

**Albert Stolow**

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 Program Leader, Molecular Photonics  
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Adjunct Professor  
 Dept of Chemistry  
 Queen's University  
 Kingston, Ontario  
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 (613) 545-2200  
 (613) 545-6838 FAX

Adjunct Professor  
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 (613) 533-2707  
 (613) 533-6463 FAX

Adjunct Professor  
 Dept of Physics  
 University of Ottawa  
 Ottawa, Ontario  
 Canada K1N 6N5  
 (613) 562-5757  
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Associate Member  
 Ottawa Institute for Systems Biology  
 University of Ottawa  
 Ottawa, Ontario  
 Canada K1H 8M5  
 (613) 562-5800 ext 8073  
 (613) 562-5655 FAX

Education:

1988 PhD, University of Toronto (Supervisor: J.C. Polanyi)  
 1982 BSc, Queen's University

Teaching Appointments:

2007- Adjunct Professor, Department of Physics  
 University of Ottawa  
 2003- Adjunct Professor, Department of Physics  
 Queen's University, Kingston Ont.  
 1995- Adjunct Professor, Department of Chemistry  
 Queen's University, Kingston Ont.

Research Training:

	Doctorate	Post-Doc
Conferred	3	13
Currently Supervised	4	6

Current University Research Grants:

2012-14	NSERC Collaborative R.&D. (Team) <i>Development of a non-linear optical laser scanning microscopy system for in situ examination of cartilage reconstructive procedures</i>	\$250,000
2011-12	Canadian Institute for Photonics Innovation <i>"Stimulated Raman Scattering Microscopy with Novel Fiber Lasers."</i>	\$72,000
2011-2016	NSERC Discovery Grant (Individual) <i>"Femtosecond Molecular Science"</i>	\$425,000
2009-2014	NSERC CREATE Grant (% of Team) <i>"Quantitative Biomedicine"</i>	\$15,000

Professional Society Membership:

American Physical Society  
 Optical Society of America  
 American Chemical Society

### Honours & Awards:

2012 FAST Fellow. ETH. Zürich, Switzerland.  
2011-12 Visiting Professor, Consejo Superior de Inv. Científicas, Madrid, Spain.  
2010 Visiting Professor. University of Rome 'La Sapienza'. Rome, Italy.  
2008 Fellow, American Physical Society  
2008 Fellow, Optical Society of America  
2008 Keith Laidler Award. Canadian Society for Chemistry  
2006 Annual Award for Scientific Breakthrough. National Research Council  
2005 Annual Award for Scientific Breakthrough. National Research Council  
2004 Visiting Professor. École Normale Supérieure. Paris, France.  
2003 McElvain Lecturer. University of Wisconsin at Madison. WI, USA  
2001 Barringer Award of the Spectroscopy Society of Canada  
1989-91 N.S.E.R.C. Postdoctoral Fellowship (U.C. Berkeley)  
1987 University of Toronto Open Doctoral Fellowship  
1983-86 Lash Miller Award. University of Toronto  
1985-86 N.S.E.R.C. Postgraduate Scholarship  
1983-84 N.S.E.R.C. Postgraduate Scholarship  
1980 R.T. Mohan Undergraduate Scholarship, Queen's University

### Research Experience:

1992-96 Research Associate, Ultrafast Phenomena Group  
Steacie Institute for Molecular Sciences, NRC  
1989-92 Postdoctoral Fellow (Supervisor: Y.T. Lee)  
Department of Chemistry  
University of California, Berkeley  
1989 Visiting Scientist  
Laser & Plasma Physics Group, Division of Physics  
National Research Council of Canada

### Committees & Appointments:

2012-13 Member, International Advisory Committee. XXV International Symposium on Molecular Beams. Prague CZ.  
2012- 15 Member, Editorial Board. Journal of Chemical Physics. American Institute of Physics.  
2011-12 Member, International Steering Committee. International Conference on Raman Spectroscopy.  
2011. Symposium Co-chair. "Attosecond & Strong Field Physics". Laser Science XXVII Conference. American Physical Society.  
16-20 October 2011.  
2011-12 Guest Editor, Journal of Physics B: Atomic, Molecular and Optical Physics. Special Issue on "Molecular-Frame Photoelectron Angular Distributions".  
2011 External Expert. Final Evaluation of European Science Foundation Project # MP0603: "Chemical imaging by means of CARS-microscopy (MicroCARS)"  
2011- Member, Editorial Advisory Board of the Journal of Raman Spectroscopy (Wiley)  
2010- Member, Ultrafast Optical Phenomena Technical Group. Optical Society of America.  
2010- Associate Member. Ottawa Institute for Systems Biology. University of Ottawa.  
2010 Guest Editor, IEEE Journal of Selected Topics in Quantum Electronics. Special Issue on Ultrafast Science and Technology.  
2010- Member, Proposal Review Panel. Linac Coherent Light Source, SLAC National Accelerator Laboratory. Stanford University.  
2010-

Member, Editorial Board, Physical Chemistry Letters (American Chemical Society)  
2010-  
Member, Editorial Board, Chemical Physics (Elsevier)  
2010  
Member, Advisory Board, X-Ray Frontiers Program. Kavli Institute for Theoretical Physics. UC Santa Barbara, USA.  
2010  
Chair, Gordon Research Conference on Photoions, Photoionization & Photodetachment. Galveston TX 31 Jan – 5 Feb 2010.  
2009-  
Member, Program Committee, 17<sup>th</sup> International Conference on Ultrafast Phenomena. June 2010  
2009  
Co-Chair, “Dynamic Imaging”. LPHYS’09 18<sup>th</sup> International Laser Physics Workshop. 13-17 July 2009. Barcelona, Spain.  
2009-11  
Member, Editorial Board, Journal of Physical Chemistry A (American Chemical Society)  
2008  
Scientific Program Co-chair. NATO Advanced Study Institute. “Laser Control & Monitoring in New Materials, Biomedicine, Environment, Security & Defense” Nov.24 – Dec.5, 2008. Ottawa, Canada.  
2008-  
Member, Advisory Board, Munich-Centre for Advanced Photonics. Munich, Germany.  
2007-  
Member, Editorial Board, Journal of Biophotonics (Wiley VCH)  
2007-8  
Member, Program Committee, 16<sup>th</sup> International Conference on Ultrafast Phenomena. June 2008  
2006-  
PhD Supervisor for Mr. Adrian Pegoraro, Dept. of Physics, Queen's University  
2005-2010  
Member, Editorial Board, Chemical Physics Letters (Elsevier)  
2005  
Conference Co-Chair. Laser Science 2005, American Physical Society, Joint with Optical Society of America.  
2004-5  
Member, Program Committee, International Quantum Electronics Conference IQEC2005  
2004-5  
Symposium Co-chair. Pacificchem 2005. “Photophysical Dynamics in Biological Molecules”  
15-20 December 2005. Honolulu, HI. USA  
2004  
Conference Co-chair. 2004 Cross Border Workshop on Laser Science: “From Nonlinear Optics to Biophotonics”. May 6-8  
2004. Ottawa, ON, Canada  
2004-  
Member, Editorial Board for ChemPhysChem (European Physical Societies, Wiley-VCH))  
2003-4  
Symposium Co-chair. American Chemical Society Annual Meeting. Symposium on “Emerging Ultrafast Laser Spectroscopies: From Chemistry to Biophysics”. March 2004 Anaheim, CA, USA  
2003-4  
Member, Program Committee, XIV International Conference on Ultrafast Phenomena. Optical Society of America. July 2004. Niigata Japan.  
2003-4  
Member of the International Advisory Board for 14<sup>th</sup> International Conference on Vacuum Ultraviolet Radiation Physics. July  
2004. Cairns Australia  
2002-  
PhD Supervisor for Mr. Rune Lausten, Dept. of Physics, Queen's University  
2002-  
PhD Supervisor for Mr. Benjamin Sussman, Dept. of Physics, Queen's University  
2000  
Member, Canadian Photonics Experts Visioning Panel  
2000-  
PhD Supervisor for Mr. Anthony Lee, Dept. of Chemistry, Queen's University  
2000-  
Joint PhD Supervisor for Mr. Marc Smits, Dept. of Chemistry, University of Amsterdam  
1999  
Member, Program Committee, XII International Conference on Ultrafast Phenomena

1999-  
Member, Advisory Panel for Gordon Conference on Multiphoton Processes  
1999  
Member, Editorial Board of PhysChemComm (Royal Society Chemistry)  
1999  
Member, Organizing Committee, Cross Border Workshop on Laser Science, 20-22 May  
Ottawa, Ontario  
1998  
Member, NRC Forecasting Committee on Molecular Electronics  
1998  
Member, Organizing Committee, NRC Workshop on Organic Materials for Microelectronics, 4-5 December  
Ottawa, Ontario  
1997  
Member, Sub-committee on Photophysics, Photochemistry & Photobiology, International Quantum Electronics Conference  
1996-  
Member, Advisory Panel for Gordon Conference on Molecular Electronic Spectroscopy

Publications in Refereed Journals: (Current Hirsch Index:  $h = 35$ )

108. A.C.-T. Ko, A. Ridsdale, L.B. Mostaçõ-Guidolin, A. Major, A. Stolow & M.G. Sowa  
“Nonlinear optical microscopy in decoding arterial diseases”  
Biophysical Reviews (*in press*)

