

KRISTEN LYNN ZURASKI

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EDUCATION

- Doctor of Philosophy in Physical Chemistry 2013-2018
University of Southern California
- Bachelor of Science in Chemistry 2008-2012
Michigan State University

RESEARCH EXPERIENCE

Research Assistant at University of Southern California 2013 – 2018

- Advisor: Dr. Hanna Reisler
- Experimental studies on the molecular dissociation dynamics of small atmospherically relevant clusters
 - Focus involved fundamental studies of the $\text{HCl}_m\text{H}_2\text{O}_n$ ($m = 1-3$, $n = 0-3$) hydrogen-bonded clusters. The largest observed being the $\text{HCl}-(\text{H}_2\text{O})_3$ tetramer. Clusters of all sizes were introduced into a high vacuum chamber via a pulsed molecular beam. The cluster of interest was then selected by infrared irradiation that was absorbed to induce dissociation to HCl , H_2O , and $\text{HCl}_m\text{H}_2\text{O}_n$ fragments. The monomers were detected in selected ro-vibrational states by resonance enhanced multiphoton ionization in tandem with time-of-flight mass spectrometry and velocity map imaging.
 - Goal of this project was to learn about the dissociation pathways, product energy distributions, and dissociation energies for individual clusters. Combined with other studies, this provides a better understanding of hydrogen bonding and acid solvation on a larger scale.
- *Presentations:*
 1. 62nd Pacific Conference on Spectroscopy and Dynamics, **2015** (poster): [Kristen Zuraski](#), [Daniel Kwasniewski](#), Amit Samanta, and Hanna Reisler, “A Step Closer to Understanding Acid Solvation: Dissociation Dynamics of Mixed HCl and H₂O Clusters”
 2. The 2015 International Chemical Congress of Pacific Basin Societies, **2015** (poster): [Kristen Zuraski](#), Daniel Kwasniewski, Amit Samanta, and Hanna Reisler, “A Step Closer to Understanding Acid Solvation: Dissociation Dynamics of the $\text{HCl}-(\text{H}_2\text{O})_3$ Tetramer”
 3. Gordon Research Conference on Molecular Interactions & Dynamics, **2016** (poster): [Kristen Zuraski](#), [Daniel Kwasniewski](#), Amit Samanta, and Hanna Reisler, “Farewell to HCl: Dissociation Dynamics of Mixed HCl and H₂O Clusters”
 4. Gordon Research Seminar on Molecular Interactions & Dynamics, **2016** (talk): Kristen Zuraski, “Imaging Studies of Small HCl and H₂O Mixed Clusters”
 5. Conference on the Dynamics of Molecular Collisions, **2017** (poster): Kristen Zuraski, [Daniel Kwasniewski](#), and Hanna Reisler, “Hats Off to HCl: Dissociation Dynamics of the $\text{HCl}-(\text{H}_2\text{O})_3$ Tetramer”
- *Awards:* Women in Science and Engineering Travel Grants
- *Publication:*
 1. Zuraski, K.; Kwasniewski, D.; Samanta, A., Reisler, H. Vibrational Predissociation of the $\text{HCl}-(\text{H}_2\text{O})_3$ Tetramer *J. Phys. Chem. Lett.* **2016**, 7, 4243.
 2. Zuraski, K.; Wang, K., Kwasniewski, D.; Bowman, J. Reisler, H. Predissociation Dynamics for the $\text{HCl}-(\text{H}_2\text{O})_3$ Tetramer: An Experimental and Theoretical Investigation *J. Chem. Phys.* **2018**, 148, 204303.

Graduate Internship at NASA's Jet Propulsion Laboratory in Pasadena, California May 2017- Present

- Advisor: Stanley Sander
- Experimental Kinetics Studies for Atmospheric Chemistry Applications
 - Focused on the effects of pressure, temperature, and hydration levels on the kinetics of radical reaction species that are dominant in the upper troposphere. Specifically, the reaction of hydroxyethylperoxy radical with nitric oxide, and the branching ratios to ozone production and destruction pathways. Initial methods involved chemical ionization in a variable injector position flow tube followed by analysis by a quadrupole mass spectrometer. Initial studies were used in preparation to

work performed at Advanced Light Source at the Lawrence Berkeley National Lab (LBNL). Here, multiplexed mass spectrometry with photoionization by tunable-synchrotron radiation was used to obtain full sets of data as a function of mass, photon energy, and time after the reaction.

- Goal of this project was to accurately determine kinetic information and branching ratios for these reactions to address uncertainties in atmospheric modeling of climate change.

- Additional Training at JPL: Electrical Safety, Pressure Safety, Cryo Safety, Hazardous Waste Training, Chemical Safety Training, Ethics Training, Cyber Security Training, Laser Safety Training
- Additional Training at LBNL: Running the MPIMS instrument on Beamline 9.0.2, chemical hygiene and safety training, general radiological training, safety at the ALS training, and laser safety training

Research Assistant at Michigan State University

2010-2012

- Advisor: Marcos Dantus
- Project on studying the effects of infrared irradiation on whole body organisms
- Training in ultrafast laser systems, second and third harmonic light generation, two-photon imaging, and multiphoton intrapulse interferometry phase scan pulse shaping
- *Presentations*
 1. Nonlinear Optics in 50 Symposium, **2011** (poster): Kristen Zuraski, Ilyas Saytashev, Nelson Winkler, Marcos Dantus “Imaging Photodamage in Full-bodied Organisms Induced by Ultrafast Laser Pulses”
 2. Midwestern Symposium on Undergraduate Research in Chemistry, **2011** (poster): Kristen Zuraski, Ilyas Saytashev, Nelson Winkler, Marcos Dantus “Imaging Photodamage in Full-bodied Organisms Induced by Ultrafast Laser Pulses”
- *Awards:*
 1. Image of the Week Award in Optics and Photonics News (2011),
 2. Midwestern Symposium Research Best Poster Award (2011)
- *Publications:*
 1. Saytashev, I.; Arkhipov, S.; Winkler, N.; Zuraski, K., Lozovoy, V., Dantus, M. Pulse Duration and Energy Dependence of Photodamage and Lethality Induced by Femtosecond Near Infrared Laser Pulses in *Drosophila melanogaster*, *Journal of Photochemistry and Photobiology B: Biology* **2012**, *115*, 42–50.

LEADERSHIP ROLES AT USC

- Graduate Student Government, Director of Finance
- Chemistry Graduate Student Government, Officer
- Women in Chemistry, Officer
- Research Group Safety Officer