

GARRY S. GRUBBS II, PH.D.

Missouri University of Science and Technology (MS&T) • Department of Chemistry
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EDUCATION

Doctor of Philosophy | May 2011 | University of North Texas

- Division of Physical Chemistry
- Major field: Physical Chemistry/Microwave Spectroscopy
- Major Professor: Dr. Stephen Cooke
- Dissertation: "Investigating Molecular Structures: Rapidly Examining Molecular Fingerprints Through Fast Passage Broadband Fourier Transform Microwave Spectroscopy."
- Defended: November 2010
- Commencement: May 2011

Bachelor of Science, Chemistry | May 2006 | Texas A&M University

- Major: Chemistry
- American Chemical Society certified degree

PROFESSIONAL EXPERIENCE

Assistant Professor, Dept. of Chemistry | Missouri University of Science and Technology | August 2013 - Present

- Undergraduate Courses taught: 1) Quantum Chemistry, 2) Thermodynamics, 3) Physical Chemistry Lab, and 4) General Chemistry II
- Graduate Courses taught: 1) Solution and Molecular Thermodynamics and 2) Spectroscopy
- Research: Microwave/Rotational Spectroscopy
- Research advisor to undergraduate and graduate students
- Organizer of the Midwest Microwave Consortium

Postdoctoral Fellow | Wesleyan University | January 2011 - August 2013

- Advisor: Stewart E. Novick
- Research: Microwave/Rotational Spectroscopy
- National Science Foundation Grant (CHE-1011214) to study molecular hydrogen complexes of heavy metal containing salts as a model for hydrogen fuel storage in metal-organic frameworks.

Graduate Student | University of North Texas | August 2006 - December 2010

- Research Assistant under Steve Cooke: Responsibilities included laboratory management, collecting and analyzing data, and writing manuscripts.
- Lab Instructor: Courses were General Chemistry 1 and 2, Organic 1, and General Chemistry for Non-Majors.
- Lecture Teaching Assistant: Courses were General Chemistry 1 and Organic Chemistry 1 and 2.
- Covered in-class lectures when needed for these courses as well as for Physical Chemistry 1 when needed for my advisor. Made keys, graded assignments and kept up a website for professors in addition to providing instruction.
- Tutored in the Chemistry Resource Center where undergraduates came to receive help on coursework and curricula.

Summer Program Math Teacher | University of North Texas Trio Upward Bound | Summer 2005 and 2006

- Taught high school level algebra, geometry, and pre-calculus to high school students.

Analytical Laboratory Prep | Talem, Inc. | May 2003 - August 2003

- Prepared water, soil and other type field samples for Metals, Total Organic Carbon (TOC), Total Kjeldahl Nitrogen (TKN), Total Nitrogen (TN), Biological Oxygen Demand (BOD), and Phosphorus analyses.

TEACHING EXPERIENCE (APPROXIMATE CLASS ENROLLMENT)

Fall 2018	CHEM 3410 Physical Chemistry I: Thermodynamics (34 students) Teaching Effectiveness: Not Yet Rated
Summer 2018	CHEM 1320 General Chemistry II Lecture (8 students) Teaching Effectiveness: Not Rated
Spring 2018	CHEM 3419/3459 Accelerated Physical Chemistry Laboratory (10 students) Teaching Effectiveness: 3.43
Fall 2017	CHEM 3410 Physical Chemistry I: Thermodynamics (87 students) Teaching Effectiveness: 2.54
Spring 2016	CHEM 3419/3459 Accelerated Physical Chemistry Laboratory (12 students) Teaching Effectiveness: 3.17
Fall 2016	CHEM 3419/3459 Accelerated Physical Chemistry Laboratory (4 students) Teaching Effectiveness: 3.33 CHEM 6450 Spectroscopy (7 students) Teaching Effectiveness: 3.67
Spring 2016	CHEM 3419/3459 Accelerated Physical Chemistry Laboratory (3 students) Teaching Effectiveness: 4.0
Fall 2015	CHEM3419/ 3459 Accelerated Physical Chemistry Laboratory (9 students), Revamped Physical Chemistry Lab Teaching Effectiveness: 3.75
Spring 2015	CHEM 3410 Physical Chemistry I: Thermodynamics (67 students) Teaching Effectiveness: 2.49
Fall 2014	CHEM 5410/4410 Solution and Molecular Thermodynamics/Chemical Thermodynamics (5 students) Teaching Effectiveness: 3.7/4.0 <i>Accolade: Received "Tappemeyer Teaching Excellence Award"</i>
Fall 2013	CHEM 343 Introduction to Quantum Chemistry (19 students) Teaching Effectiveness: 2.7/4.0

RESEARCH FUNDING / GRANTS

Current Funding:

July 2016 - June 2019

NSF ECCS. 10% Co-PI. "A Multi-Physics-Based Approach to Active Microwave Thermography" 3 years. **Amount: \$362,513.** Submitted 2015.

July 2018 - June 2019

NSF ECCS. 10% Co-PI. "A Multi-Physics-Based Approach to Active Microwave Thermography-REU Supplement" 1 year. **Amount: \$8,000.** Submitted 2018.

August 2018 - July 2019

NSF EAGER CSDM-A, Single PI. "Three-wave microwave mixing techniques to study and utilize nuclear quadrupole coupling effects in chiral molecules." 1 year. **Amount: \$59,752.** Submitted 2018.

Pending Funding and to be Submitted:

June 2019 – May 2022

NSF CMI, 80% PI. "Instrument Development of a Multi-Detection CP-FTMW/3WM Spectrometer with Single-Source Sensitivity for Exploration of Exotic Ions, Complexes, and Chiral Species." 3 years. **Amount: \$477,710.** Submitted 2018.

August 2019 – July 2022

NSF AAG, 20% PI. "Theoretical and Experimental Investigation of New Astronomically Relevant Molecules." 3 years. **Amount: \$899,850.** Submitted 2018.

September 2019 – May 2022

DOE Heavy Element Chemistry Program, Sole PI. "Probing *f*-electron contributions to bonding in molecules and complexes using microwave spectroscopy." White Paper in Progress.

September 2019 - September 2022

NASA ROSES Laboratory Astrophysics, Single PI. "Finding the Missing Oxygen: Rotational Spectroscopy Data and Analyses for the Detection of Probable Oxygen-Containing Species in the Interstellar Medium." Resubmission. 3 years.

Completed Funding Projects:

October 2017 - May 2018

NASA Missouri EPSCoR. Single PI. "Van der Waals Interaction Studies of an Important Earth and Interstellar Molecule, O₂." 1 year. **Amount: \$10,000.** Submitted 2017.

June 2017

DARPA DSO Days, Invited to join a sidebar with a program manager. Submitted 2017.

