Carlos R. Baiz

Assistant Professor of Chemistry
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Current Research Interests

How do molecules interact with their environment and how can we measure those interactions? This question has motivated and continues to motivate much of my work. Driven by the dynamic balance between solvent exposure, hydrophobic contacts, and hydrogen bonding, protein folding is a textbook example of how complex solute-solvent interactions determine biological structure and dynamics. My research uses ultrafast two-dimensional spectroscopy (2D IR) infrared microscopy, in combination with advanced modeling, to investigate key aspects of protein biophysics including structure and folding, and protein-membrane interactions, and protein organization.

Education and Academic Positions

University of Texas at Austin — Austin, TX
Department of Chemistry — 2015-Present
Assistant Professor of Chemistry

University of Chicago — Chicago, IL
NIH Ruth L. Kirschstein Postdoctoral Fellow — 2013-2015
Department of Chemistry and James Franck Institute
Advisor: Prof. Andrei Tokmakoff

Massachusetts Institute of Technology — Cambridge, MA
Postdoctoral Fellow — 2011-2013
Department of Chemistry
Advisor: Prof. Andrei Tokmakoff

University of Michigan — Ann Arbor, MI
Ph.D. - Physical Chemistry — 2006-2011
Department of Chemistry
Advisor: Prof. Kevin J. Kubarych
Thesis: Investigating ultrafast condensed-phase chemical dynamics with coherent multidimensional spectroscopy

Michigan Technological University — Houghton, MI
B.S. Chemistry, *Magna Cum Laude* — 2002-2005
Advisor: Prof. Bahne C. Cornilsen

Honors and Awards

CNS Teaching Excellence Award — 2018
College of Natural Sciences, University of Texas at Austin

Ruth L. Kirschstein National Research Service Award (F32) — 2013-2015
National Institutes of Health

Kasimir Fajans (best thesis) Award — Spring 2015
Department of Chemistry, University of Michigan

Rackham Predoctoral Fellowship 2010-2011
Rackham Graduate School, University of Michigan
Excellence in Research Fellowship Winter 2009
Department of Chemistry, University of Michigan
Outstanding Graduate Student Instructor Award Spring 2008
Rackham Graduate School, University of Michigan

Teaching Experience

Assistant Professor of Chemistry, University of Texas at Austin 2015-Present

- Advanced Physical Chemistry
  Second semester graduate course on time-dependent quantum mechanics and modern non-linear spectroscopy.
- Molecular Biophysics
  Upper-level undergraduate course on modern biophysics: Protein structure, dynamics, biological membranes, modern techniques.
- Physical Chemistry for Life Sciences Majors
  Introductory Physical Chemistry course covering thermodynamics, chemical kinetics and selected topics in biophysics.

Postdoctoral Fellow, University of Chicago: 2014-2015
Guest lectures in graduate biophysics.

Graduate Students and Postdocs Mentored

Name	Position	Years	Current Position
Ravi Kumar Venkatraman	Postdoc	2019-Present	UT-Austin
Sean C. Edington	Postdoc	2015-2018	Yale Univ.
Kwang-Im Oh	Postdoc	2016-Present	UT-Austin
Jennifer C. Flanagan	Grad	2015-Present	UT-Austin
Mason L. Valentine	Grad	2015-Present	UT-Austin
Chris P. Baryiames	Grad	2016-Present	UT-Austin
Ji-Yeon Kim	Grad	2016-Present	UT-Austin
Stephanie Liu	Grad	2018-Present	UT-Austin
Matt Mlsna	Grad	2018-Present	UT-Austin

Synergistic Activities

Course Development: Developed a curriculum for a graduate course in Advanced Physical Chemistry at UT-Austin. The course covers time-dependent quantum mechanics with emphasis on applications to modern non-linear spectroscopy.

Outreach/Education: Hosted high-school and undergraduate research students as part of the Welch Summer Scholars Program and NSF REU program at UT-Austin. Students spend 6 weeks in the lab learning to collect and analyze data and present their results at a department-wide symposium.

Conferences/Workshops Organized: Co-organized and co-hosted the first Southwest Ultrafast Conference at UT-Austin with Prof. Sean Roberts (UT-Austin). The conference brought together

researchers in the Mountain West and Great Plains States in the field of ultrafast optics and spectroscopy with 100+ attendees (~65 students and postdocs), and 16 speakers.
Co-Organized a Membrane Biophysics Symposium ("membrane day") at UT-Austin (April 2016) together with Prof. Ron Elber and Prof. Lauren Webb.

