

Brett A. McGuire

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Education

Ph.D. Physical Chemistry, California Institute of Technology, 2015
M.S. Physical Chemistry, Emory University, 2011
B.S. Chemistry (*Highest Distinction*), University of Illinois at Urbana-Champaign, 2009
Charleston High School (*Valedictorian*); Charleston, IL, 2005

Research Experience

Hubble Postdoctoral Fellow 2017 – Present
National Radio Astronomy Observatory
Harvard-Smithsonian Center for Astrophysics

Research Area: Interstellar reaction screening and unbiased molecular discovery via laboratory Microwave Spectral Taxonomy and AMDOR spectroscopy. ALMA, SOFIA, and GBT investigations of molecular inventories and chemical evolution in exotic chemical environments.

Jansky Postdoctoral Fellow 2014 – 2017
National Radio Astronomy Observatory
Harvard-Smithsonian Center for Astrophysics

Research Area: Technique development and microwave spectroscopy of van der Waals complexes and astrochemically-relevant radicals and ions. Radioastronomical observational searches for new molecular species and investigations of complex molecular evolution in the interstellar medium.

Graduate Research Assistant 2011 – 2014
California Institute of Technology Advisor: Geoffrey A. Blake

Research Area: Ultrafast terahertz time-domain spectroscopy of astrophysical ice analogs, and far-infrared astronomical observations of the same. Radioastronomical observations of molecular masers and exotic cations.

Graduate Research Assistant 2009 – 2011
Emory University Advisor: Susanna L. Widicus Weaver

Research Area: Investigations of high-Q optical cavities in the millimeter and submillimeter wavelength ranges for the development of high-sensitivity submillimeter spectroscopy methods.

Undergraduate Research Assistant 2006 – 2009
University of Illinois at Urbana-Champaign Advisor: Benjamin J. McCall

Research Area: Design and development of a hollow-cathode ion discharge source for the infrared study of spin-exchange interactions in the reaction of $\text{H}_3^+ + \text{H}_2$.

Academic Appointments

- (2018 - Present) Research Associate, Atomic and Molecular Physics, Harvard-Smithsonian Center for Astrophysics
- (2017 - Present) Research Assistant Professor, Department of Astronomy, University of Virginia
- (2018) Adjunct Research Assistant Professor, Department of Chemistry, University of Illinois
- (2015 - 2018) Visiting Scientist, Atomic and Molecular Physics, Harvard-Smithsonian Center for Astrophysics
- (2011 - 2014) NSF Graduate Research Program Fellow, California Institute of Technology
- (2011) Curriculum Development Fellow, Emory University
- (2009 - 2011) Robert W. Woodruff Fellow, Emory University

Honors and Awards

- 2019 AAS Laboratory Astrophysics Division Early Career Award
- 2018 ACS Physical Chemistry Division Young Investigator Award
- 2018 List of Teachers Ranked as Excellent by Their Students, University of Illinois ([Student Evaluations](#))
- 2016 NASA Astrobiology Institute Early Career Collaboration Award
- 2015 ACS Astrochemistry Award for Best Doctoral Dissertation
 - APS DCP New Investigator Award
 - AAS Rodger Doxsey Dissertation Prize
- 2014 NASA Astrobiology Institute Early Career Collaboration Award
 - Everhart Lectureship Award
- 2013 Rao Prize at the 68th International Symposium on Molecular Spectroscopy
- 2007-2009 List of Teachers Ranked as Excellent by Their Students, University of Illinois (4 Semesters)
 - Student Evaluations: [Fall 2007](#), [Spring 2008](#), [Fall 2008](#), [Spring 2009](#)
- 2005-2009 University of Illinois James Scholar

Publications

[Google Scholar Profile](#) – [NASA ADS Profile](#) – [ORCID Profile](#)

Invited Refereed Publications (3)

[Blue](#) numbers are active links to full article pdfs (in most PDF viewers).

