

Christopher G. Elles

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RESEARCH INTERESTS

Condensed-phase chemical reaction dynamics; Excited-state dynamics of photochromic molecular switches, photo-triggers, and photoactive materials; Nanoplasmon-mediated photochemistry; Ultrafast laser spectroscopy

ACADEMIC APPOINTMENTS

Associate Professor, University of Kansas, *2016-present*
Assistant Professor, University of Kansas, *2009-2016*
Visiting Professor, University of Rome "La Sapienza", *Summer 2012*

EDUCATION

Postdoc, University of Southern California and Argonne National Laboratory, *2004-2009*
Research Project: *Reaction mechanisms in the ionization of liquid water*
Advisors: Stephen E. Bradforth (USC) and Robert A. Crowell (ANL)
Ph.D., Chemistry, University of Wisconsin–Madison, *July 2004*
Dissertation: *Vibrational relaxation and photodissociation dynamics in solution*
Advisor: F. Fleming Crim
B.S., Chemistry, Colorado State University, *May 1999*
Research Project: *Characterization of non-aqueous and mixed-solute reverse micelles*
Advisor: Nancy E. Levinger

SELECTED AWARDS

Finalist, Honor for an Outstanding Progressive Educator (H.O.P.E.) Award, Univ. of Kansas, *2016*
J. Michael Young Academic Advisor Award, University of Kansas, *2016*
National Science Foundation CAREER Award, *2012-2017*
University of Rome Visiting Professorship, *2012*
Kansas NSF EPSCoR First Award, *2011*
Arthur Adamson Postdoctoral Award in Chemistry, University of Southern California, *2009*
Excellence in Physical Chemistry Research Award, University of Wisconsin, *2004*
Chemistry Undergraduate Research Award, Colorado State University, *1999*
Sigma Xi Grant-in-Aid of Research, *1998*

AFFILIATIONS

American Association for the Advancement of Science, *2004-present*
American Chemical Society, *1998-present*

PUBLICATIONS

Based on work performed at KU:

24. M. de Wergifosse, A. L. Houk, A. I. Krylov, and C. G. Elles, *Two-photon absorption spectroscopy of trans-stilbene, cis-stilbene, and phenanthrene: Theory and experiment*, Journal of Chemical Physics (submitted 12/13/2016).
23. M. de Wergifosse, C. G. Elles, and A. I. Krylov, *Two-photon absorption spectroscopy of stilbene and phenanthrene: Excited-state analysis and comparison with ethylene and toluene*, Journal of Chemical Physics (submitted 12/13/2016).

22. G. Batignani, E. Pontecorvo, C. Ferrante, M. Aschi, C. G. Elles, and T. Scopigno, *Visualizing excited-state dynamics of a diaryl thiophene: Femtosecond stimulated Raman scattering as a probe of conjugated molecules*, *Journal of Physical Chemistry Letters*, **7**, 2981 (2016).
21. A. L. Houk, R. S. Givens, and C. G. Elles, *Two-photon activation of p-hydroxyphenacyl phototrigger: Toward spatially controlled release of diethyl phosphate and ATP*, *Journal of Physical Chemistry B*, **120**, 3178 (2016).
20. A. L. Houk, I. L. Zheldakov, T. A. Tommey, and C. G. Elles, *Two-photon excitation of trans-stilbene: Spectroscopy and dynamics of electronically excited states above S₁*, *Journal of Physical Chemistry B*, **119**, 9335 (2015).
19. B. Langdon, J. Garlick, X. Ren, D. J. Wilson, A. M. Summers, S. Zigo, M. F. Kling, S. Lei, C. G. Elles, E. Wells, E. D. Poliakoff, K. D. Carnes, V. Kumarappan, I. Ben-Itzhak, and C. A. Trallero-Herrero, *A carrier-envelope-phase stabilized terawatt class laser at 1 kHz with a wavelength tunable option*, *Optics Express*, **23**, 4563 (2015).
18. C. L. Ward and C. G. Elles, *Cycloreversion dynamics of a photochromic molecular switch via one-photon and sequential two-photon excitation*, *Journal of Physical Chemistry A*, **118**, 10011 (2014).
17. E. Pontecorvo, C. Ferrante, C. G. Elles, and T. Scopigno, *Structural rearrangement accompanying the ultrafast electrocyclization reaction of a photochromic molecular switch*, *Journal of Physical Chemistry B*, **118**, 6915 (2014).
16. I. L. Zheldakov, O. Grinevich, A. Mejiritski, C. G. Elles, and D. C. Neckers, *Transient spectroscopy of 5,7-diiodo-3-butoxy-6-fluorone (DIBF)*, *Photochemistry and Photobiology*, **90**, 335 (2014).
15. L. Sarkany, J. M. Wasylenko, S. Roy, D. A. Higgins, C. G. Elles, and V. Chikan, *Investigation of fluorescence emission from CdSe nanorods in PMMA and P3HT/PMMA films*, *Journal of Physical Chemistry C*, **117**, 18818 (2013).
14. E. Pontecorvo, C. Ferrante, C. G. Elles, and T. Scopigno, *Optimally shaped narrowband pulses for femtosecond stimulated Raman spectroscopy in the range 330-750 nm*, *Optics Express*, **21**, 6866 (2013).
13. C. L. Ward and C. G. Elles, *Controlling the excited-state reaction dynamics of a photochromic molecular switch with sequential two-photon excitation*, *Journal of Physical Chemistry Letters*, **3**, 2995 (2012).
12. I. L. Zheldakov, J. M. Wasylenko, and C. G. Elles, *Excited-state dynamics and efficient triplet formation in phenylthiophene compounds*, *Physical Chemistry Chemical Physics*, **14**, 6211 (2012).

