

**Richard Alan Loomis**  
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Washington University in Saint Louis

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**Professional History:**

2005-present: Associative Professor of Chemistry, Washington University, Saint Louis, MO.  
2003-present: Member Center for Materials Innovation, Washington University, Saint Louis, MO.  
Nanostructured Materials Synthesis Thrust Area, 2003-present.  
Energy Materials Thrust Area, 2005-present – Chair, 2005-present.  
1998-2005: Assistant Professor of Chemistry, Washington University, Saint Louis, MO.

**Education:**

1996-1998: National Research Council Postdoctoral Fellow, National Institute of Standards and Technology, University of Colorado, Boulder, CO. Advisor: Stephen R. Leone.  
1996: Postdoctoral Fellow, University of Colorado, Boulder, CO. Advisor: Stephen R. Leone.  
1989-1995: Ph.D. in Chemistry, University of Pennsylvania, Philadelphia, PA. Advisor: Marsha I. Lester.  
1985-1989: B.S. with Honors, Dickinson College, Carlisle, PA. Advisor: John W. Luetzelschwab.

**Research Interests:**

Physical chemistry, chemical reaction dynamics, chemical kinetics, and molecular spectroscopy especially as these fields pertain to investigating intermolecular interactions and optical properties of nanostructured materials.

The techniques implemented to investigate intermolecular interactions include femtosecond to nanosecond time scale linear and non-linear laser spectroscopy, quantum-mechanical wave packet dynamics and coherent control, and intramolecular and intermolecular energy redistribution. Molecular beam and supersonic expansion techniques are used to lower the internal energies of molecules and to form weakly bound pre-reactive complexes. These complexes represent the launching pad for the subsequent intermolecular dynamics experiments. Coherent control experiments implement closed-loop, genetic learning algorithms to optimize the yield of a specific reaction product by tailoring in both time and amplitude an excitation femtosecond laser pulse. The properties of the optimized laser pulse are then used to extract valuable information about the potential energy surfaces that dictate the reaction of interest.

While the push toward faster and more efficient electronic circuitry relies on the ability to synthesize semiconductor structures on nanometer scales, the optical and electronic properties of these nanostructures are interesting in their own right. We are investigating quantum effects that arise from the reduced dimensionality of semiconductor nanodots and nanowires using absorption and fluorescence spectroscopy. Our group is also developing novel optical microscopy experiments that will enable us to use multiple femtosecond lasers to excite and monitor the dynamics of excitons in and along single nanostructures with temporal and spatial resolution.

**Awards:**

National Science Foundation – CAREER Award (2004).  
David and Lucile Packard Fellowship in Science and Engineering (2001).  
Washington University, Graduate Student Senate – Outstanding Faculty Mentor Award (2008).  
Washington University, Graduate Student Senate – Special Recognition for Excellence in Mentoring (2001, 2007).  
Washington University, Council of Students of Arts and Sciences Faculty Award (2000, 2004, 2008).  
Research Corporation, Research Innovation Awardee (1999).  
Camille and Henry Dreyfus New Faculty Awardee (1998).

National Research Council Postdoctoral Fellowship, NIST and University of Colorado (1996-8).  
Chairman's Teaching Award, Department of Physics, University of Pennsylvania (1990).  
Magna Cum Laude, Dickinson College (1989).  
Horace Elton Rogers Science Award, for "Most Promising Science Student", Dickinson College (1988).  
Dana Fellowship, "Young Researcher's Grant", Dickinson College (1988).  
Charles Zugg Memorial Scholarship, for "Academic Excellence", Dickinson College (1986).

### **Research Grants Received:**

National Science Foundation (#0346745; \$537,665 – 3/1/04 to 2/28/10), “Career: Experimental Investigation of the Dependence of Intermolecular Dynamics on Molecular Orientation.” (*Principal Investigator*)  
David and Lucile Packard Fellowship in Science and Engineering (#2001-18985; \$625,000 – 10/1/01 to 9/30/08), “How Do Molecules React: Determining the Pathways of Radical-Molecule Bimolecular Reactions.” (*Principal Investigator*)  
American Chemical Society – Petroleum Research Fund Series G (#36990-G 6; \$25,000 – 9/1/01 to 8/31/03), “Time-resolved Quantum-mechanical Studies of Photo-initiated Bimolecular Reaction Dynamics.” (*Principal Investigator*)  
Research Corporation – Research Innovation Award (#RI0243; \$35,000 – 1/1/99 – 1/1/03), “Probing and Controlling Ultrafast Radical-Molecule Bimolecular Reaction Dynamics Using Femtosecond Pump-Probe and Optical Pulse Shaping Techniques.” (*Principal Investigator*)  
Camille and Henry Dreyfus Foundation – New Faculty Award (#NF-98-053; \$25,000 – 9/1/98 to 8/31/00), “Probing and Controlling Ultrafast Radical-Molecule Bimolecular Reaction Dynamics.” (*Principal Investigator*)

### **Undergraduate Student Research Advisees:**

Kevin K. Maddox (B.S. Washington University, 2000 – Currently, graduate student at the University of Wisconsin, Madison).  
Andrew C. Crowther (B.S. Washington University, 2002; NSF Predoctoral Fellow 2002 – Currently, graduate student at the University of Wisconsin, Madison).  
David B. Strasfeld (B.S. Washington University, 2004 – Currently, graduate student at the University of Wisconsin, Madison).  
Jeffrey R. Lancaster (B.S. Washington University, 2005 – Currently, graduate student at Columbia University).  
Elizabeth J. Fesser (B.S. Washington University, 2006 – Currently, graduate student at University of Illinois).  
Lauren E. Buchanan (B.S. Washington University, 2008; NSF Predoctoral Fellow 2008 – Currently, graduate student at the University of Wisconsin, Madison).  
Joseph Brown (B.S. Washington University, May 2008 – Currently, student at Northwestern University School of Medical).  
John Cheairs (B.S. Washington University, May 2008 – Currently, graduate student at University of Kentucky).  
Jesse G. McDaniel (B.S. Washington University, May 2008 – Currently, technician in my laboratory).  
Carolyn A. Auchter (B.S. Washington University, expected May 2009).  
Michael A. Love, Jr. (B.A. Morehouse College, expected May 2009).  
Sarah Rajaram (B.A. Washington University, expected May 2010).