Current Research Funding

- Welch Foundation Research Grant. "Studies in biophysical chemistry: applications of ultrafast infrared spectroscopy." (Grant: F-1891) [PI]
- National Science Foundation: "Understanding Extremely Heterogeneous Biological Membranes" [Co-PI with Prof. Ron Elber]
- American Chemical Society, Petroleum Research Fund (PRF): "Interfacial solvation in reverse micelles: applications of ultrafast infrared spectroscopy" [PI]
- Marc Lewis and Elizabeth Crook Foundation, Research Grant: "Understanding the mechanism of cryoprotectant toxicity neutralization." [PI]
- Catalyst Grant, College of Natural Sciences, University of Texas at Austin "Investigating Protein Conformational Dynamics with IR Spectroscopy" [Co-PI with Prof. Richard Aldrich]

Service

UT-Austin:

- Graduate Admissions Committee, co-Chair (2018-Present)
- Diversity, Equity, & Inclusion Distinction Award Committee, CNS (Spring 2019)
- Diversity and Inclusion Committee, College of Natural Sciences, (Spring 2016 -Present)
- Graduate Admissions Committee, Department of Chemistry, UT-Austin (2015-Present)
- Course and Curriculum Committee, Department of Chemistry (Spring 2016, Fall 2018-Present)
- UT Membrane Biophysics Symposium, Co-organizer (April 2016)
- Southwest Ultrafast Laser Conference (June 2016)
- Faculty Hiring Committee (Fall/Spring 2016)
- Graduate Awards Committee, College of Natural Sciences (Spring 2016-Present)
- Undergraduate Fellowships Committee, Department of Chemistry (Spring 2018)

National Service:

- Invited Panel Member NSF BIO (Molecular Biophysics), 2019
- Invited Panel Member NIH MSFB (Macromolecular Structure and Function B), 2018
- Invited Panel Member NIH BBM (Biophysics and Biochemistry of Membranes), 2017
- Member, Biophysical Society Publications Committee (Nov 2017—Present)
- Ad-hoc reviewer for: CPIMS (DOE); BBM (NIH); DOE (SBIR); Army Research Office (DOD); Various international funding agencies.
- Organized Ultrafast Symposium at Frontiers in Optics and Laser Science (American Physical Society, Optical Society of America Joint Conference), November 2016
- Member: American Chemical Society, Biophysical Society, Optical Society of America, Society of Latin-American Biophysicists (SOBLA), American Physical Society

Patent

Vibrational Spectroscopy for Quantitative Measurement of Analytes Issued: August, 2015
Carlos R. Baiz, Kevin C. Jones and Andrei Tokmakoff
United States Patent and Trademark Office US20130221222 A1

Book Chapter

An Introduction to Protein 2D IR Spectroscopy 2013
Carlos R. Baiz, Mike E. Reppert, and Andrei Tokmakoff
Ultrafast Infrared Vibrational Spectroscopy, Edited by Michael D. Fayer
CRC Press, ISBN: 1466510137, (2013)