Prior to joining KU:

11. O. Marsálek, C. G. Elles, P. A. Pieniazek, Eva Pluhařová, J. Vande Vondele, S. E. Bradforth, and P. Jungwirth, *Chasing charge localization and chemical reactivity following photoionization in liquid water*, *Journal of Chemical Physics*, **135**, 224510 (2011).
10. C. G. Elles, C. A. Rivera, Y. Zhang, P. A. Pieniazek, and S. E. Bradforth, *Electronic structure of liquid water from polarization-dependent two-photon absorption spectroscopy*, *Journal of Chemical Physics*, **130**, 084501 (2009).
9. C. G. Elles, I. A. Shkrob, R. A. Crowell, D. A. Arms, and E. C. Landahl, *Transient x-ray absorption spectroscopy of hydrated halogen atom*, *Journal of Chemical Physics*, **128**, 061102 (2008).
8. C. G. Elles, I. A. Shkrob, R. A. Crowell, and S. E. Bradforth, *Excited state dynamics of liquid water: Insight from the dissociation reaction following two-photon excitation*, *Journal of Chemical Physics*, **126**, 164503 (2007).
7. C. G. Elles, A. E. Jailaubekov, R. A. Crowell, and S. E. Bradforth, *Excitation-energy dependence of the mechanism for two-photon ionization of liquid H₂O and D₂O from 8.3 to 12.4 eV*, *Journal of Chemical Physics*, **125**, 044515 (2006).
6. C. G. Elles and F. F. Crim, *Connecting chemical dynamics in gases and liquids*, *Annual Review of Physical Chemistry*, **57**, 273 (2006).

5. L. Sheps, A. C. Crowther, C. G. Elles, and F. F. Crim, *Recombination dynamics and hydrogen abstraction reactions of chlorine radicals in solution*, Journal of Physical Chemistry A, **109**, 4296 (2005).
4. C. G. Elles, M. J. Cox, G. L. Barnes, and F. F. Crim, *Recombination and reaction dynamics following photodissociation of CH₃OCl in solution*, Journal of Physical Chemistry A, **108**, 10973 (2004).
3. C. G. Elles, M. J. Cox, and F. F. Crim, *Vibrational relaxation of CH₃I in the gas phase and in solution*, Journal of Chemical Physics, **120**, 6973 (2004).
2. C. G. Elles, D. Bingemann, M. M. Heckscher, and F. F. Crim, *Vibrational relaxation of CH₂I₂ in solution: Excitation level dependence*, Journal of Chemical Physics, **118**, 5587 (2003).
1. C. G. Elles and N. E. Levinger, *Reverse micelles solubilizing DMSO and DMSO/water mixtures*, Chemical Physics Letters, **317**, 624 (2000).

