

## CURRICULUM VITAE

**André D. Bandrauk, Ph.D., FRSC, FAAAS, O.C.**, born in Berlin, B.Sc. (Hon. Chem.) from l'Université de Montréal, M.Sc. in theoretical chemistry from M.I.T. and Ph.D. in Chemical Physics from McMaster University (Hamilton, Canada), NATO Fellow at Oxford University's Mathematical Institute (1968-70), assistant at the Technische Hochschule Munchen (1970) before being appointed as an assistant professor of theoretical chemistry at l'Université de Sherbrooke. He has been an invited researcher and lecturer at prestigious institutions: International Collaborator, Los Alamos Natl. Lab., USA (1984); Senior Visiting Scientist, NRC-Ottawa (1985); Foreign Lecturer, Institute of Chem. Phys., Moscow, USSR (1985); C.A. McDowell Lecturer, University of British Columbia, Vancouver (1990); Foreign Professor, Institute for Molecular Science, Okazaki, Japan (1992); Japan Society for Promotion of Science Lecturer, (Tohoku Univ.-1997); Visiting Professor, Université de Paris Sud (Orsay), (1998); Invited speaker, Harvard University (2008, 2005, 2002, 1995, 1993), M.I.T. (2000). In 1982, awarded a Killam Research Fellowship by the Canada Council, was elected as a Fellow to the Royal Society of Canada in 1992. In 1989 received the **Herzberg** prize from the Canadian Spectroscopy Society for his theoretical work on molecules in intense laser fields, awarded the prestigious **John Polanyi** (Nobel Prize 1986) Award by the Chemical Society of Canada in 2001, has edited the first books on: "**Molecules in Laser Fields**" (Marcel Dekker, N.Y., 1994) and "**Laser Control + Manipulation of Molecules**", (ACS book-2003), became director of the Center for parallel computing and IBM Center of Excellence at l'Université de Sherbrooke and is member of the new National Center of Excellence in Photonics. He is currently a **CANADA RESEARCH CHAIR** in Computational Chemistry & Molecular Photonics and a new **Fellow of the American Association for the Advancement of Science, AAAS** (2003). He became Chair of the Department of Chemistry in 2005 and in **2007 received a prize from the Humboldt Foundation (Berlin, Germany)**. He was awarded the NSERC – **J. C. Polanyi Prize for Attosecond Science** (with P. B. Corkum, NRC) in 2008. (NSERC'S highest scientific prize) – has also been elected **Fellow** of the American Physical Society (FAPS) and was honored at the University of Berlin by a doctorate "*honoris causa*" for pioneering research in Attosecond Science. In 2009 he is elected **Fellow** of SIAM (Society for Industrial and Applied Mathematics, USA) for outstanding contributions to computational mathematics. The 8<sup>th</sup> International Symposium on Ultrafast Intense Laser Science (ISUILS8) was held in his honour in 2009 for his seminal contributions to this new science. In 2010 he receives from the Quebec government – **Prix du Québec** – in recognition of his major contribution to the creation of the new "Attosecond Science" and in 2011 he is invited by the Chinese Academy of Science to coorganize the first "Asian Attosecond Science" workshop in Beijing. The Governor General of Canada appoints him in 2011 as an **Officer of the Order of Canada** for pioneering work in Attosecond Chemistry.

-----

**André D. Bandrauk, Ph.D., FRSC, FAAAS, O.C.**, né à Berlin, premier diplôme en chimie de l'Université de Montréal, suivi d'un M.Sc. en chimie théorique de M.I.T. et finalement du Ph.D. en "chemical physics" de l'Université McMaster (Hamilton, Canada); chercheur boursier de l'OTAN de 1968 à 1970 à l'Institut de Mathématiques de l'Université d'Oxford, un adjoint de recherche en 1970 à la Technische Hochschule de Munich et ensuite nommé professeur adjoint de chimie théorique à l'Université de Sherbrooke. Il a été à maintes reprises invité comme chercheur à des institutions prestigieuses tel que Los Alamos National Lab. (USA-1984); Conseil National de Recherche (Ottawa-1985); Institut de Chimie et Physique (Moscou-1995). En 1990, premier canadien à prononcer la conférence CA McDowell à l'Université de British Columbia (Vancouver) fut invité comme professeur à l'Institut des Sciences Moléculaires, Okazaki, Japon, en 1992, conférencier de la Japan Society for Promotion of Science, (Tohoku Univ. - 1997); Professeur invité, Université de Paris-Sud (Orsay-1988) et à l'Université Harvard (2008, 2005, 2002, 1995, 1993), M.I.T. (2000). Le Conseil des Arts du Canada lui décerna la bourse **Killam** de 1982 à 1984, nommé **membre titulaire** de la Société Royale du Canada en 1992; en 1989 reçoit le prestigieux prix **Herzberg de la Société Canadienne de Spectroscopie** pour ses travaux théoriques sur le comportement des molécules en interaction avec les champs laser; récipiendaire en 2001 du prestigieux prix **John Polanyi** (Lauréat Nobel 1986) par la Société canadienne de Chimie, il édite les premiers livres sur le sujet: "**Molecules in Laser Fields** (M. Dekker, NY. 1994))" et "**Laser Control + Manipulation of Molecules** " (ACS book-2003), ensuite Directeur du Centre de Calcul Parallèle et Centre d'Excellence IBM à l'Université de Sherbrooke et membre du nouveau Centre National d'Excellence en Photonique. Il occupe présentement le poste de **CHAIRE DE RECHERCHE DU CANADA** en Chimie Computationnelle et Photonique Moléculaire. En 2003, élu **Fellow de l'American Association for the Advancement of Science**, directeur du Département de chimie depuis 2005 ; en **2007 reçoit le prix de la Fondation Humboldt (Berlin, Allemagne)**. Le CRSNG lui décerne le **Prix J.**

**C. Polanyi** pour la *Science Attoseconde* (avec P. B. Corkum, CNRC) en 2008 (le plus haut prix du CRSNG) et il est maintenant **Fellow** de l'American Physical Society (FAPS) et honoré par l'Université de Berlin par un doctorat "honoris causa". En 2009 il est élu **Fellow** de SIAM (Society for Industrial and Applied Mathematics, USA) pour ses contributions exceptionnelles en calcul scientifique. Le 8<sup>e</sup> Symposium de Science Laser Ultra Rapide et Intense (ISUILS8) en 2009 a honoré ses contributions majeures à cette nouvelle science. En 2010 le gouvernement lui décerne le Prix du Québec (Prix Marie-Victorin) pour sa contribution majeure à la création de la nouvelle « Science Attoseconde ». En 2011 l'Académie des sciences de la Chine l'invite à coorganiser le premier atelier asiatique en « Science Attoseconde » à Beijing. En 2011 le gouverneur général nomme Andre D. Bandrauk **Officier de l'Ordre du Canada** pour ses travaux d'avant-garde en chimie Attoseconde.