107. C. Weeraman, M. Chen, D. Moffatt, R. Lausten, A. Stolow, L. Johnston.  
"A Combined Vibrational Sum Frequency Generation Spectroscopy and Atomic Force Microscopy Study of Sphingomyelin-Cholesterol Monolayers"  
Langmuir (*in press*)

106. R.C. Burruss, A.D. Slepko, A.F. Pegoraro, A. Stolow  
“Unraveling the complexity of deep gas accumulations with 3D multimodal CARS microscopy”  
Geology (*in press*)

105. R.Y. Brogaard, O. Schalk, A.E. Boguslavskiy, G.D. Enright, H. Hopf, V. Raev, E. Tarcoveanu, T.I. Sølling, A. Stolow  
“The Paternò-Büchi reaction: importance of triplet states in the excited-state reaction pathway”  
Physical Chemistry Chemical Physics 14, 8572 (2012)

104. M. Spanner, J. Mikosch, A.E. Boguslavskiy, M.M. Murnane, A. Stolow, S. Patchkovskii  
“Strong-field ionization and high-order-harmonic generation during polyatomic molecular dynamics of N<sub>2</sub>O<sub>4</sub>”  
Physical Review A 84, 033426 (2012)

103. A.E. Boguslavskiy, J. Mikosch, A. Gijsbertsen, M. Spanner, S. Patchkovskii, N. Gador, M.J.J. Vrakking, A. Stolow  
“The multielectron ionization dynamics underlying attosecond strong field spectroscopies”  
Science 335, 1336 (2012)

102. K.I. Popov, A.F. Pegoraro, A. Stolow, L. Ramunno  
“Image formation in CARS and SRS: effect of an inhomogeneous nonresonant background medium”  
Optics Letters 37, 473 (2012)

101. R. Livingstone, O. Schalk, A.E. Boguslavskiy, G. Wu, L.T. Bergendahl, A. Stolow, M.J. Paterson, D. Townsend  
“Following the excited state relaxation dynamics of indole and 5-hydroxyindole using time-resolved photoelectron spectroscopy”  
Journal of Chemical Physics 135, 194307 (2011)

100. D.C. Kennedy, C.S. McKay, M.C.B. Legault, D.C. Danielson, J.A. Blake, A.F. Pegoraro, A. Stolow, Z. Mester, J.P. Pezacki  
“Cellular Consequences of Copper Complexes Used To Catalyze Bioorthogonal Click Reactions”  
Journal of the American Chemical Society 133, 17993 (2011)

99. G. Wu, A.E. Boguslavskiy, O. Schalk, M.S. Schuurman, A. Stolow

- “Ultrafast Non-adiabatic Dynamics of Methyl Substituted Ethylenes: the  $\pi^*3s$  Rydberg State”  
Journal of Chemical Physics 135, 164309 (2011)
98. M. Spanner, J. Mikosch, A. Gijsbertsen, A.E. Boguslavskiy, A. Stolow  
“Multielectron Effects and Nonadiabatic Electronic Dynamics in Above Threshold Ionization and High Harmonic Generation”  
New Journal of Physics 13, 93010 (2011)
97. P.J. Bustard, G. Wu, R. Lausten, D. Townsend, I.A. Walmsley, A. Stolow, B.J. Sussman  
“From Quantum Control to Quantum Technology with the Dynamic Stark Effect”  
Faraday Discussions 153, 321 (2011)
96. G. Wu, P. Hockett, A. Stolow  
“Time-Resolved Photoelectron Spectroscopy: from wavepackets to observables”  
Physical Chemistry Chemical Physics 13, 18447 (2011)
95. O. Schalk, A.E. Boguslavskiy, A. Stolow, M.S. Schuurman  
“Through-Bond Interactions and the Localization of Excited State Dynamics”  
Journal of the American Chemical Society 133, 16451 (2011)
94. A.E. Boguslavskiy, M.S. Schuurman, D. Townsend, A. Stolow  
“Non-Born–Oppenheimer wavepacket dynamics in polyatomic molecules: vibrations at conical intersections in DABCO”  
Faraday Discussions 150, 419 (2011)
93. R.Y. Brogaard, A.E. Boguslavskiy, O. Schalk, G.D. Enright, H. Hopf, V.A. Raev, P.G. Jones, D.L. Thomsen, T.I. Solling, A. Stolow  
“Pseudo-Bimolecular [2+2] Cycloaddition Studied by Time-Resolved Photoelectron Spectroscopy”  
Chemistry-A European Journal 17, 3922 (2011)
92. P. Hockett, C.Z. Bisgaard, O.J. Clarkin, A. Stolow  
“Time-resolved imaging of purely valence-electron dynamics during a chemical reaction”  
Nature Physics 7, 612 (2011)
91. K.I. Popov, A.F. Pegoraro, A. Stolow, L. Ramunno  
“Image Formation in CARS Microscopy: Effect of the Gouy Phase Shift”  
Optics Express 19, 5902 (2011)
90. A.D. Slepko, A. Ridsdale, H-N Wan, M-H Wang, A.F. Pegoraro, D.J. Moffatt, J.P. Pezacki, F-J Kao, A. Stolow  
“Forward-collected simultaneous fluorescence lifetime imaging and coherent anti-Stokes Raman scattering microscopy”  
Journal of Biomedical Optics 16, 021103 (2011)
89. D. Townsend, B.J. Sussman, A. Stolow.  
“A Stark Future for Quantum Control”  
Journal of Physical Chemistry A 115, 357 (2011)
88. A.D. Slepko, A. Ridsdale, A.F. Pegoraro, D.J. Moffatt, A. Stolow  
“Multimodal CARS microscopy of structured carbohydrate biopolymers”  
Biomedical Optics Express 1, 1347 (2010)
87. A. Pegoraro, A. Slepko, A. Ridsdale, J.P. Pezacki & A. Stolow  
“Single laser source for multimodal CARS microscopy”  
Applied Optics 49, F10 (2010)
86. R.K. Lyn, D.C. Kennedy, A. Stolow, A. Ridsdale, J.P. Pezacki  
“Dynamics of lipid droplets induced by the hepatitis C virus core protein”  
Biochemical and Biophysical Research Communications 399, 518 (2010)

- 85 D.R. Blais, R.K. Lyn, M.A. Joyce, Y. Rouleau, R. Steenbergen, N. Barsby, L.F. Zhu, A.F. Pegoraro, A. Stolow, D.L. Tyrrell, J.P. Pezacki  
“Activity-based Protein Profiling Identifies a Host Enzyme, Carboxylesterase 1, which Is Differentially Active during Hepatitis C Virus Replication”  
Journal of Biological Chemistry 285, 25602 (2010)
84. L.B. Mostaço-Guidolin, M.G. Sowa, A. Ridsdale, A.F. Pegoraro, M.S.D. Smith, M.D. Hewko, E.K. Kohlenberg, B. Schattka, M. Shiomi, A. Stolow, A.C-T. Ko  
“Differentiating atherosclerotic plaque burden in arterial tissues using femtosecond CARS-based multimodal nonlinear optical imaging”  
Biomedical Optics Express 1, 59 (2010)
83. C. Weeraman, S.A. Mitchell, R. Lausten, L.J. Johnston, A. Stolow  
“Vibrational sum frequency generation spectroscopy using inverted visible pulses”  
Optics Express 18, 11487 (2010)
82. O. Schalk, A. Boguslavskiy, A. Stolow  
“Substituent Effects on Dynamics at Conical Intersections: Cyclopentadienes”  
Journal of Physical Chemistry A 114, 4058 (2010)
81. A.C.T. Ko, M.S.D. Smith, L.B. Mostaço-Guidolin, M.D. Hewko, E.K. Kohlenberg, B. Schattka, M.G. Sowa, A. Ridsdale, A.F. Pegoraro, A. Stolow, M. Shiomi  
“Multimodal nonlinear optical imaging of atherosclerotic plaque development in myocardial infarction prone rabbits”  
Journal of Biomedical Optics 15, 20501 (2010)
80. M.G. Sowa, L.B. Mostaco-Guidolin, M.S.D. Smith, E.K. Kohlenberg, A. Ridsdale, A. Stolow & A.C.T. Ko  
“Nonlinear Optical Measurements of the Artery Wall: Parameters Related to the Progression of Atherosclerosis”  
Measurement Science Review 9, 93 (2009)
79. A.F. Pegoraro, A. Ridsdale, D.J. Moffatt, J.P. Pezacki, A. Stolow, B.K. Thomas, L. Fu, L. Dong, M.E. Fermann  
“All-fiber CARS microscopy of live cells”  
Optics Express 17, 20700 (2009)
78. A.F. Pegoraro, A. Stolow, A. Ridsdale, D.J. Moffatt, J.P. Pezacki, Y. Jia  
“CARS Microscopy Made Simple”  
Biophotonics 18(8), 36 (2009)
77. A. Stolow  
“Chemical Physics: Molecular Conformations Fielded”  
Nature 461, 1063 (2009)
76. R.K. Lyn, D.C. Kennedy, S.M. Sagan, D.R. Blais, Y. Rouleau, A.F. Pegoraro, X.S. Xie, A. Stolow, J.P. Pezacki  
“Direct imaging of the disruption of hepatitis C virus replication complexes by inhibitors of lipid metabolism”  
Virology 394, 130 (2009)
75. A.F. Pegoraro, A. Ridsdale, D.J. Moffatt, J.P. Pezacki, A. Stolow  
“CARS Microscopy Made Simple”  
Photons 7, 50 (2009)
74. C.Z. Bisgaard, O.J. Clarkin, G. Wu, A.M.D. Lee, O. Geßner, C.C. Hayden & A. Stolow  
“Time-resolved Molecular Frame Dynamics of Fixed-in-Space CS<sub>2</sub> Molecules”  
Science 323, 1464 (2009)
73. A.F. Pegoraro, A. Ridsdale, D.J. Moffatt, Y. Jia, J.P. Pezacki & A. Stolow  
“Optimally chirped multimodal CARS microscopy based on a single Ti:sapphire oscillator”  
Optics Express 17, 2984 (2009)
72. C.Z. Bisgaard, H. Satzger, S. Ullrich & A. Stolow  
“Excited-State Dynamics of Isolated DNA Bases: A Case Study of Adenine”