January 2017 - December 2017

MO Research Board. Single PI. "Structural Investigations of Noble Metal Clusters." 1 year. **Amount: \$28,000.** Submitted 2016.

January 2014 - December 2014

MO Research Board. Single PI. "Investigations into a He Bond with MX (M=Ag or Au; X=F or Cl)." 1 year. **Amount: \$22,000.** Submitted 2013.

June 2013

Wesleyan University Distinctive Project Grant (Internal Grant). Co-PI with Stewart E. Novick and Daniel A. Obenchain, "Chirped-Pulse Fourier Transform Microwave Spectroscopy of Controlled Gas Mixtures." FY2013, **Amount: \$8,826.** Submitted 2013.

October 2011 - July 2012

Wesleyan University Project Grant (Internal Grant). Co-PI with Stewart E. Novick, "Understanding Chemical Reactions at Room Temperature via Chirped-Pulse Waveguide Spectroscopy." FY2012, **Amount: \$2,350.** Submitted 2011.

Previously Submitted:

September 2018 - September 2021

NASA ROSES Laboratory Astrophysics, Single PI. "Finding the Missing Oxygen: Rotational Spectroscopy Data and Analyses for the Detection of Probable Oxygen-Containing Species in the Interstellar Medium." 3 years. **Amount: \$544,251.** Submitted 2018.

September 2018 - August 2023

DOE Heavy Elements Program, Single PI. "Studying *f*-Electron Contributions in Thorium and Uranium-Containing Molecules and Complexes." 5 years. **Amount: \$750,000.** Submitted 2018.

September 2018 - August 2020

ACS Petroleum Research Fund. Co-PI (Main PI). "Early Chemical Pathway Investigations of Terpenoids to Petroleum using Fourier Transform Microwave Spectroscopic Techniques on Terpenoid van der Waals Complexes." 2 years. **Amount: \$110,000.** Submitted 2017.

June 2018 - May 2021

NSF- Chemical Measurement and Imaging. 80% PI. "The Instrument Development of a CP-FTMW Spectrometer with Unprecedented Sensitivity for Problems in Chemical Research." 3 years. **Amount: \$586,162.** Submitted 2017.

March 2018 - February 2023

NSF CAREER. Single PI. "CAREER: Solving and Utilizing Multiple Spin Couplings in van der Waals Systems using Gas Phase Microwave Spectroscopic Techniques." 5 years. **Amount: \$549,689.** Submitted 2017.

September 2017 - August 2021

Beckman Young Investigators Program, Single PI. "Resolution and Sensitivity: Chirped-Pulse Fourier Transform Microwave (CP-FTMW) Spectroscopy based on Optical Detection." 4 years. **Amount: \$750,000.** Submitted 2017.

February 2017 - January 2022

NSF CAREER. 100% PI. "CAREER: High-resolution microwave studies of the geometric, spin, and large amplitude motion effects in systems containing a crucial van der Waals interaction partner, O₂" 5 years. **Amount: \$727,885.** Submitted 2016.

July 2016 - June 2021

NSF Faculty Early Career Development Program. Single PI. "CAREER: Microwave Spectroscopic Investigations of Metal Clusters and Their Interactions" 5 years. **Amount: \$787,864.** Submitted 2015

January 2017 - December 2021

NSF S-STEM Strand 2. 80% Co-PI. "Enabling Underrepresented Student STEM Success Through Rigorous, State-of-the-Art Chemical Instrumentation Training" 5 years. **Amount: \$999,065.** Submitted 2015.

September 2015 - August 2020

Department of Energy Early Career Research Grant. Single PI. "High-Resolution Microwave Spectroscopy of Actinide-Containing Molecules and Complexes" 5 years. **Amount: \$750,000.** Submitted 2014.

September 2015 - August 2020

Department of Energy Early Career Research Grant. Single PI. "Fundamental Investigations into Rare Gas-Metal Bonding Motifs" 5 years. **Amount: \$750,000.** Submitted 2014.

September 2015 - August 2017

American Chemical Society Petroleum Research Fund Doctoral New Investigator Grant. Single PI. "Fundamental Investigations into Rare Gas-Metal Bonding Motifs" 2 years. **Amount: \$110,000.** Submitted 2014.

September 2015 - August 2018

National Science Foundation CSDM-A. Single PI. "Fundamental Investigations into Rare Gas-Metal Bonding Motifs" 3 years. **Amount: \$359,985.** Submitted 2014.

September 2014 - August 2017

NSF Program CSDM-A. Main PI (90%). "Investigations into the Existence of a He Bond with Coinage Metal Halides." 3 years. **Amount: \$582,842.** Submitted 2013.

SERVICE, COMMUNITY AND VISIBILITY ACTIVITIES

Department:

September 2017 - May 2018, Faculty Senate Substitute

March 2017 - April 2018, Fluorescence Spectrometer Committee Chair

September 2016 - September 2017, Department Graduate Recruitment Committee Member

May 2016, Leader of Department Instrumentation Grant

September 2015 - September 2016, Undergraduate Affairs and Scholarship Committee

September 2014 - August 2015, MS&T Department of Chemistry Graduate Affairs Committee

March 2014 - September 2016, MS&T Departmental Personnel Committee Member, Elected to Committee 3 straight years

September 2013 - Present, American Chemical Society South Central Missouri Local Section Executive Committee, **2015 Chair-Elect, 2016 Chair, 2017 Immediate Past Chair and Treasurer, 2018 Treasurer**

September 2013 - Present, MS&T Department of Chemistry Various Ad-Hoc Committees

September 2013 - August 2014, MS&T Department of Chemistry Graduate Affairs Committee *Chair*

Campus or College Level:

January 2018 - Present, CASB First Year Research Experiences Faculty

April 2016 - Present, Campus Faculty Recruitment and Retention Committee

June 2014 - July 2014, Missouri S&T Summer Research Academy Faculty Mentor

March 2014 - Present, Mars Rover Design Team Associate Faculty Advisor, **2017 URC CHAMPIONS**

Local Community:

August 2014 - Present, American Chemical Society South Central Missouri Local Section National Chemistry Week Organizing Committee

August 2014 - Present, American Chemical Society South Central Missouri Local Section Excellence in Teaching Award Selection Committee

August 2014 - Present, American Chemical Society South Central Missouri Local Section Fall and Spring BBQ Organizer

Field Service and Visibility:

June 2014 - Present, Editor (2017-Present) and Editor-in-Training (2014-2017) for the Microwave Spectroscopy Newsletter, the premier source for current research in the field

August 2013 - Present, Organizer of the Midwest Microwave Consortium consisting of 6 Universities-Missouri S&T, Eastern Illinois University, University of Missouri-Kansas City, University of Virginia-Wise, College of Charleston, and Austin College- and 7 Investigators-Garry Grubbs II, Sean Peebles, Rebecca Peebles, Peter Groner, Galen Sedo, Gamil Guirgis, and Lindsay Zack

June 2018, Session Chair for session FA. Vibrational Structure/Frequencies at the 73rd International Symposium on Molecular Spectroscopy.

