L. ROBERT BAKER

The Ohio State University
Department of Chemistry and Biochemistry
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APPOINTMENTS

- **Associate Professor** (2019 to present)
  The Ohio State University, Department of Chemistry and Biochemistry

- **Assistant Professor** (2014–2019)
  The Ohio State University, Department of Chemistry and Biochemistry

- **Postdoctoral Fellow** (2012–2014)
  University of California, Berkeley
  Advisor: Stephen R. Leone

EDUCATION

- **Ph.D. Degree**, Physical Chemistry (2008–2012)
  University of California, Berkeley
  Advisor: Gabor A. Somorjai
  GPA: 4.0
  Thesis Title: Charge Transfer and Catalysis at the Oxide–Metal Interface

- **MS Degree**, Physical Chemistry (2007–2008)
  Brigham Young University
  Advisors: Steven R. Goates and James E. Patterson
  GPA: 4.0
  Thesis Title: Spectroscopic Study of Compressible Mobile Phase and Stationary Phase Behavior in Chromatography

- **BS Degree**, Chemistry (2004–2007)
  Brigham Young University
  GPA: 3.92

FUNDING

(Principal investigator for total funding of $12.2M, 5 active federal grants)

- **National Science Foundation Mid-scale RI-1** (2019–2024)
  Award Number: 1935885
  Project Title: Mid-scale RI-1 (M1:IP): NSF National Extreme Ultrafast Science (NEXUS) Facility
  Role: Principal Investigator and Facility Co-Director, (Co-PIs: Louis DiMauro, Jay Gupta, Roland Kawakami, and Claudia Turro)
  Award Amount: $9,500,000

- **Air Force Office of Scientific Research** (2019–2022)
  Award Number: FA9550-19-1-0184
  Project Title: Elucidating the Mechanism of Charge Transfer and Transport at Surfaces Using Ultrafast XUV Spectroscopy
  Role: Principal Investigator
  Award Amount: $450,000

- **National Science Foundation MRSEC Seed Grant** (2019–2020)
  Award Number: 1420451
  Project Title: Center for Emergent Materials Proto IRG-I
  Role: Principal Investigator
  Award Amount: $52,360

- **National Science Foundation Chemical Catalysis** (2017–2020)
  Award Number: 1665280
  Project Title: SusChEM: CO_2 Photo-Electrochemistry on Metal Oxide Surfaces Studied by Vibrational Sum Frequency Generation Spectroscopy and DFT
  Role: Principal Investigator (co-PI: Aravind Asthagiri)
  Award Amount: $449,541

- **National Science Foundation Major Research Instrumentation** (2016–2019)
  Award Number: 1625792
  Project Title: Acquisition of X-Ray Photoelectron Spectrometer with Near Ambient Pressure and High Temperature Capabilities for Discovering New Material Phenomena with In Situ Studies
  Role: Principal Investigator (Co-PIs: Anne Co, David Cole, Gerald Frankel, and Umit Ozkan)
  Award Amount: $699,300

- **Department of Energy Early Career Award** (2015–2020)
  Award Number: DE-SC0014051
  Project Title: Probing Ion Solvation and Charge Transfer at Electrochemical Interfaces Using Nonlinear Soft X-Ray Spectroscopy
  Role: Principal Investigator
  Award Amount: $760,000

- **Air Force Office of Scientific Research Young Investigator Award** (2015–2018)
  Award Number: FA9550-15-1-0204
  Project Title: Understanding the Mechanism of Catalytic Selectivity During Electrochemical CO_2 Reduction Using Nonlinear Soft X-Ray Spectroscopy
  Role: Principal Investigator
  Award Amount: $360,000

HONORS AND AWARDS

- **Young Innovator Award in NanoEnergy** (2019)
  Highlighted in NR45 special issue of *Nano Research*
  (Awarded to 45 researchers under 45 for their contributions to the field of nanomaterials and energy science)

- **Kavli Foundation Emerging Leader in Chemistry Nominee** (2018)
  ACS Physical Chemistry Division
  (Selected as one of two nominees from the ACS Physical Chemistry Division for the Kavli Foundation Emerging Leader in Chemistry Lecture)