*Denotes senior authorship

- [55] Melosso, M., & McGuire, B.A.,* “Laboratory and observational rotational spectroscopy of ethylene glycol up to 1 THz,” **2019**, *Journal of Physical Chemistry A*, in prep.
- [54] [McGuire, B.A.](#),* Brünken, S., Asvany, O., & Schlemmer, S., “Observations of interstellar ion chemistry enabled by laboratory spectroscopy: past, present, and future.,” **2019**, *Nature Reviews Physics*, in prep.
- [53] McCarthy, M.C., & [McGuire, B.A.](#), “Astrochemistry in the laboratory: Bridging the gap from carbon chains to aromatic rings,” **2019**, *Journal of Physical Chemistry A*, in prep.

Refereed Publications As Senior Author (4)

- [52] El-Abd, S., Brogan, C.L., Hunter, T.R., Willis, E.R., Garrod, R.T., & [McGuire, B.A.](#), “Interstellar glycolaldehyde, methyl formate, and acetic acid I: A bi-modal abundance pattern in star-forming regions,” **2019**, *Astrophysical Journal*, accepted.
- [51] Xue, C., Remijan, A.J., Brogan, C.L., Hunter, T.R., Herbst, E., & [McGuire, B.A.](#), “ALMA detection of vibrationally excited ($v_t = 1, 2$) acetic acid toward NGC 6334I,” **2019**, *Astrophysical Journal*, accepted.
- [50] Burkhardt, A.M., Herbst, E., Kalenskii, S., McCarthy, M.C., Remijan, A.J., & [McGuire, B.A.](#), “Detection of HC_5N and HC_7N isotopologues in TMC-1 with the Green Bank Telescope,” **2018**, *Monthly Notices of the Royal Astronomical Society*, 474, 5068.
- [49] Burkhardt, A.M., Dollhopf, N., Corby, J.F., Carroll, P.B., Shingledecker, C.N., Loomis, R.A., Booth, S.T., Blake, G.A., Remijan, A.J., & [McGuire, B.A.](#), “CSO and CARMA observations of L1157. II. Chemical complexity in the shocked outflow,” **2016**, *Astrophysical Journal*, 827, 21.