### **Washington University Undergraduate Chemistry Major Advisees:**

Neal Burton (B.S., 2001)	Jane Ratner (B.S., 2007)
John T. Russell (B.S., 2002)	Jill Savla (B.S., 2007)
Jennifer Schwartz (B.S., 2002)	Kristen Voss (B.S., 2007)
Beverly R. Chen (B.S., 2003)	Joseph Brown (B.S., expected 2008)
Erin A. Geordi (B.S., 2003)	Lauren E. Buchanan (B.S., expected 2008)
Brian P. Rajca (B.S., 2003)	Lonia R. Friedlander (B.S., expected 2008)
Kathleen M. Antony (B.S., 2004)	Jesse G. McDaniel (B.S., expected 2008)
Robert D. Cooper (B.S., 2004)	Daniel R. Tilden (B.S., expected 2008)
Bryce K. Fukunaga (B.S., 2004)	Musa R. Abdelaziz (B.S., expected 2009)
Navandra H. Gunawardena (B.S., M.S., 2004)	Michael A. Bevilacqua (B.S., expected 2009)
Kevin Mayo (B.S., 2004)	Stephanie Brosius (B.S., expected 2009)
Jeremy O'Brien (B.S., 2004)	Christian A. Koziatek (B.S., expected 2009)
Laura A. Richards (B.S., 2004)	Aaron L. Hecht (B.S., expected 2010)

Corinna J. Yu (B.S., 2004)  
Joshua Zwickl (B.S., 2004)  
Sushant Govindan (B.S., 2006)

Lucy Liu (B.S., expected 2010)  
Lai Xue (B.S., expected 2010)

### **Graduate Student Thesis Advisees:**

Matthew D. Bradke (M.S., Washington University, 2001); currently a Senior Chemist with the Arkansas Department of Health.  
David S. Boucher (Ph.D., Washington University, 2006); currently a Postdoctoral with Fleming Crim, University of Wisconsin.  
Joshua P. Darr (Ph.D., Washington University, 2006); currently a Postdoctoral with Carl Lineberger, Univ. of Colorado.  
John J. Glennon (Ph.D. student, 2004-2007); currently a Senior Staff Scientist with Lockheed Martin Coherent Technologies.  
Kenneth W. Hartman (Ph.D. student, 2006-2007)  
Jessica Hoy (Ph.D. student, 2006-present)  
Virginia L. Wayman (Ph.D. student, 2006-present)  
Jeremy T. Buckingham (Ph.D. student, 2007-present)  
Ashley L. Reinitz (Ph.D. student, 2008-present)  
Kenny Buyle (Ph.D. student, 2008-present)

### **Postdoctoral Fellows:**

Dr. Jeanette A. Fiss (Ph.D., University of Illinois – Chicago, 2000), 11/01/00-10/31/01; present position unknown.  
Dr. Paul R. Winter (Ph.D., University of Colorado, 1999), 07/01/02-11/01/02; currently a Senior Chemistry with Chemir Analytical Services.  
Dr. Bailin Zhang (Ph.D., Dalian Institute of Chemical Physics, 2002), 02/11/03-07/01/03; currently a postdoctoral fellow at Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan.  
Dr. Kevin Raffael (Ph.D., Exeter – Exeter, U.K., 2003), 10/01/06-7/15/07.  
Dr. Todd D. Jaeger (Ph.D., University of Georgia, 2004), 6/15/07-2/23/08; currently a Senior Sales Manager with New Focus Corporation.

### **Teaching Experience at Washington University:**

Molecular Spectroscopy, Chem 584 – graduate level course with 4-10 students, (Spring, 2006 and 2008).  
Special Topics in Physical Chemistry: Modern Spectroscopy, Chem 580 – graduate level course with 14 students, (Spring, 2005).  
Physical Chemistry I, Chem 401 – a junior-level lecture course required for chemistry majors with ≈60 students, (Fall, 2001, 2002, 2006, 2007).  
General Chemistry, Chem 111 – a freshman-level lecture course with 250-280 students in my sections and 600-650 students overall, (Fall, 2000 and 2004).  
Quantum Chemistry, Chem 422 – a senior-level lecture course that was an elective and required for majors with 25 & 50 students, (Fall, 1999 and Spring, 2001).  
Special Topics in Physical Chemistry: Recent Advances in Probing Reaction Dynamics, Chem 580 – a graduate-level lecture course with 5 students, (Fall, 1998).

### **Washington University Service and Committee Activities:**

Washington University Arts and Sciences Faculty Council, (2006-present) – Chair (2008-present).  
Executive Committee of the Graduate Council – Chair, (2005-6, 2007-8).  
Florence Moog Fellowships in the Biological Sciences and Chemistry Selection Committee, (2005-present).  
Faculty Associate for William Greenleaf Elliot College, (2005-8).  
Graduate Council Teaching and Professional Development Committee, (2002-3; 2004-8) – Chair (2002-3 and 2005-6).  
Ervin and Enterprise Scholars Program Selection Committee, (2003-present).  
Panelist for Washington University, Orientation for New Graduate Students in Arts and Sciences, (August, 2003 and 2004).  
Department of Chemistry, Seminar Committee, (2001-2006).  
Residential Life, Residential Advisor Selection Committee, (2001).