- **Victor K. LaMer Award Finalist** (2016)
  ACS Colloid & Surface Science Division

- **Early Career Award** (2015)
  Department of Energy, Condensed Phase and Interfacial Molecular Science

- **Young Investigator Award** (2015)
  Air Force Office of Scientific Research, Molecular Dynamics and Theoretical Chemistry

- **Benjamin Boussert Memorial Award** (2012)
  University of California, Berkeley, Department of Chemistry
  (Award of $2,000 for exemplifying commitment to social or environmental change)

- **Outstanding Graduate Student Instructor Award** (2012)
  University of California, Berkeley

- **Gerald K. Branch Fellowship** (2010–2011)
  University of California, Berkeley, Department of Chemistry
  (Full tuition support and living stipend for 12 months)

- **Nicholes-Maw Fellowship** (2007–2008)
  Brigham Young University, Department of Chemistry
  (Award of $2,000)

- **Garth L. Lee Teaching Award** (2007)
  Brigham Young University, Department of Chemistry

- **Ernest Hollings Scholarship** (2005–2007)
  National Oceanic and Atmospheric Administration
  ($800/month stipend for 24 months and paid summer internship at Pacific Marine Environmental Laboratory)

PUBLICATIONS

From Ohio State University:
(† Corresponding author)

13. S. Biswas, S. Wallentine, S. Bandaranayake, **L. R. Baker**†, "Controlling Polaron Formation at Hematite Surfaces by Molecular Functionalization Probed by XUV Reflection-Absorption Spectroscopy," *Journal of Chemical Physics*, **2019**, Just Accepted. **(Editor-selected Feature Article)**

12. E. Fugate, S. Biswas, M. Clement, M. Kim, D. Kim, A. Asthagiri†, **L. R. Baker**†, "The Role of Phase Impurities and Lattice Defects on the Electron Dynamics and Photochemistry of $CuFeO_2$ Solar Photocathodes," *Nano Research*, **2019**, Just Accepted. **(NR45 Special Issue highlighting L. R. Baker as Young Innovator in NanoEnergy)**

11. L. Lin, J. Husek, S. Biswas, S. M. Baumler, T. Adel, K. Ng, **L. R. Baker**, H. C. Allen†, "Iron (III) Speciation Observed at Aqueous and Glycerol Surfaces: Vibrational Sum Frequency and X-Ray," *Journal of the American Chemical Society*, **2019**, Just Accepted.

10. S. Biswas, J. Husek, S. Londo, E.A. Fugate, **L. R. Baker**†, "Identifying the Acceptor State in NiO Hole Collection Layers: Direct Observation of Exciton Dissociation and Interfacial Hole Transfer Across a Fe_2O_3/NiO Heterojunction," *Physical Chemistry Chemical Physics*, **2018**, *20*, 24545–24552. **(Cover Article, Featured in 2018 Hot Articles Collection)**

9. S. Biswas, J. Husek, S. Londo, **L. R. Baker**†, "Ultrafast Electron Trapping and Defect-Mediated Recombination in NiO Probed by Femtosecond Extreme Ultraviolet (XUV) Reflection-Absorption Spectroscopy," *Journal of Physical Chemistry Letters*, **2018**, *9*, 5047–5054.

8. J. Husek, A. Cirri, S. Biswas, A. Asthagiri, **L. R. Baker**†, "Hole Thermalization Dynamics Facilitate Ultrafast Spatial Charge Separation in $CuFeO_2$ Solar Photocathodes," *Journal of Physical Chemistry C*, **2018**, *122*, 11300–11304.

7. S. Biswas, J. Husek, **L. R. Baker**†, "Elucidating Ultrafast Electron Dynamics at Surfaces Using Extreme Ultraviolet (XUV) Reflection-Absorption Spectroscopy," *Chemical Communications*, **2018**, *54*, 4216–4230. **(Invited Feature Article)**

6. S. Biswas, J. Husek, S. Londo, **L. R. Baker**†, "Highly Localized Charge Transfer Excitons in Metal Oxide Semiconductors," *Nano Letters*, **2018**, *18*, 1228–1233. **(Highlighted by Advances in Engineering)**

5. J. Husek, A. Cirri, S. Biswas, **L. R. Baker**†, "Surface Electron Dynamics in Hematite (α-Fe_2O_3): Correlation Between Ultrafast Surface Electron Trapping and Small Polaron Formation," *Chemical Science*, **2017**, *8*, 8170–8178.