Peer-Reviewed Publications

Google Scholar Page:
http://scholar.google.com/citations?user=T0dpJS0AAAAJ

1. Mason L. Valentine, Alfredo E. Cardenas, Ron Elber, and **Carlos R. Baiz** "Physiological Calcium Concentrations Slow Dynamics at the Lipid-Water Interface", In press, Biophysical Journal (2018)
2. Sean C. Edington, and **Carlos. R. Baiz**, "Vibrational Relaxation in EDTA is ion dependent", J. Phys. Chem. A., In press, (2018)
3. Kwang-Im Oh, and Carlos R. Baiz, "Crowding Stabilizes DMSO – Water Hydrogen-bonding Interactions" J. Phys. Chem. B., 122 (22), 5984, (2018)
4. Sean C. Edington, Andrea Gonzalez, Thomas R. Middendorf, D. Brent Halling, Richard W. Aldrich, and **Carlos R. Baiz**, "Coordination to lanthanide ions distorts binding site conformation in calmodulin", Proc. Natl. Acad. Sci., In press (2018). DOI: 10.1073/pnas.1722042115
5. Kavya Rajesh, Kwang-Im Oh and **Carlos R. Baiz**, "Formamide stabilizes proteins in dimethyl sulfoxide (DMSO) solutions", Submitted (2018)
6. Kwang-Im Oh, Kavya Rajesh, John F. Stanton, **Carlos R. Baiz** "Quantifying Hydrogen-Bond Populations in Dimethyl Sulfoxide/Water Mixtures", Angewandte Chemie, ASAP (2017) DOI: 10.1002/anie.201704162 – Cover Article.
7. Sean Coleman Edington, Jennifer C. Flanagan, and **Carlos R. Baiz**, "An Empirical IR Frequency Map for Ester C=O Stretching Vibrations", *J. Phys. Chem. A*, 120, 3888-3896 (2016)
8. Xin-Xing Zhang, Kevin C Jones, Ann Fitzpatrick, Chunte Sam Peng, Chi-Jui Feng, **Carlos R Baiz**, Andrei Tokmakoff, "Studying Protein–Protein Binding Through T-Jump Induced Dissociation: Transient 2D IR Spectroscopy of Insulin Dimer", *J. Phys. Chem. B*, 120, 5134-5145 (2016)

Prior to UT-Austin

9. Paul Stevenson, Christoph Götz, **Carlos R. Baiz**, Jasper Akerboomf, Andrei Tokmakoff and Alipasha Vaziri, "Visualizing KcsA conformational changes upon ion binding by atomistic modeling of infrared spectroscopy" *J. Phys. Chem. B,* 119, 5824–5831 (2015)
10. **Carlos R. Baiz**, and Andrei Tokmakoff "Structural Disorder of Folded Proteins: Isotope-Edited 2D IR Spectroscopy and Markov State Modeling" *Biophys J.* 108, 7, 1747-1757 (2015)*
11. **Carlos R. Baiz**, Denise Schach, and Andrei Tokmakoff, "Ultrafast 2D IR microscopy" *Optics Express*, 22, 18724 (2014)*

12. Carlos R. Baiz, Yu-Shan Lin, Chunte Sam Peng, Kyle A. Beauchamp, Vincent A. Voelz, Vijay S. Pande ,and Andrei Tokmakoff "A Molecular Interpretation of 2D IR Protein Folding Experiments with Markov State Models", *Biophysical Journal*, 106, 1359 (2014) *
13. Chunte Sam Peng, Carlos R. Baiz, Andrei Tokmakoff, "Direct observation of ground-state lactam-lactim tautomerization using temperature-jump transient 2D IR spectroscopy", *Proc. Nat. Acad. Sci.* 110, 9243-9248 (2013)
14. Bowu Luan, Bing Shan, Carlos R. Baiz, Andrei Tokmakoff, and Daniel P. Raleigh, "Cooperative Cold Denaturation: The Case of the C-Terminal Domain of Ribosomal Protein L9", *Biochem.* 52, 2402-2409 (2013)
15. Carlos R. Baiz, Mike Reppert, and Andrei Tokmakoff, "Amide I Two-Dimensional Infrared Spectroscopy: Methods for Visualizing the Vibrational Structure of Large Proteins", *J. Phys. Chem. A.* 117, 5955-5961 (2013)
16. Jessica M. Anna, Carlos R. Baiz, Matthew R. Ross, Robert McCanne & Kevin J. Kubarych, "Ultrafast equilibrium and non-equilibrium chemical reaction dynamics probed with multidimensional infrared spectroscopy", *Int. Rev. Phys. Chem.* 31, (3), 367 (2012)
17. Carlos R. Baiz, Chunte S. Peng, Michael E. Reppert, Kevin C. Jones, and Andrei Tokmakoff, "Coherent two-dimensional infrared spectroscopy: Quantitative analysis of protein secondary structure in solution", *Analyst,* 137, 1793-1799 (2012)*
18. Carlos R. Baiz, Kevin J. Kubarych, Eitan Geva and Edwin L. Sibert III, "Local-mode approach to modeling multidimensional infrared spectra of metal carbonyls", *J. Phys. Chem. A.* 115 (21), 5354 ,(2011)
19. Carlos R. Baiz, Kevin J. Kubarych, and Eitan Geva, "Molecular Theory and Simulation of Coherence Transfer in Metal Carbonyls and Its Signature on Multidimensional Infrared Spectra" *J. Phys. Chem. B*, 115, (18) , 5322, (2011)
20. Carlos R. Baiz, and Kevin J. Kubarych and Eitan Geva, "Ultrabroadband Detection of an Infrared Continuum by Chirped-Pulse Upconversion" *Optics Letters*, 36 (2) 187, (2011)
21. John T. King, Carlos R. Baiz and Kevin J. Kubarych. "Solvent-Dependent Spectral Diffusion in a Hydrogen Bonded "Vibrational Aggregate"" *J. Phys. Chem. A.* 114 (39) 10590 (2010).
22. Carlos R. Baiz and Kevin J. Kubarych, "Ultrafast Transient Vibrational Stark Spectroscopy: Exploring Excited-State Charge-Transfer by Measuring the Solvent Response", *J. Amer. Chem. Soc (Comm),* 132 (37), 12784-12785 (2010)*
23. Carlos R. Baiz, Robert McCanne, and Kevin J. Kubarych, "Transient vibrational echo versus transient absorption spectroscopy: A direct experimental and theoretical comparison", *Applied Spectroscopy,* 64 (9) 1037-1044 (2010)
24. Jessica. M. Anna, Matthew. J. Nee, Carlos. R. Baiz, Robert. McCanne, Kevin. J. Kubarych, "Measuring Absorptive Two-Dimensional Infrared Spectra Using Chirped-Pulse Upconversion Detection", *J. Opt. Soc. Am. B,* 27, 382-393 (2010)
25. Carlos R. Baiz, Robert McCanne, and Kevin J. Kubarych, "Structurally Selective Geminate Rebinding Dynamics of Solvent-Caged Radicals Studied with Nonequilibrium Infrared Echo Spectroscopy", *J. Amer. Chem. Soc*, 131 (38), 13590, (2009) – Featured as a cover article in C&EN News.*