June 2017, Session Chair for session WD. Clusters/Complexes at the 72nd International Symposium on Molecular Spectroscopy.

September 2016 - December 2016, Host for Galen Sedo Sabbatical

April 2014, Session Chair for the 1st Annual Undergraduate Research Symposium on High Resolution Spectroscopy and Structure

June 2012, Session Chair for session MH. MICROWAVE at the 67th Ohio State University International Symposium on Molecular Spectroscopy.

Reviewing Activities:

UTSA ORAU Proposal Reviewer

NSF CSDM-A Program Ad-Hoc and Panel Reviewer

South Carolina Experimental Program to Stimulate Competitive Research and Institutional Development

ChemPhysChem, 1 paper to date.

Chemistry-A European Journal, 1 paper to date.

Journal of Chemical Physics, 5 papers to date.

Journal of Molecular Spectroscopy, 9 papers to date.

Inorganic Chemistry, 1 paper to date.

Journal of Physical Chemistry A, 5 papers to date.

Journal of Molecular Structure, 3 papers to date.

Journal of the American Chemical Society, 1 paper to date.

RESEARCH ADVISEES

Current Graduates

Frank Marshall (Fall 2015 - Present) B.S. 2015 Physics and Applied Mathematics, Missouri University of Science and Technology

2016 – 2017 TA Award Winner

2017 – 2018 TA Award Winner

Amanda Duerden (Fall 2017 - Present) B.S. 2017 Chemistry, Missouri University of Science and Technology
2017 - 2018 TA Award Winner

Current Undergraduates

Nicole Moon (Spring 2016 - Present) Chemistry Major

OURE Project (2016): Insights into the Pt-Catalyzed Hydrogenation of Acetylene and Ethylene

OURE Project (2017): O₂ Complexation

OURE Project (2018): O₂ Complexation

Missouri University of Science and Technology Physical Chemistry Award 2018

Josh Isert (Spring 2018 - Present) Chemistry Major

FYRE Project (2018): Chirality Determination using Dipole Forbidden Transitions

Bethany Paramathas (Spring 2019 - Present) Chemistry Major

FYRE Project (2019): Actinides, Ions, and f-Electrons: Understanding Chemical Bonding when Chemical Models Break Down

Former Undergraduates

David Gillcrist (Spring 2014 - Spring 2018) B.S. Physics and Applied Mathematics;

OURE Project (2014 - Present): High Resolution Spectroscopy of Lanthanide and Actinide Molecules,
Graduate Student in Physics at University of Alberta

Ivan Sedlacek (Fall 2017 - Spring 2018) B.S. Chemistry, Employed at Brewer Science, Inc.

Thomas Persinger (Spring 2014 - Spring 2017) B.S. Chemistry

OURE Project (2015 - 2017): Rg-Noble Metal Bonding

2016 University of Illinois-Urbana-Champaign REU Student

2017 University of Utah REU Student

Missouri University of Science and Technology Physical Chemistry Award 2017

Graduate Student at Emory University with Michael Heaven

Nicholas Force (Spring 2014 - Fall 2014) Chemistry Major

Cassandra Hurley (Spring 2014 - Spring 2015) Ceramics Engineering Major; 2014-2015 OURE Project:
Fundamental Investigations of III-V Semiconductor Molecules

Frank Marshall (Spring 2014 - Summer 2015) B.S. 2015 Physics and Applied Mathematics; OURE Project
(2014 - 2015): Rg-Noble Metal Bonding

Nicholas Payton (Spring 2014 - Fall 2014) Chemistry Major

Nelson Shreve (Spring 2014 - Spring 2015) B.S. Physics and Philosophy; 2014-2015 OURE Project: Insights
into the Pt-Catalyzed Hydrogenation of Acetylene and Ethylene; Currently Pursuing a Medical
Doctorate at St. Louis University

Stephen Jaeger (Fall 2015 - Present) B.S. Chemistry, working in industry

Missouri S&T Summer Research Academy (High School Students)

Jisu Eo (June 2015 - July 2015) Finishing High School Studies

Alexander Bradley (June 2015 - July 2015) Finishing High School Studies in Wylie, TX

Hannah Shumaker (June 2014 - July 2014) Undergraduate

Teresa Schneider (June 2014 - July 2014) Undergraduate

PUBLICATIONS AND CITATION METRICS

My **43 publications (1 in revision)** are listed below. All have been published or submitted in peer-reviewed journals. My work has produced **412** citations with an *h*-index of **11** and *i10*-index of **12**. (Metrics provided by Google[®] Scholar on 11/13/2018).

Missouri S&T

1. Frank E. Marshall, Nicole Moon, Thomas D. Persinger, David J. Gillcrist, Nelson E. Shreve, William C. Bailey, G. S. Grubbs II. "High-Resolution Spectroscopy Near the Continuum Limit: The Microwave Spectrum of 3-Bromo-1,1,1,2,2-pentafluoropropane." *Molecular Physics*. (2018) **Manuscript Accepted to Special Issue in Memoriam of Dieter Cremer**. Invited by Elfi Kraka to Submit.
2. Galen Sedo, Frank E. Marshall, Garry S. Grubbs II. "Rotational Spectra of the Low Energy Conformers Observed in the (1R)-(-)-Myrtenol Monomer." *Journal of Molecular Spectroscopy*. (2018) **Revision Submitted to Special Issue on Chirality**.
3. Frank E. Marshall, Rachel Dorris, Sean A. Peebles, Rebecca A. Peebles, G. S. Grubbs II. "The Microwave Spectrum and Structure of Ar-1,3-Difluorobenzene." *Journal of Physical Chemistry A*. (2018) **Manuscript Accepted**. DOI: [10.1021/acs.jpca.8b05282](https://doi.org/10.1021/acs.jpca.8b05282).
4. Frank E. Marshall, Justin L. Neill, Matt T. Muckle, Brooks H. Pate, Z. Kisiel, and G. S. Grubbs II. "Observation of ³⁶ArH³⁷Cl, ³⁸ArH³⁵Cl, and ³⁸ArH³⁷Cl in Natural Abundance using CP-FTMW Spectroscopy." *Journal of Molecular Spectroscopy*. **344** (2018) 34. DOI: [10.1016/j.jms.2017.10.009](https://doi.org/10.1016/j.jms.2017.10.009).