4. A. Cirri, J. Husek, S. Biswas, and **L. R. Baker**†, "Achieving Surface Sensitivity in Ultrafast XUV Spectroscopy: $M_{2,3}$-Edge Reflection–Absorption of Transition Metal Oxides," *Journal of Physical Chemistry C*, **2017**, *121*, 15861–15869.

3. Y. Mueanngern, X. Yang, Y. Tang, F. Tao, and **L. R. Baker**†, "Catalysis at Multiple Length Scales: Crotonaldehyde Hydrogenation at Nanoscale and Mesoscale Interfaces in Platinum–Cerium Oxide Catalysts," *Journal of Physical Chemistry C*, **2017**, *121*, 13765–13776.

2. X. Yang, E. A. Fugate, Y. Mueanngern, **L. R. Baker**†, "Photo-Electrochemical CO_2 Reduction to Acetate on Iron–Copper Oxide Catalysts," *ACS Catalysis,* **2017**, *7*, 177–180.

1. X. Yang, Y. Mueanngern, Q. A. Baker, **L. R. Baker**†, "Crotonaldehyde Hydrogenation on Platinum–Titanium Oxide and Platinum–Cerium Oxide Catalysts: Selective C=O Bond Hydrogenation Requires Platinum Sites Beyond the Oxide–Metal Interface," *Catalysis Science & Technology*, **2016**, *6*, 6824–6835. **(Themed issue on Nanocatalysis)**

Prior to Ohio State University:

16. J. Y. Park, **L. R. Baker**, and G. A. Somorjai, "The Role of Hot Electrons and Metal-Oxide Interfaces in Surface Chemistry and Catalytic Reactions," *Chemical Reviews*, **2015**, *115*, 2781–2817.

15. **L. R. Baker**, C. M. Jiang, S. T. Kelly, J. M. Lucas, J. Vura-Weis, M. K. Gilles, A. P. Alivisatos, and S. R. Leone, "Charge Carrier Dynamics of Photoexcited Co_3O_4 in Methanol: Extending High Harmonic Transient Absorption Spectroscopy to Liquid Environments," *Nano Letters*, **2014**, *14*, 5883–5890. **(Highlighted by IOP Institute of Physics in *NanotechWeb*)**

14. C. M. Jiang, **L. R. Baker**, J. M. Lucas, J. Vura-Weis, A. P. Alivisatos, and S. R. Leone, "Characterization of Photo-Induced Charge Transfer and Hot Carrier Relaxation Pathways in Spinel Cobalt Oxide (Co_3O_4)," *Journal of Physical Chemistry C*, **2014**, *118*, 22774–22784.

13. G. Kennedy, **L. R. Baker**, and G. A. Somorjai, "Selective Amplification of C=O Bond Hydrogenation on Pt by an Active TiO_2 Support: Catalytic Reaction and Sum Frequency Generation Vibrational Spectroscopy Studies of Crotonaldehyde Hydrogenation," *Angewandte Chemie International Edition*, **2014**, *53*, 3405–3408.

12. F. Shi, **L. R. Baker**, A. Hervier, G. A. Somorjai, and K. Komvopoulos, "Tuning the Electronic Structure of Titanium Oxide Support to Enhance the Electrochemical Activity of Platinum Nanoparticles," *Nano Letters*, **2013**, *13*, 4469–4474.

11. K. An, N. Musselwhite, G. Kennedy, V. Pushkarev, **L. R. Baker**, and G. A. Somorjai, "Preparation of Mesoporous Oxides and Their Support Effects on Pt Nanoparticle Catalysis in Catalytic Hydrogenation of Furfural," *Journal of Colloid and Interface Science*, **2013**, *392*, 122–128.

