Arthur E. Bragg
Associate Professor
Department of Chemistry
Johns Hopkins University

221 Remsen Hall
3400 North Charles Street
Baltimore, MD 21218

Phone: (410) 516-5616
Fax: (410) 516-8420
e-mail: artbragg@jhu.edu

EDUCATION, EXPERIENCE, RESEARCH INTERESTS, AND AWARDS

EDUCATION

University of California, Berkeley (Berkeley, CA), 1999-2004
- Ph.D., December 2004, Chemistry
- Advisor: Daniel M. Neumark
- Thesis: Excited-State Dynamics of Molecular and Cluster Anions Studied with Time-Resolved Photoelectron Spectroscopy and Imaging

Albion College (Albion, MI); 1995-1999
- B. A., Chemistry and Physics, summa cum laude, College Honors, May 1999

PROFESSIONAL EXPERIENCE

Associate Professor
- Department of Chemistry, Johns Hopkins University, July 2017 - present.

Assistant Professor
- Department of Chemistry, Johns Hopkins University, July 2010 - present.

Postdoctoral Fellow
- Department of Chemistry & Biochemistry, University of California, Los Angeles; April 2005-June 2010
- Advisor: Benjamin J. Schwartz

Part-time Lecturer
- Department of Chemistry & Biochemistry, University of California, Los Angeles; March - June 2010

RESEARCH INTERESTS

Ultrafast spectroscopy
Nonadiabatic chemical dynamics
Raman spectroscopy
Photochemistry
Photophysics of organic materials
Molecular photoswitches

AWARDS, HONORS, AND FELLOWSHIPS

NSF CAREER Faculty Young Investigator Award, 2015
Chancellor's Award for Postdoctoral Research, UCLA, 2010
Amgen Award for Postdoctoral Research & Post-doctoral Research Excellence Award, Department of Chemistry & Biochemistry and Molecular Biology Institute, UCLA, 2010
Excellence in Postdoctoral Research, Division of Physical Chemistry, American Chemical Society, 2009
NSF Graduate Research Fellowship, 1999-2002
Barry M. Goldwater Scholarship, 1997-1999

PUBLICATIONS

PUBLICATIONS AS A JHU FACULTY MEMBER

1. K. J. Smith, Y. Cheng, E. S. Arinze, N. E. Kim, A. E. Bragg,* and S. M. Thon.* Dynamics of Energy Transfer in Large Plasmonic Aluminum Nanoparticles. *ACS Photonics* (2017), DOI: 10.1021/acsphotonics.7b00932. *corresponding authors

2. J. A. Snyder, P. Grüninger, H. F. Bettinger,* and A. E. Bragg.* BN Doping and the Photochemistry of Polyaromatic Hydrocarbons: Photocyclization of Hexaphenyl Benzene and Hexaphenyl Borazine. *J. Phys. Chem. A* **121**, 8359-8367 (2017). *corresponding authors

3. X. Zhao, D. Madan, Y. Cheng, J. Zhou, H. Li, S. M. Thon, A. E. Bragg, M. E. DeCoster, P. E. Hopkins, and H. E. Katz. High Conductivity and Electron-Transfer Validation in an n-Type Fluoride-Anion-Doped Polymer for Thermoelectrics in Air. *Advanced Materials* **29**, 1606928 (2017).

4. J. A. Snyder, P. Grüninger, H. F. Bettinger,* and A. E. Bragg.* Excited-State Deactivation Pathways and the Photocyclization of BN-Doped Polyaromatics. *J. Phys. Chem. A* **121**, 5136-5146 (2017). *corresponding authors

5. J. Zhou, C. P. Folster, S. K. Surampudi, D. Jimenez, R. S. Klausen,* and A. E. Bragg.* Asymmetric Charge Separation and Recombination in Symmetrically Functionalized Sigma-Pi Hybrid Oligosilanes. *Dalton Trans*. **46**, 8716-8726 (2017). *corresponding authors (Cover Article)

6. *Invited Perspective (cover)*: A. E. Bragg,* W. Yu , J. Zhou, and T. J. Magnanelli. Ultrafast Raman Spectroscopy as a Probe of Local Structure and Dynamics in Photoexcited Conjugated Materials. *J. Phys. Chem. Lett*. **7**, 3990−4000 (2016). *corresponding author

7. J. Zhou, V. K. Outlaw, C. A. Townsend, and A. E. Bragg. Quenching of pH-Responsive Luminescence of a Benzoindolizine Sensor by Photoinduced Hydrogen Shift. *Chem. Eur. J*. **22**, 15212-15215 (2016).

8. V. K. Outlaw, J. Zhou, A. E. Bragg, and C. A. Townsend. Unusual Blue-Shifted Acid-Responsive Photoluminescence Behavior in 6-Amino-8-cyanobenzo[1,2-*b*]indolizines. *RSC Adv*. **6**, 61249-61253 (2016).

9. W. Yu, T. J. Magnanelli, J. Zhou, and A. E. Bragg. Structural Heterogeneity in the Localized Excited States of Poly(3-hexylthiophene). *J. Phys. Chem. B* **120**, 5093-5102 (2016).

10. M. S. Molloy, J. A. Snyder, J. R. DeFrancisco, and A. E. Bragg. Structural Control of Nonadiabatic Photochemical Bond Formation: Photocyclization in Structurally Modified *ortho*-Terphenyls. *J. Phys. Chem. A* **120**, 3998-4007 (2016).