#### CITATION

**André D. Bandrauk, Ph.D., FRSC, FAAAS, O.C.** – Professor of Theoretical Chemistry, Université de Sherbrooke. – For outstanding contributions to the field of computational and theoretical chemistry, in particular for theoretical modelling and predictions of new applications of modern laser science to chemical physics. He pioneered the use of quantum scattering theory to describe nonperturbative phenomena in molecular spectroscopy such as predissociation. This research led to the prediction of molecular stabilization in intense laser fields, a theoretical discovery recently confirmed experimentally at the Max Planck Institute (Munich). His theoretical work on the use of chirped pulses to control photochemical processes has had a major impact on both experimental and theoretical developments of this important area of chemical physics. Using advanced supercomputers, he has led the way in predicting the existence of new molecules in the presence of superintense lasers, in controlling electrons in molecules, in elucidating the phenomenon of enhanced ionization of molecules in intense laser fields and most recently in proposing a new imaging technique by lasers for measuring molecular wavefunctions. He is considered a "pioneer" in the new area of intense laser field photochemistry and photophysics. His innovative combination of novel theoretical models and supercomputing techniques has led him with his research group to define new directions in this new emerging field: laser control and manipulation of chemical & physical processes, in which he is an acknowledged leader. He has published over 400 papers and edited 10 books on the subject of laser-molecule interactions, thus establishing himself as a world authority in this new area of modern science. He currently is appointed **Canada Research Chair** in Computational Chemistry & Molecular Photonics by the Canadian Government and has been awarded NSERC'S highest prize, the **J. C. Polanyi Prize** for *Attosecond Science*. (with P.B. Corkum – NRC) and also a similar prize from the Humboldt Foundation (Berlin) and the Quebec government (**Prix Marie-Victorin**) in 2010. In 2011, the Governor General appoints Andre D Bandrauk as **Officer of the Order of Canada** for pioneering work in Attosecond Chemistry.

-----

#### CITATION

**André D. Bandrauk, Ph.D., FRSC, FAAAS, O.C.** – Professeur de Chimie théorique. Université de Sherbrooke – est reconnu mondialement pour ses importantes contributions à la chimie computationnelle et théorique, plus particulièrement pour ses travaux théoriques en modélisation et développement de nouvelles applications des lasers modernes à la chimie-physique. Ce chercheur a développé les premières applications de la théorie quantique de diffusion aux phénomènes nonperturbatifs en spectroscopie moléculaire tel que la prédissociation. De là est venue la prédiction par ses recherches de la stabilisation moléculaire en présence de champs laser intenses, une découverte théorique qui vient d'être confirmée expérimentalement au Max Planck Institute (Munich). Ses travaux théoriques sur l'utilisation des impulsions laser à fréquence variable, dite "chirpées", afin de contrôler les processus photochimiques et photophysique ont eu un impact majeur sur les développements expérimentaux et théoriques de cet important nouveau domaine de la chimie et de la physique. À l'aide de superordinateur, il a prédit l'existence de nouvelles molécules en présence de laser superintense, de même le phénomène d'ionisation moléculaire exaltée et dernièrement il a proposé une nouvelle méthode d'imagerie moléculaire par les lasers. De l'avis de ses pairs, il est un théoricien exceptionnel qui combine de façon innovatrice des nouveaux modèles théoriques et des techniques de calcul par superordinateur. Il est aujourd'hui considéré un "pionnier" de la photochimie et photophysique en champ laser intense, un leader qui définit des nouvelles directions de recherche dans ce nouveau domaine de recherche en émergence: le contrôle et la manipulation par laser des processus photochimiques et physiques.

Il a déjà publié au-delà de 400 articles de recherche et a édité 10 livres sur le sujet des interactions laser-molécule. Il s'est attiré ainsi une réputation internationale par son originalité et sa créativité dans ce nouveau domaine de la science moderne. Il a été dernièrement nommé **Chaire de recherche du Canada** en Chimie computationnelle et photonique moléculaire par le Gouvernement du Canada et le CRSNG veint de lui décerner son plus important prix, le **J. C. Polanyi Prize** pour la *Science Attoseconde*. (avec P.B. Corkum – CNRC) et un prix aussi de la Fondation Humboldt (Berlin) et le Prix du Québec (**Prix Marie-Victorin**) en 2010. En 2011 Andre D Bandrauk est nommé **Officier de l'Ordre du Canada** par le gouverneur général pour ses travaux d'avant-garde en chimie Attoseconde.

1. Nom / Name **BANDRAUK, Ph.D., FRSC, FAAAS, O.C.**  
 Prénom / First / second André Dieter  
 Lieu de naissance Berlin/Allemagne  
 Birth place Germany

2. **Diplômes / Diplomas:**

Période		Institution/Organization	Discipline	Diploma	Year
De/from	À/to			Diplôme	Année
1958	1961	Univ. de Montréal (Loyola College)	Honours Chem.	B.Sc.	1961
1961	1963	MIT (Cambridge, USA)	Theoret. Chem. (with W.R. Thorson)	S.M.	1963
1965	1968	McMaster (Canada)	Chemical Phys. (with RFW Bader)	Ph.D.	1968

3. **Expériences académiques & professionnelles / Experiences:**

Année / Year		Institution / Organization	Postes occupés Positions
De/from	À/to		
1963	1965	Loyola College, Montreal	Assistant Professor - Chemistry
1968	1970	Mathem. Inst., Oxford Univ. U.K.	NATO Research Fellow (with CA Coulson/MS Child)
1970	1974	Universite de Sherbrooke	Prof. Adjoint / Chimie Théorique
1974	1978	Universite de Sherbrooke	Prof. Agrégé / Chimie Théorique
1978	Présent	Universite de Sherbrooke	Prof. Titulaire / Chimie Théorique
1977	1978	Univ. of California – Berkeley	Visiting Professor (with W.H. Miller)
1983	1984	Los Alamos National Lab., USA	International Research Fellow (with D.K. Campbell)
1990	1994	National Center for Excellence in Molecular Dynamics - (Univ. Victoria)	Group Leader – "Coherent Control"
1991	1992	Institute for Molecular Science, Okazaki, Japan	International Visiting Professor (with H. Nakamura)
1992	----	Centre de Recherche de Physique du Solide, Université de Sherbrooke	Chercheur associé
1995	2000	Centre IBM de Calcul Parallèle. Université de Sherbrooke – CACBUS	Directeur
1997	2000	Japan Society for Promotion of Science (Tohoku University)	Visiting Fellow (with Y. Fujimura)
1998 (mars-mai)		Université de Paris-Sud / Orsay	Professeur invité (with O. Atabek)
1999	2009	<b>Membre du Centre National d'Excellence en Photonique (Univ. Laval)</b>	Chercheur – volet Imagerie, Imaging Attosecond Science
2001, 2002, 2004 (Jan.)	2001, 2002, 2004 (Fev.)	<b>National Research Council/Ottawa</b>	Visiting Scientist (P.B. Corkum)
2001, 2002 (March)	2001,2002 (May)	<b>Theor. Phys. Inst. Santa Barbara, CA</b>	Visiting Scientist (with W. Kohn)
2001 (Sept.)	2015 (Sept.)	<b>Centre de Recherches Mathématiques (Montréal)</b>	Chercheur invité (J. Hurtubise) Membre régulier