10. **L. R. Baker**, G. Kennedy, J. M. Krier, M. Van Spronsen, R. M. Onorato, and G. A. Somorjai, "The Role of an Organic Cap in Nanoparticle Catalysis: Reversible Restructuring of Carbonaceous Material Controls Catalytic Activity of Platinum Nanoparticles for Ethylene Hydrogenation and Methanol Oxidation," *Catalysis Letters*, **2012**, *142*, 1286–1294.

9. **L. R. Baker**, G. Kennedy, M. Van Spronsen, A. Hervier, X. Cai, S. Chen, L. Wang, and G. A. Somorjai, "Furfuraldehyde Hydrogenation on Titanium Oxide-Supported Platinum Nanoparticles Studied by Sum Frequency Generation Vibrational Spectroscopy: Acid–Base Catalysis Explains the Molecular Origin of Strong Metal–Support Interactions," *Journal of the American Chemical Society*, **2012**, *134*, 14208–14216.

8. J. M. Krier, W. Michalak, **L. R. Baker**, K. An, K. Komvopoulos, and G. A. Somorjai, "Sum Frequency Generation Vibrational Spectroscopy of Colloidal Platinum Nanoparticle Catalysts: Disordering versus Removal of Organic Capping," *Journal of Physical Chemistry C*, **2012**, *116*, 17540–17546.

7. **L. R. Baker**, A. Hervier, G. Kennedy, and G. A. Somorjai, "Solid-State Charge-Based Device for Control of Catalytic Carbon Monoxide Oxidation on Platinum Nanofilms Using External Bias and Light," *Nano Letters*, **2012**, *12*, 2554–2558.

6. A. Hervier, **L. R. Baker**, H. Seo, K. Komvopoulos, and G. A. Somorjai, "Titanium Oxide/Platinum Catalysis: Charge Transfer from Titanium Oxide Support Controls Activity and Selectivity in Methanol Oxidation on Platinum," *Journal of Physical Chemistry C*, **2011**, *115*, 22960–22964.

5. **L. R. Baker**, A. Hervier, H. Seo, G. Kennedy, K. Komvopoulos, and G. A. Somorjai, "Highly n-Type Titanium Oxide as an Electronically Active Support for Platinum in the Catalytic Oxidation of Carbon Monoxide," *Journal of Physical Chemistry C*, **2011**, *115*, 16006–16011.

4. H. Seo*, **L. R. Baker***, A. Hervier, J. Kim, J. L. Whitten, and G. A. Somorjai, "Generation of Highly n-Type Titanium Oxide Using Plasma Fluorine Insertion," *Nano Letters* **2011**, *11*, 751–756. (* Co-first author)

3. **L. R. Baker**, A. W. Orton, M. A. Stark, and S. A. Goates, "Density gradients in packed columns: II. Effects of density gradients on efficiency in supercritical fluid separations," *Journal of Chromatography A* **2009**, *1216*, 5594–559.

2. **L. R. Baker**, M. A. Stark, A. W. Orton, B. A. Horn, and S. A. Goates, "Density gradients in packed columns: I. Effects of density gradients on retention and separation speed," *Journal of Chromatography A* **2009**, *1216*, 5588–5593.

1. **L. R. Baker**, A. W. Orton, S. R. Goates, and B. A. Horn, "Characterization of Carbon Dioxide Mobile Phase Density Profiles in Packed Capillary Columns by Raman Microscopy," *Applied Spectroscopy* **2009**, *63*, 108–111. **(Cover Article)**

PATENTS

2. **L. R. Baker**, X. Yang, "Catalytic Materials and Methods of Making and Using Thereof," US Patent Application No. 15/602,696, (2017).

1. **L. R. Baker**, H. Seo, A. Herier, G. A. Somorjai, "Generation of Highly n-Type, Defect Passivated Transition Metal Oxides Using Plasma Fluorine Insertion," US Patent 9,312,342 (2016).