11. C. R. Pitts, B. Ling, J. A. Snyder, A. E. Bragg,* and T. Lectka.* Aminofluorination of Cyclopropanes: A Multifold Approach through a Common, Catalytically Generated Intermediate. *J. Am. Chem. Soc*. **138**, 6598-6609 (2016). *corresponding authors

12. A. M. Sanders, T. J. Magnanelli, A. E. Bragg, and J. D. Tovar. Photoinduced Electron Transfer within Supramolecular Donor-Acceptor Peptide Nanostructures under Aqueous Conditions. *J. Am. Chem. Soc*. **138**, 3362–3370 (2016).

13. J. Zhou, S. K. Surampudi, A. E. Bragg,* and R. S. Klausen.* Photoinduced Charge Separation in Molecular Silicon. *Chem. Eur. J.* **22**, 6204-6207 (2016). *corresponding authors

14. J. Zhou, X. Guo, H. E. Katz and A. E. Bragg. Molecular Switching via Multiplicity-Exclusive E/Z Photoisomerization Pathways. *J. Am. Chem. Soc*. **137**, 10841-10850 (2015).

15. X. Guo, J. Zhou, M. Siegler, A. E. Bragg,* and H. E. Katz.* Visible Light-Triggered Molecular Photoswitch Based on Reversible E/Z Isomerization of a 1,2-Dicyanoethene Derivative. *Angew. Chem*. **127**, 4864-4868 (2015). (*Highlighted as a "Hot Paper"*) *corresponding authors

16. J. Zhou and A. E. Bragg. Structural Relaxation of Photoexcited Quaterthiophenes Probed with Vibrational Specificity. *J. Phys. Chem. Lett.* **6**, 3496-3512 (2015).

17. J. A. Snyder and A. E. Bragg. Structural Control of Nonadiabatic Bond Formation: Photochemical Formation and Stability of Substituted 4a,4b-Dihydrotriphenylenes. *J. Phys. Chem. A* **119**, 3972-3985 (2015).

18. T. J. Magnanelli and A. E. Bragg. Time-resolved Raman Spectroscopy of Polaron Pairs in Poly-(3-hexylthiophene) (P3HT) Aggregates. *J. Phys. Chem. Lett.* **6**, 438-445 (2015).

19. P. J. Donohoo-Vallett and A. E. Bragg. π-Delocalization and the Vibrational Spectroscopy of Conjugated Materials: Computational Insights on the Raman Frequency Dispersion of Thiophene, Furan, and Pyrrole Oligomers and Polymers. *J. Phys. Chem. B* **119**, 3583-3594 (2015).

20. W. Yu, P. J. Donohoo-Vallett, J. Zhou, and A. E. Bragg. Ultrafast Photoinduced Nuclear Relaxation of a Conformationally Disordered Conjugated Polymer Probed with Transient Absorption and Femtosecond Stimulated Raman Spectroscopies. *J. Chem. Phys*. **141**, 044201 (2014). (*An Editor's Pick for 2014*)

21. M. S. Molloy, J. A. Snyder, and A. E. Bragg. Structural and Solvent Control of Nonadiabatic Photochemical Bond Formation: Photocyclization of *o*-Terphenyl in Solution. *J. Phys. Chem. A* **118,** 3913-3925 (2014).

22. M. C. Smith, J. A. Snyder, B. C. Streifel, and A. E. Bragg. Ultrafast Excited-State Dynamics of *ortho*-Terphenyl and 1,2-Dicyclohexene: The Role of "Ethylenic Twisting" in the Nonadiabatic Photocyclization of Stilbene Analogs. *J. Phys. Chem. Lett*. **4**, 1895-1900 (2013).

23. W. Yu, J. Zhou, and A. E. Bragg. Exciton Conformational Dynamics of Poly(3-hexylthiophene) (P3HT) in Solution from Time-resolved Resonant-Raman Spectroscopy. *J. Phys. Chem. Lett*. **3**, 1321-1328 (2012).

PUBLICATIONS PRIOR TO JOINING JHU FACULTY

1. A. E. Bragg,* G. U. Kanu, and B. J. Schwartz.* Nanometer-Scale Phase Separation and Preferential Solvation in THF-Water Mixtures: Ultrafast Electron Hydration and Recombination Dynamics Following CTTS Excitation of I⁻. *J. Phys. Chem. Lett*. **2**, 2797-2804 (2011). [Highlighted in *Nat. Chem.*, **3**, 906-907 (2011)] * corresponding authors

2. A. E. Bragg, W. J. Glover, and B. J. Schwartz. Watching the Solvation of Atoms in Liquids One Solvent Molecule at a Time. *Phys. Rev. Lett*. **104**, 233005 (2010).

3. R. M. Young, G. B. Griffin, O. T. Ehrler, A. Kammrath, A. E. Bragg, J. R. R. Verlet, O. Cheshnovsky, and D. M. Neumark. Charge Carrier Dynamics in Semiconducting Mercury Cluster Anions. *Phys. Scripta*, **80**, 048102 (2009).

4. A. E. Bragg, M. C. Cavanagh, and B. J. Schwartz. Linear Response Breakdown in the Solvation Dynamics Induced by Atomic Electron-Transfer Reactions. *Science*, **321**, 1817-1822 (2008). [Article highlighted in a "Perspective" by Richard Stratt, Brown University, *Science* **321**, 1789-1790 (2008)]

5. A. E. Bragg and B. J. Schwartz. Ultrafast Charge-Transfer-to-Solvent Dynamics of Iodide in Tetrahydrofuran. 2. Photoinduced Electron Transfer to Counterions in Solution. *J. Phys. Chem. A* **112**, 3530-3543 (2008).