5. Frank E. Marshall, Galen Sedo, Channing West, Brooks H. Pate, Stephanie M. Allpress, Corey J. Evans, Peter D. Godfrey, Don McNaughton, and G. S. Grubbs II. "The Rotational Spectrum and Complete Heavy Atom Structure of the Chiral Molecule Verbenone." *Journal of Molecular Spectroscopy*. **342** (2017) 109. DOI: [10.1016/j.jms.2017.09.003](https://doi.org/10.1016/j.jms.2017.09.003). Spectroscopy of Large Amplitude Vibrational Motions on the Occasion of Jon Hougen's 80th Birthday.
6. Daniel Obenchain, Derek Frank, G. S. Grubbs II, Herbert M. Pickett, and Stewart Novick. "The Covalent Interaction Between Dihydrogen and Gold: A Rotational Spectroscopic Study of H₂-AuCl." *Journal of Chemical Physics*. **146** (2017) 204302. DOI: [10.1063/1.4983042](https://doi.org/10.1063/1.4983042).
7. G. S. Grubbs II. "The Carbon Mainframe Structure of *Cis-Trans*-1,3-Difluoroacetone." *Journal of Molecular Structure*. **1128** (2017) 263. DOI: [10.1016/j.jms.2016.04.001](https://doi.org/10.1016/j.jms.2016.04.001).
8. Frank E. Marshall, David J. Gillcrist, Thomas D. Persinger, Stephen Jaeger, Cassandra C. Hurley, Nelson E. Shreve, Nicole Moon, and G. S. Grubbs II. "The CP-FTMW Spectrum of Bromoperfluoroacetone." *Journal of Molecular Spectroscopy*. **328** (2016) 59. DOI: [10.1016/j.jms.2016.07.014](https://doi.org/10.1016/j.jms.2016.07.014).
9. G. S. Grubbs II, Derek S. Frank, Daniel A. Obenchain, S. A. Cooke, and Stewart E. Novick. "The pure rotational spectrum of a Claisen rearrangement precursor Allyl Phenyl Ether using CP-FTMW spectroscopy." *Journal of Molecular Spectroscopy*. **324** (2016) 1. DOI: [10.1016/j.jms.2016.04.001](https://doi.org/10.1016/j.jms.2016.04.001).
10. G. S. Grubbs II, Daniel A. Obenchain, Derek S. Frank, Stewart E. Novick, S. A. Cooke, Agapito Serrato III, and Wei Lin. "A Study of the Monohydrate and Dihydrate Complexes of Perfluoropropionic Acid using Chirped-Pulse Fourier Transform Microwave (CP-FTMW) Spectroscopy." *Journal of Physical Chemistry A*. **119** (2015) 10475. DOI: <http://dx.doi.org/10.1021/acs.jpca.5b08347>.
11. G.S. Grubbs II, Daniel A. Obenchain, Herbert M. Pickett, and Stewart E. Novick. "Erratum: 'H₂—AgCl: A spectroscopic study of a dihydrogen complex' " [*J. Chem. Phys.* **141**, 114306 (2014)]. *Journal of Chemical Physics*. **143** (2015) 029901. DOI: <http://dx.doi.org/10.1063/1.4926540>.
12. G. S. Grubbs II, Daniel A. Obenchain, Herbert M. Pickett, and Stewart E. Novick. "H₂—AgCl: a spectroscopic study of a dihydrogen complex." *Journal of Chemical Physics*. **141** (2014) 114306. DOI: <http://dx.doi.org/10.1063/1.4895904>.
13. James Brown, Xiao-Gang Wang, Tucker Carrington Jr., G. S. Grubbs II, Richard Dawes. "Computational study of the rovibrational spectrum of CO₂—CS₂." *Journal of Chemical Physics*. **140** (2014) 114303. DOI: <http://dx.doi.org/10.1063/1.4867792>. Editors' Pick on August 8, 2014.

Wesleyan University (Postdoctoral Fellowship)

14. Daniel J. Frohman, G. S. Grubbs II, Zhenhong Yu, and Stewart E. Novick. "Probing the chemical nature of dihydrogen complexation to transition metals, a case study: H₂-CuF." *Inorganic Chemistry*. **52** (2013) 816. DOI: <http://dx.doi.org/10.1021/ic301941k>.
15. G. S. Grubbs II, Stewart E. Novick, W. C. Pringle, Jr., Jaan Laane, Esther J. Ocola, and S. A. Cooke. "A Bis-trifluoromethyl Effect: Doubled Transitions in the Rotational Spectra of Hexafluoroisobutene, (CF₃)₂C=CH₂." *Journal of Physical Chemistry A*. **116** (2012) 8169. DOI: <http://dx.doi.org/10.1021/jp305812z>.
16. G. S. Grubbs II, P. Groner, Stewart E. Novick, S. A. Cooke. "Methyl group internal rotation and the choice of Hamiltonian for the pure rotation spectrum of 1,1-difluoroacetone." *Journal of Molecular Spectroscopy*. **280** (2012) 21. DOI: <http://dx.doi.org/10.1016/j.jms.2012.07.004>. Special Broadband Rotational Spectroscopy Issue.
17. G. S. Grubbs II, Daniel J. Frohman, Stewart E. Novick, S. A. Cooke. "Measurement and Analysis of the Pure Rotational Spectra of Tin Monochloride, SnCl, using Laser Ablation equipped Chirped Pulse and Cavity Fourier Transform Microwave Spectroscopy." *Journal of Molecular Spectroscopy*. **280** (2012) 85. DOI: <http://dx.doi.org/10.1016/j.jms.2012.07.013>. Special Broadband Rotational Spectroscopy Issue.
18. G. S. Grubbs II, A. Serrato III, Daniel. A. Obenchain, S. A. Cooke, Stewart. E. Novick, and W. Lin. "The rotational spectrum of perfluoropropionic acid." *Journal of Molecular Spectroscopy*. **275** (2012) 1. DOI: <http://dx.doi.org/10.1016/j.jms.2012.04.003>.

19. B. E. Long, G. S. Grubbs II, J. D. Langridge, and S. A. Cooke. "Rotational Spectra, Nuclear Quadrupole Coupling Tensors, and Structures for $\text{CF}_3\text{CF}_2\text{X}$, $\text{X}=\text{Cl}$, Br ." *Journal of Molecular Structure*. **1023** (2012) 55. DOI: <http://dx.doi.org/10.1016/j.molstruc.2012.02.064>. Special issue for Jaan Laane's 70th birthday.
20. W. C. Bailey, R. K. Bohn, C. T. Dewberry, G. S. Grubbs II, and S. A. Cooke. "The structure and helicity of perfluorooctanonitrile, $\text{CF}_3\text{-(CF}_2\text{)}_6\text{-CN}$." *Journal of Molecular Spectroscopy*. **270** (2011) 61. DOI: <http://dx.doi.org/10.1016/j.jms.2011.09.001>.
21. Daniel J. Frohman, G. S. Grubbs II, and Stewart E. Novick. "Microwave spectroscopy, Dunham analysis, and hyperfine splittings of the isotopomers of zinc monosulfide, ZnS ." *Journal of Molecular Spectroscopy*. **270** (2011) 40. DOI: <http://dx.doi.org/10.1016/j.jms.2011.08.007>.