ChemPhysChem 10, 101 (2009)

71. A. Pegoraro A. Ridsdale R.K. Lyn J.P. Pezacki & A. Stolow

“Simple High Performance Multi-modal Coherent Anti-Stokes Raman Scattering (CARS) Microscopy Based on a Two-Photon Microscope”

Microscopy and Microanalysis 14 (Supplement S2), 758 (2008)

70. A. Stolow & J.G. Underwood

“Time-Resolved Photoelectron Spectroscopy of Non-adiabatic Dynamics in Polyatomic Molecules”

Advances in Chemical Physics. Vol. 139, Edited by S.A. Rice, (Wiley, New York, 2008) p.497

69. W. Li, R. Lock, S. Patchkovskii, A. Stolow, H.C. Kapteyn, M.M. Murnane

“Time-resolved Dynamics in N<sub>2</sub>O<sub>4</sub> probed using High Harmonic Generation”

Science 322, 1207 (2008)

68. R. Lausten, O. Smirnova, B.J. Sussman, S. Gräfe, A.S. Mouritzen, & A. Stolow

“Time- and frequency-resolved coherent anti-Stokes Raman scattering spectroscopy with sub-25 fs laser pulses”

Journal of Chemical Physics 128, 244310 (2008)

67. B.J. Sussman, R. Lausten & A. Stolow

“Focusing of light following a 4-f pulse shaper: Considerations for quantum control”

Physical Review A 77, 043416 (2008)

66. A.M.D. Lee, J.D. Coe, S. Ullrich, M.-L. Ho, S.-J. Lee, B.-M. Cheng, M.Z. Zgierski, I.-C. Chen, T.J. Martinez, A. Stolow

“Substituent effects on dynamics at conical intersections: alpha,beta-enones”

Journal of Physical Chemistry A 111, 11948 (2007)

65. N. Gador, E. Samoylova, V.R. Smith, A. Stolow, D.M. Rayner, W. Radloff, I.V. Hertel, T. Schultz

“Electronic Structure of Adenine and Thymine Base Pairs Studied by Femtosecond Electron-Ion Coincidence Spectroscopy”

Journal of Physical Chemistry A 111, 11743 (2007)

64. H.R. Hudock, B.G. Levine, A.L. Thompson, H. Satzger, D. Townsend, N. Gador, S. Ullrich, A. Stolow, T.J. Martinez  
“Ab Initio Molecular Dynamics and Time-Resolved Photoelectron Spectroscopy of Electronically Excited Uracil and Thymine”

Journal of Physical Chemistry A 111, 8500 (2007)

63. M. Noestheden, Q. Hu, L.-L. Tay, A.M. Tonary, A. Stolow, R. MacKenzie, J. Tanha, J.P. Pezacki

“Synthesis and characterization of CN-modified protein analogues as potential vibrational contrast agents”

Bioorganic Chemistry 35, 284, (2007)

62. X.-L. Nan, A.M. Tonary, A. Stolow, X.S. Xie, J.P. Pezacki

“Intracellular imaging of HCV RNA and cellular lipids by using simultaneous two-photon fluorescence and coherent anti-Stokes Raman scattering microscopies”

ChemBioChem 7 1895 (2006)

61. D. Townsend, H. Satzger, T. Ejdrup, A.M.D. Lee, H. Stapelfeldt & A. Stolow

“<sup>1</sup>B<sub>2</sub>(<sup>+</sup>Σ<sub>u</sub>) Excited State Decay Dynamics in CS<sub>2</sub>”

Journal of Chemical Physics 125, 234302 (2006)

60. K.F. Lee, D.M. Villeneuve, P.B. Corkum, A. Stolow & J.G. Underwood

“Field-free three-dimensional alignment of polyatomic molecules”

Physical Review Letters 97, 173001 (2006)

59. B.J. Sussman, D. Townsend, M. Yu. Ivanov & A. Stolow

“Dynamic Stark Control of Molecular Photodissociation”

Science 314, 278 (2006)

58. H. Satzger, D. Townsend, & A. Stolow

“Reassignment of the low lying cationic states in gas phase adenine and 9-methyl adenine”

Chemical Physics Letters 430, 144 (2006)

57. S.V. Levchenko, H. Reisler, A.I. Krylov, O. Gessner, A. Stolow, H. Shi, A.L.L. East  
“Photodissociation dynamics of the NO dimer: I. Theoretical overview of the ultraviolet singlet excited states”  
Journal of Chemical Physics 125, 084301 (2006)

56. H. Satzger, D. Townsend, M.Z. Zgierski, S. Patchkovskii, S. Ullrich & A. Stolow  
“Primary processes underlying the photostability of isolated DNA bases: Adenine”  
Proceedings of the National Academy of Sciences 103, 10196 (2006)

55. B. J. Sussman, J. G. Underwood, R. Lausten, M. Yu. Ivanov & A. Stolow  
“Quantum control via the dynamic Stark effect: Application to switched rotational wave packets and molecular axis alignment”  
Physical Review A 73, 053403 (2006)

54. O. Gessner, A.M.D. Lee, J.P. Shaffer, H. Reisler, S.V. Levchenko, A.I. Krylov, J. G. Underwood, H. Shi, A.L.L. East, D.M. Wardlaw, E.t-H. Chrysostom, C.C. Hayden & A. Stolow  
“Femtosecond Multi-dimensional Imaging of a Molecular Dissociation”  
Science 311, 219 (2006)

53. R. Lausten, P. Rochon, M. Ivanov, P. Cheben, S. Janz, P. Desjardins, J. Ripmeester, T. Siebert & A. Stolow  
“Optically reconfigurable azobenzene polymer-based fibre Bragg filter”  
Applied Optics 44, 7039 (2005)

52. B.J. Sussman, M.Yu. Ivanov & A. Stolow  
“Non-perturbative quantum control via the non-resonant dynamic Stark effect”  
Physical Review A 71, 051401R (2005)

51. J.G. Underwood, B.J. Sussman & A. Stolow  
“Field-free three dimensional molecular axis alignment”  
Physical Review Letters 94, 143002 (2005)

50. M. Smits, C.A. de Lange, A. Stolow & D.M. Rayner  
“Absolute ionization rates of multielectron transition metal atoms in strong infrared laser fields”  
Physical Review Letters 93, 213003 (2004)

49. M. Smits, C.A. de Lange, A. Stolow & D.M. Rayner  
“Dynamic polarization in the strong field ionization of small metal clusters”  
Physical Review Letters 93, 203402 (2004)

48. A. Stolow & D.M. Jonas  
“Multi-dimensional Snapshots of Chemical Dynamics”  
Science 305, 1575 (2004)

47. O. Gessner, E.t-H. Chrysostom, A.M.D. Lee, D.M. Wardlaw, M-L. Ho, S-J. Lee, B-M. Cheng, M.Z. Zgierski, I-C. Chen, J.P. Shaffer, C.C. Hayden & A. Stolow  
“Non-adiabatic intramolecular and photodissociation dynamics studied by femtosecond time-resolved photoelectron and coincidence imaging spectroscopy”  
Faraday Discussions 127, 193 (2004)

46. S. Ullrich, T. Schultz, M.Z. Zgierski & A. Stolow  
“Electronic relaxation dynamics in DNA and RNA bases studied by Time-Resolved Photoelectron Spectroscopy”  
Phys. Chem. Chem. Phys. 6, 2796 (2004)

45. A. Stolow, A.E. Bragg, D.M. Neumark  
“Femtosecond Time-resolved Photoelectron Spectroscopy”  
Chemical Reviews 104, 1719 (2004)