6. A. E. Bragg and B. J. Schwartz. The Ultrafast Charge-Transfer-to-Solvent Dynamics of Iodide in Tetrahydrofuran. 1. Exploring the Roles of Solvent and Solute Electronic Structure in Condensed-Phase Charge-Transfer Reactions. *J. Phys. Chem. B* **112**, 483-494 (2008).

7. A. Kammrath, J. R. R. Verlet, A. E. Bragg, G. B. Griffin, and D. M. Neumark. Dynamics of Charge-Transfer-to-Solvent Precursor States in I¯(H2O)n (n = 3-10) Clusters Studied with Photoelectron Imaging. *J. Phys. Chem. A* **109**, 11475-11483 (2005).

8. J. R. R. Verlet, A. E. Bragg, A. Kammrath, O. Cheshnovsky, and D. M. Neumark. Comment on `Characterization of excess electrons in water-cluster anions by quantum simulations.' *Science* **310**, 1769b (2005).

9. A. E. Bragg, J. R. R. Verlet, A. Kammrath, O. Cheshnovsky, and D. M. Neumark. Electronic Relaxation Dynamics of Water-Cluster Anions. *J. Am. Chem. Soc*. **127**, 15283-15295 (2005).

10. J. R. R. Verlet, A. E. Bragg, A. Kammrath, O. Cheshnovsky, and D. M. Neumark. Observation of Large Water-Cluster Anions with Surface-Bound Excess Electrons. *Science* **307**, 93-96 (2005). [Ranked among papers listed with Science magazine's "Top 10 accomplishments in science," 2004.]

11. A. E. Bragg, J. R. R. Verlet, A. Kammrath, O. Cheshnovsky, and D. M. Neumark. Time-Resolved Intraband Electronic Relaxation Dynamics of Hgn^- Clusters (n=7-13, 15, 18) Excited at 1.0 eV. *J. Chem. Phys*. **122**, 054314 (2005).

12. A. E. Bragg, J. R. R. Verlet, A. Kammrath, O. Cheshnovsky, and D. M. Neumark. Hydrated Electron Dynamics: From Clusters to Bulk. *Science* **306**, 669-671 (2004). [Article highlighted in a "Perspective" written by Ken Jordan, University of Pittsburgh, *Science* **306**, 618-619 (2004); ranked among papers listed with Science magazine's "Top 10 accomplishments in science," 2004.]

13. J. R. R. Verlet, A. E. Bragg, A. Kammrath, O. Cheshnovsky, and D. M. Neumark. Time-Resolved Relaxation Dynamics of Hgn^- ($11 \leq n \leq 16$, $n = 18$) Clusters Following Intraband Excitation at 1.5 eV. *J. Chem. Phys*. **121**, 10015-10025 (2004).

14. A. Stolow, A. E. Bragg, and D. M. Neumark Femtosecond Time-Resolved Photoelectron Spectroscopy. *Chem. Rev*. **104**, 1719-1757 (2004).

15. A. E. Bragg, J. R. R. Verlet, A. Kammrath, and D. M. Neumark. $C6^-$ Electronic Relaxation Dynamics Probed via Time-Resolved Photoelectron Imaging (TRPEI). *J. Chem. Phys*. **121**, 3515-3526 (2004).

16. A. E. Bragg, R. Wester, A. V. Davis, A. Kammrath, and D. M. Neumark. Excited-State Detachment Dynamics and Rotational Coherences of $C2^-$ via Time-Resolved Photoelectron Imaging. *Chem. Phys. Lett*. **376**, 767-775 (2003).

17. R. Wester, A. E. Bragg, A. V. Davis, and D. M. Neumark Time-resolved Study of the Symmetric SN2-Reaction I^- +CH3I. *J. Chem. Phys*. **119**, 10032-10039 (2003).

18. A. V. Davis, R. Wester, A. E. Bragg, and D. M. Neumark. Vibrational Relaxation in $I2^-$ (Ar)n (n = 1,2,6,9) and $I2^-$ (CO2)n (n = 1,4,5) Clusters Excited by Femtosecond Stimulated Emission Pumping. *J. Chem. Phys*. **119**, 2020-2031 (2003).

19. A. V. Davis, R. Wester, A. E. Bragg and D. M. Neumark. Time-Resolved Photoelectron Imaging of the Photodissociation of $I2^-$. *J. Chem. Phys*. **118**, 999-1002 (2003).

20. R. Wester, A. V. Davis, A. E. Bragg, and D. M. Neumark. Cluster Calorimetry by Femtosecond Stimulated Emission Pumping: Excitation and Evaporative Cooling of $I2^-$ (CO2)n,", *Phys. Rev. A* **65**, 051201(R) (2002).

21. A. V. Davis, R. Wester, A. E. Bragg, and D. M. Neumark. Vibrational Relaxation in Clusters: Energy Transfer in $I2^-$ (CO2)4 Excited by Femtosecond Stimulated Emission Pumping. *J. Chem. Phys*. **117**, 4282-4292 (2002).

22. C. Frischkorn, A. E. Bragg, A. V. Davis, R. Wester, and D. M. Neumark. Electronic Relaxation Dynamics of Carbon Cluster Anions: Excitation of the $\tilde{C} \leftarrow \tilde{X}\ 0_0^0$ Transition in $C6^-$. *J. Chem. Phys*. **115**, 11185-11192 (2001).

SEMINARS, CONFERENCE AND MEETING PARTICIPATION

INVITED TALKS AND PRESENTATIONS

1. **Meeting on *Dynamics of Molecular Collisions* (DMC XXVI)**, Tahoe City, CA; July 14th, 2017. "*Structural Control of Nonadiabatic Chemical Dynamics in Solution – from Photoswitching to Photochemical Bond Formation*."