Faculty Associate for Liggett/Koenig Residential College, (2000-1).  
Washington University Arts and Sciences Graduate Council Departmental Representative, (1999-present).  
Department of Chemistry, Graduate Work Committee, (1999-present) – Chair (2004-present).  
Department of Chemistry, Graduate Admissions and Recruitment Committee, (1998-present) – Chair of Recruitment Committee (2002-present).  
Department of Chemistry, Library Committee, (1998-2006).

### **Professional Activities:**

Reviewer of five proposals submitted to NSF, CAREER Award (2004-present).  
Reviewer of one proposal submitted to the U.S. Civilian Research and Development Foundation (2004).  
Session Chair at the OSU International Symposium on Molecular Spectroscopy (2004, 2007).  
Reviewer of five proposals submitted to ACS-PRF G (2004-present).  
Reviewer of four proposals submitted to ACS-PRF AC (2002-present).  
Peer Review Panel for the 30th International Symposium on Combustion (January, 2004).  
Review Panel for NSF-SBIR/STTR (March, 2003).  
Reviewer of eight proposals submitted to NSF, Physical Chemistry Division (2001-present).  
Reviewer of five proposals submitted to DOE, Chemical Sciences Division (2001-present).  
Reviewer of one proposal submitted to NASA, Planetary Atmospheres Program (2000).  
Scientific/technical consultant for Oakwood Medical Management, L.L.C., Saint Louis, MO (2000-1).  
Co-organizer of “Reactions in Small Clusters Workshop”, Telluride, CO (August 1-6, 1999).  
Reviewer of nine papers submitted to *Chemical Physics Letters* (1997-present).  
Reviewer of 12 papers submitted to *Journal of Chemical Physics* (1997-present).  
Reviewer of nine papers submitted to *Journal of Physical Chemistry A* (1997-present).  
Reviewer of two papers submitted to *Journal of Physical Chemistry C* (2006-present).  
Reviewer of three papers submitted to *Physical Chemistry Chemical Physics* (2004-present).  
Reviewer of three papers submitted to *Chemistry of Materials* (2007-present).  
Reviewer of three papers submitted to *Journal of the American Chemical Society* (2007-present).  
Reviewer of three papers submitted to *Journal of Physics B* (2007-present).  
Reviewer of two papers submitted to *Nano Letters* (2007-present).

### **Memberships:**

American Chemical Society, American Physical Society - Divisions of Laser Science and Chemical Physics.

### **Publications:**

45. J.P. Darr and R.A. Loomis\*, “Interrogation of  $\text{He}_2 \cdots \text{I}^{35}\text{Cl}(B, v'=3)$  dissociation dynamics”, in preparation.
44. J.P. Darr and R.A. Loomis\*, “Experimental interrogation of the anisotropies in the potential energy surfaces of rare gas–dihalogen complexes”, to be submitted to *Phys. Chem. Chem. Phys.*
43. J.J. Glennon, R. Tang, W.E. Buhro, and R.A. Loomis\*, “Reversible photo-induced and chemical passivation of CdSe quantum wires”, in preparation.
42. J.J. Glennon, R. Tang, W.E. Buhro, and R.A. Loomis\*, D.A. Bussian, H. Htoon, V.I. Klimov\*, “Exciton localization and migration in single CdSe quantum wires at low temperature”, submitted to *Phys. Rev. Lett.*
41. J.J. Glennon, L.E. Buchanan, R. Tang, W.E. Buhro, and R.A. Loomis\*, “Delocalized excitons and multiexciton states in single CdSe quantum wires”, submitted to *Nature Mater.*
40. Y. Zhang, K. Vidma, D.H. Parker, and R.A. Loomis, “Photodissociation of the linear Ar-I<sub>2</sub> van der Waals complex: velocity-map imaging of the I<sub>2</sub> fragment”, *J. Chem. Phys.*, **130**, 104302/1-104302/2 (2009)
39. D.S. Boucher, J.P. Darr, D.B. Strasfeld, and R.A. Loomis\*, “Spectroscopic identification of higher-order rare gas-dihalogen complexes with different geometries:  $\text{He}_{2,3} \cdots \text{Br}_2$  and  $\text{He}_{2,3} \cdots \text{ICl}$ ”, *J. Phys. Chem. A*, **112**, 13393-13401 (2008).
38. J.P. Darr, R.A. Loomis\*, and A.B. McCoy, “Probing the dependence of long-range, four-atom interactions on intermolecular orientation: 2. Molecular deuterium and iodine monochloride”, *J. Phys. Chem. A*, **112**, 9494-9502 (2008).