2005	2010	<b>Centre for Quantum Control, University of Toronto</b>	External Affiliate (P. Brumer)
2005	2007	<b>Chair – Directeur</b>	Dépt. de chimie, U. de Sherbrooke
2002	2016	<b>Chaire de Recherche du Canada Canada Research Chair, U. de S.</b>	Chimie computationnelle et photonique moléculaire
2008	2011	<b>Humboldt Prize</b>	Frei Univ. Berlin Germany)
2008	2011	<b>Leader – Équipe FQRNT : AttoQuebec</b>	U. de Sherbrooke, INRS, U. Laval
2011	2013	<b>Visiting Professor</b>	Academic Icon Program, Univ. Of Malaysia
2010	2015	<b>Director-Molecular Modelling-Visualization Center</b>	Université de Sherbrooke

#### 4. Prix et distinctions / Honours:

- ◇ 1966-68 NSERC Graduate Fellowship – McMaster Univ. (with RFW Bader).
- ◇ 1968-70 NATO Research Fellow – Mathem. Inst. Oxford Univ., UK (with C.A. Coulson).
- ◇ 1982-84 **Killam Research Fellow (Canada Council).**
- ◇ 1983-85 Senior Visiting Science Fellow – NRC – Ottawa (with P. Hackett).
- ◇ 1984-90 International Fellow – Los Alamos Lab., USA (with D.K. Campbell).
- ◇ 1987 **Fellow – Chemical Institute of Canada (FCIC).**
- ◇ 1989 Herzberg Medal – Canadian Spectroscopy Society.
- ◇ 1990 C.A. McDowell Chemical Physics Lecturer – UBC.
- ◇ 1992 **Fellow – Royal Society of Canada (FRSC).**
- ◇ 1992 International Visiting Professor – IMS/Okazaki, Japan (with H. Nakamura and K. Morokuma).
- ◇ 1996 First International Scientific visitor – Ukrainian Academy of Sciences and Royal Society of Canada.
- ◇ 1997 **Visiting Fellow** – Japan Society for Promotion of Science – Tohoku, Tokyo and Kyoto Universities.
- ◇ 1998 (3 mois) -Professeur Invité – Labo de Photophysique Moléculaire, Université de Paris-Sud, Orsay, France.
- ◇ 1999 **JSPS Visiting Fellow** – Tohoku University (Japan).
- ◇ 2000-01 Chercheur invité – Centre de Recherche Mathématique (Montréal).
- ◇ 2001 Foreign Visitor, Dept. of Theor. Phys., Santa Barbara, CA (with W.H. Kohn).
- ◇ 2001 Visiting Scientist – National Research Council, Ottawa (with P.B. Corkum).
- ◇ **2001 John Polanyi (1986 Nobel Prize) Award-Canadian Society of Chemistry.**
- ◇ **2002-16 Canada Research Chair in Computational Chemistry & Photonics.**
- ◇ **2003 Fellow of American Association for Advancement of Science (FAAAS).**
- ◇ **2005 Prix U. Archambault – Association canadienne française pour l'avancement des sciences (ACFAS).**
- ◇ **2008-11 Fellow of Humboldt Foundation (Germany).**
- ◇ **2008 NSERC – J. C. Polanyi Prize (with P. B. Corkum, NRC)**
- ◇ **2008 FAPS – Fellow of the American Physical Society**
- ◇ **2008 Doctorate ‘Honoris – Causa’ – Free University of Berlin**
- ◇ **2009 FSIAM – Fellow of Society for Industrial Applied Maths – USA**

- ◇ **2010**      **Prix du Québec (Prix Marie-Victorin)**
- ◇ **2011**      **Officer of Order of Canada – Officer de l'Ordre du Canada for (pour) Science**  
**“Attoseconde Science”**

## **5. Sociétés Savantes / Learned Societies**

- ◇ Membre de la Corporation des chimistes du Québec
- ◇ Membre de l'Association canadienne française pour l'Avancement des sciences (ACFAS).
- ◇ Member of American Physical Society (APS).
- ◇ Member of American Chemical Society (ACS).
- ◇ Member of Society for Industrial and Applied Mathematics (SIAMS).
- ◇ Member of Canadian Association of Theoretical Chemists (CATC).
- ◇ Membre de l'Association canadienne de physique (ACP).
- ◇ **Fellow** – Killam Foundation (Canada Council)
- ◇ **Fellow** – Canadian Society of Chemists (FCIC)
- ◇ **Fellow** – Royal Society of Canada (FRSC)
- ◇ **Fellow** – Japan Society for Promotion of Science (JSPS)
- ◇ **Fellow** – American Association for Advancement of Science (FAAAS).
- ◇ **Fellow** – Humboldt Foundation (Germany)
- ◇ **Fellow** – American Physical Society (FAPS)
- ◇ **Fellow** – SIAM (Society for Industrial and Applied Mathematics, USA)

## **6. Organization / de conférences / of Conferences**

1. Canadian Theoretical Chemistry Conference, Dalhousie Univ., Halifax (1983) – co-directeur.
2. NATO School on Low Dimensional Systems – Orford, Que (1985) – co-directeur.
3. NATO Advanced Workshop on Atoms & Molecules in Laser Fields – Lennoxville, Que. (1987) – directeur.
4. NATO Advanced Workshop on Coherence Phenomena – Hamilton (Ont.) (1990) – codirecteur with S. Wallace (Toronto).
5. First Canadian Conference on Computational Chemistry – Orford, Que. (1991) – Fondateur et directeur.
6. Canadian Soc. For Chem. Annual Conf.-'93, Sherbrooke (Qc) – Programme Chair / Président Scientifique.
7. PACIFICHEM'95, Symposium on Coherent Control, Honolulu (1995) – co-directeur with Y. Fujimura (Sendai, Japan).
8. North American Chemistry Conference '97, Symposium on Electron Control (Cancun, Mexico (1997)) – director.
9. CIC Annual Conference – Toronto '99 – Symposium on Laser Photochemistry – director.
10. 4<sup>th</sup> Canadian Conference on Computational Chemistry – Lennoxville (Qc) (2000) – co-director.
11. PACIFICHEM 2000 – Symposium on Laser Control (Hawaii 2000) – co-director with R.Gordon (Chicago, USA).
12. Centre de Recherches Mathématiques – Montréal (Qc) – Director – Workshop "Numerical methods for Quantum Control" – Spring 2002.
13. Canada-Russia Workshop on Photonics – Québec City - Dec. 2001 – co-director.
14. Multidimensional Schroedinger Equations Symp. – SIAM Annual Meeting – Montréal (Qc) (été 2003) – co-director.