RECENT AND FORTHCOMING TALKS

New Directions in Chemical Education, Midwest Regional Meeting of ACS, Lawrence, KS (Oct. 2017)
Chemistry and Dynamics in Complex Environments, Telluride, CO (June 2017)
253rd National Meeting of the American Chemical Society, San Francisco, CA (April 2017)
Department of Physics, Kansas State University, Manhattan, KS (March 2017)
Department of Chemistry, Western Kentucky University, Bowling Green, KY (February 2017)
Department of Chemistry & Biochemistry, Montana State University, Bozeman, MT (October 2016)
Spectroscopy and Dynamics on Multiple Potential Energy Surfaces, Telluride, CO (July 2016)
Southwest Ultrafast Conference, University of Texas, Austin, TX (June 2016)
Modeling the Unseen in the Physical Sciences, Manhattan, KS (June 2016)
Department of Chemistry, University of Missouri–Kansas City, Kansas City, MO (November 2015)
Department of Chemistry, University of Wisconsin, Madison, WI (October 2015)
250th National Meeting of the American Chemical Society, Boston, MA (August 2015)
Chemistry and Dynamics in Complex Environments, Telluride, CO (June 2015)
XVIIth Intl. Conference on Time-Resolved Vibrational Spectroscopy, Madison, WI (June 2015)
Connecting Physics with the Next Generation Science Standards, Manhattan, KS (June 2015)
Department of Chemistry, University of Nebraska, Lincoln, NE (April 2015)
Department of Chemistry, State University of New York at Buffalo, Buffalo, NY (April 2015)
249th National Meeting of the American Chemical Society, Denver, CO (March 2015)
Department of Chemistry & Biochemistry, Ohio State University, Columbus, OH (March 2015)
Department of Chemistry, University of Louisville, Louisville, KY (February 2015)
Department of Chemistry & Biochemistry, Ohio University, Athens, OH (February 2015)
Department of Chemistry & Biochemistry, University of California, San Diego, CA (February 2015)
Department of Chemistry, University of Southern California, Los Angeles, CA (February 2015)
Spectroscopy and Dynamics on Multiple Potential Energy Surfaces, Telluride, CO (July 2014)
Breaking and Making Bonds with Light Workshop, Telluride, CO (June 2014)
Department of Chemistry, Wichita State University, Wichita, KS (February 2014)
Department of Chemistry, Colorado State University, Fort Collins, CO (February 2014)
Department of Chemistry & Biochemistry, University of Notre Dame, South Bend, IN (Jan. 2014)
Department of Chemistry, Marquette University, Milwaukee, WI (November 2013)
Department of Chemistry, Creighton University, Omaha, NE (October 2013)

Department of Chemistry, Missouri Western State University, St. Joseph, MO (September 2013)
Chemistry and Dynamics in Complex Environments, Telluride, CO (June 2013)
 245th National Meeting of the American Chemical Society, New Orleans, LA (April 2013)
 Department of Chemistry, University of California–Irvine, Irvine, CA (April 2013)
Gordon Research Conference on Molecular Energy Transfer, Ventura, CA (January 2013)

FUNDING

Portable Raman spectrometer. General Research Fund (KU), \$10,000, 2016
Collaborative research: Imaging and controlling ultrafast dynamics of atoms, molecules, and nanostructures. National Science Foundation, RII Track 2, \$132,059 (sub-award), 2014-2017
Ultrafast dynamics of organic and molecular electronics components. American Chemical Society Petroleum Research Fund, \$100,000, 2013-2016
Controlling non-adiabatic reaction dynamics in solution: A window on the fundamental details of chemical reactions. National Science Foundation CAREER Award, \$650,000, 2012-2017
Controlling non-adiabatic dynamics in solution: One- and two-photon excitation of photochromic molecular switches. Kansas NSF EPSCoR First Award, \$71,264, 2011-2012
Molecules in action: Watching and controlling chemical reactions with lasers. New Faculty General Research Fund (KU), \$8,000, 2010-2012

RESEARCH MENTORING

Current Students:

Timothy J. Quincy	5 th year graduate
Matthew S. Barclay	3 rd year graduate (co-advised by M. Caricato)
Christopher J. Otolski	3 rd year graduate
David A. Stierwalt	1 st year graduate
Kristen H. Burns	1 st year graduate
Sadegh Mahvidi	visiting graduate student
Emmaline R. Lorenzo	undergraduate
Brooks Hidaka	undergraduate
Whitney M. Harmon	undergraduate

Visiting Scholar:

Jordan Mantha, Associate Professor, Mid-America Nazarene University (*Summer 2016*)

Former Postdoc:

Dr. Igor L. Zheldakov (2010-2013) Chemist, Spectra Group Inc., Milbury, OH

Former Graduate Students:

Cassandra L. Ward (Ph.D., <i>May 2014</i>)	Postdoc, Wayne State University
Jenna M. (Wasylenko) Lindsey	Teacher, Atchison High School
Amanda L. (Staker) Houk (Ph.D., <i>Oct. 2015</i>)	Sr. Scientist, Savannah River Nat'l. Lab.