Refereed Publications As First (18) or Second (13) Author

†Denotes equal authorship credit

- [48] McGuire, B.A., Shingledecker, C.N., Willis, E.R., Lee, K.L.K., Martin-Drumel, M.-A., Blake, G.A., Brogan, C.L., Burkhardt, A.M., Caselli, P., Chuang, K.-J., El-Abd, S., Hunter, T.R., Ioppolo, S., Linnartz, H., Remijan, A.J., Xue, C., & McCarthy, M.C., “Searches for Interstellar HCCSH and H₂CCS,” **2019**, *Astrophysical Journal*, accepted.
- [47] Alonso, E.R., McGuire, B.A., Kolesniková, L., Carroll, P.B., León, I., Brogan, C.L., Hunter, T.R., Guillemin, J.-C., & Alonso, J.L., “The laboratory millimeter and sub-millimeter rotational spectrum of lactaldehyde and an astronomical search in Sgr B2(N), Orion-KL, and NGC 6334I,” **2019**, *Astrophysical Journal*, accepted.
- [46] Melosso, M., McGuire, B.A., Tamassia, F., Esposti, C.D., & Dore, L., “Astronomical search of vinyl alcohol assisted by submillimeter spectroscopy,” **2019**, *ACS Earth and Space Chemistry*, 3, 1189.
- [45] Bøgelund, E.G., McGuire, B.A., Hogerheijde, M.R., van Dishoeck, E.F., & Ligterink, N.F.W., “Methylamine and other simple N-bearing species in the hot cores NGC 6334I MM1-3,” **2019**, *Astronomy & Astrophysics*, 624, A82.
- [44] Ginsburg, A., McGuire, B.A., Bally, J., Plambeck, R., Goddi, C., & Wright, M., “Orion SrcI’s disk is salty,” **2019**, *Astrophysical Journal*, 872, 54.
- [43] Lee, K.L.K., McGuire, B.A.,[†] & McCarthy, M.C., “Gas-phase synthetic pathways to benzene and benzonitrile: a combined microwave and thermochemical investigation,” **2019**, *Physical Chemistry Chemical Physics*, 21, 2946.
- [42] McGuire, B.A., “2018 Census of interstellar, circumstellar, extragalactic, protoplanetary disk, and exoplanetary molecules,” **2018**, *Astrophysical Journal Suppl.*, 239, 17.
- [41] McGuire, B.A., Brogan, C.L., Hunter, T.R., Remijan, A.J., Blake, G.A., Burkhardt, A.M., Carroll, P.B., van Dishoeck, E.F., Garrod, R.T., Linnartz, H., Shingledecker, C.N., & Willis, E.R., “First results of an ALMA Band 10 spectral line survey of NGC 6334I: Detections of glycolaldehyde (HC(O)CH₂OH) and a new compact bipolar outflow in HDO and CS,” **2018**, *Astrophysical Journal Lett.*, 863, L35.
- [40] McGuire, B.A., Martin-Drumel, M.-A., Lee, K.L.K., Stanton, J.F., Gottlieb, C.A., & McCarthy, M.C., “Vibrational satellites of C₂S, C₃S, and C₄S: Microwave spectral taxonomy as a stepping stone to the millimeter-wave band,” **2018**, *Physical Chemistry Chemical Physics*, 20, 13870.
- [39] Bøgelund, E.G., McGuire, B.A., Ligterink, N.F.W., Taquet, V., Brogan, C.L., Hunter, T.R., Hogerheijde, M.R., & van Dishoeck, E.F., “Low levels of methanol deuteration in the high-mass star-forming region NGC 6334I,” **2018**, *Astronomy & Astrophysics*, 615, A88.
- [38] McGuire, B.A., Burkhardt, A.M., Kalenskii, S., Shingledecker, C.N., Remijan, A.J., Herbst, E., & McCarthy, M.C., “Detection of the aromatic molecule benzonitrile (*c*-C₆H₅CN) in the interstellar medium,” **2018**, *Science*, 359, 202.
- [37] McGuire, B.A., Shingledecker, C.N., Willis, E.R., Burkhardt, A.M., El-Abd, S., Motiyenko, R., Brogan, C.L., Hunter, T.R., Margulés, L., Guillemin, J.-C., Garrod, R.T., Herbst, E., & Remijan, A.J., “ALMA discovery of interstellar methoxymethanol (CH₃OCH₂OH) in NGC 6334I,” **2017**, *Astrophysical Journal Lett.*, 851, L46.
- [36] Corby, J.F., McGuire, B.A., Herbst, E., & Remijan, A.J., “The molecular chemistry of diffuse and translucent clouds in the line-of-sight to Sgr B2 – Absorption by simple organic and inorganic molecules in the GBT PRIMOS survey,” **2017**, *Astronomy & Astrophysics*, 610, A10.
- [35] McGuire, B.A., Martin-Drumel, M.-A., & McCarthy, M.C., “Electron donor-acceptor nature of the ethanol-CO₂ dimer,” **2017**, *Journal of Physical Chemistry A*, 121, 6283.
- [34] McGuire, B.A., Burkhardt, A.M., Shingledecker, C.N., Kalenskii, S., Remijan, A.J., & McCarthy, M.C., “Detection of interstellar HC₃O in TMC-1 with the Green Bank Telescope,” **2017**, *Astrophysical Journal Lett.*, 843, L28.