15. Workshop on Dynamic Imaging – 2003 (Orford, Qc) – director.
16. Centre de recherches mathématiques de Montréal (Qc) – co-director – Workshop – High Dimensional Partial Differential Equations – August 2005.
17. PACIFICHEM 2005 – Symposium on Chemistry with Intense Lasers (Hawaii 2005)- co-director (with R.J. Levis (Temple, USA), K. Yamanouchi (Tokyo, Japan)).
18. Theoretical Physics Institute (KITP), Santa Barbara, CA, - Attosecond Science Workshop, 2006 – co-director with A. Starace (U. Nebraska), N. Fisch (Princeton).
19. ICONO 2007 – Minsk, Bielorussia – Symposium – Attosecond Science – co-organizer.
20. Volga Conference – Nizhny Novgorod, Russia – July 2008 – Attosecond Physics
21. ACS Annual meeting 2009 – Salt Lake City, USA – **Symposium** – Attosecond Science.
22. Workshop on “Quantum Imaging” – Centre de Recherches Mathématiques (Montréal) – Oct. 2009 – Co-director with M. Y. Ivanov (Imperial College, UK)
23. Symposium on Attosecond Science – PACIFICHEM 2010 (Hawaiï – with K.Yamanouchi)
24. Attosecond Science Workshop – KITP Beijing – China – 2011 (with A. Starace)
25. Imaging-Controlling Electrons with Ultrafast Lasers – AAAS Annual Meeting – Vancouver 2012

## **7. Comités Nationaux & Internationaux / Committees – International & National**

1. International Raman Conf. – Ottawa 1980 – Member of Scientific Committee.
2. Comité d'Énergie – FCAR – Ministère de l'Éducation – Québec (1982-84).
3. NSERC – Chemistry Grant Committee (1985-87).
4. NSERC – Committee on Research Computation (1989-90).
5. NSERC – Committee on Supercomputing (1994-95).
6. High Performance Computing Society of Canada – Member of Executive Committee (1993-1997) ; (1999-2003).
7. Royal Society of Canada – Member of Council – Division of Math & Science – (1995-98).
8. IUPAC – member of Advisory Committee – Istanbul Conference (1995).
9. Brioni International Conference – Member of Scientific Committee (1993-2000).
10. International Conference on Multiphoton Processes – Member of International Committee (1993-97).
11. Canadian Computational Chemistry Conference – Member of Executive Committee (1993-98).
12. Nat. Center of Excellence in Molecular Dynamics – Member of Scientific Committee (1990-93).
13. J. Phys. Chem. – Member of Editorial Board – 1990-93.
14. Examiner Jury / 29<sup>th</sup> International Chemistry Olympiad – 1997 (Montreal).
15. Comité FCAR-FCI (1999 - 2001).
16. Secretary – Secrétaire – Science Division – Royal Society of Canada – 1999-2002.
17. Executive Board – Canadian High Performance Computation Consortium (2000-2010).
18. Member - Rutherford Medal Committee – Royal Society of Canada (2001-2004).
19. Member of Polanyi Award Committee – CSC-CIC (2001-2004).
20. Member – International Committee – ICPEAC – 2002 – 2006.
21. Member – CFI-FCI expert committee on High Performance Computing (2003-2004).
22. Phys. Rev. **A** – Member of Editorial Board – 2004-2010.
23. International Committee on Intense Laser Sciences (Chair-K.Yamanouchi, Tokyo Univ. (2003-2010).
24. International Committee for Advances in Atomic, Molecular, Optical Physics (Chair – M. Mohan, Delhi, India) 2007.

25. Member of Scientific Committee – High Performance Computing Symposium (2008-HPCS – Que.)
26. Member of IUPAC (International Union of Pure & Applied Chemistry) board on Ultrafast Intense Laser Science) (Chair – K.Yamanouchi – Tokyo - 2008-2010).
27. Member of NSF (USA) Panel Board on CDI (Cyber Discovery – Innovation) (Chair – B. Schneider) -2008.
28. Member of Scientific Committee for UCLS2009 – Ultra Intense Laser Science (Frascati, Italy).
29. Editorial board – J. Atom. Molec., Opt. Phys. (2008-2011).
30. ICOMP 2008 – Heidelberg (Germany) – Member of Program Committee
31. NSERC – Vanier Scholarships – Member of Jury (2008-2009).

## **8. Services / à l'Université de Sherbrooke / to University**

- i. Membre du Conseil – Faculté des Sciences – 1983-86.
- ii. Groupe de Recherche en Semiconducteur & Diélectrique – Faculté des Sciences – Codirecteur – 1982-85.
- iii. Center of Excellence in Molecular Dynamics - Université de Sherbrooke node director – 1990-94.
- iv. CACBUS – Centre IBM de Calcul Parallèle – Directeur – 1994-2000.
- v. Membre du comité des doctorats d'honneurs – 1999-2004.
- vi. Centre National D'Excellence en Photonique – membre (2000-2012).
- vii. RISQ – Comité d'innovation – Recherche – Représentant de l'U. de Sherbrooke (2003-2006).
- viii. Directeur – Département de chimie (2005-2007).
- ix. Directeur – Centre de Modélisation et Visualisation Moléculaire FCI-MDEIE – Faculté des sciences (2010-2015)

## **9. Appréciation & Critique pour / Reviewer for:**

1. Physical Review A, B, E.
2. Physical Review Letters.
3. Journal of Chemical Physics.
4. Journal of Physical Chemistry
5. Chemical Physics Letters
6. Chemical Physics
7. Physics Letters A
8. Journal of American Chemical Society
9. Journal of Physics A & B
10. Journal de Physique
11. Journal of Mathematical Chemistry
12. Journal of Molec. Spectry
13. Canadian Journal of Physics
14. Canadian Journal of Chemistry
15. Journal of Applied Mathematics
16. Science
17. Nature
18. Nature Physics
19. Optics Express and Letters
20. Natural Science & Engineering Research Council (Canada) (NSERC)

21. National Science Foundation (USA)
22. Department of Energy (USA) (DOE)
23. Department of Commerce (USA)
24. Department of Defense (USA)
25. Israeli Academy of Sciences
26. Austrian Science Foundation
27. NATO Science Division
28. Fonds de Chercheurs et Chercheurs (Québec) (FCAR), (FQRNT)
29. Royal Society of Canada
30. Wolf Foundation
31. Petroleum Research Fund / ACS
32. Humboldt Foundation - Germany
33. Académie des Sciences – France
34. Canadian Foundation for Innovation
35. Canadian Society of Chemistry
36. National Research Council of Canada
37. Canadian Research Chairs Program.
38. Royal Society of Chemistry – U.K.
39. Reviews of Modern Physics
40. Research Corporation, University of Texas
41. Comités d'habilitation – CNRS – INRIA (France)
42. Vienna Science and Technology Fund
43. Israeli Science Foundation
44. External Affairs – Canada
45. New Journal of Physics
46. DFG – German National Research Council
47. US – Israeli Research Fund
48. France – Agence Nationale de Recherche

## MAJOR CONTRIBUTIONS TO SCIENCE (HIGHLY CITED PAPERS)

\*\*papers refer to *Attosecond Science*

### 1. *Theory of Molecular Predissociation*

A.D. Bandrauk, M.S. Child – Molec. Phys. **19**, 95– 111 (1970).