Former KU Undergraduates:

Nicholas Jackson	KU undergraduate
Jorge L. Perez	KU undergraduate
Jung Moon Suh	KU undergraduate
Thomas Hurley	
Victoria L. Gunderson (B.A., Chemistry, <i>May 2016</i>)	
Johnathon R. Bliss (B.S., Chemistry, <i>May 2015</i>)	
Graham Oltjen (B.S., Chemistry, <i>May 2014</i>)	Halliburton
William L. Cleek (B.S., Chemistry, <i>May 2013</i>)	KU Medical School
Heidi J. LeSage (B.S., Chemistry, <i>May 2011</i>)	Grad Student, KU School of Ed.
Alyssa Auld (B.S., Chemistry Education, <i>May 2010</i>)	Teacher, Mill Valley HS (KS)

Summer REU Students:

Ryan Hamelin (<i>NSF-REU; Summer 2015</i>)	Fitchburg State Univ. (MA)
Darien J. Morrow (<i>NSF-REU; Summer 2014</i>)	Grad Student, U. of Wisconsin
Samantha L. Allen (<i>NSF-REU; Summer 2013</i>)	Grad Student, U. of Colorado
Tyler A. Tommey (<i>NSF-REU; Summer 2011</i>)	Grad Student, U. of Akron
Joseph M. Varberg (<i>NSF-REU; Summer 2010</i>)	Grad Student, IUPUI

COURSES TAUGHT

CHEM 110 Introductory Chemistry
 CHEM 180 Chemistry Seminar I
 CHEM 511 Biological Physical Chemistry Laboratory
 CHEM 530 Physical Chemistry I
 CHEM 531 Physical Chemistry I Laboratory
 CHEM 536 Physical Chemistry II Laboratory
 CHEM 695 Chemistry Seminar II
 CHEM 700 Responsible Scholarship in the Chemical Sciences
 CHEM 854 Chemical Kinetics and Dynamics

COMMITTEES & SERVICE

University of Kansas:

Faculty Senate & University Senate (elected, 2015-18)
 Undergraduate STEM Education Committee (2013)

College of Liberal Arts & Sciences:

Faculty Mentorship Program (for at-risk undergraduates, 2016-17)
 Committee on Graduate Studies (2012-13, 2015)

Department Committees:

Faculty Performance Review Committee (elected, 2016-19)
 Chemistry REU Program Committee (2015-16)
 Chair Advisory Committee (2010-11, 2015-16)
 Graduate Admissions Committee (2010-15; Chair 2012-14)
 Physical Chemistry Faculty Search Committee (2013)
 Department Chair Search Committee (2013)
 Search Committee for Graduate Programs Assistant (2012, 2014)
 Search Committee for Director of Instrumentation Teaching Laboratories (2011)
 Physics Machine Shop Committee (2011)
 Graduate Recruiting Committee (2009-10, 2016-17)

High School Teacher Development Workshops (co-organizer and presenter):

Connecting the Physics of Waves and Electromagnetic Radiation with the Next Generation Science Standards, Manhattan, KS (June 8-10, 2015)
Seeing the Unseen in Physical Sciences, Manhattan, KS (June 9-10, 2016)
Seeing the Unseen in Physical Sciences, Manhattan, KS (June 15-16, 2017)

Meetings/Symposia Organized:

Spectroscopy and Dynamics on Multiple Potential Energy Surfaces, 72nd International Symposium on Molecular Spectroscopy, Urbana-Champaign, IL (June 19-23, 2017)
Spectroscopy Applied to Structure, Dynamics, and Imaging, American Chemical Society Midwest Regional Meeting (MWRM), Lawrence, KS (October 18-20, 2017)

Proposal Reviews:

Department of Energy, National Science Foundation, Petroleum Research Fund, Ohio University Research Council, Czech Science Foundation (GACR), German Research Foundation (DFG)

Journal Reviews:

Advanced Materials, Applied Sciences, Chemical Physics, Chemical Physics Letters, Chemistry- A European Journal, ChemPhysChem, Colloids and Surfaces, Journal of the American Chemical Society, Journal of Chemical Physics, Journal of Physical Chemistry, Journal of Physical Chemistry Letters, Optical Materials, Physical Chemistry Chemical Physics (PCCP), Science, Science Advances

– January 20, 2017