University of North Texas (Doctoral Student)

22. B.E. Long, G. S. Grubbs II, and S. A. Cooke. "The pure rotational spectra of the two lowest energy conformers of the asymmetric ether $\text{C}_4\text{H}_9\text{OC}_2\text{H}_5$." *Journal of Molecular Spectroscopy*. **269** (2011) 113. DOI: <http://dx.doi.org/10.1016/j.jms.2011.05.008>.
23. B.E. Long, R. A. Powoski, G. S. Grubbs II, W. C. Bailey and S. A. Cooke. "The microwave spectrum of methyl chlorodifluoroacetate: methyl internal rotation and chlorine nuclear electric quadrupole coupling." *Journal of Molecular Spectroscopy*. **266** (2011) 21. DOI: <http://dx.doi.org/10.1016/j.jms.2011.01.001>.
24. G.S. Grubbs II and S. A. Cooke. "Structure and Barrier to Methyl Group Internal Rotation for $(\text{CF}_3)_2\text{CFCF}_2\text{OCH}_3$ and its Isomer $n\text{-C}_4\text{F}_9\text{OCH}_3$ (HFE-7100)." *Journal of Physical Chemistry A*. **115** (2011) 1086. DOI: <http://dx.doi.org/10.1021/jp110390y>.
25. G. S. Grubbs II, W. C. Bailey and S. A. Cooke. "Concerning the Electronic and Geometric Structure of Bromodifluoroacetonitrile, CBrF_2CN ." *Journal of Molecular Structure*. **987** (2011) 255. DOI: <http://dx.doi.org/10.1016/j.molstruc.2010.12.035>.
26. G. S. Grubbs II, C. T. Dewberry, A. King, Wei Lin, W. C. Bailey and S. A. Cooke. "Chlorine Nuclear Quadrupole Coupling in Chlorodifluoroacetyl Chloride: Theory and Experiment." *Journal of Molecular Spectroscopy*. **263** (2010) 127. DOI: <http://dx.doi.org/10.1016/j.jms.2010.07.001>.
27. G. S. Grubbs II and S. A. Cooke. "Conformational Energies of $\text{C}_4\text{F}_9\text{OC}_2\text{H}_5$ (HFE-7200)." *Chemical Physics Letters*. **495** (2010) 182. DOI: <http://dx.doi.org/10.1016/j.cplett.2010.07.004>.
28. G. S. Grubbs II, R. A. Powoski, D. Jojola and S. A. Cooke. "Some Geometric and Electronic Structural Effects of Perfluorinating Propionyl Chloride." *Journal of Physical Chemistry A*. **114** (2010) 8009. DOI: <http://dx.doi.org/10.1021/jp103966e>.
29. G. S. Grubbs II, C. T. Dewberry, S. A. Cooke and Wei Lin. "The Shape of Perfluorobutyryl Fluoride, $\text{C}_3\text{F}_7\text{COF}$, in the Gas Phase." *Journal of Molecular Structure*. **973** (2010) 190. DOI: <http://dx.doi.org/10.1016/j.molstruc.2010.03.069>.
30. G. S. Grubbs II, G. Kadiwar, W. C. Bailey, and S. A. Cooke. "The Complete Iodine and Nitrogen Nuclear Electric Quadrupole Coupling Tensors for Fluoroiodoacetonitrile Determined by Chirped Pulse Fourier Transform Microwave Spectroscopy." *Journal of Chemical Physics*. **132** (2010) 024310. DOI: <http://dx.doi.org/10.1063/1.3291619>.
31. G. S. Grubbs II and S. A. Cooke. "¹¹⁷Sn and ¹¹⁹Sn Hyperfine Structure in the Rotational Spectrum of Tin Monosulfide Using Laser Ablation-Source Equipped, Chirped-Pulse Fourier Transform Microwave Spectroscopy." *Journal of Molecular Spectroscopy*. **259** (2010) 120. DOI: <http://dx.doi.org/10.1016/j.jms.2009.12.003>.
32. R. A. Powoski, G. S. Grubbs II, and S. A. Cooke. "A Conformational Study of Butyryl Chloride Using Chirped Pulse Fourier Transform Microwave Spectroscopy and Quantum Chemical Calculations." *Journal of Molecular Structure*. **963** (2010) 106. DOI: <http://dx.doi.org/10.1016/j.molstruc.2009.10.020>.
33. G. S. Grubbs II and S. A. Cooke. "Chirped-Pulse Fourier Transform Microwave Spectroscopy of Perfluoroiodoethane." *Journal of Molecular Structure*. **963** (2010) 87. DOI: <http://dx.doi.org/10.1016/j.molstruc.2009.10.019>.