37. J.P. Darr and R.A. Loomis\*, “Experimental interrogation of the multidimensional He + ICl( $E, v^\dagger$ ) and He + ICl( $\beta, v^\dagger$ ) intermolecular potential energy surfaces”, *J. Chem. Phys.*, **129**, 144306/1-144306/11 (2008).
36. J.J. Glennon, W.E. Buhro, and R.A. Loomis\*, “Simple surface-trap-filling model for photoluminescence blinking spanning entire CdSe quantum wires”, *J. Phys. Chem. C*, **112**, 4813-4817 (2008).
35. D.S. Boucher and R.A. Loomis\*, “Stabilization of different conformers of weakly bound complexes to access varying excited-state intermolecular dynamics”, *Adv. Chem. Phys.*, **138**, 375-419 (2008).
34. J.P. Darr, A.C. Crowther, and R.A. Loomis\*, “Probing the dependence of long-range, four-atom interactions on intermolecular orientation: 1. Molecular hydrogen and iodine monochloride”, *J. Phys. Chem. A*, **111**, 13387-13396 (2007).
33. J.J. Glennon, R. Tang, W.E. Buhro\*, and R.A. Loomis\*, “Synchronous photoluminescence intermittency (blinking) along whole semiconductor quantum wires”, *Nano Lett.*, **7**, 3290-3295 (2007).
32. S.A. Ray, A.B. McCoy\*, J.J. Glennon, J.P. Darr, E.J. Fesser, J.R. Lancaster, and R.A. Loomis\*, “Experimental and theoretical investigations of the He $\cdots$ I<sub>2</sub> rovibronic spectra in the I<sub>2</sub> B–X, 20–0 region”, *J. Chem. Phys.*, **125**, 164314/1-164314/9 (2006).
31. J.P. Darr and R.A. Loomis\*, “Low-energy, collision-induced vibrational energy relaxation within a heavy molecule-light atom supersonic expansion: ICl/He”, *Phys. Chem. Chem. Phys.*, **7**, 3323-30 (2005).
30. D.S. Boucher, D.B. Strasfeld, R.A. Loomis\*, J.M. Herbert, S.A. Ray, and A.B. McCoy\*, “Characterization of the T-shaped and linear conformers of a rare gas–homonuclear dihalogen complex: He $\cdots$ <sup>79</sup>Br<sub>2</sub>(X,  $v''=0$ )”, *J. Chem. Phys.*, **123**, 104312/1-104312/14 (2005).
29. J.P. Darr, J.J. Glennon, R.A. Loomis\*, “Observation of bound-free transitions of the linear Ar $\cdots$ I<sub>2</sub>(X,  $v''=0$ ) complex in and above the I<sub>2</sub> B–X region”, *J. Chem. Phys.*, **122**, 131101/1-131101/4 (2005).
28. J.P. Darr, R.A. Loomis\*, and A.B. McCoy, “The dissociation dynamics of He $\cdots$ ICl(B,  $v'=2,3$ ) complexes with varying amounts of internal energy”, *J. Chem. Phys.*, **122**, 044218/1-044218/12 (2005).
27. D.S. Boucher, J.P. Darr, M.D. Bradke, R.A. Loomis\*, and A.B. McCoy\*, “A combined experimental/theoretical investigation of the He + ICl interactions: Determination of the binding energies of the T-shaped and linear He $\cdots$ I<sup>35</sup>Cl(X,  $v''=0$ ) isomers”, *Phys. Chem. Chem. Phys.*, **6**, 5275-82 (2004).
26. D.B. Strasfeld, J.P. Darr, and R.A. Loomis\*, “Experimental characterization of the Ne + ICl(X,  $v''=0$ ) and Ne + ICl(B,  $v'=2$ ) intermolecular potentials”, *Chem. Phys. Lett.*, **397**, 116-22 (2004).
25. A.B. McCoy\*, J.P. Darr, D.S. Boucher, P.R. Winter, M.D. Bradke, and R.A. Loomis\*, “A combined experimental/theoretical investigation of the He + ICl interactions: I. The ro-vibronic spectrum of He $\cdots$ ICl complexes in the ICl B–X, 3–0 region”, *J. Chem. Phys.*, **120**, 2677-85 (2004).
24. J.P. Darr and R.A. Loomis\*, “Experimental observation of competing pathways in the relaxation of ICl\* in a He supersonic expansion”, *Faraday Discuss.*, **127**, 213-26 (2004).
23. W.E. Buhro\*, H. Yu, J. Li, R.A. Loomis, P.C. Gibbons, and L-W. Wang, “Cadmium selenide quantum wires and the transition from 3D to 2D confinement”, *JACS*, **125**, 16168-9 (2003).
22. J.P. Darr, A.C. Crowther, and R.A. Loomis\*, “Direct measurement of the binding energy of the linear He $\cdots$ I<sup>35,37</sup>Cl(X) isotopomers”, *Chem. Phys. Lett.*, **378**, 359-67 (2003).
21. D.S. Boucher, M.D. Bradke, J.P. Darr, and R.A. Loomis\*, “Preferential stabilization of different isomers of weakly bound complexes”, *J. Phys. Chem. A*, **107**, 6901-4 (2003).
20. H. Yu, J. Li, R.A. Loomis, L-W. Wang and W.E. Buhro\*, “2D vs. 3D quantum confinement in indium phosphide; experimental comparison of quantum wires and quantum dots”, *Nature Mater.*, **2**, 517-20 (2003).
19. M.D. Bradke and R.A. Loomis\*, “Spectroscopic observation of the preferentially stabilized, linear He $\cdots$ ICl(X <sup>1</sup> $\Sigma^+$ ) complex”, *J. Chem. Phys.*, **118**, 7233-44 (2003).
18. J.P. Reid, R.A. Loomis, and S.R. Leone\*, “Competition between N–H and N–D bond cleavage in the photodissociation of NH<sub>2</sub>D and ND<sub>2</sub>H”, *J. Phys. Chem. A*, **104**, 10139-49 (2000).
17. J.P. Reid, R.A. Loomis, and S.R. Leone\*, “The effect of parent zero-point motion on the ND<sub>2</sub> ( $\tilde{A}$ ) rotational state distribution in the 193.3 nm photolysis of ND<sub>3</sub>”, *Chem. Phys. Lett.*, **324**, 240-8 (2000).