ORAL PRESENTATIONS

56 talks presented or scheduled since July 2014, including 43 invited talks. Invited talks include:

- 14th Femtochemistry Conference, Shanghai, China
- International School for Attosecond and Ultrafast X-Ray Science, Erice, Sicily, Italy
- Max Planck Institute of Quantum Optics, Garching, Germany
- Fritz Haber Institute, Berlin, Germany
- 2 Invited talks at Gordon Research Conferences
- Keynote Address at National ACS Colloid & Surface Science Symposium
- 9 Invited talks at ACS/ECS National Meetings
- 20 Invited Department Seminars/Colloquia

Complete list provided below:

International Presentations:

4. "Achieving Surface Sensitivity in Ultrafast XUV Spectroscopy," presented at 14th Femtochemistry Conference, Shanghai, China, August 2019. **(Invited Talk)**

3. "Transient Absorption and Transient Reflectivity Spectroscopy in Molecules and Solids," presented at International School on the Frontiers of Attosecond and Ultrafast X-Ray Science, Erice, Sicily, Italy, March 2019. **(Invited Lecture)**

2. "Observing Surface Electron Dynamics in Catalytic Materials Using Femtosecond XUV Reflection-Absorption Spectroscopy," presented at Fritz Haber Institute, Department of Physical Chemistry, Berlin, Germany, December 2018. **(Invited Talk)**

1. "Observing Surface Electron Dynamics in Catalytic Materials Using Femtosecond XUV Reflection-Absorption Spectroscopy," presented at Max Planck Institute of Quantum Optics, Garching, Germany, December 2018. **(Invited Talk)**

National Presentations:

29. "Observing Ultrafast Charge and Spin Dynamics at Photochemical Interfaces," to be presented at National Meeting of the Electrochemical Society, Atlanta, GA, October 2019. **(Invited Talk)**

28. "Visualizing Charge and Spin Dynamics at Catalytic Interfaces," presented at SSRL/LCLS Users Meeting, Workshop on Current and Future Opportunities in Time-Resolved X-Ray Science: Materials and Interfaces, Menlo Park, CA, September 2019. **(Invited Talk)**

27. "Understanding the Role of the Metal–Support Interface During Ethanol Steam Reforming on Nickel–Cerium Oxide Catalysts," to be presented at National Meeting of the American Chemical Society, San Diego, CA, August 2019. **(Invited Talk)**

26. "Achieving Surface Sensitivity in Ultrafast XUV Spectroscopy," presented at International Symposium on Molecular Spectroscopy, Champaign, IL, June 2019.

25. "Ultrafast Electron Trapping and Defect-Mediated Recombination in Nickel Oxide: Resolving Effects of Oxygen Vacancies and Grain Boundaries," presented at National Meeting of the American Chemical Society, Orlando, FL, April 2019. **(Invited Talk)**

24. "Molecular Mechanisms of Ethanol Steam Reforming on Bifunctional Nickel–Cerium Oxide Catalysts," presented at National Meeting of the American Chemical Society, Orlando, FL, April 2019.

23. "Ultrafast Electron Dynamics in $CuFeO_2$ Solar Photocathodes Measured by XUV Reflection-Absorption Spectroscopy," presented at National Meeting of the American Chemical Society, Boston, MA, August 2018. **(Invited Talk)**

22. "Elucidating Ultrafast Electron Dynamics at Surfaces Using Extreme Ultraviolet (XUV) Reflection-Absorption Spectroscopy," presented at National Meeting of the American Chemical Society, Boston, MA, August 2018. **(Invited Talk)**

21. "Catalysis at Multiple Length Scales: Bifunctional Activation at Nano and Mesoscale Interfaces in Platinum–Cerium Oxide Catalysts," presented at National Meeting of the American Chemical Society, Boston, MA, August 2018. **(Invited Talk)**

20. "Tracking Surface Electron Dynamics in Catalytic Materials," presented at the Molecular Interactions and Dynamics Gordon Research Conference, Easton, MA, July 2018. **(Invited Talk)**

19. "Surface Electron Dynamics in $CuFeO_2$ Catalysts Studied by Ultrafast XUV Spectroscopy," presented at National Meeting of the American Chemical Society, New Orleans, LA, March 2018.

18. "Surface Electron Dynamics in Hematite (α-Fe_2O_3): Correlation Between Ultrafast Surface Electron Trapping and Small Polaron Formation," presented at National Meeting of the American Chemical Society, New Orleans, LA, March 2018.

