

## Curriculum Vitae

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Department of Chemistry  
Chapman University  
Orange, CA 92866

(714) 744-7660  
[larue@chapman.edu](mailto:larue@chapman.edu)

### Education

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**University of California at Santa Barbara**, Santa Barbara, CA

*Ph.D* in Physical Chemistry, March 2011

Advisor: Professor Alec Wodtke

Dissertation title: Studies of Non-Adiabatic Effects at the Gas-Surface Interface

**Willamette University**, Salem, OR

B.A. in Chemistry with minors in Mathematics and Physics, May 2004

Graduated cum laude

### Teaching Experience

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**Chapman University**, Orange, CA

*Assistant Professor of Chemistry*

August 2015 - Present

**Willamette University**, Salem, OR

*Visiting Assistant Professor of Chemistry*

August 2014 – December 2014

### Research Experience

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**Chapman University**, Orange, CA

*Assistant Professor of Chemistry*

August 2015 - Present

Use Raman and x-ray spectroscopies to understanding the fundamental processes that occur during catalytic reactions and bridge the pressure gap between ultra-high vacuum conditions and real-world catalytic conditions.

**SUNCAT Center for Catalysis, Stanford University / SLAC National Accelerator Laboratory**, Menlo Park, CA

*Postdoctoral Scholar*

August 2011 - 2015

Investigated the reaction dynamics of bond breakage and bond formation during catalytically relevant reactions, such as CO oxidation and the Fischer-Tropsch process, using optical lasers, x-ray spectroscopies, and THz radiation.

**Department of Chemistry and Biochemistry, University of California at Santa Barbara**, Santa Barbara, CA

*Research Assistant*

August 2005 - March 2011

Examined the importance and mechanisms of non-adiabatic energy transfer during chemical encounters and the role they play in heterogeneous catalysis.

**Dalian Institute of Chemical Physics**, Dalian, China

*Extended Research Visit Fellow*

June 2007 - September 2007

Used two-photon photoemission (2PPE) to probe the ultrafast excited electron dynamics and photochemical kinetics of molecules adsorbed on catalytic surfaces.

### Publications

J. LaRue, H. Öberg, H. Xin, M. Beye, M. L. Ng, F. Sorgenfrei, G. Mercurio, S. Moeller, H. Öström, A. Föhlisch, M. Wolf, W. Wurth, M. Persson, J. K. Nørskov, F. Abild-Pedersen, H. Ogasawara, L. G. M. Pettersson, A. Nilsson, Electronic structure mapping during catalytic CO hydrogenation on Ru, *In manuscript*

M. Beye, H. Öberg, H. Xin, G. L. Dakovski, M. Dell'Angela, A. Föhlisch, J. Gladh, M. Hantschmann, F. Hieke, S. Kaya, D. Kühn, J. LaRue, G. Mercurio, M. P. Minitti, A. Mitra, S. P. Möller, M. L. Ng, A. Nilsson, D. Nordlund, J. Nørskov, H. Öström, H. Ogasawara, M. Persson, W. F. Schlotter, J. A. Sellberg, M. Wolf, F. Abild-Pedersen, L. G. M. Pettersson, W. Wurth, Ultrafast Observation of Activated Chemisorbed Oxygen, *Submitted*

J. LaRue, A. Lindenberg, A. Fisher, H. Ogasawara, A. Nilsson, THz-induced catalytic reaction of CO oxidation, *Physical Review Letters* **115**(3) (2015) 036103; DOI: 10.1103/PhysRevLett.115.036103

H. Xin, J. LaRue, H. Öberg, H. Öström, M. Beye, M. Dell'Angela, R. Coffee, J. Gladh, M. L. Ng, J. A. Sellberg, S. Kaya, F. Sorgenfrei, G. Mercuri, D. Nordlund, W. F. Schlotter, J. Turner, A. Föhlisch, M. Wolf, W. Wurth, H. Ogasawara, J. K. Nørskov, L. G. M. Pettersson, A. Nilsson, F. Abild-Pedersen, Strong Influence of the Coadsorbate Interaction on CO Desorption Dynamics, *Physical Review Letters* **114**(15) (2015) 156101; DOI: 10.1103/PhysRevLett.114.156101

H. Öberg, J. Gladh, M. Dell'Angela, T. Anniyev, M. Beye, R. Coffee, A. Föhlisch, T. Katayama, S. Kaya, J. LaRue, A. Møgelhøj, D. Nordlund, H. Ogasawara, W. F. Schlotter, J. A. Sellberg, F. Sorgenfrei, J. J. Turner, M. Wolf, W. Wurth, H. Öström, A. Nilsson, J. K. Nørskov, L. G. M. Pettersson, Optical Laser-Induced CO Desorption from Ru(0001) Monitored with a Free-Electron X-ray Laser: DFT Prediction and X-ray Confirmation of a Precursor State, *Surface Science*; DOI: 10.1016/j.susc.2015.03.011

H. Öström, H. Öberg, H. Xin, J. LaRue, M. Beye, M. Dell'Angela, J. Gladh, M. L. Ng, J. A. Sellberg, S. Kaya, F. Sorgenfrei, G. Mercurio, D. Nordlund, W. F. Schlotter, A. Föhlisch, M. Wolf, W. Wurth, M. Persson, J. K. Nørskov, F. Abild-Pedersen, H. Ogasawara, L. G. M. Pettersson, A. Nilsson, Probing the Transition State Region in Catalytic CO Oxidation on Ru, *Science* **2015**, *347*, 978-982, DOI: 10.1126/science.1261747