16. J.P. Reid, and R.A. Loomis, and S.R. Leone\*, "Characterization of dynamical product-state distributions by spectral extended cross-correlation: Vibrational dynamics in the photofragmentation of NH<sub>2</sub>D and ND<sub>2</sub>H", *J. Chem. Phys.*, **112**, 3181-91 (2000).
15. R.A. Loomis, J.P. Reid and S.R. Leone\*, "Photofragmentation of ammonia at 193.3 nm: Bimodal rotational distributions and vibrational excitation of NH<sub>2</sub>( $\tilde{A}$ )", *J. Chem. Phys.*, **112**, 658-69 (2000).
14. R. Uberna, Z. Amitay, R.A. Loomis, and S.R. Leone\*, "Phase control of wave packet dynamics using shaped femtosecond pulses", *Faraday Discuss.*, **113**, 385-400 (1999).
13. R.A. Loomis, S.R. Leone\*, and M.K. Gilles, "Novel five-membered ring intermediates in gas phase reactions", *Res. Chem. Intermed.*, **24**, 707-53 (1998).
12. J. Lindner, R.A. Loomis, J.J. Klaassen, and S.R. Leone\*, "A laser photolysis/time-resolved Fourier transform infrared emission study of OH( $X^2\Pi$ ,  $v$ ) produced in the reaction of alkyl radicals with O( $^3P$ )", *J. Chem. Phys.*, **108**, 1944-52 (1998).
11. M.I. Lester\*, R.A. Loomis, R.L. Schwartz, and S.P. Walch, "Electronic quenching of OH A  $^2\Sigma^+$  ( $v' = 0, 1$ ) in complexes with hydrogen and nitrogen", *J. Phys. Chem.*, **101**, 9195-206 (1997).
10. R.A. Loomis and M.I. Lester\*, "OH-H<sub>2</sub> entrance channel complexes", *Ann. Rev. Phys. Chem.*, **48**, 643-73 (1997).
9. R.A. Loomis, J.J. Klaassen, J. Lindner, P.G. Christopher, and S.R. Leone\*, "Fourier transform infrared emission study of the mechanism and dynamics of HOI formed in the reaction of alkyl iodides with O( $^3P$ )", *J. Chem. Phys.*, **106**, 3934-47 (1997).
8. R.L. Schwartz, L.C. Giancarlo, R.A. Loomis, R.T. Bonn, and M.I. Lester\*, "Intermolecular vibrations and relaxation dynamics in complexes of OH A  $^2\Sigma^+$  ( $v'=0, 1$ ) with N<sub>2</sub>", *J. Chem. Phys.*, **105**, 10224-36 (1996).
7. R.A. Loomis, R.L. Schwartz, and M.I. Lester\*, "Electronic spectroscopy and quenching dynamics of OH-H<sub>2</sub>/D<sub>2</sub> pre-reactive complexes", *J. Chem. Phys.*, **104**, 6984-96 (1996).
6. R.A. Loomis and M.I. Lester\*, "Stabilization of reactants in a weakly bound complex: OH-H<sub>2</sub> and OH-D<sub>2</sub>", *J. Chem. Phys.*, **103**, 4371-4 (1995).
5. M.I. Lester\*, R.A. Loomis, L.C. Giancarlo, M.T. Berry, C. Chakravarty, and D.C. Clary, "Refinement of the OH A  $^2\Sigma^+$  ( $v=0$ ) + Ar intermolecular potential energy surface", *J. Chem. Phys.*, **98**, 9320-34 (1993).
4. M.T. Berry, R.A. Loomis, L.C. Giancarlo, and M.I. Lester\*, "Stimulated emission pumping of intermolecular vibrations in OH-Ar( $X^2\Pi$ )", *J. Chem. Phys.*, **96**, 7890-903 (1992).
3. G. Vandegrift\* and R. Loomis, "End-loss analyzer for plasma diagnosis", *Rev. Sci. Instr.*, **62**, 1368-9 (1991).
2. G. Vandegrift\*, T. Baker, J. DiGrazio, A. Dohne, A. Flori, R. Loomis, C. Steel, and D. Velat, "Wave cutoff on a suspended slinky", *Amer. J. Phys.*, **57**, 949-51 (1989).
1. J.W. Luetzelschwab\*, T.W. Baker, R.A. Loomis, and W.L. Phillis, "Effect of humidity on radon adsorption by charcoal", *Proceedings of the Health Physics Meeting*, Albuquerque, NM, (1989).

### **Presentations:**

71. R.A. Loomis, "Spectroscopy and dynamics of multiexciton states in single CdSe quantum wires." American Chemical Society National Meeting, New Orleans, LA, April 5 – 10, 2008. (Contributed Talk)
70. R.A. Loomis, J.J. Glennon, D.A. Bussian, H. Htoon, V.I. Klimov, R. Tang, W.E. Buhro, "Energetic relaxation of excitons prepared within single CdSe quantum wires." American Chemical Society National Meeting, New Orleans, LA, April 5 – 10, 2008. (Poster)
69. R.A. Loomis, "Interrogation of the energetics and dynamics of excitons prepared within single CdSe quantum wires." Department of Chemistry, Pittsburgh State University, Pittsburgh, KS, February 1, 2008. (Departmental Seminar)
68. R.A. Loomis, "Probing the details of the full dimensionality of intermolecular potential energy surfaces." Department of Chemistry, University of Missouri, Kansas City, Kansas City, MO, January 31, 2008. (Departmental Seminar)