2. **Workshop on *Quantum Dynamics and Spectroscopy of Functional Molecular Materials and Biological Photosystems***, École de Physique des Houches (France); May 23rd, 2017. "*Probes of Structure, Disorder, and Dynamics of Excited States in Conjugated Materials*"

3. **253rd National Meeting of the American Chemical Society, San Francisco, CA**; April 4th, 2017. "*Probes of Structure, Disorder, and Dynamics of Excited States in Conjugated Material*." [Invited talk in symposium on "*Spectroscopy of Complex Systems*," Division of Physical Chemistry.]

4. **Department Seminar, Johns Hopkins University, Department of Chemistry**; Sept. 13th, 2016. "*Structure, Dynamics, and Disorder in Excited States of Photoresponsive Conjugated Materials*"

5. **Gordon Research Conference on *Vibrational Spectroscopy***, University of New England, Biddeford, ME; July 17th-22nd, 2016. "*Vibrational Probes of Structure, Dynamics, and Disorder in Excited States of Conjugated Molecular Materials*"

6. **Telluride Science Research Center Workshop on *Energy and Movement in Coherent Chemical Systems***, Telluride, CO; July 4-8th, 2016. "*Photochemical Pathways to Mechanical Motion with Thienyl-Ethene Photoswitches*"

7. **Department Seminar, University of California, Santa Cruz, Department of Chemistry & Biochemistry**; May 2nd, 2016. "*Structure, Dynamics, and Disorder in Excited States of Photoresponsive Conjugated Materials*"

8. **Department Seminar, Albion College, Department of Chemistry**; April 1st, 2016. "*Structural Control of Photochemical Dynamics: From Bond Formation to Photoswitching*"

9. **Department Seminar, Michigan State University, Department of Chemistry**; March 31st, 2016. "*Structure, Dynamics, and Disorder in Excited States of Photoresponsive Conjugated Materials*"

10. **Department Seminar, Bowling Green State University, Center for Photochemical Sciences and Department of Chemistry**; March 30th, 2016. "*Structure, Dynamics, and Disorder in Excited States of Photoresponsive Conjugated Materials*"

11. **Physical Chemistry Seminar, University of Pennsylvania, Department of Chemistry**; March 24th, 2016. "*Structure, Dynamics, and Disorder in Excited States of Photoresponsive Conjugated Materials*"

12. **Physical Chemistry Seminar, University of Wisconsin, Madison, Department of Chemistry**; February 22nd, 2016. "*Structure, Dynamics, and Disorder in Excited States of Photoresponsive Conjugated Materials*"

13. **Department Seminar, University of New Mexico, Department of Chemistry & Chemical Biology**; February 12th, 2016. "*Structure, Dynamics, and Disorder in Excited States of Photoresponsive Conjugated Materials*"

14. **Mesilla Chemistry Workshop on *Electrochemical Processes: Photovoltaics and Charge Transfer in Nanomaterials***; February 1st, 2016. "*Structure, Dynamics, and Disorder in Excited States of pi and Hybrid sigma-pi Conjugated Materials*"

15. **Physical Chemistry Seminar, University of Colorado at Boulder, Department of Chemistry & Biochemistry**; January 29th, 2016. "*Structure, Dynamics, and Disorder in Excited States of Photoresponsive Conjugated Materials*"

16. **Special Colloquium, Northwestern University, Department of Chemistry**; November 18th, 2015. "*Structure, Dynamics, and Disorder in Excited States of Photoresponsive Conjugated Materials*"

17. **Seminar, University of Chicago, James Franck Institute and Department of Chemistry**; November 17th, 2015. "*Structure, Dynamics, and Disorder in Excited States of Photoresponsive Conjugated Materials*"

18. **Physical Chemistry Seminar, Princeton University, Department of Chemistry**; October 13th, 2015. "*Structure, Dynamics, and Disorder in Excited States of Photoresponsive Conjugated Materials*"

19. **Department Seminar, Bucknell University, Department of Chemistry**; October 7th, 2015. "*Structural Control of Photochemical Dynamics: From Bond Formation to Photoswitching"*

20. **Department Seminar, Western Kentucky University, Department of Chemistry**; September 17th, 2015. "*Structural Control of Photochemical Dynamics: From Bond Formation to Photoswitching"*

21. **17th Meeting on Time-resolved Vibrational Spectroscopy (TRVS XVII)**, Madison, WI; June 22nd, 2015. "*Structural Dynamics and Heterogeneities of Localized Excited States in Conjugated Polymer Materials*"

22. **Telluride Research Symposium on "*Quantum Dynamics & Spectroscopy in Material and Biological Systems,*"** Telluride, CO; June 11th, 2015. "*Structural Dynamics and Heterogeneities of Localized Excited States in Conjugated Polymer Materials*"
23.
24. **Physical Chemistry Seminar, University of Rochester, Department of Chemistry**; May 18th, 2015. "*Structural Dynamics and Heterogeneities of Localized Excited States in Conjugated Polymer Materials*"

25. **Physical Chemistry Seminar, University of Delaware, Department of Chemistry**; April 22nd, 2015. "*Structure, Delocalization, and Ultrafast Dynamics of Conjugated Materials*"

26. **Physical Chemistry Seminar, Pennsylvania State University, Department of Chemistry**; April 10th, 2015. "*Structure, Delocalization, and Ultrafast Dynamics of Conjugated Materials*"

27. **Physical Chemistry Seminar, University of Maryland**; April 8th, 2015. "*Structure, Delocalization, and Ultrafast Dynamics of Conjugated Materials*"

28. **Gordon Research Conference on *Atomic and Molecular Interactions***, Stonehill College, Easton, MA; July 17th, 2014. "*Structural and Solvent Control of Nonadiabatic Photochemical Bond Formation*" (**Young Investigator Talk**)