26. **Carlos R. Baiz**, Porscha L. McRobbie, Nicholas K. Preketes, Kevin J. Kubarych, and Eitan Geva, "Two-Dimensional Infrared Spectroscopy of Dimanganese Decacarbonyl and Its Photoproducts: An Ab Initio Study", *J. Phys. Chem. A*, 113, (35), 9617, (2009)
27. **Carlos R. Baiz**, Robert McCanne, Matthew J. Nee, and Kevin J. Kubarych, "Orientational dynamics of transient molecules measured by non-equilibrium two-dimensional infrared spectroscopy", *J. Phys. Chem A*, 113 (31), 8907, (2009)
28. **Carlos R. Baiz**, Porscha L. McRobbie, Jessica M. Anna, Eitan Geva, and Kevin J. Kubarych, "Two-dimensional Spectroscopy of Metal Carbonyls", *Accounts of Chemical Research*, 42, (9), 1395, (2009)
29. **Carlos R. Baiz**, Sarah J. Ledford, Kevin J Kubarych, and Barry D. Dunietz, "Beyond 7-Azaindole: Conjugation Effects on Intermolecular Double Hydrogen-atom Transfer Reactions", *J. Phys. Chem A.*, 113 (17), 4862, (2009)
30. **Carlos R. Baiz**, Matthew J. Nee, Robert McCanne, and Kevin J. Kubarych, "Ultrafast non-equilibrium Fourier-transform two-dimensional infrared spectroscopy", *Optics Letters*, 33, 2533, (2008)
31. Matthew J. Nee, **Carlos R. Baiz**, Jessica M. Anna, Robert McCanne, and Kevin J. Kubarych, "Multilevel vibrational coherence transfer and wavepacket dynamics probed with multidimensional IR spectroscopy", *J. Chem. Phys.* 129, 084503. (2008)
32. **Carlos R. Baiz**, Matthew J. Nee, Robert McCanne, Jessica M. Anna, and Kevin J. Kubarych, "Triggered-exchange Two-dimensional Infrared Spectroscopy of Metal Carbonyl Photodissociation Dynamics", Proceedings of the 16th International Conference on Ultrafast Phenomena, Stresa, Italy. (2008)
33. Matthew J. Nee, **Carlos R. Baiz**, Jessica M. Anna, Robert McCanne, and Kevin J. Kubarych, "Vibrational Coherence Transfer in Metal Carbonyls: Solvent Dependence of Coherence Lifetimes Studied with MDIR", Proceedings of the 16th International Conference on Ultrafast Phenomena, Stresa, Italy. (2008)
34. **Carlos R. Baiz** and Barry D. Dunietz, "Theoretical Studies of Conjugation Effects on Excited State Intramolecular Hydrogen-Atom Transfer Reactions in Model Systems", *J. Phys. Chem. A,* 111 (40), 10139, (2007)