**First** application of S-Matrix theory for the non perturbative description of nonadiabatic instabilities in molecular spectra allowing for a complete description from the perturbative to nonperturbative regimes of non-Born-Oppenheimer corrections to bound-continuum perturbations in molecules.

### 2. *Semiclassical Description of "Dressed" Molecular States in Strong Laser Fields - Perturbative and Nonperturbative Regimes*

A.D. Bandrauk, M.L. Sink – J. Chem. Phys. **74**, 1110-1117 (1981).

**First** prediction of creation of laser-induced molecular potentials and new molecular bound states in strong laser fields. Theoretical predictions confirmed experimentally by P.H. Bucksbaum (Bell Labs, USA, 1990) and T. Hansch (MPI-Munich, 1997-2000).

### 3. *Theory of "Chirped" Pulses for Molecular Photochemistry and Photophysics*

S. Chelkowski, A.D. Bandrauk, P.B. Corkum, Phys. Rev. Lett. **65**, 2303-58 (1990).  
F. Légaré, S. Chelkowski, A.D. Bandrauk, J. Raman Spectry, **31**, 1500-1570 (2000).

**First** theoretical and numerical demonstration from time-dependent Schroedinger equations of the efficiency of chirped pulses for nonlinear nonperturbative population control of molecular states in infrared (i) and Raman (ii) spectroscopies.

**4. Semiclassical "Supersymmetry"**

A. Comtet, A.D. Bandrauk, D.K. Campbell – Phys. Lett. **150B**, 159-163 (1985).

Demonstration of exactness of semiclassical methods for **supersymmetric** Hamiltonians encountered in chemistry, particle physics and organic solid state physics (polyacetylene) thus establishing a bridge between different disciplines.

**\*\*5. Two-Colour Control of Harmonic Generation by Intense Laser Fields**

T. Zuo, A.D. Bandrauk, M. Ivanov, P.B. Corkum – Phys. Rev. **A51**, 3991 (1995); Phys. Rev. Lett. **74**, 2933 (1995).

**First** proposal and proof by numerical simulation of two-colour control of high order harmonic generation in atoms and molecules for the production of single "sub-femtosecond" or equivalently **attosecond** pulses.

**6. Intense Laser Field Ionization of Molecules**

- (i) S. Chelkowski, T. Zuo, O. Atabek, A.D. Bandrauk – Phys. Rev. **A52**, 2977 (1995).
- (ii) S. Chelkowski, C. Foisy, A.D. Bandrauk – Phys. Rev. **A57**, 1176 (1997).

**First** Non-Born Oppenheimer simulation of nonperturbative dissociative ionization of a molecule in an intense laser field. These calculations led to the prediction of a new nonperturbative laser-molecule phenomenon:

**Charge Resonance Enhanced Ionization (CREI)** – a major **new** concept in intense laser-matter interaction

- (iii) T. Zuo, A.D. Bandrauk, Phys. Rev. **A52**, R3511-2514 (1995).
- (iv) G.L. Kamta, A.D. Bandrauk, Phys. Rev. Lett. **94**, 203003 (2005).
- (v) A.D. Bandrauk in Progress in Ultrafast Intense Laser Science, vol 8 (Springer 2012)

**7. Laser Induced Electron Diffraction – LIED**

T. Zuo, A.D. Bandrauk, P.B. Corkum – Chem. Phys. Lett. **259**, 313-320 (1996).

New proposal of ultrafast electron diffraction of molecules by ionization and controlling the ionized electron to **recollide** with the parent molecular ion thus, allowing for visualization of ultrafast dynamics on near femtosecond time scales.

**\*\*8. Control and Enhanced Harmonic Generation in Molecular Systems by Two Colour Excitation**

A.D. Bandrauk, S. Chelkowski, E. Constant – Phys. Rev. **A56**, R2357 – 2360 (1997).

Demonstration and new proposal by numerical simulation for controlling and creating high order harmonics, in molecules for eventual **attosecond** pulse generation.

- 9. *Laser Coulomb Explosion Imaging – LCEI - for Molecular Nuclear Wave Functions***  
S. Chelkowski, A.D. Bandrauk, P.B. Corkum, Phys. Rev. Lett. **82**, 3426 (1999).

Numerical demonstration of use of ultrashort  $t \leq 5\text{fs}$  intense  $I \geq 10^{15}\text{W/cm}^2$  laser pulses to image proton wave functions from laser induced Coulombs explosion of molecules thus providing for a new time resolved spectroscopy on near femtosecond times.

- 10. *Asymmetric Dissociative Ionization of Molecules in Intense Laser Fields***  
A.D. Bandrauk, S. Chelkowski - Phys. Rev. Lett. **84** 3562-3565 (2000).

Demonstration by Non-Born Oppenheimer simulations of molecular dissociative ionization and elucidating non-classical physical processes occurring at high intensities, e.g., electron-nuclear coupled motion during tunnelling ionization, thus explaining correctly experimentally observed non-classical dissociative-ionization.

- 11. *Alignment of Molecules by Chirped Adiabatic Raman Passage – CARP***  
F. Légaré, S. Chelkowski, A.D. Bandrauk – Chem. Phys. Lett. **329**, 469 (2000).

Numerical demonstration and new proposal for creating highly vibrationally excited molecules leading to alignment by chirped laser pulses through highly nonlinear Raman processes.

- 12. *Dynamic Imaging of Nuclear Wave Function with Intense Ultrashort UV Laser Pulses***  
A.D. Bandrauk, S. Chelkowski, Phys. Rev. Lett. **87**, 273004 (2002).

New proposal from non-Born Oppenheimer molecular dissociative ionization simulations demonstrating the use of new ultrashort  $t \leq 5\text{fs}$ , intense  $I \geq 10^{15}\text{W/cm}^2$  XUV laser pulses to image nuclear wavefunctions from both electron (nonlinear photoelectron spectra) and nuclear kinetic energies.

- 13. *Intense Laser Field Ionization of Multi Electron Molecules***  
K. Harumiya, H. Kono, Y. Fujimura, A.D. Bandrauk, Phys. Rev. **A66**, 043403 (2002); **A62**, 031401 (2000).

**First** full 3-D Born Oppenheimer simulation of ionization of  $\text{H}_2$  in ultrashort intense laser fields – Confirmation in Multielectron System of the concept of CREI (Charge Resonance Enhanced Ionization) discovered in one-electron systems (See (5)).

- \*\*14. *Measurement of Duration and Phase of Attosecond Pulses***

A.D. Bandrauk, H.S. Nguyen, S. Chelkowski, Phys. Rev. **A68**, 041802 (2003); Phys. Rev. Lett. **89**, 283903 (2002).

