Catherine Moulder

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Education

Chemistry PhD program, 2nd year student, University of North Texas, Denton, TX – Fall 2017 - Current.

BS Chemistry, University of North Texas, Denton TX, May 2017.

BS Mathematics, Philosophy Minor, University of North Texas, Denton TX, May 2017.

Certificate of the Mathematics of Scientific Computation, University of North Texas, Denton, TX, May 2017.

AS Liberal Sciences, Dallas County Community College District, Brookhaven College, Farmer's Branch, TX, May 2014.

Publications and Research

Publications

Moulder, C. A.; Cundari, T. R. *A DFT Survey of the Effects of D-Electron Count and Metal Identity on the Activation and Functionalization of C−H Bonds for Mid to Late Transition Metals. Isr. J. Chem.* **2017**. DOI: 10.1002/ijch.201700066

Moulder, C. A.; Cundari, T. R.; *5d Metal(IV) Imide Complexes. The Impact (or Lack Thereof) of d-Orbital Occupation on Methane Activation and Functionalization, Inorg. Chem.,* 2017, 56 (4), pp 1823–1829 DOI: 10.1021/acs.inorgchem.6b02157

Research

National Science Foundation – Graduate Research Fellowship: Theoretical studies of bond dissociation enthalpies for heavy transition metal complexes for catalytic innovation.

In progress: a computational chemistry study of bond lengths and energies for metal complexes to compare the data found in MCSCF calculations and higher levels of theory with that of DFT and the known crystal structures. Summer 2017 – present,

A mathematical exploration of a valid plain tree problem involving functions remapping half-edges and the conditions necessary for an involution to exist under Dr. Elizabeth Drellich. Spring 2016.

Conferences & Symposiums

Poster – *Metal-Ligand Bond Strengths of 5d Metal Complexes, Paper # COMP 350, Paper ID 2990818* 256th ACS National Meeting & Exposition, Computers in Chemistry Division, Boston, MA, August 21, 2018.

Poster - *A DFT Survey of the Effects of D-Electron Count and Metal Identity on the Activation and Functionalization of C−H Bonds for Mid to Late Transition Metals*, Catherine A. Moulder, 7th Annual F.G.A. Stone Symposium 2018, Baylor University, Waco, TX., May 23, 2018.

Talk - *A DFT Survey of the Effects of D-Electron Count and Metal Identity on the Activation and Functionalization of C−H Bonds for Mid to Late Transition Metals*, Catherine A. Moulder, 51st Annual Dallas-Fort Worth Meeting-in-Miniature, Southern Methodist University, Dallas, TX., April 21, 2018.

Poster - *5d Metal(IV) Imide Complexes. The Impact (or Lack Thereof) of d-Orbital Occupation on Methane Activation and Functionalization*, Catherine A. Moulder, 7th Annual Students Portraits Symposium: Alphabet Soup, UNT in the Mix, University of North Texas, Denton, TX., May 15, 2017.

Poster - *5d Metal(IV) Imide Complexes. The Impact (or Lack Thereof) of d-Orbital Occupation on Methane Activation and Functionalization*, Catherine A. Moulder, University of North Texas Scholars' Day, University of North Texas, Denton, TX., April 11, 2017.

Poster - Ghimire, M. M.; Benton, E. N.; Almotawa, R. M.; Savage, K. D.; Harris, L. M.; Philip, P.; Prieto, B.; Vogel, S. E.; Kernen, B. P.; Naylor, B. N.; Perry, C.**; Moulder, C.**; Churchil, B. N.; Kennard, S. K.; Peterson, A. J.; Solomon, R.; Turrubiartez, A. A.; Musick, E. A.; Turner, J. L.; Johnson, D. T.; McConkey, J. C.; Paredes, J. A.; Sengphanlaya, T. M.; Omary, M. A. *"Research for the classroom big picture projects 2016: Monovalent copper diimine-based functional coordination polymers as potential solar cell materials"*, 72nd Southwest Regional Meeting of the American Chemical Society, Galveston, TX., United States, November 10-13 (2016), SWRM-143.

Talk - *5d Metal(IV) Imide Complexes. The Impact (or Lack Thereof) of d-Orbital Occupation on Methane Activation and Functionalization*, Catherine A. Moulder, Gulf Coast Undergraduate Research Symposium, Chemistry Division, Rice University, Houston, TX., October 22, 2016.

Teaching Experience

Graduate Student Assistant – Chemistry Resource Center Tutor, drop in tutoring, Department of Chemistry, University of North Texas, Denton, TX, January 2018 – May 2018

Graduate Student Assistant – Laboratory Teaching Assistant, General Chemistry for Science Majors – CHEM 1430, Department of Chemistry, University of North Texas, Denton, TX, August 2017 – December 2017

Faith Formation Teacher – 5th Grade, Saint Francis of Assisi Catholic Church, Frisco, TX, September 2017 – May 2018

Undergraduate Student Assistant – Undergraduate Teaching Assistant, College Algebra-UGMT 1300, Department of Mathematics, University of North Texas, Denton, TX, August 2016 – December 2016

Undergraduate Student Assistant – Math Lab Tutor, Department of Mathematics, University of North Texas, Denton, TX, August 2015 – May 2016

Undergraduate Student Assistant – Grader, TAMS Calculus 1, Department of Mathematics, University of North Texas, Denton, TX August 2015 – December 2015

Faith Formation Teacher – 5th Grade, Saint Francis of Assisi Catholic Church, Frisco, TX, September 2009 – May 2014

Awards

2018 National Science Foundation – Graduate Research Fellowship

2018 Ford Foundation Predoctoral Fellowship – Honorable Mention

2018, 2017 Academic Achievement Scholarship, University of North Texas Toulouse Graduate School, 2018-2019, 2017-2018

2017 Lois Honeycutt Bodine Scholarship, University of North Texas Chemistry Dept., recognition for excellence in academic achievement, open to both undergraduate and graduate students

2016 Undergraduate Research Fellowship, University of North Texas Chemistry Dept., for chemistry research under Dr. Cundari, 2016-2017

2016 W. N. Masters Award, for excellence as a 3rd year chemistry undergrad, 2016

2016 Outstanding Presentation, Gulf Coast Undergraduate Research Symposium, Rice University, October 2016 - Awarded for a short, ten minute, presentation on C-H activation by three coordinate metal-imido complexes synopsizing my undergraduate research relating to my paper with Dr. Cundari, "5d Metal(IV) Imide Complexes. The Impact (or Lack Thereof) of d-Orbital Occupation on Methane Activation and Functionalization" in Inorganic Chemistry

Spring 2016-2017 UNT 3.5 Honor Roll, full time hours required

Non-Academic Work Experience

Staff Accountant 1, Daily reconciliation of the Federal Reserve Account, General Ledger, Correspondent Bank Accounts, other internal accounts. Also, weekly Accounts Payable and subsidiary accounting along with Monthly Board reporting., North Dallas Bank and Trust, Dallas, TX, 2000

Office Manager, Atmos Laboratories, Arlington, TX, 1998

Affiliations

American Chemical Society

Boys and Girls Club of Collin County, adult volunteer

Summer Science Institute – Summer camp volunteer

Alpha Sigma Lambda – non-traditional student honor society

Phi Theta Kappa – 2 -year college honor society

UNT Math Club – former Vice President (2016-2017)

St. Francis of Assisi, Frisco TX – Faith Formation Teacher 5th grade