17. "Elucidating Surface Electron Dynamics in Metal Oxide Catalysts Using Ultrafast XUV Spectroscopy," presented at Condensed Phase and Interfacial Molecular Sciences Program Meeting, Washington DC, October 2017.

16. "Photo-Electrochemical CO_2 Reduction to Acetate on Iron–Copper Oxide Catalysts," presented at Materials Science & Technology, Pittsburg, PA, October 2017. **(Invited Talk)**

15. "Achieving Surface Sensitivity in Ultrafast XUV Spectroscopy: $M_{2,3}$ Edge Reflection-Absorption of Transition Metal Oxides," presented at American Physical Society Laser Science Meeting, Washington DC, September 2017.

14. "Photo-Electrochemical CO_2 Reduction to Acetate on Iron–Copper Oxide: Understanding Electron Dynamics in Catalysts Showing High Selectivity for CO_2 Reduction," presented at National Meeting of the American Chemical Society, Washington DC, August 2017. **(Invited Talk)**

13. "Catalysis at Multiple Length Scales: Crotonaldehyde Hydrogenation at Nanoscale and Mesoscale Interfaces in Platinum–Cerium Oxide Catalysts," presented at National Meeting of the American Chemical Society, Washington DC, August 2017. **(Invited Talk)**

12. "Investigating Surface Carrier Dynamics in Metal Oxide Catalysts Showing High Selectivity for CO_2 Reduction," presented at the Photochemistry Gordon Research Conference, Lewiston, ME, July 2017. **(Invited Talk)**

11. "Achieving Surface Sensitivity in Ultrafast XUV Spectroscopy: Investigating Surface Carrier Dynamics in Catalysts Showing High Selectivity for CO_2 Reduction," presented at Air Force Office of Scientific Research Molecular Dynamics and Theoretical Chemistry Program Meeting, Albuquerque, NM, May 2017.

10. "Determining the Active Site for Selective C=O Bond Hydrogenation: Understanding the Role of the Pt–Support Interface," presented at National Meeting of the American Chemical Society, San Francisco, CA, April 2017. **(Invited Talk)**

9. "Probing Ultrafast Electron Dynamics at Surfaces Using Soft X-Ray Transient Reflectivity Spectroscopy," presented at 253rd National Meeting of the American Chemical Society, San Francisco, CA, April 2017.

8. "Probing Ultrafast Electron Dynamics at Surfaces Using Soft X-Ray Transient Reflectivity Spectroscopy," presented at National Meeting of the American Physical Society, New Orleans, LA, March 2017.

7. "Understanding Electron Dynamics in Mixed Metal Oxide Catalysts Showing High Selectivity for Photo-Electrochemical CO_2 Reduction to Acetate," presented at Materials Research Society Meeting, Boston, MA, November 2016.

6. "Probing Charge Transfer at Electrochemical Interfaces Using Nonlinear XUV Spectroscopy," presented at New Laser Scientist Meeting sponsored by APS Division of Laser Science, Rochester, NY, October 2016. **(Invited Talk)**

5. "Understanding Electron Dynamics in Mixed Metal Oxide Catalysts Showing High Selectivity for Photo-Electrochemical CO_2 Reduction to Acetate," presented at National Meeting of the American Chemical Society, Philadelphia, PA, August 2016.

4. "Using Ultrafast Soft X-Ray Spectroscopy and Nano-Patterned Surfaces to Understand Interfacial Charge Transfer in Catalytic Systems," presented at Colloid and Surface Science Symposium, Boston, MA, June 2016. **(Victor K. LaMer Keynote Address)**

3. "High Harmonic Generation Soft X-Ray Spectroscopy for Probing Interfacial Charge Carrier Dynamics in Catalytic Systems," presented at Materials Science & Technology, Columbus, OH, October 2015. **(Invited Talk)**

2. "Nanopatterned Surfaces for Highly Selective C=O Bond Hydrogenation: Understanding the Role of the Pt–Support Interface," presented at Colloid and Surface Science Symposium, Pittsburgh, PA, June 2015.

1. "Charge Carrier Dynamics of Photoexcited Co_3O_4 in Methanol: Extending High Harmonic Transient Absorption Spectroscopy to Liquid Environments," presented at National Meeting of the American Chemical Society, Denver, CO, March 2015.