Proposal for measuring duration and absolute phase of sub-femtosecond (attosecond pulses) using asymmetric ionization as a diagnostic tool – cited by F Krausz et al., Science, **305**, 1267-68 (2004).

**\*\*15. *Optimal Control of Attosecond Pulse Synthesis***

A. B. Yedder, C. LeBris, O. Atabek, A.D. Bandrauk, Phys. Rev. **A69**, 041802 (2004).

**First** application of Quantum Control Theory to Laser Control of High Order Harmonic Generation leading to generation of single **attosecond** pulses.

**16. *Phase Dependence of Enhanced Ionization in Nonsymmetric Molecules***

- i) G. Lagmago-Kamta, A. D. Bandrauk – Phys. Rev. Lett. **94**, 203003 (2005); Phys Rev A **76**, 053409 (2007).
- ii) G. Lagmago-Kamta, A. D. Bandrauk, P.B. Corkum, J. Phys. **B38**, L 339-345 (2005).

Theory and numerical demonstration of existence of Charge Resonance Enhanced Ionization – CREI (See (5)) in nonsymmetric molecules thus, providing a new efficient source of even and odd harmonics for **attosecond** pulse generation.

**\*\*17. *Chirped Attosecond Pulses for Broad-band Photoelectron Spectroscopy***

G. Yudin, A.D. Bandrauk, P.B. Corkum – Phys. Rev. Lett. **96**, 063002 (2006).

New proposal for creating very short **attosecond** pulses providing extremely large broadband. Theoretical demonstration of superiority of such chirped pulses over transform-limited pulses, and new applications for monitoring molecular electron wavepackets.

**18. *New Route to Laser Control of Nuclear Processes***

S. Chelkowski, A.D. Bandrauk, P.B. Corkum, Phys. Rev. Lett. **93**, 083602 (2004).

Proposal for laser control of nuclear processes, including **nuclear fusion** by adopting new concept of laser induced electron recollision (P.B. Corkum, Phys. Rev. Lett. **72**, 1994 (1993)) to particle – particle collision at super high intensities,  $I \geq 10^{22} \text{ W/cm}^2$ , intensities recently achieved at LOA (Paris- G. Mourou / Private Communication).

**\*\*19. *Numerical Methods for Molecular Time-Dependent Schroedinger- Maxwell Equations***

- i) A. D. Bandrauk, H. Shen, Chem. Phys. Lett. **176**, 428-432 (1991), J. Chem. Phys. **99**, 1185 (1993).
- ii) A.D. Bandrauk, E. Dehghanian, H. Z. Lu, Chem. Phys. Lett. **419**, 346 (2006).
- iii) E. Lorin, A.D. Bandrauk, Comput. Phys. Commun. **177**, 908 (2007)

First application **(i)** in chemical physics of high order split-operator methods for nonperturbative time-dependent Schroedinger-Maxwell equation simulations. Development **(ii)** of high order methods using new complex integration algorithms with future application to Quantum Monte Carlo methods and laser propagation for **attosecond** pulse generation **(iii)**.

**20. *Molecules in Laser Fields***, edit A.D. Bandrauk (M. Dekker, Publisher, NY, 1994).

**First** book dealing with nonperturbative laser-molecule interactions including laser control.

21. *Quantum Control – "Mathematical and Numerical Challenges"* – edit A.D. Bandrauk, M. Delfour, C. LeBris (American Mathematical Society, NY, 2003).

**First**, book dealing with mathematical and numerical issues for applications of quantum control in chemistry and physics.

22. *Imaging of Molecular Orbitals by Femtosecond Ionization* – G. Lagmago-Kamta, A.D. Bandrauk, Phys. Rev. **A74**, 033415 (2006).

New method for imaging directly orbitals in molecules.

- \*\*23. *Observing Electron-Nuclear Motion in Molecules*  
S. Chelkowski, G. L. Yudin, A. D. Bandrauk, J. Phys. **B39**, S409 (2006).  
T. Bredtmann, S. Chelkowski, A. D. Bandrauk, Phys Rev. A 84, 021401 (2011)

**First** proposal to monitor electron motion with **attosecond** pulses.

- \*\*24. *First Maxwell-Schrodinger-Dirac Simulation of Intense Laser Pulse Propagation in a Molecular medium*  
E. Lorin, A. D. Bandrauk, N.J. Phys. **10**, 025033 (2008); Comput-Phys. Commun. 177, 908 (2007); Commun. Comput. Phys. **9**, 406 (2010); J Nonlinear Analysis **B12**, 190 (2011).

- \*\*25. *Quantum Dynamic Imaging*, edit. A.D. bandrauk, M. Y. Ivanov, (Springer, 2011) – book on workshop organized at Centre de Recherches Mathématiques (Montreal) – Mathematical theory and numerical methods for imaging quantum dynamics from femto to attoseconds.

- \*\*26. **Circular Polarization Attosecond Pulses** – New proposal for Circularly Polarized MHOHG and Attosecond Pulse generation, K.J. Yuan, A.D. Bandrauk – Phys Rev A 83, 063422 (2011); Phys Rev A 84, 023410 (2011); J. Phys. B. (Special Edition) 44, 1-21 (2012).

## PUBLICATIONS

411. F. Fillion-Gourdeau, E. Lorin, A.D. Bandrauk – Numerical Solution of the Diatomic Dirac equation – B splines without spurious state – Phys Rev A 2012
410. A.D. Bandrauk, F. Légaré – Enhanced Ionization of Molecules in Intense Laser Fields – in Progress in Ultrafast Intense Laser Science, edit. K. Yamanouchi et al, vol 8 (2012)
409. F. Fillion-Gourdeau, E. Lorin, A.D. Bandrauk – Numerical Solution of the Dirac Equation in Laser – Matter Interaction – AIP Conf Proc 1368, p 13-16 (2012)
408. K.J. Yuan, A.D. Bandrauk – MATI Angular Distributions with Attosecond Bichromatic Intense XUV Pulses – Phys Rev A 85, 013413 (2012)
407. K.J. Yuan, A.D. Bandrauk – Circularly Polarized Attosecond Pulses from MHOHG – J Phys B 44, 0000 (2011)
406. E. Lorin, A.D. Bandrauk – Accurate Numerical Computation of Micro-Macro Nonlinear Optics – J. Comput. Science 2012
405. E.P. Fowe, A.D. Bandrauk – Non Perturbative TDDFT and Time-Dependent Electron Localization Functions – Can J. Chem. 2012

