

- Education**
- Ph.D., Physical Chemistry**, Princeton University **June 2015**  
“A Diode Laser Study of the Catalytic Oxidation Dynamics of Acetaldehyde on Polycrystalline Platinum”  
Advisers: Steven Bernasek and Annabella Selloni
- B.Sc., Chemistry**, University of Virginia **May 2009**  
“A Photochemically Activated, Oxygen Consuming TiO<sub>x</sub> Sol-Gel Film”  
Adviser: John T. Yates, Jr.
- I. E. S. Paris and l’Université de Paris IV - Sorbonne** **Sept - Dec 2006**  
Courses (in French) at the I.E.S. Paris Center and l’Université de Paris IV - Sorbonne.
- Research Experience**
- Postdoctoral Research**, University of Texas at Austin **Oct 2015 - Present**  
Adviser: Carlos Baiz  
Investigation of ion binding, energy exchange, and conformational dynamics of calcium-sensing protein calmodulin using ultrafast 2D IR spectroscopy, molecular dynamics simulations, and FTIR. Notable experience includes:
- Building an ultrafast 2DIR spectrometer and writing original data acquisition and control software.
  - Mentoring several undergraduate and graduate students.
  - Developing models of solvation, ion binding, and conformational dynamics using FTIR spectroscopy, 2D IR spectroscopy, molecular dynamics simulations, and electronic structure calculations.
- Graduate Research**, Princeton University **Sept 2009 - Sept 2015**  
Study of oxidation dynamics on Pt surfaces using state-resolved infrared laser absorption spectroscopy and mass spectrometry. Notable experience includes:
- Investigating reaction dynamics through analysis of product CO<sub>2</sub>’s rotational-vibrational state population and mass spectrometry of the product stream.
  - Rebuilding a flow reactor system and building a thermal desorption spectroscopy (TDS) system using parts available in our lab.
  - Writing original software in Python and LabView for the efficient processing and analysis of experimental data, most notably for state-resolved infrared spectra.
- Undergraduate Research**, University of Virginia **Sept 2007 - May 2009**  
Research in the lab of Professor John T. Yates, Jr. on multiple surface science research projects involving:
- Infrared and UV/VIS spectroscopy of titanium sub-oxide films.
  - Thermal desorption spectroscopy studies of organic molecules on single-walled carbon nanotubes.
- Teaching Experience**
- Graduate Concentration in Teaching and Mentoring** **Sept 2016 - June 2018**  
College of Natural Sciences, University of Texas at Austin

**Senior Graduate Fellow** May 2013 - June 2015  
McGraw Center for Teaching and Learning, Princeton University

**Graduate Fellow** May 2012 - May 2013  
McGraw Center for Teaching and Learning, Princeton University

**Resident Graduate Student** Sept 2010 - May 2014  
Butler Residential College, Princeton University

**Teaching Assistant** Sept 2010 - May 2012  
Departments of Chemistry and Near Eastern Studies, Princeton University

**Teaching Assistant** Jan 2008 - May 2008  
Department of Chemistry, University of Virginia

**Technical Skills** **Experimental design:** Optics and ultrafast lasers; design, construction, and maintenance of ultrahigh vacuum apparatus and instrumentation; machining  
**Experimental techniques:** Ultrafast two-dimensional infrared spectroscopy, Fourier transform infrared spectroscopy, laser absorption spectroscopy, mass spectrometry, X-ray photoelectron spectroscopy, scanning tunneling microscopy, scanning electron microscopy, thermal desorption spectroscopy  
**Computer languages and software:** Python, MATLAB, LabView, PHP, SQL, HTML, CSS, Java, C, OpenMP, Gaussian, GROMACS, various flavors of Linux and BSD

**Publications** Halling, DB\*; **Edington, SC\***; Bennett, SM, ; Middendorf, TR; Baiz, CR; and Aldrich, RW. "Small biochemical perturbations disrupt protein function". In preparation.

**Edington, SC** and Bernasek, SL. "Elucidating the reaction dynamics of catalytic acetaldehyde oxidation on polycrystalline platinum". In preparation.

**Edington, SC** and Baiz, CR. "Vibrational relaxation in EDTA is ion-dependent". Accepted. *J. Phys. Chem. A*, **2018**, XXX, XXX-XXX.

**Edington, SC**; Gonzalez, A; Middendorf, TR; Halling, DB; Aldrich, RW; and Baiz, CR. "Coordination to trivalent lanthanide ions distorts binding site conformation in calmodulin". *Proc. Natl. Acad. Sci. U.S.A.*, **2018**, 115 (14), pp E3126-E3134.

**Edington, SC**; Flanagan, JC; Baiz, CR. "An Empirical IR Frequency Map For Ester C=O Stretching Vibrations". *J. Phys. Chem. A*, **2016**, 120 (22), pp 3888-3896.

Li, JG; Kim, S; **Edington, S**; Nedy, J; Cho, S; Lee, K; Heeger, AJ; Gupta, MC; Yates, JT. "A study of stabilization of P3HT/PCBM organic solar cells by photochemical active TiO<sub>x</sub> layer". *Sol. Ener. Mat. Sol. Cells*, **2011**, 95 (4), pp 1123-1130.

Buttner, M; Xiao, L; Mandetort, L; **Edington, S**; Johnson, JK; Yates, JT. "Enhancement of Adsorption Inside Single Walled Carbon Nanotubes - Li Doping Effect on n-Heptane van der Waals Bonding". *Phys. Chem. C*, **2009**, 113 (12), pp 4829-4838.