- [33] Margulés, L., McGuire, B.A., Senent, M.L., Motiyenko, R., Remijan, A.J., & Guillemin, J.-C., “Sub-millimeter wave spectra of 2-hydroxyacetonitrile (glycolonitrile) and its searches in GBT PRIMOS observations of Sgr B2(N),” **2017**, *Astronomy & Astrophysics*, 601, A50.
- [32] McGuire, B.A., Martin-Drumel, M.-A., Thorwirth, S., Brünken, S., Lattanzi, V., Neill, J.L., Spezzano, S., Yu, Z., Zaleski, D.P., Remijan, A.J., Pate, B.H., & McCarthy, M.C., “Molecular polymorphism: microwave spectra, equilibrium structures, and an astronomical investigation of the HNCS isomeric family,” **2016**, *Physical Chemistry Chemical Physics*, 18, 22693.
- [31] McGuire, B.A., Carroll, P.B., Loomis, R.A., Finneran, I.A., Jewell, P.R., Remijan, A.J., & Blake, G.A., “Discovery of the interstellar chiral species propylene oxide,” **2016**, *Science*, 352, 1449.
- [30] McGuire, B.A., Allodi, M.A., Ioppolo, S., & Blake, G.A., “THz time-domain spectroscopy of mixed CO₂-CH₃OH interstellar ice analogs,” **2016**, *Physical Chemistry Chemical Physics*, 18, 20199.
- [29] McGuire, B.A., Carroll, P.B., Dollhopf, N., Crockett, N., Corby, J.F., Loomis, R.A., Burkhardt, A.M., Shingledecker, C.N., Blake, G.A., & Remijan, A.J., “CSO and CARMA observations of L1157. I. A deep search for hydroxylamine (NH₂OH),” **2015**, *Astrophysical Journal*, 812, 76.
- [28] McGuire, B.A., Carroll, P.B., Boynton, A.N., Mendez, J.M., & Blake, G.A., “The ignition of thermite using the potassium chlorate “rocket” reaction: a systematic demonstration of reaction chemistry,” **2015**, *Journal of Chemical Education*, 92, 1117.
- [27] Loomis, R.A., McGuire, B.A., Shingledecker, C.N., Burkhardt, A.M., Johnson, C.H., Blair, S., Robertson, A., & Remijan, A.J., “Investigating the minimum energy principle in searches for new molecular species – the case of H₂C₃O isomers,” **2015**, *Astrophysical Journal*, 799, 34.
- [26] Carroll, P.B., McGuire, B.A., Remijan, A.J., Apponi, A.J., Ziurys, L.M., Lovas, F.J., & Blake, G.A., “The search for a complex molecule in a selected hot core region: a rigorous attempt to confirm trans-ethyl methyl ether toward W51 e1/e2,” **2015**, *Astrophysical Journal*, 799, 15.
- [25] Ioppolo, S., McGuire, B.A., Allodi, M.A., & Blake, G.A., “THz and mid-IR spectroscopy of interstellar ice analogs: methyl and carboxylic acid groups,” **2014**, *Faraday Discussions*, 168, 461.
- [24] McGuire, B.A., Carroll, P.B., Sanders, J.L., Widicus Weaver, S.L., Blake, G.A., & Remijan, A.J., “A CSO search for *l*-C₃H⁺: Detection in the Orion Bar PDR,” **2014**, *Monthly Notices of the Royal Astronomical Society*, 442, 2901.
- [23] McGuire, B.A., Carroll, P.B., Gratier, P., Guzmán, V., Pety, J., Roueff, E., Gerin, M., Blake, G.A., & Remijan, A.J., “An observational investigation of the identity of B11244 (*l*-C₃H⁺/C₃H⁻),” **2014**, *Astrophysical Journal*, 783, 36.
- [22] McGuire, B.A., Carroll, P.B., Blake, G.A., Hollis, J.M., Lovas, F.J., Jewell, P.R., & Remijan, A.J., “A search for *l*-C₃H⁺ in Sgr B2(N), Sgr B2(OH) and the dark cloud TMC-1,” **2013**, *Astrophysical Journal*, 774, 56.
- [21] Carroll, P.B., McGuire, B.A., Zaleski, D.P., Neill, J.L., Pate, B.H., & Widicus Weaver, S.L., “The rotational spectra of glycolaldehyde isotopologues measured in natural abundance by chirped-pulse Fourier transform microwave spectroscopy,” **2013**, *Journal of Molecular Spectroscopy*, 284, 21.
- [20] McGuire, B.A., Loomis, R.A., Charness, C.M., Corby, J.F., Blake, G.A., Hollis, J.M., Lovas, F.J., Jewell, P.R., & Remijan, A.J., “Interstellar carbodiimide (HNCS) - A new astronomical detection from the GBT PRIMOS survey via maser emission features,” **2012**, *Astrophysical Journal Letters*, 758, L33.
- [19] Pulliam, R., McGuire, B.A., & Remijan, A.J., “A search for interstellar hydroxylamine (NH₂OH) toward select astronomical sources,” **2012**, *Astrophysical Journal*, 751, 1.
- [18] McGuire, B.A., Wang, Y., Bowman, J.M., & Widicus Weaver, S.L., “Do H₅⁺ and its isotopologues have rotational spectra?” **2011**, *Journal of Physical Chemistry Letters*, 2, 1405.