404. A.D. Bandrauk, S. Chelkowski, H.Z. Lu – High Frequency Correlated Nuclear-Electron Motion in Molecules – Chem. Phys. 2012
403. F. Fillion-Gourdeau, E. Lorin, A.D. Bandrauk – Numerical Computation of Relativistic Diatomic Molecular Spectra – HPCS 2011 Proceedings
402. C.A. Lefebvre, A.D. Bandrauk – Dynamic Response of  $H_3^{++}$  to Ultrashort Intense Pulses – Beyond Barn Oppenheimer – HPCS 2011 Proceedings
401. C.A. Ullrich, A.D. Bandrauk – Atoms and Molecules in Strong Laser Fields – in “Time Dependent Density Functional Theory”, edit A Marques et al, (Springer 2012), chapt. 18.
400. X.B. Bian, Y. Huismans, O. Smirnova, A.D. Bandrauk, M. Vrakking – Time-Resolved Photoelectron Holography – Phys Rev A 84, 043420 (2011)
399. E.P. Fowe, A.D. Bandrauk – Nonperturbative TDDFT of Ionization and HHG in OCS,  $CS_2$  – Phys Rev A 84, 035402 (2011)
398. K. J. Yuan, A.D. Bandrauk – Generation of Circularly Polarized Attosecond Pulses from Extended Asymmetric Molecular Ions – Phys Rev A 84, 023410 (2011)
397. T. Bredtmann, S. Chelkowski, A.D. Bandrauk – Monitoring Attosecond Electron – Nuclear Motion – Phys Rev A 84, 021401 (2011)
396. K.J. Yuan, A.D. Bandrauk – Angle Dependent Molecular ATI with Linear and Circular Polarized Ultrashort Intense Laser Pulses – Phys Rev A 84, 013426 (2011)
395. E. Lorin, A.D. Bandrauk – Maxwell Schrodinger Plasma Model for Quantum Filamentation – Physica D (2011) - accepted
394. A.D. Bandrauk, S. Chelkowski, K.J. Yuan – Laser Control of Collision-Recollision – Intl. Rev. At. Molec. Phys. 2, 1-23 (2011)
393. F. Légaré, E. Penka Fowe, A. D. Bandrauk, J. Sanderson – Enhanced Ionization and Coulomb Explosion of  $CO_2$  – Phys Rev Lett – 107, 06301 (2011)
392. K.J. Yuan, A.D. Bandrauk – “Circularly Polarized MHOHG with Intense Laser Pulses and Static Fields” – Phys Rev A – 83, 063422 (2011)
391. X.B. Bian, A.D. Bandrauk – Nonadiabatic MHOHG from Polar Molecules – Spectral Red Shift – Phys Rev A83, 041403 (R) (2011)
390. K.J. Yuan, H.Z. Lu, A.D. Bandrauk – Linear-Circular Polarization Ionization of  $H_2$ ,  $H_2^+$  by Attosecond Pulses – Phys Rev A – 83, 043418 (2011)
389. D. Tchitchekova, H.Z. Lu, A.D. Bandrauk – MHOHG in a Nonlinear Two-Electron Molecule  $H_3^+$  - J Phys B 44, 065601 (2011)
388. X.B. Bian, A.D. Bandrauk – Phase Control of Multichannel MHOHG by the Asymmetric  $HeH^{++}$  in 2-Colour Laser Fields – Phys Rev A – 83, 023414 (2011)
387. G.K. Paramonov, O. Kuhn, A.D. Bandrauk – Energy Transfer and Ionization in Extended Quantum Systems – Phys. Chem Chem. Phys. – 13, 8637 (2011)
386. D.I. Bondar, G. L. Yudin, M.Y. Ivanov, A.D. Bandrauk – Non Sequential Double Ionization – Anti correlation of Electrons – Phys Rev A – 83, 013420 (2011)
385. G.K. Paramonov, O. Kuhn, A.D. Bandrauk – Energy Transfer among Distant Quantum Systems – Phys Rev A – 83, 013418 (2011)
384. A.D. Bandrauk, S. Chelkowski, H.Z. Lu – Correlated Electron – Nuclear Motion Visualized by Time-Frequency Analysis – in Quantum Dynamic Imaging – edit A.D. Bandrauk, M.Y. Ivanov (Springer NY 2011) – chapt. 3
383. A.D. Bandrauk, E. Penka Fowe – Nonperturbative TDDFT for Molecules in Intense Laser Fields – in “Coherence and Ultrashort Pulses” – edit F.J. Duarte (Intech Pub. Vienna, Au 2011) – chapt. 21
382. E. Lorin, A.D. Bandrauk – Simple and Accurate P-Q Solver for Maxwell-Dirac Equations – J. Nonlinear Analysis B – 12, 190 (2011).

381. X. B. Bian, A.D. Bandrauk, Multichannel MHOHg in Asymmetric Diatomics – Phys Rev Lett 105, 093903 (2010)
380. E. Dehghanian, A.D. Bandrauk, G.L. Kamta – Enhanced Ionization of H<sub>2</sub> in Intense Laser Fields – Phys Rev A – 81, 061403 (2010).
379. K. J. Yuan, A.D. Bandrauk – High Order Elliptically Polarized Harmonic Generation in Extended Molecules – Phys. Rev. A 81, 063412 (2010)
378. S. Chelkowski, A.D. Bandrauk – Visualizing Electron Delocalization and the EPR Paradox – Phys. Rev. A 81, 062101 (2010)
377. S. Chelkowski, A.D. Bandrauk – EPR Paradox in Photoionization – Photodissociation – ar Xiv: 1001.3837 [quant-physics] 2010
376. E. Lorin, A.D. Bandrauk – MultiResolution Scheme for Time-Dependent Schroedinger Equations – Comput. Phys. Commun. 187, 626 (2010).
375. E. Penka-Fowe, A.D. Bandrauk – Time Dependent Electron Localization Functions at High Laser Intensities – Can. J. Chem. – 88, 1186 (2010)
374. E. Lorin, A.D. Bandrauk – Maxwell-Schroedinger Numerical Algorithms for Pulse Propagation in Molecular Media – Lecture Notes in Computer Science 5976 HPCS 2009 Proceedings – 59760099 (2010).
373. A.D. Bandrauk, H.Z. Lu – Efficient Numerical Methods for TDSE's in Intense Laser Fields Lecture Notes in Computer Science 5975 – HPCS 2009 Proceedings – 59753155 (2010)
372. E. Penka Fowe, A.D. Bandrauk – Nonlinear TDDFT and HHG in CO<sub>2</sub> – Lecture Notes in Computer Science 5976 HPCS 2009 Proceedings 59760134 (2010)
371. E. Lorin, A.D. Bandrauk – The WASP Model - Filamentation in Molecular Media by Maxwell-Schroedinger Simulations – Comm. Comput. Phys. – 9, 406-440 (2010)
370. A.D. Bandrauk, C. Barty, C.H. Keitel, P. Tirolf, A. H. Werdenmuller – Photonuclear Physics – Exploring Nuclei with Photons – Max Planck Society eDoc – ID: 463885.0, p.68-91 (2009/12)
369. A.D. Bandrauk, G. Paramonov – Laser Induced Nuclear Fusion – LINF – with Super Intense Lasers – AIP Conf Proc vol. 1209 (2010), p. 7-10
368. E. Penka-Fowe, A.D. Bandrauk – Nonlinear TDDFT of CO<sub>2</sub> in Ultrashort Intense Laser Pulses, Phys Rev A, 81, 023411 (2010)
367. A.D. Bandrauk – FAZSST – Femto-Atto-ZeptoSecond Science & Technology – Photonics, vol. 7, 15-18 (2009)
366. A. D. Bandrauk, J. Manz, M. Vrakking – Attosecond Molecular Dynamics – Chem. Phys. 366, 1 (2009)
365. K.J. Yuan, A.D. Bandrauk – Laser Induced Electron Diffraction in H<sub>2</sub> with Linear and Circular Polarization Ultrashort XUV Laser Pulses – Phys Rev A 80, 061403 (2009)
364. G.L. Yudin, S. Patchkowskii, P.B. Corkum, A.D. Bandrauk – Unified Treatment of Attosecond Photoionization and Compton Scattering – J Phys B – 42, 205601 (2009)
363. K.J. Yuan, A.D. Bandrauk – Electron Recollision Dynamics in HHG -Phys Rev A, 80, 053404 (2009)
362. G.L. Kamta, A.D. Bandrauk – Orbital Symmetry in Molecular HHG – Phy Rev A – 80, 041403 (2009)
361. A.D. Bandrauk, S. Chelkowski – Attosecond Science – The Next Frontier – Physics in Canada – April-May, 2009.
360. E. Penka-Fowe, A.D. Bandrauk – Nonlinear TDDFT of Ionization of CO<sub>2</sub> – Can. J. Chem. 2009 – 87, 1081 (2009)
359. A.D. Bandrauk, S. Chelkowski, J. Manz, P.B. Corkum – Attosecond Photoionization of Coherent Electronic Wave Packets – J. Phys B 42, 134001 (2009).