**Edington, S**. "Temperature-Programmed Desorption of n-Heptane from Single-Walled Carbon Nanotubes". *The Virginia Journal of Undergraduate Research*, Spring 2008.

**Presentations scheduled** "Probing ion coordination and energy exchange in chelate complexes with ultrafast vibrational spectroscopy" **Edington, SC** and Baiz, CR. Oral presentation at 256th ACS

National Meeting, Aug 19-23, 2018, Boston, MA.

“Revealing ion- and mutation-dependent structure and dynamics in calmodulin’s ion binding sites with ultrafast vibrational spectroscopy” **Edington, SC**; Halling, BD; Middendorf, TR; Aldrich, RW; and Baiz, CR. Oral presentation at 256th ACS National Meeting, Aug 19-23, 2018, Boston, MA.

“Interrogating coordination and energy exchange in ion binding structures with ultrafast infrared spectroscopy” **Edington, SC**; Halling, BD; Middendorf, TR; Aldrich, RW; and Baiz, CR. Poster at Vibrational Spectroscopy GRC, July 29 - Aug 3, 2018, Biddeford, ME.

“Mapping binding conformation and energy exchange in chelate complexes and biomolecules with Redfield theory, electronic structure calculations, and 2D IR spectroscopy” **Edington, SC**; Halling, BD; Middendorf, TR; Aldrich, RW; and Baiz, CR. Poster at Vibrational Spectroscopy GRS, July 28-29, 2018, Biddeford, ME.

“Probing biological ion binding with 2D IR spectroscopy” **Edington, SC**; Halling, BD; Middendorf, TR; Aldrich, RW; and Baiz, CR. Oral presentation at Vibrational Spectroscopy GRS, July 28-29, 2018, Biddeford, ME.

Presentations  
delivered

“Probing the structure and dynamics of biological ion binding with time-resolved infrared spectroscopy” **Edington, SC**. Talk given at Yale University Department of Chemistry, May 31, 2018, New Haven, CT.

“Probing ion-dependent changes to calmodulin binding site conformation with FTIR and ultrafast 2D IR spectroscopy” **Edington, SC**; Gonzalez, A; Middendorf, TR; Halling, BD; Aldrich, RW; and Baiz, CR. Oral presentation at 255th ACS National Meeting, Mar 18-22, 2018, New Orleans, LA.

“What does it take to be a scientist?” **Edington, SC**. Talk given at O’Henry Middle School as part of Classroom Science Days, AAAS Annual Meeting 2018, Feb 15-19, 2018, Austin, TX.

“Revealing the dynamics that control protein and biomolecule activity using FTIR and ultrafast 2DIR spectroscopy in combination with molecular dynamics simulations” **Edington, SC**; Middendorf, TR; Aldrich, RW; and Baiz, CR. Poster at 254th ACS National Meeting, Aug 20-24, 2017, Washington, DC.

“Active, exploratory learning in physics, chemistry, and biology through cutting-edge biophysics research” **Edington, SC**. Oral presentation at Austin Area STEM Conference, Aug 2-5, 2016, Austin, TX.

“Elucidating the mechanism of heterogeneous acetaldehyde oxidation on polycrystalline platinum through flow cell studies” **Edington, SC** and Bernasek, SL. Oral presentation at 76<sup>th</sup> Physical Electronics Conference, June 20-23, 2016, Fayetteville, AR.

“An Empirical IR Frequency Map For Ester C=O Stretching Vibrations” **Edington, SC**; Flanagan, JC; Baiz, CR. Poster at Southwest Ultrafast Conference, June 16-17, 2016, Austin, TX.

“Probing catalytic oxidation dynamics on platinum with state-resolved diode laser spectroscopy” **Edington, SC**. Talk given at U.T. - Austin Department of Chemistry, Sept 18, 2015, Austin, TX.

“Probing catalytic oxidation dynamics on platinum with state-resolved diode laser spectroscopy” **Edington, SC**. Talk given at Harvard Department of Chemistry, Aug 11, 2015, Cambridge, MA.

“Internal energy of CO<sub>2</sub>(g) formed by the catalytic oxidation of acetaldehyde on a polycrystalline platinum surface” **Edington, SC** and Bernasek, SL. Oral presentation at 74<sup>th</sup> Physical Electronics Conference, June 25-27, 2014, LaCrosse, WI.

“Eddy Covariance Measurements of CO<sub>2</sub> and Water Vapor Fluxes in a Heterogeneous Landscape on the Princeton University Campus” **Edington, S** and Smith, J. Poster at Mid-Infrared Technologies for Health and the Environment Workshop, Aug 5-10, 2007, Princeton, NJ.

**Professional /  
Community  
Activities**

American Chemical Society (Mar 2009 - Present)  
American Association for the Advancement of Science (Mar 2009 - Present)  
American Physical Society (Aug 2015 - Present)  
Princeton University Graduate Student Government (Nov 2011 - Jun 2015)  
*President Mar 2014 - Mar 2015*  
Chemistry Graduate Student Organization (Jan 2010 - Jun 2015)  
*President Jun 2011 - Jun 2012*  
National Society of Collegiate Scholars  
Phi Eta Sigma National Honor Society  
Golden Key National Honors Society