67. R.A. Loomis, "Interrogation of the energetics and dynamics of excitons prepared within single CdSe quantum wires." Department of Chemistry, Northwest Missouri State University, Maryville, MO, January 30, 2008. (Departmental Seminar)
66. R.A. Loomis, "Experimental interrogation of the spectroscopy and dynamics within single CdSe quantum wires." Department of Physical Chemistry, Peking University, Beijing, China, September 19, 2007. (Departmental Seminar)
65. R.A. Loomis, "Dissociation dynamics of hydrogen-dihalogen complexes." Dynamics of Molecular Collisions Conference, Santa Fe, NM, July 8-13, 2007. (Poster)
64. R.A. Loomis and J.J. Glennon, "Spectroscopy and dynamics within single cadmium selenide quantum wires." 62<sup>nd</sup> Ohio State University International Symposium on Molecular Spectroscopy, Columbus, OH, June 18-22, 2007. (Invited Talk)
63. R.A. Loomis, "Dissociation dynamics of hydrogen-dihalogen complexes." 62<sup>nd</sup> Ohio State University International Symposium on Molecular Spectroscopy, Columbus, OH, June 18-22, 2007. (Contributed Talk)
62. R.A. Loomis, "Characterization of the photophysics within single CdSe quantum wires at low temperature." Center of Integrated Nanotechnologies, Sandia and Los Alamos National Laboratories, Albuquerque, NM, April 18, 2007. (Invited Talk)
61. R.A. Loomis, "Experimental interrogation of the photophysics within CdSe nanostructures and its dependence on dimensionality." University of Georgia, Athens, GA, February 1, 2007. (Departmental Seminar)
60. R.A. Loomis, "Experimental interrogation of the photophysics within CdSe nanostructures and its dependence on dimensionality." Notre Dame University, South Bend, IN, January 18, 2007. (Departmental Seminar)
59. R.A. Loomis, "Probing the details of the full dimensionality of intermolecular potential energy surfaces." Department of Chemical Physics, University of Science and Technology of China, Hefei, Anhui, China, October 11, 2006. (Departmental Seminar)
59. R.A. Loomis, "Probing the details of the full dimensionality of intermolecular potential energy surfaces." Department of Chemical Physics, University of Science and Technology of China, Hefei, Anhui, China, October 11, 2006. (Departmental Seminar)
58. R.A. Loomis, "Probing the details of the full dimensionality of intermolecular potential energy surfaces." Key Laboratory of Molecular Reaction Dynamics, Beijing, China, October 10, 2006. (Departmental Seminar)
57. R.A. Loomis, "Probing bimolecular interactions with atomic resolution." Hope College, Holland, MI, September 22, 2006. (Departmental Seminar)
56. R.A. Loomis, "Probing bimolecular interactions with atomic resolution." Calvin College, Grand Rapids, MI, September 21, 2006. (Departmental Seminar)
55. J.P. Darr and R.A. Loomis, "Spectroscopic identification of multiple conformers of *o,p*-H<sub>2</sub>⋯ICl and *o,p*-H<sub>2</sub>⋯I<sub>2</sub> complexes." American Physical Society National Meeting, Baltimore, MD, March 12 – 17, 2006. (Contributed Talk)
54. J.J. Glennon, R. Tang, W.E. Buhro, and R.A. Loomis, "Observation of synchronous photoluminescence intensity fluctuations within single CdSe quantum wires." American Physical Society National Meeting, Baltimore, MD, March 12 – 17, 2006. (Contributed Talk)
53. R.A. Loomis, "Probing bimolecular interactions with atomic resolution." Morehouse College, Atlanta, GA, January 31, 2006. (Departmental Seminar)
52. R.A. Loomis, "Experimental interrogation of the photophysics within CdSe nanostructures and its dependence on dimensionality." Emory University, Atlanta, GA, January 30, 2006. (Departmental Seminar)
51. R.A. Loomis, "The interactions of rare gas atoms with dihalogen molecules: finding the surprise ending of an old story." Marquette University, Milwaukee, WI, November 4, 2005. (Departmental Seminar)
50. R.A. Loomis, "The interactions of rare gas atoms with dihalogen molecules: finding the surprise ending of an old story." Brigham Young University, Provo, UT, October 7, 2005. (Departmental Seminar)
49. R.A. Loomis, "The interactions of rare gas atoms with dihalogen molecules: finding the surprise ending of an old story." University of Wisconsin-Madison, Madison, WI, October 4, 2005. (Departmental Seminar)