44. S. Ullrich, T. Schultz, M.Z. Zgierski & A. Stolow



- “Direct observation of Electronic Relaxation Dynamics in Adenine *via* Time-Resolved Photoelectron Spectroscopy”  
Journal of the American Chemical Society (Commun.) 126, 2262 (2004)
43. M.Smits, C.A. de Lange, S. Ullrich, T. Schultz, M. Schmitt, J.G. Underwood, J. P. Shaffer, D.M. Rayner & A.Stolow  
“Stable kHz rate molecular beam laser ablation sources”  
Review of Scientific Instruments 74, 4812 (2003)
42. T.Schultz, J.Quenneville, B.Levine, A.Toniolo, S.Lochbrunner, M.Schmitt, J.P.Shaffer, M.Z.Zgierski & A.Stolow  
“Mechanism and Dynamics of Azobenzene Photoisomerization”  
Journal of the American Chemical Society (Commun.) 125, 8098 (2003)
41. J.G. Underwood, M. Spanner, M.Yu. Ivanov, J. Mottershead, B.J. Sussman & A. Stolow  
“Switched Wavepackets: A Route to Non-perturbative Quantum Control”  
Physical Review Letters 90, 223001 (2003)
40. A.Stolow  
“Time-resolved Photoelectron Spectroscopy: Non-adiabatic Dynamics in Polyatomic Molecules”  
International Reviews in Physical Chemistry 22, 377 (2003)
39. A.Stolow  
“Femtosecond Time-resolved Photoelectron Spectroscopy of Polyatomic Molecules”  
Annual Reviews of Physical Chemistry 54, 89 (2003)
38. S-H. Lee, K-C. Tang, I-C. Chen, M. Schmitt, J.P. Shaffer, T. Schultz, J.G. Underwood, M.Z. Zgierski & A. Stolow  
“Substituent Effects in Molecular Electronic Relaxation Dynamics via Time-Resolved Photoelectron Spectroscopy:  $\pi\pi^*$  States in Benzenes”  
Journal of Physical Chemistry A 106, 8979 (2002)
37. M. Lezius, V. Blanchet, M. Yu. Ivanov & A. Stolow  
“Polyatomic molecules in strong laser fields: Nonadiabatic multielectron dynamics”  
Journal of Chemical Physics 117, 1575 (2002)
36. K.Resch, V.Blanchet, A.Stolow & T.Seideman  
“Toward Polyatomic Wavepacket Decomposition: Final State Effects”  
Journal of Physical Chemistry A 105, 2756 (2001)
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#### Conference Proceedings

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I.Fischer, M.J.J.Vrakking, D.M.Villeneuve & A.Stolow  
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I.Fischer, M.J.J.Vrakking, D.M.Villeneuve & A.Stolow  
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"Lifetime Enhancement of Rydberg States observed in Vibrational Wavepacket Experiments"  
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Workshop Int. Inst. Pure Appl. Chem.  
World Sci. Singapore

#### Book Chapters

M.S. Schuurman & A. Stolow  
"Interrogation of Nonadiabatic Molecular Dynamics Via Time-Resolved Photoelectron Spectroscopy"  
in 'Conical Intersections: Theory, Computation and Experiment', Edited by W. Domcke, D. Yarkony, H. Köppel. Advanced Series in Physical Chemistry Vol. 17 (World Scientific, Singapore 2011).

A. Stolow & J.G. Underwood  
"Time-Resolved Photoelectron Spectroscopy of Non-adiabatic Dynamics in Polyatomic Molecules"  
Advances in Chemical Physics. Vol. 139, Edited by S.A. Rice, (Wiley, New York, 2008)

C.C. Hayden & A.Stolow  
"Non-adiabatic Dynamics studied by Femtosecond Time-resolved Photoelectron Spectroscopy"

Advanced Physical Chemistry, Vol.10, Edited by C-Y Ng. (World Scientific Singapore, 2000)

Invited Talks:

Department of Chemistry.. Universidad Autonoma.  
Madrid, Spain  
29 August 2011  
“Dynamics of Polyatomic Molecules in Laser Fields”

Department of Chemistry. Universidad Complutense.  
Madrid, Spain  
28 August 2011  
“Dynamics at Conical Intersections”

Gordon Research Conference on Electronic Spectroscopy & Dynamics.  
Lewiston, ME, USA.  
23 July 2012.  
“The Dynamophore: Localization of Excited State Dynamics”

Photonics North 2012. Bio-Medical-Infection Conference.  
Montreal, PQ.  
7 June 2012.  
“Broadly Tunable CARS Microscopy in the Fingerprint Region”

Keynote Seminar, Inaugural Symposium  
Waitt Advanced Biophotonics Center  
Salk Institute for Biological Studies  
San Diego, CA, USA  
May 4, 2012  
“Multimodal CARS Microscopy: Label-free Live Cell Nonlinear Imaging”

Instrumentation Development Meeting.  
Stanford Linear Coherent Light Source (LCLS II).  
Stanford, CA, USA  
March 22, 2012  
“Time-resolved Photoelectron Spectroscopy”

Gordon Research Conference on Photoionization & Photodetachment  
Galveston, TX, USA  
February 16, 2012  
“Polyatomic Molecules in Strong Laser Fields”

Institute Colloquium.  
Max-Planck-Institute for Quantum Optics  
Garching, Germany  
January 13, 2012  
“Molecular Sciences: The Dynamical Perspective”

Symposium on Chemical Physics.  
University of Waterloo.  
Waterloo, Ontario.  
November 6, 2011.  
“CARS Microscopy Made Simple”

Seminar. Department of Chemistry.  
University of California, Berkeley.  
Berkeley, California, USA  
November 2, 2011.  
“CARS Microscopy Made Simple”

Physical Chemistry Colloquium. Department of Chemistry.  
University of California, Berkeley.  
Berkeley, California, USA  
November 1, 2011.  
“Watching Ultrafast Charge & Energy Flow in Molecules”

Colloquium. Department of Physics.  
Frei Universität Berlin.  
Berlin, Germany.  
25 October 2011.  
“CARS Microscopy Made Simple”

Colloquium. Fritz-Haber-Institut der Max-Planck-Gesellschaft.  
Berlin, Germany.  
24 October 2011  
“Dynamic Stark Control”

Colloquium. McGill Chemical Society. McGill University.  
Montreal, PQ.  
4 October 2011.  
“CARS Microscopy Made Simple: Label-free, Chemical Specific Nonlinear Optical Imaging of Live Cells & Tissues”

Conference on Molecular Energy Transfer  
Oxford, UK.  
15 September 2011  
“Towards Polanyi rules for polyatomics via time-resolved photoelectron spectroscopy”

American Chemical Society National Meeting.  
Denver, CO, USA  
1 September 2011  
“Attosecond strong field dynamics of polyatomic molecules”

American Chemical Society National Meeting.  
Denver, CO, USA  
29 August 2011  
“Multimodal CARS Microscopy using a simple femtosecond source”

Gordon Research Conference on Quantum Control of Light & Matter  
Mount Holyoke College, MA, USA  
3 August 2011  
“Molecules in Intermediate to Strong Laser Fields”

Faraday Discussion 153: Coherence and Control in Chemistry”  
Leeds, UK  
26 July 2011  
“From Molecular Control to Quantum Technology with the dynamic Stark Effect”

Colloquium. Max-Born-Institute for Nonlinear Optics  
Berlin, Germany  
22 July 2011  
“Imaging the Ultrafast Electronic Dynamics of Polyatomic Molecules:  
Molecular Frame Photoelectron Imaging, Quantum Control, Attosecond Strong Field Physics”

Colloquium. Institut de Ciències Fòniques  
Barcelona, Spain  
18 July 2011  
“Dynamics of Polyatomic Molecules in Laser Fields”

The Madrid Conference on Femtochemistry  
Madrid, Spain.  
11 July 2011  
“Reaction Dynamics”

Canadian Society for Chemistry  
Montreal, PQ  
9 June 2010  
“Time-Resolved Imaging of Purely Valence Electron Dynamics During a Chemical Reaction”

Canadian Society for Chemistry  
Montreal, PQ  
8 June 2011  
“A Pulse Shaping Approach to Broadband Infrared Sum Frequency Generation Spectroscopy”

Microscopical Society of Canada 38<sup>th</sup> Annual Meeting  
Ottawa ON  
7 June 2011  
“Multi-modal CARS microscopy using a simple femtosecond source”

Information Photonics  
Ottawa, ON  
18 May 2011  
“High Performance Multimodal CARS Microscopy using a Single Laser Source”

Photonics North  
Ottawa, ON  
16 May 2011  
“CARS Microscopy Made Simple”

Focus On Microscopy Conference  
Konstanz, Germany  
20 April 2011  
“CARS Microscopy for Hoi Polloi”

University of Bern  
Bern, Switzerland  
14 April 2011  
“Multimodal CARS Microscopy using a Simple Femtosecond Source”

ETH Zürich  
Zürich Switzerland  
12 April 2011  
“Polyatomic Molecules in Laser Fields: Dynamics, Control, Strong Fields”

Ecole Polytechnique Federale de Lausanne  
Lausanne, Switzerland  
11 April 2011  
“Polyatomic Molecules in Laser Fields: Dynamics, Control, Strong Fields”

Faraday Discussions 150. “Frontiers in Spectroscopy”  
Basel, Switzerland  
7 April 2011  
“Non-Born Oppenheimer wavepacket dynamics in polyatomic molecules: vibrations at conical intersections in DABCO”

Colloquium  
Ottawa Institute of Systems Biology  
Faculty of Medicine, University of Ottawa  
29 March 2011



“Shining New Light on Live Cells: Nonlinear Optical Microscopy”

Beckman Laser Institute  
University of California, Irvine  
3 March 2011

“CARS Microscopy Made Simple”

