogen.

Philadelphia Nerd Nite Café, 2012. A popular social event for science enthusiasts, locals from the Philadelphia area meet at Frankford Hall, a beer garden in eastern Philadelphia, to hear entertaining talks on science and other “nerdy” subjects. Dr. Zdilla gave a lecture on chemistry and energy which included liquid nitrogen Leidenfrost effect, detonating a hydrogen balloon, and the thermite reaction. Photosynthesis and alternative energy were discussed, as well as explosives. The talk also included a vocal and guitar performance of Tom Lehrer’s “The Elements.”

“Sam Kean’s Science Cabaret,” Philadelphia Science Festival, 2011. 1st prize. As part of the scientific outreach of the Philadelphia Science Festival, and in honor of the International Year in Chemistry, Dr. Zdilla participated in an evening of fun science involving three competing performers who provided a “cabaret-themed” chemical demonstration performance for the Philadelphia community. Dr. Zdilla demonstrated the “Briggs-Rauscher oscillating reaction, H₂ generation from magnesium metal, and subsequent detonation, “breathing” liquid nitrogen, and performed “The Elements” by Tom Lehrer. Chemical Heritage Foundation, Philadelphia, PA.

George Washington Carver Science Fair, Judge. 2011, 2016. The George Washington Carver Science Fair is a Philadelphia program designed to encourage early participation in science in urban youth. Judges from local schools and universities select the best poster presentations, and award prizes and honorable mention to participants. Academy of Natural Science, Philadelphia, PA.

Science and Discovery Leader at a local summer school program. **2010-2014.** Exploring science and performing experiments with elementary school children. Topics for the week include plate tectonics, friction, hematology, viscosity, and magnetism.

Iota Sigma Pi National Chemistry Week for Elementary Students, volunteer. 2008, 2006. Traveled to elementary schools in the Lafayette/West Lafayette area to perform demonstrations and lead elementary children in chemistry experiments in topics such as polymers and surfactants.

Science Expo sponsored by Princeton University Chemistry Department, volunteer. 2002-2004. A science program for middle school students during which they see chemical demonstrations, and do experiments to excite interest in the subject.

Departmental Service

Science Talks for Temple Alumni Weekend and Temple Recruiting Events The College of Science and Technology hosts annual fundraising events for alumni during Alumni Weekend, and for the college counselors from prospective high schools through cooperation with Temple Admissions. This has often included science talks from faculty for a lay audience. Presentations usually focus on chemistry and alternative energy with ties into the Zdilla labs research and its relationship to global energy challenges.

Temple Undergraduate Chemistry Society, Lunch and the Lab. 2009-present. The Lunch and the Lab seminar series is an outreach to Temple Chemistry undergraduates to get them involved in research at an early stage of their studies.

Graduate recruiting weekend. 2010-present. Temple’s chemistry department held its first graduate student

recruitment weekend in Winter of '10. For this event, Dr. Zdilla assisted in organization of events, especially the poster session luncheon, and provided transportation for prospective graduate students on their tour of Philadelphia, and their travel to dinner at the Standard Tap.

Departmental Committees (Temple University)

Chair, Graduate Committee 2021-present

Resumption of Research Committee (pandemic planning) 2020-2021

Faculty Advisor (2010-2021)

Departmental Instrument Committee (2013-present)

Undergraduate Curriculum Committee (2010-2021)

Graduate Admissions Committee (2010-2014)

Faculty Recruiting Committee (2010/11, 2016/17)

Service to the College of Science and Technology

College of Science and Technology Committees

Liaison to CST for the Temple University Research Forum 2011-present

Dean's Advisory Committee, 2016-2020

University Service

National Scholarships Mentoring/Interviewing Committee 2016-present

University Sabbatical Committee, 2017

University Commencement Speaker and Awards committee, 2018

Fellowship Campus Committees for UK awards and Knight-Hennessy awards (2016-present)

Other Service

NSF REU Program advisor. 2018-present. Temple's recently funded NSF REU program brings undergraduates from small teaching institutions to Temple to perform research over the summer. I hosted a student from a local community college, Shaoquan Brooks in 2018. His summer work will lead to a coauthorship on one paper.

Fullbright Program advisor. 2018-present. A graduate student, Prabhat Prakash, from the Indian Institute of Science Education and Research (IISER) Pune won a Fullbright Fellowship to spend 6-9 months in my lab in 2018-19 performing theoretical computations and simulations on our battery electrolyte materials, and learning some experimental synthetic and electrochemistry for the first time.