Refereed Publications As Contributing Author (17)

- [17] Brogan, C.L., Hunter, T.R., Towner, A.P.M., McGuire, B.A., MacLeod, G.C., Gurwell, M.A., Cyganowski, C.J., Brand, J., Burns, R.A., Caratti o Garatti, A., Chen, X., Chibueze, J.O., Hirano, N., Hirota, T., Kim, K.-T., Kramer, B.H., Linz, H., Menten, K.M., Remijan, A.J., Sanna, A., Sobolev, A.M., Sridharan, T.K., Stecklum, B., Sugiyama, K., Surcis, G., van der Walt, J., Volvach, A.E., & Vovlach, L.N., “Sub-arcsecond (sub)millimeter imaging of the massive protocluster G358.93–0.03: Discovery of 14 new methanol maser lines associated with a hot core,” **2019**, *Astrophysical Journal Lett.*, accepted.
- [16] Burkhardt, A.M., Shingledecker, C.N., Le Gal, R., McGuire, B.A., Remijan, A.J., & Herbst, E., “Modeling C-shock chemistry in isolated molecular outflows: A case study of L1157,” **2019**, *Astrophysical Journal*, 881, 32.
- [15] Lee, K.L.K., Martin-Drumel, M.-A., Lattanzi, V., McGuire, B.A., Caselli, P., & McCarthy, M.C., “Gas-phase detection and rotational spectroscopy of ethynethiol, HCCSH,” **2018**, *Molecular Physics*, 117, 1381.
- [14] Brogan, C.L., Hunter, T.R., Cyganowski, C.J., Chibueze, J.O., Friesen, R., Hirota, T., MacLeod, G.C., McGuire, B.A., & Sobolev, A.M., “The extraordinary outburst in the massive protostellar system NGC6334I-MM1: Flaring of the water masers in a north-south bipolar outflow driven by MM1B,” **2018**, *Astrophysical Journal*, 866, 87.
- [13] Cordiner, M.A., Charnley, S.B., Kisiel, Z., McGuire, B.A., & Kuan, Y.-J., “Deep K-band observations of TMC-1 with the Green Bank Telescope: Detection of HC₇O, non-detection of HC₁₁N, and a search for new organic molecules,” **2017**, *Astrophysical Journal*, 850, 187.
- [12] Widicus Weaver, S.L., Laas, J.C., Zou, L., Kroll, J.A., Rad, M.L., Hays, B.M., Sanders, J.L., Lis, D.C., Cross, T.N., Wehres, N., McGuire, B.A., & Sumner, M.C., “Deep, broadband spectral line surveys of molecule-rich interstellar clouds,” **2017**, *Astrophysical Journal Suppl.*, 232, 3.
- [11] Towner, A.P.M., Brogan, C.L., Hunter, T.R., Cyganowski, C.J., McGuire, B.A., Indebetouw, R., Friesen, R., & Chandler, C.J., “VLA survey of dense gas in extended green objects: prevalence of 25 GHz methanol masers,” **2017**, *Astrophysical Journal Suppl.*, 230, 22.
- [10] Loomis, R.A., Shingledecker, C.N., Langston, G., McGuire, B.A., Dollhopf, N., Burkhardt, A.M., Corby, J.F., Carroll, P.B., Mennicke, C., Woolard, K., Turner, B., & Remijan, A.J., “Non-detection of HC₁₁N toward TMC-1: constraining the formation chemistry of large carbon-chain molecules,” **2016**, *Monthly Notices of the Royal Astronomical Society*, 436, 4175.
- [9] Martin-Drumel, M.-A., McCarthy, M.C., Patterson, D., McGuire, B.A., & Crabtree, K.N., “Automated two-dimensional rotational spectroscopy to identify and characterize individual chemical compounds,” **2016**, *Journal of Chemical Physics*, 144, 124202.
- [8] McCarthy, M.C., Martinez, O., McGuire, B.A., Crabtree, K.N., Martin-Drumel, M.-A., & Stanton, J.F., “Isotopic studies of *trans*- and *cis*-HOCO using rotational spectroscopy: formation, chemical bonding, and molecular structures,” **2016**, *Journal of Chemical Physics*, 144, 124304.
- [7] McCarthy, M.C., Crabtree, K.N., Martin-Drumel, M.-A., Martinez, O., McGuire, B.A., & Gottlieb, C.A., “A laboratory study of C₃H⁺ and the C₃H radical in three new vibrationally excited ²Σ states using a pin-hole nozzle discharge source,” **2015**, *Astrophysical Journal*, 217, 10.
- [6] Neill, J.L., Bergin, E.A., Lis, D.C., Schilke, P., Crockett, N., Favre, C., Emprechtinger, M., Comito, C., Qin, S.-L., Anderson, D., Burkhardt, A.M., Chen, J.-H., Harris, B.J., Lord, S.D., McGuire, B.A., McNeill, T.D., Monje, R.R., Phillips, T.G., Steber, A.L., Vasyunina, T., & Yu, S., “*Herschel* observations of EXtraOrdinary Sources: Analysis of the full *Herschel*/HIFI molecular line survey of Sagittarius B2(N),” **2014**, *Astrophysical Journal*, 789, 9.
- [5] Crockett, N., Bergin, E.A., Neill, J.L., Favre, C., Schilke, P., Lis, D.C., Bell, T.A., Blake, G.A., Cernicharo, J., Emprechtinger, M., Esplugues, G.B., Gupta, H., Klescheva, M., Lord, S.D., Marcelino, N., McGuire, B.A., Pearson, J., Phillips, T.G., Plume, R., van der Tak, F., Tercero, B., & Yu, S., “*Herschel* observations of EXtraOrdinary Sources: Analysis of the HIFI 1.2 THz wide spectral survey toward Orion KL I. methods,” **2014**, *Astrophysical Journal*, 787, 112.