Institute Colloquium. Center for Free-Electron Laser Science.  
Hamburg, Germany.  
19 January 2011

“Imaging the Dynamics of Polyatomic Molecules”

INRS - Énergie, Matériaux et Télécommunications  
Varenes, Quebec.  
5 November 2010

“Multi-modal CARS Microscopy Using a Simple Femtosecond Source”

Department of Engineering Physics.  
Ecole Polytechnique de Montreal. Quebec.  
4 November 2010

“CARS Microscopy Made Simple”

Department of Physics  
University of Stockholm, Sweden  
11 October 2010

“Polyatomic Molecules in Laser Fields: Non-adiabatic Dynamics, Quantum Control, Strong Field Physics”

International Conference on Raman Spectroscopy.  
Boston, MA USA  
12 August 2010

“Multi-modal CARS Microscopy Using a Simple Femtosecond Source”

Future Developments in Coherent Raman Microscopy.  
Harvard University. Cambridge University.  
7 August 2010

“CARS Microscopy for Hoi Polloi”

International Max Planck Research School of Advanced Photon Science. Munich-Centre for Advanced Photonics.  
Wildbad Kreuth, Germany.  
1 August 2010

“Ultrafast Molecular Dynamics”

Gordon Research Conference on Atomic & Molecular Interactions  
Tilton, NH, USA  
18 July 2010

“Dynamics and Control in the Molecular Frame”

Lecturer, Ultrafast X-ray Science Summer School. SLAC National Accelerator Laboratory. Stanford University.  
Menlo Park, CA. USA  
22 June 2010

“Dynamics in the Molecular Frame using Weak and Strong Laser Fields”

Lecturer, Ultrafast X-ray Science Summer School. SLAC National Accelerator Laboratory. Stanford University.  
Menlo Park, CA. USA  
22 June 2010

“Wavepacket Dynamics in Polyatomic Molecules: Creation, Evolution, Control and Detection”

Keynote Speaker. U.S. Department of Energy. 31<sup>st</sup> Annual Combustion Research Meeting.  
Warrenton, VA USA

2 June 2010

“Ultrafast Dynamics and Quantum Control of Nonadiabatic Processes”

93<sup>rd</sup> Canadian Society for Chemistry Conference. Symposium on Coherence & Decoherence in Molecular Dynamics.  
Toronto, ON

1 June, 2010

“Non-resonant, non-perturbative Dynamic Stark Control of Quantum Dynamics”

Department of Chemistry

University of Rome “La Sapienza”

Rome, Italy

29 April 2010

“Quantum Control, Molecules in Strong Laser Fields”

Department of Chemistry

University of Perugia

Perugia, Italy

27 April 2010

“Femtochemistry from the Molecule’s Viewpoint”

Department of Chemistry

University of Rome “La Sapienza”

Rome, Italy

26 April 2010

“Femtosecond Pump-Probe Spectroscopy”

Sigma Xi Lecture

Ottawa, ON

17 February, 2010

“Shining New Light on Live Cells: Nonlinear Optical Microscopy”

Department of Chemistry, Stanford University

Stanford, CA, USA

4 December, 2009

“CARS Microscopy Made Simple”

The Future of Ultrafast Soft X-ray Science

Lawrence Berkeley Laboratory

Berkeley, CA, USA

2 December, 2009

“Time-Resolving Chemical Reaction Dynamics”

ACS 238<sup>th</sup> National Meeting. Symposium on 25 Years of ZEKE

Washington DC, USA.

17 August 2009

“Time-resolved photoelectron spectroscopy in the molecular frame”

ACS 238<sup>th</sup> National Meeting. Symposium on Biological Applications of Nonlinear Optical Imaging and Spectroscopy

Washington DC, USA.

19 August 2009

“Optimally chirped multimodal CARS Microscopy based on a single Ti:Sa oscillator”

CSC2009 Canadian Society for Chemistry

Hamilton, ON

1 June 2009

“Time-Resolved Chemical Dynamics from the Molecule’s Perspective”

XI<sup>th</sup> Cross Border Workshop on Laser Science

Ottawa, ON

29 May 2009

“Optimally Chirped High Performance CARS Microscopy of Live Cells and Tissues”

Photonics North. Symposium on Photonics Design & Simulation.

Quebec City, QC

24 May 2009

“High Performance Multimodal CARS Microscopy using a Single Femtosecond Source”

40<sup>th</sup> Annual Meeting of the American Physical Society Division of Atomic, Molecular Optical Physics

Charlottesville, VA USA

21 May 2009

“Imaging Ultrafast Dynamics in the Molecular Frame”

Colloquium

Department of Chemistry & James Franck Institute

University of Chicago, Chicago IL USA

20 April 2009

“Ultrafast Travels and Detours along the Arrow of Chemistry”

The Canadian Laser Applications Network (CLAN) Meeting

Toronto, ON

11-12 March, 2009

“Chemical-specific, non-destructive material diagnostics via Coherent Nonlinear Raman Microscopy”

Ontario Institute for Cancer Research

MaRS Centre, Toronto, ON

9 February, 2009

“Label-free imaging of cells using CARS Microscopy”

Gordon Research Conference on Molecular Energy Transfer

Ventura, California USA

18-23 January 2009

“Nonadiabatic charge and energy flow in excited molecules: Dynamics & Control”

NATO Advanced Study Institute. “Laser Control & Monitoring in New Materials, Biomedicine, Environment, Security & Defense” Ottawa, Canada.

Nov.26, 2008

“CARS in Biomedicine – II: Microscopy”

NATO Advanced Study Institute. “Laser Control & Monitoring in New Materials, Biomedicine, Environment, Security & Defense” Ottawa, Canada.

Nov.25, 2008

“CARS in Biomedicine – I: Non-linear Optics & Coherent Control”

NRC-NSERC-BDC Workshop on Organic Photovoltaics

Laval University, Quebec City, Quebec

18 November 2008

“Characterization of Multiple Exciton Generation (MEG) in nanocrystals & composites”

Colloquium

Chemistry, Temple University

Philadelphia, PA, USA

23 October 2008

“Ultrafast Travels & Detours along the Arrow of Chemistry”

International Conference on Multiphoton Processes

Heidelberg, Germany

18-23 September 2008

“Probing Dynamics of Polyatomic Molecules: Photoelectron Spectroscopy and High Harmonic Generation”

Gordon Research Conference on Multiphoton Processes  
Tilton, New Hampshire USA  
8-13 June 2008  
“Polyatomic Molecular Dynamics: High Harmonic Generation vs. Time-Resolved Photoelectron Spectroscopy”

Keith Laidler Award Lecture. Canadian Society for Chemistry  
Edmonton, Alberta.  
27 May 2008  
“Non-adiabatic Dynamics and its Quantum Control”

ACFAS Symposium on Biophotonics  
Quebec City, Quebec.  
6 May 2008  
“Coherent Anti-Stokes Raman Scattering (CARS) Microscopy of Live Cells”

American Chemical Society. National Meeting. Symposium on Optical Probes of Dynamics in Complex Systems.  
New Orleans, LA. USA  
4-10 April 2008  
“Non-adiabatic Molecular Dynamics and its Quantum Control”

American Physical Society. March Meeting. Focus Session on Quantum Control  
New Orleans, LA. USA  
12 March 2008  
“Non-resonant, non-perturbative Dynamic Stark Control of Quantum Dynamics”

48<sup>th</sup> Sanibel Symposium. Session on Non-adiabatic Phenomena  
St. Simons Island, Georgia USA  
26 Feb. 2008  
“Non-adiabatic Molecular Dynamics and its Quantum Control”

University of Alberta. Department of Physics  
Edmonton AB.  
17 January 2008  
“Molecular Physics in Strong Laser Fields”

University of Alberta. Department of Chemistry  
Edmonton AB.  
16 January 2008  
“Ultrafast Molecular Science: From Femtochemistry to Biophotonics”

University of Calgary. Department of Chemistry  
Calgary AB.  
15 January 2008  
“Ultrafast Molecular Science: From Femtochemistry to Biophotonics”

Ottawa-Carleton Institute of Physics  
University of Ottawa  
12 December 2007  
“Ultrafast Molecular Sciences: from Quantum Dynamics to Biophotonics”

Canada-Taiwan Bilateral Workshop on “Emerging Photonic Applications in Medicine”  
Taipei, Taiwan  
13-14 November 2007  
“Coherent Anti-Stokes Raman Scattering (CARS) Microscopy of Live Cells”

Workshop on “Science for a New Class of Soft X-Ray Light Sources”  
University of California, Berkeley  
8-10 October, 2007

“Non-adiabatic Dynamics in Polyatomic Molecules”

Institute of Optics & Department of Physics  
Peking University  
Beijing, China  
26 September, 2007

“Ultrafast Molecular Physics in Laser Fields”

10<sup>th</sup> National Chemical Dynamics Meeting  
Dalian, China  
20-24 September, 2007  
“Femtosecond Molecular Science: Time, Phase, Intensity”

Department of Physics  
Imperial College  
London UK  
6 August 2007  
“Polyatomic Molecules in Laser Fields”

Department of Physics  
University College London  
London UK  
1 August 2007  
“Polyatomic Molecules in Laser Fields”