Regional Presentations:

3. "Observing Ultrafast Charge and Spin Dynamics at Photochemical Interfaces," presented at Ohio Photochemical Society Meeting, Maumee Bay, OH, May 2019. **(Invited Talk)**

2. "Achieving Surface Sensitivity in XUV Spectroscopy: Understanding Electron Dynamics in Metal Oxide Catalysts Showing High Selectivity for CO_2 Reduction," presented at American Chemical Society Central Regional Meeting, Dearborn, MI, June 2017. **(Invited Talk)**

1. "Achieving Surface Sensitivity in XUV Spectroscopy: Ultrafast $M_{2,3}$ Edge Reflection-Absorption of Transition Metal Oxides," presented at American Vacuum Society Florida Chapter Meeting, Orlando, FL, March 2017. **(Invited Talk)**

Invited Department Seminars and Colloquia:

20. "Visualizing Charge and Spin Dynamics at Catalytic Interfaces," Chemistry Seminar, presented at Brigham Young University, Provo, UT, October 2019.

19. “Visualizing Charge and Spin Dynamics at Catalytic Interfaces,” Physical Chemistry Seminar, to be presented at University of Rochester, Rochester, NY, September 2019.

18. “Visualizing Ultrafast Electron Dynamics at Catalytic Surfaces,” Chemistry Seminar, presented at University of Kansas, Lawrence, KS, February 2019.

17. “Visualizing Ultrafast Electron Dynamics at Catalytic Surfaces,” Physical Chemistry Seminar, presented at University of Michigan, Ann Arbor, MI, January 2019.

16. “Visualizing Ultrafast Electron Dynamics at Catalytic Surfaces,” Inorganic Chemistry Seminar, presented at Michigan State University, East Lansing, MI, November 2018.

15. “Visualizing Ultrafast Electron Dynamics at Catalytic Surfaces,” Physical Chemistry Seminar, presented at University of Texas at Austin, Austin, TX, November 2018.

14. “Visualizing Ultrafast Electron Dynamics at Catalytic Surfaces,” Chemical Sciences and Engineering Division Colloquium, presented at Argonne National Laboratory, Lemont, IL, November 2018.

13. “Visualizing Ultrafast Electron Dynamics at Catalytic Surfaces,” Physical Chemistry Seminar, presented at Pennsylvania State University, University Park, PA, November 2018.

12. “Visualizing Ultrafast Electron Dynamics at Catalytic Surfaces,” Physical Chemistry Seminar, presented at University of Washington, Seattle, WA, October 2018.

11. “Visualizing Ultrafast Electron Dynamics at Catalytic Surfaces,” Physical Chemistry Seminar, presented at University of California, Los Angeles, Los Angeles, CA, October 2018.

10. “Visualizing Ultrafast Electron Dynamics at Catalytic Surfaces,” Chemistry at the Space-Time Limit (CaSTL) Seminar, presented at University of California, Irvine, Irvine, CA, October 2018.

9. “Visualizing Ultrafast Electron Dynamics at Catalytic Surfaces,” Physical Chemistry Seminar, presented at University of Illinois Urbana-Champaign, Urbana, IL, September 2018.

8. “Visualizing Ultrafast Electron Dynamics at Catalytic Surfaces,” Chemistry Seminar, presented at University of Houston, Houston, TX, September 2018.

7. “Visualizing Ultrafast Electron Dynamics at Catalytic Surfaces,” Physical Chemistry Seminar, presented at Iowa State University, Ames, IA, September 2018.

6. “Visualizing Ultrafast Electron Dynamics at Catalytic Surfaces,” Physical Chemistry Seminar, presented at University of Southern California, Los Angeles, CA, September 2018.

5. “Visualizing Ultrafast Electron Dynamics at Catalytic Surfaces,” Physical Chemistry/Chemical Physics Colloquium, presented at University of Colorado Boulder, Boulder, CO, September 2018.

4. “Visualizing Ultrafast Electron Dynamics at Catalytic Surfaces,” Physical Chemistry Seminar, presented at Colorado State University, Fort Collins, CO, September 2018.