34. G. S. Grubbs II and S. A. Cooke. "The Gas Phase Characterization of Perfluorobutyryl Chloride, C_3F_7COCl , Using Chirped Pulse Fourier Transform Microwave Spectroscopy." *Chemical Physics Letters*. **483** (2009) 21. DOI: <http://dx.doi.org/10.1016/j.cplett.2009.10.043>.
35. G.S. Grubbs II, B. E. Long, R. A. Powoski and S. A. Cooke. "Chirped-Pulse Fourier Transform Microwave Spectroscopy of the Simple Chiral Compound Bromofluoroacetonitrile, $CHBrFCN$." *Journal of Molecular Spectroscopy*. **258** (2009) 1. DOI: <http://dx.doi.org/10.1016/j.jms.2009.08.010>.
36. G. S. Grubbs II, W. C. Bailey and S. A. Cooke. "Chirped Pulse Fourier Transform Microwave Spectroscopy of 1,1,2,2-Tetrafluoro-3-iodopropane." *Molecular Physics*. **107** (2009) 2221. DOI: <http://dx.doi.org/10.1080/00268970903228741>.
37. G. S. Grubbs II, W. C. Bailey and S. A. Cooke. "Changes at the iodine nucleus in 1-iodopropane when one hydrogen at the carbon-3 position is replaced by fluorine." *Chemical Physics Letters*. **477** (2009) 37. DOI: <http://dx.doi.org/10.1016/j.cplett.2009.06.059>.
38. C. T. Dewberry, G. S. Grubbs II, and S. A. Cooke. "A Molecule with Small Rotational Constants Containing an Atom with a Large Nuclear Quadrupole Moment: The Microwave Spectrum of Trans-1-Iodoperfluoropropane." *Journal of Molecular Spectroscopy*. **257** (2009) 66. DOI: <http://dx.doi.org/10.1016/j.jms.2009.06.008>.
39. G. S. Grubbs II, C. T. Dewberry, K. C. Etchison, M. M. Serafin, S. A. Peebles, and S. A. Cooke. "The Pure Rotational Spectrum of Pivaloyl Chloride, $(CH_3)_3CCOCl$, between 800 MHz and 18800 MHz. *Journal of Molecular Spectroscopy*. **251** (2008) 378. DOI: <http://dx.doi.org/10.1016/j.jms.2008.04.010>. Special issue dedicated to Edward Cohen and Herb Pickett.
40. C. T. Dewberry, K. C. Etchison, G. S. Grubbs II, R. A. Powoski, M. M. Serafin, S. A. Peebles, and S. A. Cooke. "The ^{115}Sn , ^{117}Sn , ^{119}Sn nuclear spin-rotation constants in stannous monoxide, SnO , and a new multi-isotopomer analysis." *Journal of Molecular Spectroscopy*. **248** (2008) 20. DOI: <http://dx.doi.org/10.1016/j.jms.2007.11.009>.
41. M. M. Serafin, S. A. Peebles, C. T. Dewberry, K. C. Etchison, G. S. Grubbs II, R. A. Powoski, and S. A. Cooke. "Concerning the electron density at the Pb nucleus in PbO as a function of bond length." *Chemical Physics Letters*. **449** (2007) 33. DOI: <http://dx.doi.org/10.1016/j.cplett.2007.10.031>.
42. C. T. Dewberry, K. C. Etchison, G. S. Grubbs II, R. A. Powoski, M. M. Serafin, S. A. Peebles, and S. A. Cooke. "Oxygen-17 Hyperfine Structures in the Pure Rotational Spectra of SrO , SnO , BaO , HfO , and ThO ." *Physical Chemistry Chemical Physics*. **9** (2007) 5897. DOI: <http://dx.doi.org/10.1039/B712798G>. Inside front cover article.
43. G. S. Grubbs II, C. T. Dewberry, K. C. Etchison, K. Kerr and S. A. Cooke. "A Search Accelerated Correct Intensity Fourier Transform Microwave Spectrometer with Pulsed Laser Ablation Source." *Review of Scientific Instruments*. **78** (2007) 096106. DOI: <http://dx.doi.org/10.1063/1.2786022>.

PRESENTATIONS (Personally Presented)

- G. S. Grubbs II (Planned 2019, March 7: **INVITED SEMINAR**) Trinity University, San Antonio, TX.
- G.S. Grubbs II (Planned 2018, November 8: **INVITED SEMINAR**) Western Illinois University, Macomb, IL.
- G.S. Grubbs II (Planned 2018, September 28: **INVITED SEMINAR**) *Microwave Spectroscopy: Living at the Intersection of Space, Chirality, Quantum Chemistry, and Technology*. Baylor University, Waco, TX.
- Frank E. Marshall, Nicole Moon, Amanda Jo Duerden, G. S. Grubbs II (2018, June: Talk). *ATTEMPTS TO SOLVE O_2 -CONTAINING VAN DER WAALS INTERACTIONS USING SPFIT AND SPCAT WITH MICROWAVE MEASUREMENT PRECISION: PROBLEMS, PITFALLS, AND SUCCESSES*. **TH03**. Presented at the 73rd International Symposium on Molecular Spectroscopy at the University of Illinois at Urbana-Champaign, Urbana, IL.
- G.S. Grubbs II (2018, March: **INVITED TALK**). *The Structure Determination of O_2 -Containing van der Waals Complexes Using Microwave Spectroscopy and an Asymmetric Hund's Case B Approach*. Presented at the 27th Austin Symposium on Molecular Structure and Dynamics at Dallas, Dallas, TX.