29. **Gordon Research Conference on *Photochemistry***, Stonehill College, Easton, MA; July 17th, 2013. "*Structural Characteristics and Dynamics of Excited Conjugated Polymers Probed by Time-Resolved Raman Spectroscopy*" (**Young Investigator Talk**)

30. **Department Seminar, Juniata College, Department of Chemistry**; April 30th, 2013. "*Excited-State Structural Properties and Dynamics of Conjugated Molecules and Materials Probed by Time-Resolved Spectroscopies*"

31. **Department Seminar, Lehigh University, Department of Chemistry**; February 27th, 2013. "*Excited-State Structural Properties and Dynamics of Conjugated Molecules and Materials Probed by Time-Resolved Spectroscopies*"

32. **60th Annual Western Spectroscopy Association Conference**, Pacific Grove, CA; January 31st, 2013. "*Structural Characteristics and Dynamics of Excited Conjugated Polymers Probed by Time-Resolved Raman Spectroscopy*"

CONTRIBUTED TALKS AND POSTER PRESENTATIONS

AS JHU FACULTY MEMBER

1. **253rd National Meeting of the American Chemical Society, San Francisco, CA**; April 2nd, 2017. "*Photochemical Pathways for Motion in E/Z Photoswitchable Thienyl-Ethenes,*" A. E. Bragg. [Contributed presentation in symposium on "*Sunlight-driven Processes: Exposing the Mechanisms Underlying Productive Photoactivities*," Division of Physical Chemistry.]

2. **Gordon Research Conference on *Photochemistry***, Bates College, Lewiston, ME; July 23rd-28th, 2017. ***Student poster presentation***: "*Ultrafast Photophysical Response of Plasmonic Aluminum Nanoparticles: Oxide Facilitation of Fast Thermal Transport*," K. J. Smith, Y. Cheng, E. S. Arinze, S. M. Thon, and A. E. Bragg.

3. **Gordon Research Conference on *Photochemistry***, Bates College, Lewiston, ME; July 23rd-28th, 2017. ***Student poster presentation***: "*Wavelength Dependence of Excited State Relaxation Pathways in E/Z Photoswitchable Thienyl-Ethenes*," J. D. Young, C. Honick, C. Pitts, J. Zhou, and A. E. Bragg.

4. **252nd National Meeting of the American Chemical Society**, Philadelphia, PA; Aug. 21st, 2015. ***Contributed talk***: "*Photoinduced Electron and Energy Transfer within Supramolecular Donor-Acceptor Peptide Nanostructures under Aqueous Conditions*," T. Magnanelli, A. Sanders, J. D. Tovar, and A. E. Bragg. Presented in symposium on "*Dynamics of Natural and Artificial Systems for Energy Conversion: Insights Gained from Spectroscopic Methods and Theory*," Division of Physical Chemistry.

5. **Gordon Research Conference on *Electron Donor-Acceptor Interactions***, Salve Regina University, Newport, RI; Aug. 7th-10th, 2016. ***Student poster presentation***: "*Photoinduced Charge Separation and Recombination in σ–π Conjugated Organosilanes*," J. Zhou, S. Surampudi, R. S. Klausen, and A. E. Bragg.

6. **250th National Meeting of the American Chemical Society**, Boston, MA; Aug. 19th, 2015. ***Contributed talk***: *"Structural Dynamics and Heterogeneities of Localized Excited States in Conjugated Polymer Materials,"* A.E. Bragg. Presented in symposium on "*Structure and Dynamics in Complex Chemical Systems: Gaining New Insights through Recent Advances in Time-Resolved Spectroscopies,*" Division of Physical Chemistry.

7. **250th National Meeting of the American Chemical Society**, Boston, MA; Aug. 19th, 2015. ***Student poster presentation*: "***Structural Control of Nonadiabatic Photochemical Bond Formation: Photocyclization Dynamics of ortho-Terphenyl & Structural Analogs,"* M. S. Molloy, J. A. Snyder, J. R. DeFrancisco, and A. E. Bragg. Division of Physical Chemistry Poster Session.

8. **Gordon Research Conference on *Photochemistry***, Stonehill College, Easton, MA; July 19th-24th, 2015. ***Student poster presentation:*** "*Ultrafast Characterization of Charge Transfer Processes Within Nanoparticulate and Peptide-based Aggregates of Conjugated Polymers and Oligomers*," T. J. Magnanelli and A. E. Bragg.

9. **17th Meeting on Time-resolved Vibrational Spectroscopy (TRVS XVII)**, Madison, WI; June 23rd, 2015. ***Student poster presentation***: "*Vibrational Spectroscopy and Nuclear Dynamics of Excited-State Conjugated Polymers, Oligomers, and Photoswitches from Femtosecond Stimulated Raman and Ultrafast Transient Absorption Spectroscopies*," J. Zhou, W. Yu, and A. E. Bragg.

10. **248th National Meeting of the American Chemical Society**, San Francisco, CA; Aug. 13th, 2014. ***Contributed talk:*** "*Structure, Dynamics and Delocalization in Conjugated Polymers Revealed with Raman Spectroscopy*," A. E. Bragg. Presented in symposium on "*Computational Spectroscopy*," Division of Physical Chemistry.

11. **Gordon Research Conference on *Vibrational Spectroscopy***, University of New England, Biddeford, ME; Aug. 3rd-8th, 2014. ***Poster presentation***: "*Structure, Dynamics, and Delocalization in Conjugated Polymers Revealed with Raman Spectroscopy*," W. Yu, J. Zhou, P. J. Donohoo-Vallett, and A. E. Bragg.