Invited Talks and Seminars (since 2015)

1. Telluride Vibrational Dynamics Workshop, (July 2019)
2. American Chemical Society Spring Meeting, Orlando, FL (Apr 2019)
3. ACS Southwest Meeting, Little Rock, AR (November 2018)
4. Trinity University, Department Seminar, San Antonio, TX (October 2018)
5. Texas State University, Department Seminar, San Marcos, TX (October 2018)
6. Telluride Vibrational Dynamics Workshop, Telluride, CO (July 2018)
7. Gordon Research Conference on Vibrational Spectroscopy, Discussion Leader, University of New England (July 2018)
8. Chemical Biophysics Symposium, University of Toronto, Toronto, CA – keynote speaker (Apr 2018)
9. Telluride Vibrational Dynamics Workshop, Telluride, CO (July 2017)

10. American Chemical Society Spring Meeting, San Francisco, CA (April 2017)
11. Trinity University, San Antonio, TX, (April 2017)
12. University of Rochester, Department Symposium, Rochester NY (March 2017)
13. Xavier University, New Orleans, LA (February 2017)
14. Frontiers in Optics and Laser Science (OSA/APS), Rochester NY (October 2016)
15. Southwest Ultrafast Conference, Austin, TX (June 2016)
16. Biophysics Symposium, University of Texas at Austin (April 2016)
17. Nonlinear Dynamics Colloquium, Department of Physics, University of Texas at Austin (April 2016)
18. Fajans Award Seminar, Department of Chemistry, University of Michigan (April 2016)
19. Atomic, Molecular, and Optical Physics Colloquium, Department of Physics, University of Texas at Austin (September 2015)

Conference Presentations

1. **Carlos R. Baiz**, "Biophysical Studies of Proteins and Membranes with 2D IR Spectroscopy", Telluride Workshop on Multidimensional Vibrational Spectroscopy, Telluride, CO - Talk
2. **Carlos R. Baiz**, "Investigating ion-binding with 2D IR spectroscopy", International Conference on Coherent Multidimensional Spectroscopy (CMDS), Seoul, South Korea (2018) - Talk
3. **Carlos R. Baiz** "Investigating lipid membranes with ultrafast two-dimensional infrared spectroscopy", Chemical Biophysics Symposium, University of Toronto (2018) - Talk
4. **Carlos R. Baiz** "Ultrafast two-dimensional infrared spectroscopy of disordered surfactant interfaces", American Chemical Society National Meeting, New Orleans, LA (2018) - Talk
5. **Carlos R. Baiz** "Ultrafast 2D IR spectroscopy of lipid membranes: Experiments and simulations", American Chemical Society National Meeting, New Orleans, LA (2018) - Talk
6. **Carlos R. Baiz**, "Investigating Lipid-Water Interfaces with Vibrational Spectroscopy", Telluride Workshop on Vibrational Dynamics, Telluride, CO (2017)
7. **Carlos R. Baiz**, "Investigating lipid membrane interfaces with 2D IR spectroscopy", American Chemical Society Annual Meeting, San Francisco, CA (2017) - Talk
8. **Carlos R. Baiz**, "Ultrafast Methods for Investigating Structure and Dynamics of Biological Systems", Frontiers In Optics/Laser Science, Rochester, NY (2016) - Talk
9. **Carlos R. Baiz**, "Investigating the dynamics of interfacial ester carbonyls in lipid bilayers", 8th International Conference on Coherent Multidimensional Spectroscopy, Groningen, the Netherlands (2016) – Poster
10. **Carlos R. Baiz**, "Investigating the dynamics of interfacial ester carbonyls in lipid bilayers", Southwest Ultrafast Conference, Austin, TX (2016) – Talk
11. **Carlos R. Baiz** "Developing a spectroscopic toolkit for investigating dynamics at the bilayer interface", UT Membrane Symposium, Austin, TX (2016) – Talk

Student/Postdoc Presentations:

12. Kwang-Im Oh, Korean Chemical Society, Daegu, Korea (2018)
13. Sean C. Edington, "Probing ion coordination and energy exchange in chelate complexes with ultrafast vibrational spectroscopy", 256th ACS National Meeting, Boston MA (2018)
14. Sean C. Edington, "Revealing ion- and mutation-dependent structure and dynamics in calmodulin's ion binding sites with ultrafast vibrational spectroscopy" , 256th ACS National Meeting, Boston MA (2018)
15. Kwang-Im Oh, "C=O vibrations probe the solvation dynamics of DMSO/water binary mixtures at

varying temperatures", International Conference on Coherent Multidimensional Spectroscopy (CMDS), Seoul, Korea (2018) - Poster

16. Sean C. Edington, "Mapping binding conformation and energy exchange in chelate complexes", GRC Vibrational Spectroscopy 2018 - Talk
17. Jennifer Flanagan "Computational and spectroscopic studies of pH (Low) insertion peptides in lipid membranes", 255th ACS National Meeting, New Orleans, LA (2018)– Oral
18. Sean C. Edington, "Probing ion-dependent changes to calmodulin binding site conformation with FTIR and ultrafast 2DIR spectroscopy", 255th ACS National Meeting, New Orleans, LA(2018)– Oral
19. Chris Baryiames, "Hydrogen bond populations and dynamics in sorbitan surfactant reverse micelles", 255th ACS National Meeting, New Orleans, LA(2018)– Oral
20. Kavya Rajesh, "Lysozyme denaturation in DMSO mixtures: A study on cryopreservation", 255th ACS National Meeting, New Orleans, LA(2018)– Oral
21. Jennifer Flanagan**, "**Computational and Spectroscopic Studies of pH (Low) Insertion Peptides in Lipid Membranes.", XLII Congress of the Brazilian Biophysical Society, Sao Paulo, Brazil - Oral
22. Kavya Rajesh, "Lysozyme Denaturation in DMSO mixtures", AAAS National Meeting, Austin TX, (2018) –Poster
23. Sean C. Edington, "Revealing the dynamics that control protein and biomolecule activity using FTIR and ultrafast 2DIR spectroscopy in combination with molecular dynamics simulations" 254th ACS National Meeting, Washington, DC (2017)– Poster

Prior to UT-Austin:

24. Carlos R. Baiz, Denise Schach, and Andrei Tokmakoff, "Mapping Chemical Environments with Two-dimensional Infrared Microscopy", Time Resolved Vibrational Spectroscopy 2015, Madison, WI, (2015) - Poster
25. Carlos R. Baiz, Denise Schach and Andrei Tokmakoff, Coherent two-dimensional infrared microscopy, American Physical Society, March Meeting 2015, San Antonio, TX (2015) –Talk
26. Carlos R. Baiz, Denise Schach, and Andrei Tokmakoff, Ultrafast two-dimensional infrared (2D IR) microspectroscopy, 7th International Conference on Coherent Multidimensional Spectroscopy, Eugene, OR (2014) – Talk
27. Carlos R. Baiz and Andrei Tokmakoff, "Investigating protein dynamics with isotope-edited 2D IR and Markov state models", 7th International Conference on Coherent Multidimensional Spectroscopy, Eugene, OR (2014) – Poster
28. Carlos R. Baiz, Yu-Shan Lin, Chunte S. Peng, Kyle A. Beauchamp, Vincent A. Voelz, Vijay S. Pande, and Andrei Tokmakoff, "Investigating protein folding with temperature-jump 2D IR spectroscopy and Markov state models", 9th Midwest Conference on Protein Folding, Assembly and Molecular Motions, University of Notre Dame, IN, (2014) – Talk
29. Carlos R. Baiz and Andrei Tokmakoff, "Measuring protein structural heterogeneity with two-dimensional infrared spectroscopy", 58th Annual Meeting of the Biophysical Society, San Francisco, CA (2014) – Poster
30. Carlos R. Baiz "Using 2D IR spectroscopy to interrogate protein and peptide conformational heterogeneity", Third Workshop on Molecular Kinetics, Berlin, Germany (2013) – Talk
31. Carlos R. Baiz, Chunte Sam Peng, Mike Reppert, Kevin C. Jones, Andrei Tokmakoff "Two dimensional infrared spectroscopy as a probe of protein folding: bridging the gap between

experiment and simulation" 57th Annual Meeting of the Biophysical Society, Philadelphia, PA (2013) – Talk