- G. S. Grubbs II (2017, November: **INVITED SEMINAR**). *Using Fine and Hyperfine Effects to Provide Qualitative and Quantitative Insights into Molecular Structure and Chirality: A Game of Quantum Chemical Tag*. University of Missouri-St. Louis, St. Louis, MO.
- Frank E Marshall, Nicole Moon, Thomas D. Persinger, Richard Dawes, G. S. Grubbs II (2017, June: Talk). *MICROWAVE OBSERVATION OF THE O₂-CONTAINING COMPLEX, O₂-HCl*. **TE04**. Presented at the 72nd International Symposium on Molecular Spectroscopy at the University of Illinois at Urbana-Champaign, Urbana, IL.
- Frank E Marshall, Daniel V. Hickman, Gamil A. Guirgis, Michael H. Palmer, Charles J. Wurrey, Nicole Moon, Thomas D. Persinger, G. S. Grubbs II (2017, June: Talk). *MICROWAVE SPECTRUM OF 1-SILA-1-ISOCYANOCYCLOPENT-3-ENE*. **FB01**. Presented at the 72nd International Symposium on Molecular Spectroscopy at the University of Illinois at Urbana-Champaign, Urbana, IL.
- Frank E Marshall, Nicole Moon, Thomas D. Persinger, David Joseph Gillcrist, N. E. Shreve, William C. Bailey, G. S. Grubbs II (2017, June: Talk). *AN INVESTIGATION OF THE DIPOLE FORBIDDEN TRANSITION EFFECTS IN BROMOFLUOROCARBONS AS IT PERTAINS TO 3-BROMO-1,1,1,2,2-PENTAFLUOROPROPANE USING CP-FTMW SPECTROSCOPY*. **FB05**. Presented at the 72nd International Symposium on Molecular Spectroscopy at the University of Illinois at Urbana-Champaign, Urbana, IL.
- G. S. Grubbs II (2017, April: **INVITED SEMINAR**). *FTMW Spectroscopy and the Fundamentals of Nature: A Window to Bonding, Structure, and Chirality*. Wesleyan University, Middletown, CT.
- G. S. Grubbs II, Derek S. Frank, Daniel A. Obenchain, S. A. Cooke, Stewart E. Novick (2016, June: Talk). *CP-FTMW SPECTROSCOPY OF A CLAISEN REARRANGEMENT PRECURSOR ALLYL PHENYL ETHER*. **MI02**. Presented at the 71st International Symposium on Molecular Spectroscopy at the University of Illinois at Urbana-Champaign, Urbana, IL.
- Frank E. Marshall, David Joseph Gillcrist, Thomas D. Persinger, Nicole Moon, G. S. Grubbs II (2016, June: Talk). *A CHIRPED PULSE FOURIER TRANSFORM MICROWAVE (CP-FTMW) SPECTROMETER WITH LASER ABLATION SOURCE TO SEARCH FOR ACTINIDE-CONTAINING MOLECULES AND NOBLE METAL CLUSTERS*. **MJ12**. Presented at the 71st International Symposium on Molecular Spectroscopy at the University of Illinois at Urbana-Champaign, Urbana, IL.
- Frank E. Marshall, Thomas D. Persinger, David Joseph Gillcrist, Nicole Moon, Steve Alexandre Ndengue, Richard Dawes, G. S. Grubbs II (2016, June: Talk). *MICROWAVE OBSERVATION OF THE VAN DER WAALS COMPLEX O₂-CO*. **WG14**. Presented at the 71st International Symposium on Molecular Spectroscopy at the University of Illinois at Urbana-Champaign, Urbana, IL.
- G.S. Grubbs II (2016, March: **INVITED TALK**). *A Chirped Pulse Fourier Transform Microwave (CP-FTMW) Spectrometer with Laser Ablation Source to Search for Actinide-Containing Molecules and Noble Metal Clusters*. Presented at the 26th Austin Symposium on Molecular Structure and Dynamics at Dallas, Dallas, TX.
- G. S. Grubbs II *et al* (2015, June: Talk). *THE CP-FTMW SPECTROSCOPY AND ASSIGNMENT OF THE MONO- AND DIHYDRATE COMPLEXES OF PERFLUOROPROPIONIC ACID*. **RH12**. Presented at the 70th International Symposium on Molecular Spectroscopy at the University of Illinois at Urbana-Champaign, Urbana, IL.
- G. S. Grubbs II (2015, June: Talk). *UTILIZING SPECTROSCOPIC RESEARCH TOOLS AND SOFTWARE IN THE CLASSROOM*. **RC10**. Presented at the 70th International Symposium on Molecular Spectroscopy at the University of Illinois at Urbana-Champaign, Urbana, IL.
- G. S. Grubbs II *et al* (2014, June: Talk). *THE CHIRPED PULSE AND CAVITY FOURIER TRANSFORM MICROWAVE (CP-FTMW AND FTMW) SPECTRUM OF BROMOPERFLUOROACETONE*. **WJ08**. Presented at the 69th International Symposium on Molecular Spectroscopy at the University of Illinois at Urbana-Champaign, Urbana, IL.
- G. S. Grubbs II *et al* (2014, June: Talk). *CHIRPED PULSE AND CAVITY FOURIER TRANSFORM MICROWAVE (CP-FTMW AND FTMW) INVESTIGATIONS INTO 3-BROMO-1,1,1,2,2-PENTAFLUOROPROPANE; A MOLECULE OF ATMOSPHERIC INTEREST*. **TE05**. Presented at the

69th International Symposium on Molecular Spectroscopy at the University of Illinois at Urbana-Champaign, Urbana, IL.

- G. S. Grubbs II *et al* (2013, June: Talk). *FTMW OBSERVATION AND ANALYSIS OF THE p -H₂—AgCl AND o -H₂—AgCl COMPLEX*. **FC02**. Presented at the 68th International Symposium on Molecular Spectroscopy at The Ohio State University, Columbus, OH.
- G. S. Grubbs II *et al* (2012, June: Talk). *THE CHIRPED-PULSE FOURIER TRANSFORM MICROWAVE (CP-FTMW) SPECTRUM AND POTENTIAL ENERGY CALCULATIONS FOR AN AROMATIC CLAISEN REARRANGEMENT MOLECULE, ALLYL PHENYL ETHER*. **TC11**. Presented at the 67th International Symposium on Molecular Spectroscopy at The Ohio State University, Columbus, OH.
- G. S. Grubbs II *et al* (2011, June: Talk). *CAVITY AND CHIRPED PULSE ROTATIONAL SPECTRUM OF THE LASER ABLATION SYNTHESIZED, OPEN-SHELL MOLECULE TIN MONOCHLORIDE, SnCl*. **TC12**. Presented at the 66th International Symposium on Molecular Spectroscopy at The Ohio State University, Columbus, OH.
- G. S. Grubbs II *et al* (2010, October: Poster). *OBSERVED DOUBLING IN THE PURE ROTATIONAL SPECTRA OF HEXAFLUOROISOBUTENE, (CF₃)₂C=CH₂, HEXAFLUOROACETONE IMINE, (CF₃)₂C=NH, AND ALSO 1-IODOPERFLUOROBUTANE, C₄F₁₁I*. **P18**. Presented at the University of North Texas Chemistry Centennial Celebration, Denton, TX.
- G. S. Grubbs II *et al* (2010, June: Talk) *CHIRPED PULSE FOURIER TRANSFORM MICROWAVE SPECTROSCOPY OF SnCl*. **RC06**. Presented at the 65th International Symposium on Molecular Spectroscopy at The Ohio State University, Columbus, OH.
- G. S. Grubbs II *et al* (2010, March: Poster). *OBSERVED SPLITTING IN THE CHIRPED-PULSE SPECTRUM OF PERFLUOROIODOBUTANE*. **PHYS 327**. Presented at the 239th American Chemical Society National Meeting & Exposition, San Francisco, CA.
- G. S. Grubbs II *et al* (2010, March: Poster). *DETECTING LASER ABLATION PRODUCTS USING FAST PASSAGE FOURIER TRANSFORM MICROWAVE SPECTROSCOPY: THE EXAMINATION OF THE OPEN SHELL MOLECULE SnCl*. **K1.00286**. Presented at the 2010 American Physical Society National March Meeting, Portland, OR.
- G. S. Grubbs II *et al* (2010, March: Poster). *OBSERVED DOUBLING IN THE PURE ROTATIONAL SPECTRA OF HEXAFLUOROISOBUTENE, (CF₃)₂C=CH₂, HEXAFLUOROACETONE IMINE, (CF₃)₂C=NH, AND ALSO 1-IODOPERFLUOROBUTANE, C₄F₁₁I*. **P18**. Presented at the 23rd Austin Symposium on Molecular Structure and Dynamics, Austin, TX.
- G. S. Grubbs II *et al* (2009, June: Talk). *MEASUREMENT OF THE VIBRATIONAL POPULATION DISTRIBUTION OF BARIUM SULFIDE SEEDED IN AN ARGON SUPERSONIC EXPANSION FOLLOWING PRODUCTION THROUGH THE REACTION OF LASER ABLATED BARIUM WITH CARBONYL SULFIDE*. **WF13**. Presented at the 64th International Symposium on Molecular Spectroscopy at The Ohio State University, Columbus, OH.
- G. S. Grubbs II *et al* (2008, June: Talk). *THE PURE ROTATIONAL SPECTRUM OF PIVALOYL CHLORIDE, (CH₃)₃CCOCl, BETWEEN 800 MHz AND 18800 MHz*. **FC08**. Presented at the 63rd International Symposium on Molecular Spectroscopy at The Ohio State University, Columbus, OH.