3. "Understanding the Mechanism of Catalytic Selectivity: Probing Ultrafast Electron Dynamics at Surfaces Using Soft X-Ray Transient Reflectivity Spectroscopy," Chemistry Colloquium, presented at Case Western Reserve University, Cleveland, OH, November 2016.

2. "Using Ultrafast Soft X-Ray Spectroscopy and Nano-Patterned Surfaces to Understand Interfacial Charge Transfer in Catalytic Systems," Chemistry Seminar, presented at Wright State University, Dayton, OH, October 2016.

1. "Using Ultrafast Soft X-Ray Spectroscopy and Nano-Patterned Surfaces to Understand Interfacial Charge Transfer in Catalytic Systems," Chemistry Seminar, presented at Cleveland State University, Cleveland, OH, April 2016.

PROFESSIONAL ACTIVITIES

Organized Symposia:

- Symposium Organizer
  "Elucidation of Mechanisms and Kinetics on Surfaces"
  American Chemical Society National Meeting, Philadelphia, PA, April 2020
  (Co-organizers: Líney Árnadóttir, Siris Laursen, and Aditya Savara)

- Symposium Organizer
  "High Harmonic Generation and XUV Spectroscopy"
  International Symposium on Molecular Spectroscopy, Champaign, IL, June 2019
  (Co-organizers: Scott Sayres and Josh Vura-Weis)

- Symposium Organizer
  "Elucidation of Mechanisms and Kinetics on Surfaces"
  American Chemical Society National Meeting, Orlando, FL, April 2019
  (Co-organizers: Alexey Ignatchenko, Siris Laursen, and Aditya Savara)

- Symposium Organizer
  "Applications of Ambient Pressure XPS to Catalysis Studies"
  American Chemical Society National Meeting, Boston, MA, August 2018
  (Co-organizers: Huimin Liu and Franklin Tao)

- Symposium Organizer
  "Elucidation of Mechanisms and Kinetics on Surfaces"
  American Chemical Society National Meeting, New Orleans, LA, April 2018
  (Co-organizers: Siris Laursen and Aditya Savara)

- Symposium Organizer
  "Frontiers at Interfaces: Probing the Mechanisms of Interfacial Carrier Dynamics and Surface Reactions"
  American Physical Society National Meeting, New Orleans, LA, March 2017
  (Co-organizer: Xiaoyang Zhu)

- Symposium Organizer
  "Chemistry & Energy Conversion at Interfaces"
  American Chemical Society Central Regional Meeting, Cincinnati, OH, May 2016

Workshop Participation:

- Panel Writer
  Next Generation Electrical Energy Storage
  Panel 2: Structure, Interphases, and Charge Transfer at Electrochemical Interfaces
  DOE Basic Research Needs Workshop, Washington DC, March 2017

Peer Reviewer for Following Journals:

(Total of 71 articles reviewed since July 2014)

- ACS Applied Materials & Interfaces
- ACS Catalysis
- ACS Energy Letters
- Angewandte Chemie International Edition
- Applied Spectroscopy
- Catalysis Letters
- Catalysis Today
- Catalysts
- Chemical Communications
- Chemical Science
- ChemCatChem
- ChemElectroChem
- ChemSusChem
- Dalton Transactions
- Journal of Catalysis
- Journal of Physical Chemistry
- Journal of the American Chemical Society
- Nature Nanotechnology
- Nano Letters
- Physical Chemistry Chemical Physics
- Review of Scientific Instruments
- Scientific Reports
- Surface Science
- Topics in Catalysis

Proposal Review:

- **Department of Energy**
  Condensed Phase and Interfacial Molecular Sciences Program

- **Air Force Office of Scientific Research**
  Molecular Dynamics and Theoretical Chemistry Program

- **National Science Foundation**
  Chemical Catalysis
  Centers for Chemical Innovation
  Major Research Instrumentation
  CAREER Program

- **American Chemical Society**
  Petroleum Research Fund

- **Stanford Synchrotron Radiation Light Source**
  Beam line user proposals

- **Netherlands Organisation for Scientific Research**
  Innovation Research Incentives Scheme Veni