- [4] Remijan, A.J., Snyder, L.E., McGuire, B.A., Kuo, H., Looney, L.W., Friedel, D.N., Golubiatnikov, G.Y., Lovas, F.J., Ilyushin, V.V., Alekseev, E.A., Dyubko, S.F., McCall, B.J., & Hollis, J.M., “Observational results of a multi-telescope campaign in search of interstellar urea [(NH₂)₂CO],” **2014**, *Astrophysical Journal*, 783, 77.
- [3] Allodi, M.A., Ioppolo, S., Kelley, M.J., McGuire, B.A., & Blake, G.A., “The structure and dynamics of carbon dioxide and water containing ices investigated via THz and mid-IR spectroscopy,” **2014**, *Physical Chemistry Chemical Physics*, 16, 3442.
- [2] Crabtree, K.N., Kauffman, C.A., Tom, B.A., Bečka, E., McGuire, B.A., & McCall, B.J., “Nuclear spin dependence of the reaction of H₃⁺ with H₂ II. Experimental measurements,” **2011**, *Journal of Chemical Physics*, 134, 194311.
- [1] Lovas, F.J., Plusquellic, D.F., Widicus Weaver, S.L., McGuire, B.A., & Blake, G.A., “Organic compounds in the C₃H₆O₃ family: Microwave spectrum of cis-cis dimethyl carbonate,” **2010**, *Journal of Molecular Spectroscopy*, 264, 10.