M. Dell'Angela, T. Anniyev, M. Beye, R. Coffee, A. Föhlisch, J. Gladh, T. Katayama, S. Kaya, O. Krupin, A. Møgelhøj, D. Nordlund, J. K. Nørskov, H. Öberg, H. Ogasawara, H. Öström, L. G. M. Pettersson, W. F. Schlotter, J. A. Sellberg, F. Sorgenfrei, J. LaRue, J. Turner, M. Wolf, W. Wurth, A. Nilsson, Real-Time Observation of Surface Bond Breaking with an X-ray Laser, *Science* **2013**, *339*, 1302, DOI: 10.1126/science.1231711

J. LaRue, T. Schäfer, D. Matsiev, L. Velarde, H. Nahler, D. J. Auerbach, A. M. Wodtke, Electron Kinetic Energies from Vibrationally Promoted Surface Exoemission: Evidence for a Vibrational Autodetachment Mechanism, *J. Phys. Chem. A* **2011**, *115*, 14306–14314, DOI: 10.1021/jp205868g

B. C. Knott, J. L. LaRue, A. M. Wodtke, M. F. Doherty, B. Peters, Laser-induced nucleation of a volatile solute - bubble formation in supersaturated aqueous carbon dioxide solutions, *J. Chem. Phys.* **2011**, *134*, 171102, DOI: 10.1063/1.3582897

J. LaRue, T. Schäfer, D. Matsiev, L. Velarde, H. Nahler, D. J. Auerbach, A. M. Wodtke, Kinetic energy distributions of vibrationally promoted exoelectrons at a metal surface, *Physical Chemistry Chemical Physics* **2011**, *13* (1), 97-99, DOI: 10.1039/c0cp01626h

C. Zhou, Z. Ren, S. Tan, Z. Ma, X. Mao, D. Dai, H. Fan, X. Yang, J. LaRue, R. Cooper, A. M. Wodtke, Z. Wang, Z. Li, B. Wang, J. Yang, J. Hou, Site-specific photocatalytic splitting of methanol on TiO<sub>2</sub>(110), *Chemical Science* **2010**, *1*, 575-580, DOI: 10.1039/C0SC00316F

## Jerry LaRue

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Z. Ren, C. Zhou, Z. Ma, C. Xiao, X. Mao, D. Dai, J. LaRue, R. Cooper, A. M. Wodtke, X. Yang, A Surface Femtosecond Two-Photon Photoemission Spectrometer for Excited Electron Dynamics and Time-Dependent Photochemical Kinetics, *Chin. J. Chem. Phys.* **2010**, *23* (3), 255-261, DOI: 10.1088/1674-0068/23/03/255-261

L. Verlarde, P. Engelhart, D. Matsiev, J. LaRue, D. J. Auerbach, A. M. Wodtke, Generation of tunable narrow bandwidth nanosecond pulses in the deep-ultraviolet for efficient optical pumping and high resolution spectroscopy, *Rev. Sci. Instrum.* **2010**, *81*, 063106, DOI: 10.1063/1.3436973

N. H. Nahler, J. D. White, J. LaRue, D. J. Auerbach, A. M. Wodtke, Inverse Velocity Dependence of Vibrationally Promoted Electron Emission from a Metal Surface, *Science* **2008**, *321*, 1191-1194, DOI: 10.1126/science.1160040

J. L. LaRue, J. D. White, N. H. Nahler, Z. Liu, S. Sun, P. A. Pianetta, D. J. Auerbach, A. M. Wodtke, The work function of sub-monolayer cesium-covered gold: A photoelectron spectroscopy study, *J. Chem. Phys.* **2008**, *129*, 024709, DOI: 10.1063/1.2953712

### Presentations

*Attosecond Processes in Surface Dynamics*, LCLS Annual Users' Meeting and Workshop, SLAC National Accelerator Laboratory, October 2015

*Probing the evolution of chemical reactions on metal surfaces in real time: CO hydrogenation on ruthenium*, Gordon Research Seminar on Dynamics at Surfaces, Salve Regina University, August 2015

*Caught in the Act! Chemical Reactions Exposed*, SLAC National Accelerator Laboratory Public Lecture Series, SLAC National Accelerator Laboratory, May 2015

*Probing chemical reactions on surfaces in real time*, SLAC National Accelerator Laboratory Photon Science Seminar, SLAC National Accelerator Laboratory, January 2015

*Ultrafast Probing of Chemical Reactions using X-rays from a Free-Electron Laser*, AVS 60<sup>th</sup> International Symposium and Exhibition, Long Beach, CA, October 2013

*Translational promotion of electron emission at metal surfaces*, PIRE-ECCI Workshop on Heterogeneous Catalysis and Surface Science, Dalian Institute of Chemical Physics, June 2007

*Vibrational Promotion of Electron Emission at Metal Surfaces*, PIRE-ECCI, University of California at Santa Barbara, September 2006

### Honors and Awards

2014 - 2015 Carl Tryggers Foundation Scholar

2014 - 2015 Max Planck Institute Fellow

2007 PIRE- ECCI Graduate Fellowship

2006 Phi Lambda Upsilon Member, National Honorary Chemical Society

2000 - 2004 Willamette Oregon Scholar Scholarship

2003 Willamette University Physical Chemistry Award

2003 Willamette University Summer Undergraduate Summer Research Fellowship

2002 - 2003 Florian Von Eschen Chemistry Scholarship

2001 - 2002 William Long Scholarship