12. **Gordon Research Conference on *Vibrational Spectroscopy***, University of New England, Biddeford, ME; Aug. 3rd-8th, 2014. ***Student poster presentation***: "*Vibrational Spectroscopy and Nuclear Dynamics of Excited-State Conjugated Polymers and Oligomers from Femtosecond Stimulated Raman and Ultrafast Transient Absorption Spectroscopies*," J. Zhou, W. Yu, and A. E. Bragg.

13. **Gordon Research Conference on *Atomic and Molecular Interactions***, Stonehill College, Easton, MA; July 13th-18th, 2014. ***Student poster presentation:*** "*Structural Control of Nonadiabatic Bond Formation: The Photochemical Formation and Stability of Substituted 4a,4b-Dihydrotriphenylenes*," J. A. Snyder, Molly Molloy, and A. E. Bragg.

14. **Gordon Research Conference on *Atomic and Molecular Interactions***, Stonehill College, Easton, MA; July 13th-18th, 2014. ***Student poster presentation:*** "*Ultrafast Characterization of Excited State Structure and Dynamics within Nanoparticulate Aggregates of Conjugated Polymers*," T. J. Magnanelli and A. E. Bragg.

15. **246th National Meeting of the American Chemical Society**, Indianapolis, IN; Sept. 12th, 2013. ***Contributed talk:*** "*Structural Characteristics and Dynamics of Excited Conjugated Polymers Probed by Time-Resolved Raman Spectroscopy*," A. E. Bragg. Presented in symposium on "*Physical Chemistry of Solar Energy Conversion*," Division of Physical Chemistry.

16. **Gordon Research Conference on *Photochemistry***, Stonehill College, Easton, MA; July 14th-19th, 2013. ***Student poster presentation:*** "*Ultrafast Photocyclization Dynamics of ortho-Terphenyl (OTP) in Solution*," M. C. Smith, J. A. Snyder, B. C. Streifel, and A. E. Bragg.

17. **Gordon Research Conference on *Photochemistry***, Stonehill College, Easton, MA; July 14th-19th, 2013. ***Student poster presentation:*** "*Investigation of Conformational Relaxation of Photo-excited Conjugated Polymers using Ultrafast Transient Absorption Spectroscopy and Femtosecond Stimulated Raman Spectroscopy*," W. Yu, J. Zhou, A. E. Bragg.

18. **245th National Meeting of the American Chemical Society**, New Orleans, LA; April 11th, 2013. ***Contributed talk***: "*Ultrafast Photocyclic Ring Closure of ortho-Arenes and Structurally Constrained Stilbenoids: How to Avoid Barriers on the Way to a Conical Intersection*," A. E. Bragg. Presented in symposium on "*Frontiers in Chemical Reaction Dynamics*," Division of Physical Chemistry.

19. **244th National Meeting of the American Chemical Society**, Philadelphia, PA; Aug. 22nd, 2012. ***Contributed Talk***: "*Torsion-Induced Nonadiabatic Dynamics in Small Polyphenyls Studied with Time-Resolved Spectroscopies*," M. C. Smith, J. A. Snyder, and A. E. Bragg. Presented in symposium on "*Electron and Energy Transfer Phenomena: At the Intersection of Electronic Structure Theory and Chemical Dynamics*," Division of Physical Chemistry.

PRIOR TO JOINING JHU FACULTY

1. **239th National Meeting of the American Chemical Society**, San Francisco, CA; March 22nd, 2010. ***Contributed Talk***: "*Resolving the Solvation Coordinate that Accompanies Electron-Transfer Reactions in Liquids One Solvent Molecule at a Time*," A. E. Bragg, W. G. Glover, M. C. Cavanagh, S. C. Doan, and B. J. Schwartz. Presented in symposium on "*Dynamics in Clusters and Floppy Systems: Mutual Tests between Theory and Experiment*," Division of Physical Chemistry.

2. **238th National Meeting of the American Chemical Society**, Washington DC; August 18th, 2009. ***Awardee Talk***: "*Tracking the Solvation Dynamics that Follow Photo-Initiated Electron Transfer Reactions One Solvent Molecule at a Time: Understanding a Breakdown of Linear Response at the Molecular Level*," A. E. Bragg, M. C. Cavanagh, and B. J. Schwartz. Presented in the "*Postdoctoral Highlights*" Symposium (***J. Phys. Chem*. Postdoctoral Research Award**), Division of Physical Chemistry.

3. **Gordon Research Conference on *Electronic Spectroscopy and Dynamics***, Colby College, Waterville, ME; July 19th-24th, 2009. ***Poster Presentation***: "*Understanding the Details of Solvation Dynamics that Follow Photo-Initiated Electron-Transfer Reactions One Solvent Molecule at a Time*," A. E. Bragg, S. C. Doan, M. C. Cavanagh, and B. J. Schwartz.

4. **Radiation Chemistry in the 21st Century – a Visionary Meeting**, Notre Dame Radiation Laboratory, Notre Dame, IN; July 12th-15th, 2009. ***Poster Presentation***: "*Understanding the Details of Solvation Dynamics that Follow Photo-Initiated Electron-Transfer Reactions One Solvent Molecule at a Time*," A. E. Bragg, S. C. Doan, M. C. Cavanagh, and B. J. Schwartz.

5. **236th National Meeting of the American Chemical Society**, Philadelphia, PA; August 20th, 2008; ***Contributed Talk***: "*Counterion-Dependent Charge-Transfer-to-Solvent Dynamics in Tetrahydrofuran: Ultrafast Electron Attachment Dynamics of Atomic Species in Solution*," A. E. Bragg and B. J. Schwartz. Presented in symposium on "*Spectroscopic Probes of Chemical Dynamics in Gaseous and Condensed Phases*," Division of Physical Chemistry.