Femtochemistry & Femtobiology 8  
Magdalen College, Oxford University  
Oxford UK  
22-27 July, 2007  
“Dynamics and Control of Ultrafast Non-adiabatic Processes”

Gordon Research Conference on Photochemistry  
Bryant University, Smithfield RI, USA  
8-13 July 2007  
“Ultrafast Dynamics of Non-adiabatic Photochemistry and its Quantum Control”

American Physical Society Meeting, Division of Atomic, Molecular & Optical Physics.  
Calgary, Alberta  
5 – 9 June 2007  
“Non-perturbative Quantum Control via the Non-resonant Dynamic Stark Effect”

International Symposium on Molecular Beams  
Freiburg, Germany  
27 May – 2 June 2007  
“Ultrafast Non-adiabatic Molecular Dynamics and its Quantum Control”

Seminar, Department of Chemistry  
University of Ottawa  
Ottawa, ON  
7 May, 2007  
“Femtosecond Molecular Sciences: from Non-linear Optics to Biophotonics”

Colloquium, Department of Chemistry  
University of Sherbrooke  
Sherbrooke, QC  
7 February, 2007  
“Watching and Controlling Chemical Reactions”

Colloquium, Argonne National Laboratory

Argonne, IL USA  
15 January, 2007  
“Non-adiabatic Molecular Dynamics and its Quantum Control”

Physics of Quantum Electronics Conference  
Snowbird, Utah, USA  
5 January, 2007  
“Quantum control via the Non-Resonant Dynamic Stark Effect”

International Conference on Trends in Chemical Dynamics 2006  
Yi-Lan, Taiwan  
12 December, 2006  
“Femtosecond dynamics and quantum control in the gas phase”

Colloquium, Department of Chemistry  
Boston College  
Boston, MA USA  
21 November 2006  
“Watching ultrafast charge and energy flow during chemical reactions”

International Conference on the Stereodynamics of Chemical Reactions 2006  
Arcachon, France  
14 November 2006  
“Femtosecond molecular dynamics from the molecule’s point of view”

Colloquium  
Max-Planck-Institute for Quantum Optics  
Garching, Germany  
20 June 2006  
“The Three Pillars of Femtosecond Molecular Science”

Invited Lecturer  
Tulip Summer School on “Modern Developments in Spectroscopy”  
Noordwijk, The Netherlands  
26 April 2006  
“Frequency Domain Pictures of Femtosecond Pump-Probe and Coherent Control Experiments”  
27 April 2006  
“Dynamics and Control of Polyatomic Molecules in Strong Laser Fields”

Biophysical Chemistry Symposium  
McGill University  
16 May 2006  
“Dynamical Aspects of DNA Photonics”

Department of Chemistry  
University of Southern California  
Los Angeles, CA USA  
20 March 2006  
“Femtochemistry: Both Sides Now”

Department of Physics  
University of Ottawa  
9 March 2006  
“Three Pillars of Femtosecond Science: Time, Phase, Intensity”

Gordon Conference on Photoions, Photoionization and Photodetachment  
Buellton, CA, USA  
30 January 2006  
“Time-resolved coincidence imaging spectroscopy of a complex dissociation”

PACIFICHEM.

Symposium on 'Non-adiabatic phenomena and related dynamics: theory and experiment'.

Honolulu, HI, USA

17 December 2005

"Femtosecond time-resolved coincidence imaging spectroscopy of non-adiabatic photodissociation"

Optics Colloquium

Institute of Optics

University of Rochester

Rochester NY USA

9 November 2005

"Femtosecond Molecular Dynamics from the Molecule's Point of View"

Department of Physics

University of British Columbia

3 November 2005

"Dynamics and Control of Polyatomic Molecules in Strong Non-resonant Laser Fields"

Department of Chemistry

University of British Columbia

2 November 2005

"Watching Charge and Energy Flow in Excited Molecules"

Symposium on 'Ultrafast Photoelectron Spectroscopy'

Optical Society of America/American Physical Society Laser Science 2005

Tucson, AZ, USA

19 October 2005

"Time-Resolved Coincidence Imaging of Molecular Photodissociation"

12<sup>th</sup> Canadian Semiconductor Technology Symposium

Biophotonics and Bioelectronics Workshop

Ottawa

15 August 2005

"Dynamical Aspects of DNA Photonics: Photostability of the DNA Bases"

Femtochemistry VII

Washington DC, USA

18 July 2005

"The Behaviour of Polyatomic Molecules in Strong Laser Fields"

Colloquium

Department of Physics, University of Aarhus

Aarhus, Denmark

13 April 2005

"Three Pillars of Femtosecond Science: Time, Phase, Intensity"

Colloquium

Department of Chemistry, University of Copenhagen

Copenhagen, Denmark

11 April 2005

"Three Pillars of Femtosecond Chemistry: Time, Phase, Intensity"

Departmental Seminar

Department of Physics, Vrije Universiteit

Amsterdam, The Netherlands

23 February 2005

"Dynamics and Control of Polyatomic Molecules in Strong Laser Fields"

Institute Seminar  
FOM Institute for Atomic and Molecular Physics  
Amsterdam, The Netherlands  
21 February 2005  
“Watching Charge and Energy Flow in Ultrafast Molecular Dynamics”

Colloquium  
Department of Chemistry, Wayne State University  
Detroit MI, USA  
9 February 2005  
“The Three Pillars of Femtosecond Chemistry”

Laser Science Conference, Optical Society of America.  
Symposium on Multi-dimensional Detection  
Rochester NY, USA  
13 October 2004  
“Femtosecond time-resolved coincidence imaging spectroscopy of molecular photodissociation”

Laser Science Conference, Optical Society of America.  
Symposium on Coherent Control of Matter  
Rochester NY, USA  
12 October 2004  
“Nonperturbative coherent control via the Dynamic Stark Effect”

Colloquium  
SPAM Institute  
CEA, Saclay, France  
July 1, 2004  
“Time, Phase & Intensity: Three Pillars of Femtosecond Science”

D’Alembert Colloquium  
D’Alembert Institute  
Ecole Normale Supérieure, Cachan, France  
June 30, 2004  
“Time, Phase & Intensity: Three Pillars of Femtosecond Science”

Colloquium  
Department of Physics, IRSAMC  
University of Toulouse, Toulouse, France  
June 21, 2004  
“Time, Phase & Intensity: Three Pillars of Femtosecond Science”

Seminar  
Department of Physics, CELIA  
University of Bordeaux, Bordeaux, France  
June 21, 2004  
“Time, Phase & Intensity: Three Pillars of Femtosecond Science”

Departmental Colloquium  
Departments of Chemistry  
Ecole Normale Supérieure, Paris, France  
June 8, 2004  
“Time, Phase & Intensity: Three Pillars of Femtosecond Science”

Photonics Mini-Symposium  
Departments of Physics, Electrical Engineering & Chemistry  
Queen’s University, Kingston  
May 4, 2004  
“Femtosecond Science”



Colloquium, Department of Chemistry  
University of Pennsylvania  
Philadelphia, PA, USA  
January 15, 2004  
“Time, Phase & Intensity: Three Pillars of Femtosecond Molecular Science”

Colloquium, Department of Chemistry  
Michigan State University  
East Lansing, MI, USA  
December 2, 2003  
“Time, Phase, Intensity: The Three Pillars of Femtosecond Chemistry”

McElvain Lecture in Physical Chemistry  
Department of Chemistry  
University of Wisconsin  
Madison, WI, USA  
November 25, 2003  
“The Three Pillars of Femtosecond Chemistry: Time, Phase, Intensity”

“New Frontiers in Chemical Dynamics and Femtochemistry” Symposium  
York Centre for Laser Spectroscopy and Photochemistry (YCLS)  
Department of Chemistry  
The University of York, UK  
29 October 2003  
“Time, Phase, Intensity: Three Pillars of Femtosecond Science”

Department of Chemistry  
The University of York, UK  
28 October 2003  
“Frequency Domain Pictures of Femtosecond Pump-Probe and Coherent Control Experiments”

First Canadian Workshop on Ultrafast Dynamic Imaging: UFDI 2003  
Orford, Quebec  
2 October 2003  
“Switched Wavepackets: A route to field-free 3D alignment of polyatomic molecules”

Gordon Research Conference on Quantum Control of Light and Matter  
Mount Holyoke College  
South Hadley, MA, USA  
7 August 2003  
“Non-perturbative Coherent Control: Switched Wavepackets”

Departmental Colloquium  
Department of Chemistry  
University of Virginia  
Charlottesville, VA USA  
15 April 2003  
“Femtosecond Time-resolved Photoelectron Spectroscopy: Both Sides of the Arrow of Chemistry”

AMO Physics Colloquium  
Department of Physics  
University of Virginia  
Charlottesville, VA USA  
14 April 2003  
“Molecules in Nonperturbative Laser Fields: Dynamics and Control”

2<sup>nd</sup> International SfB Workshop on “Analysis and control of ultrafast photoinduced reactions”  
Free University Berlin

Berlin, Germany  
20 March 2003  
“Molecules in Non-Perturbative Laser Fields: Dynamics and Control”

Max-Born-Institute for Non-linear Optics  
Berlin, Germany  
19 March 2003  
“Molecules in Non-Perturbative Laser Fields: Dynamics and Control”