32. **Carlos R. Baiz**, Chunte S. Peng, Mike E. Reppert, Kevin C. Jones, and Andrei Tokmakoff, "Temperature-jump amide-I 2D-IR spectroscopy: a toolkit to study protein dynamics and folding" 6th International Conference on Coherent Multidimensional Spectroscopy, Berlin, Germany (2012) – Talk
33. **Carlos R. Baiz**, Chunte S. Peng, Mike E. Reppert, Kevin C. Jones, and Andrei Tokmakoff, "Investigating Protein Structure and Folding with Temperature-Jump Multidimensional Infrared Spectroscopy" 26th Annual Symposium of the Protein Society, San Diego, CA (2012) – Poster
34. **Carlos R. Baiz**, Chunte S. Peng, Mike E. Reppert, Kevin C. Jones and Andrei Tokmakoff, "Investigating protein structure and folding with coherent two-dimensional infrared spectroscopy" American Physical Society National Meeting, Boston, MA (2012) – Talk
35. **Carlos R. Baiz**, Kevin C. Jones, Chunte S. Peng, Joshua Lessing, and Andrei Tokmakoff, "Investigating protein folding with ultrafast 2D infrared spectroscopy", 242nd ACS National Meeting, Denver, CO (2011) – Poster
36. **Carlos R. Baiz**, Porscha L. McRobbie, Kevin J. Kubarych, and Eitan Geva, "A First-Principles Model for Multidimensional Spectroscopy", 5th International Conference on Coherent Multidimensional Spectroscopy, Minneapolis, MN (2010) – Poster
37. **Carlos R. Baiz**, Robert McCanne, and Kevin J. Kubarych, "Structurally-Sensitive Rebinding Dynamics of Solvent-Caged Radical Pairs: Exploring the Viscosity Dependence", XVII International Conference on Ultrafast Phenomena, Snowmass Village, CO (2010) – Poster
38. **Carlos R. Baiz**, and Kevin J. Kubarych, "Dynamic Vibrational Stark Spectroscopy: Measuring the Solvent Response in Ultrafast Charge-transfer Reactions" XVII International Conference on Ultrafast Phenomena, Snowmass Village, CO (2010) – Talk
39. **Carlos R. Baiz**, Robert McCanne, and Kevin J. Kubarych "Temperature-dependent vibrational relaxation measured by non-equilibrium 2DIR spectroscopy", Time-Resolved Vibrational Spectroscopy 2009, Meredith, NH. (2009) – (Presented by KJK)
40. **Carlos R. Baiz**, and Kevin J. Kubarych, "Transient vibrational Stark shifts and solute-to-solvent vibrational energy transfer measured with non-equilibrium photon echo spectroscopy", Time-Resolved Vibrational Spectroscopy, Meredith, NH. (2009) – Poster
41. **Carlos R. Baiz**, Porscha L. McRobbie, Nicholas K. Preketes, Kevin J. Kubarych, and Eitan Geva, "Ab initio computation of two-dimensional infrared spectra of metal carbonyls", Q-Chem Workshop, Pittsburgh, PA. (2009) – Poster
42. **Carlos R. Baiz**, Matthew J. Nee, Robert McCanne, Jessica M. Anna, and Kevin J. Kubarych, "Triggered-exchange Two-dimensional Infrared Spectroscopy of Metal Carbonyl Photodissociation Dynamics", International Conference on Ultrafast Phenomena, Stresa, Italy. (2008) – Talk(Presented by KJK)
43. Matthew J. Nee, **Carlos R. Baiz**, Jessica M. Anna, Robert McCanne, and Kevin J. Kubarych, "Vibrational Coherence Transfer in Metal Carbonyls: Solvent Dependence of Coherence Lifetimes Studied with MDIR" International Conference on Ultrafast Phenomena, Stresa, Italy. (2008) – Poster

- Bahne C. Cornilsen, Ming Ning, **Carlos Baiz**, Tony N. Rogers, Matthew B. Chye, and Alexander I. Kolesnikov, "Inelastic Neutron Scattering Study of Hydrogen Positions in Nickel Hydroxide

Battery Electrode Materials", ACS Great Lakes Regional Meeting, Milwaukee, WI, USA. (2006) – Poster

44.