6. **Gordon Research Conference on *Radiation Chemistry and Radiation-Driven Processes in Physics, Chemistry and Biology***, Waterville, NH; July 9th, 2008. ***Young Investigator Talk***: "*Electron-Attachment Dynamics of Atomic Species in Solution Beyond the Diffusion Limit: Ultrafast Photoinduced Formation of Cation-Electron `Tight-Contact' Pairs in Liquid Tetrahydrofuran (THF),*" A. E. Bragg and B. J. Schwartz.

7. **235th National Meeting of the American Chemical Society**, New Orleans, LA; April 10th, 2008. ***Contributed Talk***: "*Atomic Solvation Dynamics and the Breakdown of Linear Response*," A. E. Bragg, M. C. Cavanagh, and B. J. Schwartz. Presented in symposium on "*Optical Probes of Dynamics in Complex Environments – Nonequilibrium Dynamics and Solvation*," Division of Physical Chemistry.

8. **234th National Meeting of the American Chemical Society**, Boston, MA; August 18th, 2007. ***Contributed Talk***: "*Hydration Dynamics of Solvated Electrons in THF-Water Mixtures*," A. E. Bragg and B. J. Schwartz. Presented in symposium on "*Hydration: From Clusters to Aqueous Solution - Electrons in Water*," Division of Physical Chemistry.

9. **American Physical Society March Meeting**, Denver, CO; March 7th, 2007. ***Contributed Talk***: *"(Na^+, e^-) Contact Pair Formation Dynamics Following Charge-Transfer-to-Solvent (CTTS) Excitation of Na^+I^- in Tetrahydrofuran (THF)*," A. E. Bragg and B. J. Schwartz. Presented in a

symposium on "*Electron and Ion Solvation in Clusters and the Condensed Phase*," Division of Chemical Physics.

10. **54th Annual Western Spectroscopy Association Conference**, Pacific Grove, CA; February 1st, 2007. ***Contributed Talk***: "*The Role of Counterions in the Charge-Transfer-to-Solvent (CTTS) Dynamics of Iodide Salts in Tetrahydrofuran (THF)*," A. E. Bragg and B. J. Schwartz.

11. **232nd National Meeting of the American Chemical Society**, San Francisco, CA; September 13th, 2006. ***Poster Presentation***: "*Charge-Transfer-to-Solvent (CTTS) Dynamics of Iodide Salts in Tetrahydrofuran (THF) and THF/Water Mixtures*," A. E. Bragg and B. J. Schwartz. Division of Physical Chemistry Poster Session.

12. **Pacifichem**, Honolulu, HI; December 18th, 2005. ***Contributed Talk***: "*Hydrated Electron Dynamics: From Cluster to Bulk*," A. E. Bragg, J. R. R. Verlet, A. Kammrath, O. Cheshnovsky, and D. M. Neumark. Presented in symposium on "*Frontiers in Structural and Functional Studies of Atomic and Molecular Clusters and Nanoparticles*."

13. **59th Annual International Symposium on Molecular Spectroscopy**, Columbus, OH; June 21st, 2004. ***Contributed Talk***: "*Time-Resolved Photoelectron Imaging of Intraband Relaxation Dynamics of Hgn^-*," A. E. Bragg, J. R. R. Verlet, A. Kammrath, O. Cheshnovsky, and D. M. Neumark.

14. **227th National Meeting of the American Chemical Society**, Anaheim, CA; March 2004. ***Poster Presentation***: "*Relaxation Dynamics of Anionic Mercury and Water Clusters via Time-Resolved Photoelectron Imaging Studies*," A. E. Bragg, A. Kammrath, J. R. R. Verlet, O. Cheshnovsky, and D. M. Neumark. SciMix and Div. of Phys. Chem. Poster Sessions.

15. **51st Annual Western Spectroscopy Conference**, Pacific Grove, CA; January 30th, 2004. ***Contributed Talk***: "*Intra- and Interband Relaxation Dynamics of Hgn^- Clusters Studied through Time-Resolved Photoelectron Imaging (TRPEI)*," A. E. Bragg, J. R. R. Verlet, A. Kammrath, O. Cheshnovsky, and D. M. Neumark.

16. **Gordon Research Conference on *Photoions, Photoionization, and Photodetachment***, Queen's College, Oxford University; September 2003. ***Poster Presentation***: "*Cluster Electronic Relaxation Dynamics Studied with Anion Time-Resolved Photoelectron Imaging (TRPEI)*," A. E. Bragg, J. R. R. Verlet, A. Kammrath, O. Cheshnovsky, and D. M. Neumark.

17. **50th Annual Western Spectroscopy Conference**, Pacific Grove, CA; January 2003. ***Poster Presentation***: "*Dynamics of Electronically Excited Molecular Anions via Time-Resolved Photoelectron Imaging (TRPEI)*," A. E. Bragg, A. V. Davis, A. Kammrath, R. Wester, and D. M. Neumark.

18. **Gordon Conference on *Photoions, Photoionization, and Photodetachment***, Williams College, Williams, MA; July 2001. ***Poster Presentation***: "*Excited-State Relaxation Dynamics of Linear Carbon Cluster Anions*," A. E. Bragg, C. Frischkorn, A. V. Davis, R. Wester, and D. M. Neumark.

19. **221st ACS National Meeting**, San Diego, CA; March 2001. ***Poster Presentation***: "*Excited-State Relaxation Dynamics of Linear Carbon Cluster Anions*," A. E. Bragg, C. Frischkorn, A. V. Davis, R. Wester, and D. M. Neumark. Division of Physical Chemistry Poster Session.