48. R.A. Loomis, "Spectroscopic interrogation of the multi-dimensional intermolecular potentials of rare gas-dihalogen complexes.", 230<sup>th</sup> American Chemical Society National Meeting, Washington, DC, August 28 – September 1, 2005. (Invited Talk)
47. J.P. Darr, J.J. Glennon, and R.A. Loomis, "Identification of bound-free transitions of the linear Ar...I<sub>2</sub> complex throughout the I<sub>2</sub> B–X region." 230<sup>th</sup> American Chemical Society National Meeting, Washington, DC, August 28 – September 1, 2005. (Contributed Talk)
46. J.P. Darr and R.A. Loomis, "The origin of the Ar...I<sub>2</sub> B–X continuum excitation signal below and above the I<sub>2</sub>(B) dissociation limit: bound-free transitions of the linear complex." 60<sup>th</sup> Ohio State University International Symposium on Molecular Spectroscopy, Columbus, OH, June 20-24, 2005. (Contributed Talk)
45. R.A. Loomis, "Spectroscopic interrogation of the multi-dimensional intermolecular potentials of rare gas atoms and dihalogens." 60<sup>th</sup> Ohio State University International Symposium on Molecular Spectroscopy, Columbus, OH, June 20-24, 2005. (Contributed Talk)
44. R.A. Loomis, "The dependence of intermolecular dynamics on internal energy within rare gas-dihalogen complexes." Molecular Energy Transfer Gordon Research Conference, Buellton, CA, January 9-15, 2005. (Invited Talk)
43. R.A. Loomis, "The characterization of the subtle dependences of intermolecular interactions on molecular orientation." U.S. National Academy of Sciences, Beckman Frontiers of Science Symposium, Irvine, CA, November 4-6, 2004. (Invited Participant)
42. J.P. Darr, D.S. Boucher, D.B. Strasfeld, R.A. Loomis, and A.B. McCoy, "The experimental and theoretical interrogation of the intermolecular potential energy surfaces of rare gas-dihalogen systems." Atomic and Molecular Interactions Gordon Research Conference, New London, NH, July 11-16, 2004. (Poster)
41. J.P. Darr and R.A. Loomis, "Observation of competing pathways in the relaxation of ICl\* in a He supersonic expansion." 59<sup>th</sup> Ohio State University International Symposium on Molecular Spectroscopy, Columbus, OH, June 21-26, 2004. (Contributed Talk)
40. R.A. Loomis, "The spectroscopic characterization of multidimensional intermolecular potential energy surfaces." University of Pittsburgh, Pittsburgh, PA, May 6, 2004. (Departmental Seminar)
39. R.A. Loomis, "The spectroscopic characterization of multidimensional intermolecular potential energy surfaces." University of California-San Diego, San Diego, CA, April 20, 2004. (Departmental Seminar)
38. R.A. Loomis, "The spectroscopic characterization of multidimensional intermolecular potential energy surfaces." University of Southern California, Los Angeles, CA, April 19, 2004. (Departmental Seminar)
37. R.A. Loomis, "Characterizing the intermolecular potential energy surfaces that dominate dynamics at low temperatures." Saint Louis University, Saint Louis, MO, April 16, 2004. (Departmental Seminar)
36. J.P. Darr and R.A. Loomis, "The competing pathways of ICl\* relaxation in a He supersonic expansion." Faraday Discussion 127, Non-adiabatic Effects in Chemical Dynamics, Saint Catherine's College, Oxford, UK, April 5-7, 2004. (Invited Talk)
35. R.A. Loomis, "The characterization of intermolecular interactions at very low temperatures: Even for dihalogens with rare gas atoms, it's not so simple!" University of California, Irvine, Irvine, CA, January 20, 2004. (Departmental Seminar)
34. R.A. Loomis, "The characterization of intermolecular interactions at very low temperatures: Even for dihalogens with rare gas atoms, it's not so simple!" Southern Illinois University, Carbondale, IL, January 16, 2004. (Departmental Seminar)
33. R.A. Loomis, "Determining the precise pathways of bimolecular reactions." University of Southern Indiana, Evansville, IN, November 18, 2003. (Departmental Seminar)
32. R.A. Loomis, "The somewhat complicated interactions and dynamics of dihalogen molecules with rare gas atoms at low temperatures." University of Pennsylvania, Philadelphia, PA, November 6, 2003. (Departmental Seminar)
31. R.A. Loomis, "The somewhat complicated interactions and dynamics of dihalogen molecules with rare gas atoms at low temperatures." JILA, University of Colorado, Boulder, CO, October 31, 2003. (Departmental Seminar)

30. R.A. Loomis, "The somewhat complicated interactions and dynamics of dihalogen molecules with rare gas atoms at low temperatures." The Ohio State University, Columbus, OH, October 13, 2003. (Departmental Seminar)
29. R.A. Loomis, "The somewhat complicated interactions and dynamics of dihalogen molecules with rare gas atoms at low temperatures." Columbia University, New York, NY, October 8, 2003. (Departmental Seminar)
28. R.A. Loomis, "The somewhat complicated interactions and dynamics of dihalogen molecules with rare gas atoms at low temperatures." Combustion Research Facility, Sandia National Laboratory, Livermore, CA, August, 6 2003. (Departmental Seminar)
27. J.P. Darr, D.S. Boucher, A.C. Crowther, and R.A. Loomis, "The formation, interaction, and dissociation of the linear and T-shaped He...ICl weakly bound complexes." Spectroscopy and Dynamics on Multiple Surfaces Workshop, Telluride, CO, July 20-27, 2003. (Invited Talk)
26. R.A. Loomis, "The dynamics of ICl in a He supersonic expansion." Dynamics of Molecular Collisions Conference, Lake Tahoe, CA, July 13-18, 2003. (Invited Talk)
25. J.P. Darr, D.S. Boucher, A.C. Crowther, and R.A. Loomis, "The formation, interaction, and dissociation of the linear and T-shaped He...ICl weakly bound complexes." Dynamics of Molecular Collisions Conference, Lake Tahoe, CA, July 13-18, 2003. (Poster)
24. R.A. Loomis, "The Intermolecular Interactions and Dynamics of Molecules at Very Low Temperatures: It's Not So Simple." University of Nevada, Reno, NV, April 11, 2003. (Departmental Seminar)
23. R.A. Loomis, "The Intermolecular Interactions and Dynamics of Molecules at Very Low Temperatures: It's Not So Simple." University of California, Davis, CA, April 10, 2003. (Departmental Seminar)
22. R.A. Loomis, "The Intermolecular Interactions and Dynamics of Molecules at Very Low Temperatures: It's Not So Simple." University of North Carolina, Chapel Hill, NC, April 2, 2003. (Departmental Seminar)
21. R.A. Loomis, "Watching Chemistry in Real-time: Catching Reactions in the Act and Teaching Them to Do What You Want Them to Do." CASW's 40<sup>th</sup> Annual New Horizons in Science Briefing, Washington University, Saint Louis, MO, October 27-30, 2002. (Invited Talk)
20. D.S. Boucher, J.P. Darr, A.C. Crowther, and R.A. Loomis, "Experimental interrogation of the He + ICl(X,v''=0) and He + ICl(B,v') interactions and dissociation dynamics." Atomic and Molecular Interactions Gordon Research Conference, Bristol, RI, July 7-12, 2002. (Poster)
19. R.A. Loomis and M.D. Bradke, "Laser-induced fluorescence spectra of the linear He...ICl(X <sup>1</sup>Σ<sup>+</sup>) Complex." 57<sup>th</sup> Ohio State University International Symposium on Molecular Spectroscopy, Columbus, OH, June 17-21, 2002. (Contributed Talk)
18. R.A. Loomis and D.S. Boucher, "Using Femtosecond Pulse Shaping to Control and Interrogate the Evolution of Bimolecular Reaction Dynamics." Quantum Control of Atomic and Molecular Motion Gordon Research Conference, South Hadley, MA, July 29-August 2, 2001. (Poster)
17. M.D. Bradke and R.A. Loomis, "Experimental investigation of He...ICl intermolecular levels and dynamics: Evidence for a linear isomer in the ground state." Dynamics of Molecular Collisions Conference, Copper Mountain, CO, July 15-20, 2001. (Poster)
16. R.A. Loomis, "Using Lasers and Quantum Chemistry to Determine the Pathways of Chemical Reactions." University of Missouri – Saint Louis, Saint Louis, MO, April 9, 2001. (Departmental Seminar)
15. R.A. Loomis, "How can reactions be monitored and controlled experimentally in small clusters." Reactions in Small Clusters Workshop, Telluride, CO, August 1-6, 1999. (Invited Talk)
14. R.A. Loomis, "Probing and controlling bimolecular reaction dynamics using pre-reactive complexes as a launching pad." Reactions in Small Clusters Workshop, Telluride, CO, August 1-6, 1999. (Invited Talk)
13. R. Uberna, R.A. Loomis, and S.R. Leone, "Coherent control of the Li<sub>2</sub> E <sup>1</sup>Σ<sub>g</sub><sup>+</sup> ionization probability using ultrashort optical pulse shaping techniques." Atomic and Molecular Interactions Gordon Research Conference, New London, NH, June 28-July 3, 1998. (Poster)