Advisee Given Presentations (Presenters Underlined)

Frank E. Marshall, Amanda Jo Duerden, Nicole Moon, David Joseph Gillerist, Ivan Sedlacek, Grier Jones, Theodore Carrigan-Broda, Gamil A. Guirgis, G. S. Grubbs II (June 2018) *STRUCTURE DETERMINATION OF 5 MEMBERED SILANE RINGS USING MICROWAVE SPECTROSCOPY*. **TJ10**. Presented at the 73rd International Symposium on Molecular Spectroscopy at the University of Illinois at Urbana-Champaign, Urbana, IL. TALK

Joshua E. Isert, Frank E. Marshall, Garry Grubbs II (May 2018) *Chirality Determination Using Dipole-Forbidden Transitions*. Presented at the First Year Research Experiences (FYRE) Program Conclusion, Missouri University of Science and Technology, Rolla, MO. POSTER

Frank E. Marshall, Amanda Duerden, Nicole Moon, David Gillcrist, Ivan Sedlacek, Gamil A. Guirgis, G. S. Grubbs II (March 2018) *STRUCTURE DETERMINATION OF 5 MEMBERED SILANE RINGS USING*

MICROWAVE SPECTROSCOPY. P10. Presented at the 27th Austin Symposium on Molecular Structure and Dynamics at Dallas, Dallas, TX. POSTER

Frank E. Marshall, William Raymond Neal Tonks, David Joseph Gillcrist, Charles J. Wurrey, Gamil A. Guirgis, G. S. Grubbs II (June 2017) *TUNNELING EFFECTS AND CONFORMATION DETERMINATION OF THE POLAR FORMS OF 1,3,5-TRISILAPENTANE. T109.* Presented at the 72nd International Symposium on Molecular Spectroscopy at the University of Illinois at Urbana-Champaign, Urbana, IL. TALK

Frank E. Marshall, Channing West, Galen Sedo, Brooks Pate, G. S. Grubbs II (June 2017) *THE COMPLETE HEAVY-ATOM STRUCTURE OF A CP-FTMW CHIRAL TAG PRECURSOR, VERBENONE. RG12.* Presented at the 72nd International Symposium on Molecular Spectroscopy at the University of Illinois at Urbana-Champaign, Urbana, IL. TALK

Frank E. Marshall, Nicole Moon, Thomas D. Persinger, David Joseph Gillcrist, G. S. Grubbs II (June 2016) *CP-FTMW SPECTRUM OF BROMOPERFLUOROACETONE. WE05.* Presented at the 71st International Symposium on Molecular Spectroscopy at the University of Illinois at Urbana-Champaign, Urbana, IL. TALK

Frank Marshall, Michael A Pride, Michelle Rojo, Katelyn R. Brinker, Zachary Walker, Michael Storrie-Lombardi, Melanie R. Mormile, and G. S. Grubbs II (June 2015) *A SIMPLE, COST EFFECTIVE RAMAN-FLUORESCENCE SPECTROMETER FOR USE IN LABORATORY AND FIELD EXPERIMENTS. RC02.* Presented at the 70th International Symposium on Molecular Spectroscopy at the University of Illinois at Urbana-Champaign, Urbana, IL. TALK

Teresa Schneider, Hannah Schumaker, and G. S. Grubbs II (July 2014) *Laser Ablation System and Automation of a CP-FTMW Spectrometer.* MS&T Summer Research Academy Poster Session, Rolla, MO. POSTER

Nelson Shreve (April 2014) *RECONSTRUCTION OF A BALLE-FLYGARE TYPE FTMW SPECTROMETER.* 1st Annual Undergraduate Research Symposium on High Resolution Spectroscopy and Structure at Wesleyan University, Middletown, CT. TALK

Frank Marshall (April 2014) *PRELIMINARY TESTING, CIRCUIT DESIGN, AND CONSTRUCTION OF A CP-FTMW SPECTROMETER.* 1st Annual Undergraduate Research Symposium on High Resolution Spectroscopy and Structure at Wesleyan University, Middletown, CT. TALK

Cassandra Hurley (April 2014) *Construction and Implementation of a Fourier Transform Microwave (FTMW) Spectrometer.* MS&T Undergraduate Research Symposium, Rolla, MO. POSTER

David Gillcrist (April 2014) *Design and Construction of a Novel Chirped Pulse Fourier Transform Microwave (CP-FTMW) Spectrometer.* MS&T Undergraduate Research Symposium, Rolla, MO. POSTER

PROFESSIONAL MEMBERSHIPS

2007 - Present, American Chemical Society Member. South Central Missouri Local Section Executive Committee - *2015 Chair-Elect, 2016 Chair, 2017 Immediate Past Chair and Treasurer, 2018 Treasurer*

2009 - Present, Alpha Chi Sigma Professional Chemistry Fraternity Member, Beta Eta Chapter

2010 - Present, American Physical Society Member.

AWARDS

February 2018, American Chemical Society National Nominee for the *Fall 2018 Kavli Foundation Emerging Leader in Chemistry Lecture*

April 2016, 2015-16 Service to the Department, Campus, and Discipline Award

April 2015, 2014 Chemistry Department Tappemeyer Teaching Excellence Award

July 2014 - May 2015, University of Missouri Faculty Scholar

Fall 2010 - Spring 2011, Thesis Dissertation Fellowship Recipient (Full Tuition, Fees and Stipend for One Academic Year), University of North Texas.

Spring 2010 - Summer 2010, Graduate Tuition Waiver Scholarship Recipient, University of North Texas

Spring 2010, *UNT Research Magazine* Selected Student for Science, Scholarship, and the Arts Piece.

Summer 2009, ORAU Fellow to attend the 59th Meeting of Nobel Laureates in Lindau, Germany.

Fall 2008 - Spring 2009, Welch Foundation Research Fellow, University of North Texas.

Spring 2009, Toulouse Graduate School Travel Award.

Fall 2008 and Spring 2010, College of Arts and Sciences Travel Grant, University of North Texas.

Spring 2008, Spring 2009, and Spring 2010, Raupe Travel Grant Award Winner, University of North Texas.

Fall 2001 - Spring 2005, Terry Scholarship Recipient (Full Tuition, Fees and Stipend Scholarship), Texas A&M University.