CONFERENCE/SYMPOSIUM ORGANIZATION

Symposium on "*Structure and Dynamics in Complex Chemical Systems: Gaining New Insights Through Recent Advances in Time-Resolved Spectroscopy*." Held at the **250th National Meeting of the American Chemical Society** (Division of Physical Chemistry), Boston, MA; August 16th-20th, 2015.

- ***Co-organizers***: Arthur Bragg (John Hopkins, Chemistry), Amber Krummel (Colorado State, Chemistry); Poul Petersen (Cornell, Chemistry).

GRADUATE AND POST-DOCTORAL RESEARCH ADVISING

FORMER ADVISEES

Dr. Paul Donohoo-Vallett (Ph.D. in Chemistry, CU Boulder, 2013)

- Post-doctoral researcher, January-September 2014
- Computational studies on Raman spectroscopy of conjugated materials
- Lecturer, Introductory Chemistry, May-August 2014 (JHU Summer Programs)
- AAAS policy fellow at U. S. Department of Energy (2014-2016)

Dr. Molly (Smith) Molloy

- Graduate-student advisee, December 2010 - August 2016; PhD defense, 7/27/2016
- Dissertation Title: *Structural and Solvent Control of Photochemical Bond Formation: Nonadiabatic Photocyclization of ortho-Terphenyls*
- Post-doctoral researcher in the Optical Spectroscopy Section at the National Heart, Lung, and Blood Institute (NIH), August 2016-August 2017
- Currently a Public Health Laboratory Scientist, Division of Environmental Sciences, Maryland State Public Health Laboratory

Dr. Jiawang Zhou

- Graduate-student advisee, December 2010 - September 2016; PhD defense, 8/29/2016
- Dissertation Title: *Ultrafast Excited-State Structural Dynamics and Charge Transfer in Photoresponsive Conjugated Molecular Materials*
- A 2015 Recipient of the National Award for Self-Financed Chinese Students Studying Overseas.
- Currently a post-doctoral researcher at Northwestern University, Chemistry (Wasielewski Lab)

Dr. Wenjian Yu

- Graduate-student advisee, December 2010 - October 2016; PhD defense, 9/28/2016
- Dissertation Title: *Ultrafast Spectroscopic Interrogation of Structural Dynamics and Disorder in Excited States of Conjugated Organic Polymers*
- Currently a post-doctoral researcher in Chemical and Biomolecular Engineering, JHU (Wang and Gracias Labs)

Dr. Joshua Snyder

- Graduate-student advisee, December 2011 - June 2017; PhD defense, 5/8/2017
- Dissertation Title: *Structural Effects on Photocyclization in Ortho-Arenes.*
- Currently a post-doctoral researcher in Chemistry, The Ohio State University (Kohler Lab)

CURRENT ADVISEES

Dr. Timothy Magnanelli

- Graduate-student advisee, December 2011 - June 2017; PhD defense, 10/11/2017
- Dissertation Title: *Spectroscopic Probes of Charge Separation, Energy Transfer, and their Dependencies on Local Structure in Assembled Organic Materials*
- Currently a post-doctoral researcher in Chemistry, JHU (Bragg Lab)

Kenneth Smith (M. S. in Chemistry, U. San Francisco, 2013; B. S. in Chemistry, UC Davis, 2005)

- Research Projects: Photophysical and Charge-Transfer Dynamics of Plasmonic-Photocatalytic Assemblies Based on Earth-Abundant Materials
- December 2013 - present

Dr. Jamie Young (Ph.D. in Chemistry, University of Warwick, 2016)

- Post-doctoral researcher, June 1st, 2016-present
- Research Projects: Photophysical dynamics in photoswitchable materials; spectroscopy of polarized organic materials.

Chana Honick (B. S. in Chemistry, University of Maryland, Baltimore County, 2016)

- Research Projects: Energy-transfer mechanisms in photoresponsive organic materials (e.g. photoswitching and singlet exciton fission).
- December 2016-present

Brandon Barrett (B. S. in Chemistry, Shippensburg University, 2016)

- Research Projects: Charge-transfer mechanisms in photoresponsive nanomaterials and hybrid organic-inorganic materials
- December 2016-present

Ryan Brady

- Research Projects: Spectroscopic probes of nonadiabatic photochemical dynamics.
- December 2017-present

INSTITUTIONAL AND PROFESSIONAL ORGANIZATION ACTIVITIES

DEPARTMENTAL COMMITTEES, CHEMISTRY

Faculty Search Committee (Junior Theorist), 2013-2015
Graduate Student Recruitment Committee, 2016-present
Graduate Admissions Committee, 2017-present
Graduate Curriculum Committee, 2016-present (Chair, 2017-present)
Undergraduate Advising, 2014-present
Dissertation Defense Committees, 2010-present

COLLEGE COMMITTEES, KRIEGER SCHOOL OF ARTS AND SCIENCES (KSAS)

KSAS Curriculum Committee (2014-present)
Graduate Board Oral Committees, 2010-present

PEER-REVIEWING

- **Granting Agencies**: NSF, DOE, ACS-PRF single PI grants
- **Journals**: *Journal of Physical Chemistry*, *Journal of Physical Chemistry Letters*, *Journal of the American Chemical Society*, *Journal of Chemical Physics*, *Nature Communications*, *Journal of Organic Chemistry, Vibrational Spectroscopy, Journal of Raman Spectroscopy*

PROFESSIONAL MEMBERSHIPS

American Chemical Society (ACS): 1998-present