Department of Chemistry  
University of Würzburg  
Würzburg, Germany  
18 March 2003  
“Time-resolved photoelectron spectroscopy: Both sides of the arrow of chemistry”

Department of Physics  
University of Würzburg  
Würzburg, Germany  
17 March 2003  
“Molecules in Non-Perturbative Laser Fields: Dynamics and Control”

Departmental Colloquium  
Department of Chemistry  
Queen’s University  
Kingston  
7 February 2003  
“Femtosecond Journeys along the Arrow of Chemistry: Both Sides Now”

Condensed Matter Physics Seminar  
Department of Physics  
Queen’s University  
Kingston ON  
6 February 2003  
“Molecules in Non-Perturbative Laser Fields”

Colloquium  
Department of Physics  
University of Waterloo  
Waterloo ON  
7 November 2002  
“Molecules in Non-Perturbative Laser Fields”

Departmental Seminar  
Department of Chemistry  
Washington University  
St. Louis, MO, USA  
24 October 2002  
“Shining New Light on Femtochemistry: Charge and Energy Flow in Molecules”

Gordon Conference on Multiphoton Processes  
Tilton, NH USA  
30 June–5 July 2002  
“Polyatomic Molecules in Strong Laser Fields”

Optical Society of America. Ultrafast Phenomena XIII  
Vancouver, BC  
May 12-17 2002  
“Charge and Energy Flow in Polyatomic Molecules: Time-Resolved Photoelectron Spectroscopy”

Optical Society of America. Interdisciplinary Laser Science Conference  
Long Beach, CA USA  
October 14-18 2001  
“Ultrafast electronic relaxation processes in polyatomic molecules”

Femtochemistry V Conference  
Toledo, Spain  
September 2-6 2001  
“New directions in Time-Resolved Photoelectron Spectroscopy: Excited State Proton Transfer, Model Molecular Switches, Coincidence Spectroscopy”

Spectroscopy Society of Canada  
2001 Barringer Award Lecture  
Toronto, ON  
August 19 2001  
“New Light on Femtosecond Chemistry: Time-resolved Photoelectron Spectroscopy”

Gordon Conference on Photoions, Photoionization & Photodetachment  
Williams College, Williamstown MA, USA  
July 8-13 2001  
“The Use of Electronic Continua in Time-Resolved Photoelectron Spectroscopy”

56<sup>th</sup> International Symposium on Molecular Spectroscopy  
Ohio State University  
Columbus, OH USA  
June 11-15 2001  
“Towards Dynamical Pictures of Zeroth Order Vibronic States”

XIX International Symposium on Molecular Beams  
Rome, Italy  
June 4-8 2001  
“Femtosecond Time-resolved Photoelectron Spectroscopy: Electronic Relaxation Dynamics in Polyatomic Molecules”

School of Chemistry  
University of Bristol, UK  
April 26, 2001  
“Time-domain studies of non-adiabatic dynamics in polyatomic molecules”

Conference on Coherent Control of Molecular Processes  
Imperial College, London UK  
April 25, 2001  
“Some Aspects of Control via Strong Non-resonant Laser Fields”

Department of Chemistry  
King’s College, London, UK  
April 24, 2001  
“Time-domain studies of non-adiabatic dynamics in polyatomic molecules”

School of Chemistry  
University of Nottingham, UK  
April 23, 2001  
“New light on femtosecond chemical dynamics”

221<sup>st</sup> American Chemical Society Meeting  
Symposium on Strong Field Chemistry  
San Diego, CA USA  
April 1-5, 2001  
“Polyatomic molecules in strong fields: non-adiabatic multi-electron dynamics”

221<sup>st</sup> American Chemical Society Meeting  
Symposium on Molecular Photoelectron Spectroscopy  
San Diego, CA USA  
April 1-5, 2001  
“Using electronic continua in time-resolved photoelectron spectroscopy”

Department of Chemistry  
Queen's University, Kingston, ON  
January 30, 2001  
"Dynamical Issues in Active Molecular Scale Electronics"

PACIFICHEM2000, International Chemical Congress of Pacific Basin Societies  
Honolulu, HI, USA  
December 16, 2000.  
“The Role of Electronic Continua in Time-resolved Photoelectron Spectroscopy”

Department of Chemistry  
University of Illinois Urbana-Champaign  
Champaign, IL, USA  
November 8, 2000  
“Shedding Light on the Forces of Darkness: Time-Resolved Photoelectron Spectroscopy”

Department of Chemistry  
University of Illinois Urbana-Champaign  
Champaign, IL, USA  
November 7, 2000  
“Polyatomic Molecules in Strong Laser Fields: Non-adiabatic Multielectron Dynamics”

European Union TMR Network Meeting  
Workshop on Imaging Techniques in Chemical Dynamics  
Heraklion, Crete, Greece  
22 October, 2000  
“Applications of Femtosecond Time-resolved Photoelectron & Coincidence-Imaging Spectroscopy”

Department of Chemistry  
California Institute of Technology  
Pasadena, CA, USA  
October 10, 2000  
“Progress in Femtosecond Time-Resolved Photoelectron Spectroscopy”

Department of Chemistry  
California Institute of Technology  
Pasadena, CA, USA  
October 9, 2000  
“Polyatomic Molecules in Strong Laser Fields”

Department of Chemistry  
Oberlin College  
Oberlin OH, USA  
September 20, 2000  
“Shedding New Light on Femtochemistry: Time-resolved Photoelectron Spectroscopy”

Gordon Conference on Molecular Electronic Spectroscopy  
Colby-Sawyer College, NH, USA  
August 3, 2000  
“Issues of Time, Phase & Intensity in Femtosecond Spectroscopy”

Gordon Conference on Multiphoton Processes  
Tilton, NH, USA

June 20, 2000  
"Coherent Control"

Faraday Discussion 115, Photoionization  
University of York, U.K.  
April 3, 2000  
"Towards disentangling coupled electronic-vibrational dynamics in ultrafast non-adiabatic processes"

Condensed Matter Physics Seminar  
Queen's University, Kingston  
December 1, 1999  
"Molecular Wavepackets: A Quantum Optics Workbench"

Ultrafast Phenomena in Spectroscopy '99  
Taipei, Taiwan  
October 25-29, 1999  
"Time-Resolved Configuration Interaction Studies of Ultrafast Internal Conversion"

Institute of Atomic & Molecular Sciences, Academia Sinica  
Taipei, Taiwan  
October 22, 1999  
"New Light on Femtosecond Chemistry: Time-Resolved Configuration Interaction"

Department of Chemistry, National Tsing-Hua University  
Hsinchu, Taiwan  
October 20, 1999  
"Ultrafast Non-adiabatic Dynamics studied by Time-resolved Configuration Interaction"

Femtochemistry IV  
Leuven, Belgium  
July 18-22, 1999  
"Time-resolved configuration interaction: Disentangling electronic from vibrational dynamics during non-adiabatic processes"

Canadian Society for Chemistry Conference  
Toronto, Ontario  
May 30 June 2, 1999  
"Disentangling electronic from vibrational dynamics in ultrafast internal conversion"

217<sup>th</sup> Nat. Meeting American Chemical Society  
Symposium on: Unimolecular Reactions and Intramolecular Dynamics  
Anaheim, CA USA  
March 21-26, 1999  
"Non-adiabatic intramolecular and unimolecular dissociation dynamics in polyatomic molecules studied by Time-resolved Photoelectron Spectroscopy "

217<sup>th</sup> Nat. Meeting American Chemical Society  
Symposium on: Linear Conjugated Polyenes  
Anaheim, CA USA  
March 21-26, 1999  
"Time-Resolved Configuration Interaction in *all-trans* Decatetraene"

FOM AMOLF Institute  
Amsterdam, Netherlands  
23 July, 1998  
"Femtosecond Time-Resolved Configuration Interaction"

Max-Planck-Institute for Quantum Optics  
Garching, Germany  
22 July, 1998

"Femtosecond Time-Resolved Configuration Interaction"

Institute for Physical & Theoretical Chemistry  
Technical University of Munich  
Garching, Germany  
20 July, 1998

"Femtosecond Time-Resolved Configuration Interaction"

XIth International Conference on Ultrafast Phenomena  
Garmisch-Partenkirchen, Germany  
12-17 July, 1998

"Femtosecond Time-Resolved Configuration Interaction"

Canadian Society for Chemistry Conference  
Whistler, BC  
31 May -4 June, 1998

"Femtosecond Time-Resolved Configuration Interaction"

Fellows Lecture  
Center for Ultrafast Optical Science  
University of Michigan  
Ann Arbor, MI, USA  
22 May, 1998

"Femtosecond Time-Resolved Configuration Interaction: Non-adiabatic Dynamics in Molecules"

S.P.I.E. Conference on Laser Techniques for State-selected and State-to-state Chemistry  
San Jose, CA, USA  
Jan.29-31, 1998

"Non-adiabatic dynamics via time-resolved photoelectron spectroscopy"

Photonics Research Ontario, "Frontiers in Photonics" Lecture Series  
University of Toronto  
Jan.21, 1998

"Non-adiabatic dynamics via time-resolved photoelectron spectroscopy"

5th Chemical Congress of North America, Symposium on Laser Control of Electrons and Molecules  
Cancun, Mexico  
Nov.11-15, 1997