12. R.A. Loomis, J.P. Reid, and S.R. Leone, "The role of tunneling in the alignment of product species following the photodissociation of ammonia species." Atomic and Molecular Interactions Gordon Research Conference, New London, NH, June 28-July 3, 1998. (Poster)
11. R.A. Loomis, J.P. Reid, and S.R. Leone, "Mechanisms and dynamics of alkyl radical/atom reactions determined by time-resolved Fourier transform infrared emission spectroscopy." 215<sup>th</sup> American Chemical Society National Meeting, Dallas, TX, March 29-April 2, 1998. (Poster)
10. R.A. Loomis and S.R. Leone, "Photodissociation dynamics of jet-cooled species using time-resolved FTIR emission spectroscopy." 13<sup>th</sup> Interdisciplinary Laser Science Conference, Long Beach, CA, October 12-17, 1997. (Contributed Talk)
9. R.A. Loomis and S.R. Leone, "Photodissociation dynamics of jet-cooled ammonia using time-resolved FTIR emission spectroscopy." Dynamics of Molecular Collisions Conference, Gull Lake, MN, July 20-25, 1997. (Poster)
8. R.A. Loomis and S.R. Leone, "Photodissociation dynamics of ammonia species cooled in a supersonic expansion." Molecular Energy Transfer Gordon Research Conference, Ventura, CA, January 5-10, 1997. (Poster)
7. R.A. Loomis, J.K. Klaassen, J. Lindner, P.G. Christopher, and S.R. Leone, "Vibrational deactivation and nascent vibrational state distributions of HOI / OH formed in the reaction of alkyl iodides + O / alkyl radicals + O atoms." Molecular Energy Transfer Gordon Research Conference, Ventura, CA, January 5-10, 1997. (Poster)
6. R.A. Loomis and M.I. Lester, "Stabilization of reactants in a weakly bound complex: OH-H<sub>2</sub> and OH-D<sub>2</sub>." Dynamics of Molecular Collisions Conference, Asilomar, CA, July 16-21, 1995. (Poster)
5. R.A. Loomis, R.L. Schwartz, and M.I. Lester, "Cavity ring-down absorption spectroscopy of halogen systems." 10<sup>th</sup> Interdisciplinary Laser Science Conference, Dallas, TX, October 2-7, 1994. (Contributed Talk)
4. R.A. Loomis, R.L. Schwartz, and M.I. Lester, "Cavity ring-down absorption spectroscopy of halogen systems." 208<sup>th</sup> American Chemical Society National Meeting, Washington, DC, August 21-26, 1994. (Poster)
3. R.A. Loomis, R.L. Schwartz, and M.I. Lester, "Cavity ring-down absorption spectroscopy of halogen systems." Electronic Spectroscopy Gordon Research Conference, Andover, NH, August 14-19, 1994. (Poster)
2. L.C. Giancarlo, R.A. Loomis, M.T. Berry, M.I. Lester, and D.C. Clary, "Experimental determination of the intermolecular bending potential in OH-Ar (A <sup>2</sup>Σ<sup>+</sup>)." 204<sup>th</sup> American Chemical Society National Meeting, Washington, DC, August 23-28, 1992. (Poster)
1. R.A. Loomis, L.C. Giancarlo, M.T. Berry, and M.I. Lester, "Experimental determination of the intermolecular bending potential in OH-Ar (A <sup>2</sup>Σ<sup>+</sup>)." Atomic and Molecular Interactions Gordon Research Conference, New London, NH, July 20-24, 1992. (Poster)