Book Chapters, White Papers, Conference Proceedings, Research Notes, and Other Publications

- [10] Four White Papers for the National Academies of Sciences 2020 Decadal Survey on Astronomy and Astrophysics in *Bulletins of the American Astronomical Society* (**2019**)
- McGuire, B.A. + 12 co-authors, “Lifting the Veil on Aromatic Chemistry: Complex Carbon Across the Stellar Life Cycle from Birth to the Afterlife.”
 - McGuire, B.A. + 10 co-authors, “Closing Gaps in Our Astrochemical Heritage: From Molecular Clouds to Planets.”
 - McGuire, B.A., Carroll, P.B., Garrod, R.T., & Remijan, A.J., “Revealing Chemical Evolution Throughout the Star-Formation Process.”
 - Savin, D.W. + 38 co-authors (inc. B.A. McGuire), “Astrophysical Science Enabled by Laboratory Astrophysics Studies in Atomic, Molecular, and Optical (AMO) Physics.”
- [9] Two Chapters in *Science with a Next-Generation Very Large Array*, E. Murphy, Ed.; ASP Conference Series (**2018**)
- McGuire, B.A., Carroll, P.B., & Garrod, R.T., “Prebiotic Molecules.”
 - McGuire, B.A., Bergin, E., Blake, G.A., Burkhardt, A.M., Cleeves, L.I., Loomis, R.A., Remijan, A.J., Shingledecker, C.N., & Willis, E.R., “Observing the Effects of Chemistry on Exoplanets and Planet Formation.”
- [8] Five Chapters in *The Encyclopedia of Astrobiology*, Gargaud, M. & Wakelam, V., Eds.; Springer Reference (**2018**)
- McGuire, B.A., “Methoxymethanol.”
 - McGuire, B.A., “Benzonitrile.”
 - McGuire, B.A. & Carroll, P.B., “Propylene oxide.”
 - McGuire, B.A. & Remijan, A. J., “Molecular line surveys.”
 - McGuire, B.A., Corby, J.F., Carroll, P.B., & Remijan, A. J., “Sgr B2.”
- [7] McGuire, B.A., Bergin, E.A., Blake, G.A., Burkhardt, A.M., Cleeves, L.I., Loomis, R.A., Remijan, A.J., Shingledecker, C.N., & Willis, E.R., “Observing the effects of chemistry on exoplanets and planet formation,” **2018** *National Academies Panel on Exoplanet Science*.
- [6] McGuire, B.A. & Carroll, P.B., “The final integrations of the Caltech Submillimeter Observatory,” **2017** *Research Notes of the American Astronomical Society* 1, 4.
- [5] McGuire, B.A. & Carroll, P.B., “Mirror asymmetry in life and in space,” **2016** *Physics Today* 69(11), 86-87.

- [4] McGuire, B.A., “Time-domain TeraHertz spectroscopy and observational probes of prebiotic interstellar gas and ice chemistry,” *Ph.D. Thesis*, California Institute of Technology (2014).
- [3] McGuire, B.A., Carroll, P. B., & Remijan, A. J., “A CSO broadband spectral line survey of Sgr B2(N)-LMH from 260 - 286 GHz,” 2013 *arXiv/astro-ph: 1306.0927*
- [2] Lovas, F.J., Plusquellic, D.F., Widicus Weaver, S.L., McGuire, B.A., & Blake, G.A., “Organic compounds in the C₃H₆O₃ family: Microwave spectrum of cis-cis dimethyl carbonate,” 2011 *Proc. of: The 2010 NASA Laboratory Astrophysics Workshop*.
- [1] Carroll, P.B., McGuire, B.A., & Widicus Weaver, S.L., “Construction of a high-resolution TeraHertz cavity ringdown spectrometer,” 2011 *Proc. of: The 2010 NASA Laboratory Astrophysics Workshop*.

Selected Recent Invited Talks (40 Total From 2012 - Present)

- McGuire, B.A., “Detecting Complex (Polycyclic?) Aromatic Molecules in the ISM.” *Chalmers University, Gothenburg, Sweden*, June 2019.
- McGuire, B.A., “Molecular Discovery Across the ALMA Bands: From salty disks to complex molecules at 900 GHz.” *73rd International Symposium on Molecular Spectroscopy*, June 2019.
- McGuire, B.A., “Lifting the Veil on Aromatic Chemistry: Complex Carbon Across the Stellar Life-cycle.” *Leiden Observatory, University of Leiden*, March 2019.
- McGuire, B.A., “The Chemistry and Dynamics of Star-forming Regions Revealed with ALMA at Band 10: Water (HDO) Outflows and Complex Organic Line Forests with 300 au Resolution.” *233rd Meeting of the American Astronomical Society*, January 2019.
- McGuire, B.A., “Seeing the forest for the trees: new molecular detections in the ALMA and (soon?) ngVLA era.” *Chalmers Jubilee Professor Meeting, Chalmers University, Sweden*, September, 2018.