Undergraduate Research Program (URP) advisor. 2009-present. I have served as an independent research advisor to nine URP students to perform minimum year-long research in the Zdilla lab. Attended discussion meetings with advisees and the whole of the Zdilla research group to discuss students' projects and provide feedback. Undergraduate students in the program have gone on to graduate school at Johns Hopkins, Yale, and Boston College.

Temple University Honors Program, Diamond Scholars, student advisor. 2010-2013. Served as advisor to two diamond scholarship awardees to perform research in the Zdilla lab. Attended discussion meetings with advisees and other diamond scholars and their advisors to discuss students' projects and provide feedback. Students in the program extend across the spectrum of disciplines from science to humanities. Both students are attending top graduate schools (Johns Hopkins and Yale).

Frances Velay Scholarship Mentor. 2016. Served as an advisor for a Velay fellow. The velay fellowship for women encourages science enrichment opportunities for women. A student, Ms. Parichhya Luitel, performed research in battery electrolytes in the Zdilla lab for the summer and Fall semesters, and presented her work at the Velay symposium.

Minority Access to Research Careers (MARC) program advisor. 2012-2014, 2020-present. Served as an advisor to two MARC program students to perform research in the Zdilla lab. Attended discussion meetings with advisees and other diamond scholars and their advisors to discuss students' projects and

provide feedback. Students in the program extend across the spectrum of disciplines from science to humanities. Dr. Zdilla's first student went on to earn a Ph.D from Johns Hopkins University in 2020, and the second one is currently working in the group.

Scientists as Teachers, Teachers as Scientists (SAT-TAS) program advisor. 2012-2013. Advised a graduate student participating in the SAT-TAS program, which placed him into a Philadelphia high school classroom. Attended workshops and symposia by the graduate students and host teachers. Advised research in the laboratory by the host teacher for one summer.

College of Science and Technology Liaison to the Temple University Research Forum and Creative Works Symposium (TURF CreWS). 2011-present. Annually, CST hosts TURF-CreWS, a selective conference for undergraduates to disseminate their research and perform or present their artistic creations. Dr. Zdilla is the CST liaison, and is responsible for reading and deciding upon abstract submissions for science presentations, and assists with organizing and moderating the oral symposium.

Faculty Academic Advisor. 2014-present. Offers advice to students inside and outside the chemistry major regarding courses to take, transfer credits, prerequisite issues, and graduation requirements.

Alumni Weekend, Temple University. 2013, 2017. As part of alumni weekend, Dr. Zdilla presented a short talk on energy and renewables for TedX conference held at Temple University. The theme of the conference was uncertainty. Dr. Zdilla's presentation was on uncertainty in the development of renewable fuels, and discussed topics ranging from fossil fuels to the internal combustion engine, and was presented to a general audience.

Grade Dispute Hearings. 2013-2015. Dr. Zdilla serves as a faculty representative in 3rd stage student grievances in grade disputes. In this courtroom-like setting, students disputing a grade, and the faculty that provided the grade present their case. Some discussion ensues, followed by a vote by the representatives present on the final outcome of the dispute claim.

Mid Atlantic Seaboard Inorganic Symposium (MASIS). 2014. Co-host and organizer of the MASIS, a symposium held every two years hosting research institutions from New Jersey, Pennsylvania, Maryland, and Delaware. This conference provides networking opportunities for graduate students from major schools along the east, but for the university, provides needed visibility for Temple as a new hub of high-impact chemical research.

Activities

Materials Research Society	2019
American Association for the Advancement of Science	2017-present
American Crystallographic Association	2015-present
American Chemical Society	2000-present
Taste of Science	2017
Philadelphia Science Festival	2011
George Washington Carver Science Fair, judge	2011, 2015
Undergraduate Research Program, advisor	2010-present
Undergraduate Research Program symposium, judge	2012
Princeton Bioinorganic Chemistry Supergroup, co-founder, co-organizer	2003-2004
Princeton Univ. Science Expo for Middle School Students, volunteer	2002-2004
Princeton University 3 rd Year Seminar Series, judge	2004
Iota Sigma Pi Natl. Chem. Week for Elementary Students, volunteer	2006, 2008
International Friendship Program, Purdue University, volunteer	2007-2009