"Non-adiabatic dynamics via time-resolved photoelectron spectroscopy"

9th European Workshop on Molecular Spectroscopy and Photon Induced Dynamics  
Toulouse, France  
Nov.7-11, 1997

"Non-adiabatic photodissociation dynamics via femtosecond time-resolved photoelectron spectroscopy"

Gordon Conference on Molecular Electronic Spectroscopy  
Oxford, UK  
Aug.31- Sept.5, 1997

"Time-resolved Photoelectron Spectroscopy"

Department of Physical & Theoretical Chemistry  
Oxford University, Oxford, UK  
April 18, 1997

"Time-resolved Photoelectron Spectroscopy"

Royal Society Discussion Meeting on "Ultrafast Processes in Chemistry & Biology"  
The Royal Society, London, UK  
April 16-17, 1997

"Applications of Wavepacket Methodology"

NRC Solid State Colloquium  
Institute for Microstructural Sciences, NRC  
Mar. 24, 1997  
"Quantum Wavepackets and Optical Control"

Colloquium, Department of Chemistry  
York University  
Toronto ON  
Feb.27, 1997  
"Wavepacketology: Optical Phase in Chemistry"

Physical Chemistry Seminar  
Department of Chemistry  
University of Toronto  
Feb.25, 1997  
"Towards Wavepacket Technology"

Joint Quantum Optics Colloquium  
Department of Physics/Institute of Optics  
University of Rochester, New York  
Feb.11, 1997  
"Towards Wavepacket Technology?"

Colloquium, Department of Chemistry & Biochemistry  
University of Colorado, Boulder  
Boulder CO USA  
Feb.1, 1997  
"Towards Wavepacket Technology?"

Seminar  
Joint Institute for Laboratory Astrophysics (JILA)  
NIST/ University of Colorado, Boulder  
Boulder CO USA  
Jan.31 1997  
"Coherent Control and Femtosecond Pump-probe Experiments"

12th Regional Symposium on Chemical Physics  
University of Waterloo  
November 1, 1996  
"Towards Wavepacket Technology?"

Departmental Seminar  
Department of Chemistry  
Brown Univeristy  
Providence, RI USA  
Oct.3, 1996  
"Ultrafast Dynamics studied by Time-resolved Photoelectron Spectroscopy"

Departmental Seminar  
Department of Chemistry  
Queen's Univeristy  
Kingston, Ont  
Sept.30, 1996  
"Chemical Dynamics studied by Time-resolved Photoelectron Spectroscopy"

Chemical Physics Seminar  
Department of Chemistry  
University of Aarhus,

Aarhus, Denmark

Sept. 16, 1996

"Wavepacket Dynamics studied by Time-resolved Photoionization & Photoelectron Spectroscopy"

Nobel Symposium on Femtochemistry & Femtobiology:  
Ultrafast Reaction Dynamics at Atomic Scale Resolution

Björkborn, Sweden

Sept. 9-12, 1996

Invited Participant

Gordon Conference on Multiphoton Processes

New London, NH USA

June 9-14, 1996

"Wavepackets, Rydberg States & Molecules"

Optical Society of America, Ultrafast Phenomena Topical Meeting

San Diego, California

May 28 - June 1, 1996

"Wavepacket Dynamics studied by Time-resolved Photoionization & Photoelectron Spectroscopy"

American Physical Society, Division of Atomic, Molecular & Optical Physics Annual Meeting

Ann Arbor, MI USA

May 15-18, 1996

"Molecular Dynamics via Femtosecond Time-resolved Photoelectron Spectroscopy"

211<sup>th</sup> Nat. Meeting American Chemical Society

Symposium on: State-to-state scattering studies in the production and reactivity of molecular ions

New Orleans, LA USA

March 25-28, 1996

"Femtosecond Time-resolved Photoelectron & Photoion Spectroscopy studies of Chemical Dynamics"

Chemical Physics Seminar

Weizmann Institute of Science

Rehovot, Israel

March 13, 1996

"Wavepackets, Rydberg States & Femtosecond Photoelectron Spectroscopy"

Bat-Sheva Seminar on Coherent Control

Neve Ilan, Israel

March 3-8, 1996

"Dynamics & Control via Femtosecond Time-resolved Photoelectron & Photoionization Spectroscopy"

Departmental Colloquium

Département de Chimie, Université de Sherbrooke

Jan. 31, 1996, Sherbrooke, Quebec

"A New Technique for Femtosecond Chemical Dynamics: Time-resolved Photoelectron Spectroscopy"

PACIFICHEM95 International Chemical Congress of Pacific Basin Societies

Symposium on: Structure, Dynamics, Control of Excited States

Dec. 17-22, 1995, Honolulu HI USA

"Femtosecond molecular dynamics via time-resolved ZEKE photoelectron spectroscopy"

Chemical Dynamics Seminar

Department of Chemistry, University of California Berkeley

Dec. 15, 1995, Berkeley, CA USA

"Femtosecond ZEKE Spectroscopy"

Sandia National Laboratory Technical Seminar

Dec. 14, 1995, Livermore CA USA



"Wavepacket Studies of Chemical Dynamics with Photoionization/photoelectron spectroscopy"

Ottawa-Carleton Chemistry Institute Seminar

Nov.6, 1995, Carleton University

"Chemical Dynamics studied by Femtosecond Time-Resolved Photoelectron Spectroscopy"

European Research Conference on Very High Resolution Spectroscopy with Photoelectrons

Sept.23-28, 1995, Lenggries, Germany

"Chemical Dynamics via Femtosecond Time-Resolved ZEKE Photoelectron Spectroscopy"

European Research Conference on Very High Resolution Spectroscopy with Photoelectrons

Sept.23-28, 1995, Lenggries, Germany

Panel Member, Round Table Discussion on 'Origin of ZEKE States'

"New Experiments for Rydberg Molecule Stabilization"

S.P.A.M. Institute Seminar

Service des Photons, Atomes et Molécules, C.E.N. Saclay, France

Sept.20, 1995

"Molecules, ZEKE Rydberg States & Femtosecond Wavepacket Experiments"

Seminar, F.O.M. Institute for Atomic & Molecular Physics

Amsterdam, The Netherlands

Sept.13, 1995

"Molecular Wavepackets & Femtosecond Photoelectron Spectroscopy"

Femtochemistry: The Lausanne Conference

Université de Lausanne

Lausanne, Switzerland

Sept.4-8, 1995

"Femtosecond Molecular Dynamics via Time-Resolved Photoelectron Spectroscopy"

Seminar, Laboratorium für Organische Chemie der ETH Zürich

Zürich, Switzerland

Sept.1, 1995

"Femtosecond Time-Resolved Photoelectron Spectroscopy"

50th Canadian Association of Physicists Congress/CAM95

Laval University

Quebec, Quebec June 11-16, 1995

"Chemical Dynamics via Femtosecond Time-Resolved Photoelectron Spectroscopy"

78th Canadian Society for Chemistry Conference

University of Guelph

Guelph Ontario, 28 May - 1 June, 1995

"Femtosecond Molecular Dynamics via Time-Resolved ZEKE Photoelectron Spectroscopy"

Departmental Chemistry Seminar

University of Virginia

Charlottesville, VA, USA

April 28, 1995

"Chemical Dynamics via Femtosecond Time-Resolved Photoelectron Spectroscopy"

Laboratoire pour Photophysique Moléculaire, Seminar

Université Paris-Sud

Orsay, France, March 3 1995

"Femtosecond Molecular Dynamics via Time-Resolved Photoelectron Spectroscopy"

Laboratoire des Collisions Atomiques et Moléculaire, Seminar

Université Paris-Sud

Orsay, France, March 1 1995  
"Femtosecond Molecular Dynamics via Time-Resolved Photoelectron Spectroscopy"

Departmental Chemistry Seminar  
Queen's University, Kingston, January 25 1995  
"Femtosecond Chemical Dynamics via Time-Resolved Photoelectron Spectroscopy"

10th Regional Symposium on Chemical Physics  
University of Waterloo, November 6, 1994  
"Femtosecond Pump-Probe ZEKE Photoelectron Spectroscopy"

21st Informal Conference on Photochemistry  
York University, 18 May, 1994  
Reaction Dynamics Section, Invited Chairman

Neil Snider Symposium, Department of Chemistry  
Queen's University, Kingston  
June 9, 1994  
"Dynamics of H<sub>2</sub> Elimination from Ethylene"

Physical Chemistry Seminar  
University of Toronto, June 10 1993  
"Photodissociation Dynamics of Ethylene"

Physical Chemistry Seminar  
University of Southern California, March 30, 1993  
"Photodissociation Dynamics of CO<sub>2</sub> "

8th Regional Symposium on Chemical Physics  
University of Waterloo, 6-8 November 1992  
"Photodissociation Dynamics of CO<sub>2</sub> at 157nm"

Physical Chemistry Seminar  
Carleton University, October 1992  
"Dynamics of H<sub>2</sub> Elimination from Ethylene"

S.P.I.E. Conference, Los Angeles, California  
Optical Methods for Time- and State-Resolved Chemistry, January, 1992  
"157nm Photodissociation Dynamics of CO<sub>2</sub> via Translational Spectroscopy"