Teaching Experience

- Professor, Physical Chemistry I: Quantum Mechanics and Spectroscopy for Majors *University of Illinois at Urbana-Champaign*, 2018
- Designed and co-Taught Graduate Course: Cosmochemistry and Extraterrestrial Life *California Institute of Technology*, 2014
- Curriculum Development Fellow, Physical Chemistry Lab *Emory University*, 2011
- Head Teaching Assistant, Accelerated General Chemistry Labs I & II *University of Illinois*, 2008 – 2009

Mentoring Experience

- Graduate Students Mentored
 - Dr. Joanna Corby, Dr. Andrew Burkhardt, Dr. Ryan Loomis, Dr. Christopher Shingledecker, Mr. Samer El-Abd
- Undergraduate Students Mentored
 - Mr. Niklaus Dollhopf, Mr. Daniel Guth, Mr. Jerry Feng, Ms. Mary Rad, Dr. Jay Kroll, Ms. Sophie Lang, Mr. Patrick Lanter, Dr. Daniel Sudrzynski, Mr. Shawn Booth, Mr. Eric Rohr, Mr. Ignacio Simon

Successful Proposals as Principle/Senior Investigator (40 Total; \$348,000 Total Funding)

- 2017 Astrobiology Graduate Conference (\$112,000 Funding)
- Stratospheric Observatory for Infrared Astronomy (SOFIA) - 4 (\$236,000 Funding)
- Atacama Large Millimeter/submillimeter Array (ALMA) - 11
- Green Bank Telescope (GBT) - 11
- GBT Large Projects (960 Total Hours) - 2
- Very Large Array (VLA) - 2
- Sub-Millimeter Array (SMA) - 1
- Combined Array for Research in Millimeter-wave Astronomy (CARMA) - 3
- Caltech Submillimeter Observatory (CSO) - 6
- Parkes Telescope - 1
- IRAM 30-m Telescope - 1
- Australian Telescope Compact Array (ATCA) - 1
- NASA Infrared Telescope Facility (IRTF) - 1

Selected Recent Service & Outreach

- Science Professional Panelist at 2019 DragonCon: Astrochemistry, SETI, and the Origins of Life
- Science Professional Panelist at 2019 AwesomeCon: New Discoveries from the Invisible Universe!
- Panelist for ACS Program in a Box: *Voyage to Mars: Red Planet Chemistry*
- Panelist for NASA ROSES, NASA Fellowship Programs, United Kingdom Science & Technology Facilities Council, and the Submillimeter Array
- Referee for Nature, Angewandte Chemie, Nature Communications, Nature Astronomy, Physical Chemistry Chemical Physics, Spectrochimica Acta A, Journal of Physical Chemistry A, Journal of Chemical Physics, ACS Earth and Space Chemistry, Journal of Molecular Spectroscopy, The Astrophysical Journal Letters, The Astrophysical Journal, Astronomy & Astrophysics, and Astronomy and Computing
- Scientific/Local Organizing Committee, Radio/Millimeter Astrophysical Frontiers in the Next Decade *National Radio Astronomy Observatory*, June 2019
- Conference Chair, 2017 Astrobiology Graduate Conference *National Radio Astronomy Observatory*, June 2017
- Co-Organizer, “ALMA’s Molecular Universe” Mini-Symposium *International Symposium on Molecular Spectroscopy*, June 2017
- Chair, Scientific Organizing Committee, Astrobiology Graduate Conference (2014 – 2016)
- Conference Chair, “Molecular Gas in Galactic Environments” *National Radio Astronomy Observatory*, April 2016

Professional Societies

- American Chemical Society (2010 - Present)
- American Astronomical Society (2012 - Present)
Committee member for Awards and Honors of the Laboratory Astrophysics Division
- International Astronomical Union (2018 - Present)
- American Association for the Advancement of Science (2016 - Present)