358. A.D. Bandrauk, J. Manz, K. J. Yuan – Electron Wave Packet Phase in Recollision Processes – Laser Phys. 19, 1559 (2009).
357. A.D. Bandrauk, S. Chelkowski, H.Z. Lu – Nuclear Motion in Harmonic Generation and Attosecond Pulse Generation – J. Phys. B. 2009 – 42, 075602 (2009)
356. A.D. Bandrauk, J. Manz, K.J. Yuan - Harmonic Generation – Quantum Simulations – Phys. Rev. A. – 79, 023403 (2009)
355. E. Lorin, S. Chelkowski, A. D. Bandrauk – Mathematical Modelling of Boundary Conditions for Laser – Molecule TDSE'S – Numerical Methods in PDE'S – 25, 110 (2009)
354. A. Mebel, A.D. Bandrauk – Theoretical Simulation of Allene Cation Decomposition – J. Chem. Phys. – 129, 224311 (2008)
353. S. Chelkowski, A.D. Bandrauk, Effect of Nuclear Motion on Molecular High Order Harmonic and Attosecond Pulse Generation – Phys. Rev. Lett – 101, 153901 (2008).
352. A.D. Bandrauk, S. Chelkowski, G. Yudin – Attosecond Molecular Science – in ‘‘Atoms and Molecules in Laser and External Fields’’ – edit M. Mohan (Narosa Pub, Delhi, India 2008) – p. 35-50.
351. A.D. Bandrauk, J. Manz, K.J. Yuan, Directional Electron Ionization with Simple Cycle Pulses – Intl J. Mass Spectrometry – 277, 189 (2008)
350. A.D. Bandrauk, F. Krausz, A.F. Starace – Focus on Attosecond Physics, New J. Phys. 10, 025004 (2008).
349. E. Lorin, A.D. Bandrauk – Efficient Parallel Computing for Intense Laser – gas Interaction – Quantum and Propagation Simulations – HPCS 2008 Symposium, IEE, p. 4-8
- \*\*348. A. D. Bandrauk, S. Barmaki – **Attosecond** Long Range Electron Transfer by High Order Harmonic Generation – Chem. Phys. – 350, 175 (2008).
- \*\*347. G. L. Yudin, S. Patchkowski, A. D. Bandrauk – **Attosecond** Spectral Phase Interferometry – J. Phys B. 40, F93 (2008).
- \*\*346. E. Lorin, S. Chelkowski, A. D. Bandrauk – **Attosecond** Pulse Generation from Aligned Molecules –New J. Phys.10, 025033 (2008).
345. G. Lagmago Kamta, A. D. Bandrauk – Enhanced Ionization in Nonsymmetric Molecules – Phy Rev A – 76,053409 (2007).
- \*\*344. E. Lorin, A. D. Bandrauk – Propagation Effects on **Attosecond** Pulse Generation – SPIE Proc., vol. **67332** (2007), p. 20-25.
343. D. Tchitchekova, S. Chelkowski, A. D. Bandrauk, Multiphoton Ion Pair Spectroscopy in Strong Fields for H<sub>2</sub> – J. Phys. Chem **A** 111, 9340 (2007).
- \*\*342. S. Chelkowski, A. D. Bandrauk, A. Staudte, P. B. Corkum – Dynamic Nuclear Interference Structure in Coulomb Explosion of H<sub>2</sub><sup>+</sup> – Phys. Rev. A – **76**, 013405 (2007).
341. S. Kawai, A. D. Bandrauk, Phase Determination of Harmonics in Aligned molecules – Phys. Rev. **A75**, 063402 (2007).
- \*\*340. S. Chelkowski, A.D. Bandrauk – Sub Laser Cycle Structures in Coulomb Explosion of Molecular Hydrogen – Application Briefs 2006, MHPCC, **12**, 23 (2007).
339. S.Kawai, A.D. Bandrauk, J.Palacio, T.Uzer – Norman Form Transition State Theory for Laser Controlled Reactions – J. Chem.Phys. **126**, 164306 (2007).
- \*\*338. S. Barmaki, A.D. Bandrauk – Molecular High Order Harmonic Generation by Laser Induced Electron Transfer – Chem. Phys. – **338**, 312 (2007).
337. G. Lagmago Kamta, A.D. Bandrauk – Effect of Enhanced Ionization in Imaging of Molecular Orbitals-Phys.– Rev A – **75**, 041401 (2007).
336. E. Lorin, A.D. Bandrauk – Maxwell Schrodinger Equations for Laser Pulse Propagation in Molecular Media – Computer Phys. Commun. – **177**, 908 (2007).

335. D. Tchichekova, S. Chelkowski, A.D. Bandrauk – Raman Vibrational Ladder Climbing – J. Raman Spectry – **38**, 927 (2007).
- \*\*334.** G.L. Yudin, S. Chelkowski, A.D. Bandrauk, P.B. Corkum – Separable Volkov-Coulomb Approach for Molecular **Attosecond** Interferometry – J. Phys. B. – **40**, F93 (2007).
- \*\*333.** A.D. Bandrauk, S. Chelkowski, G.L. Yudin – **Attosecond** Science and Electron Control-Photons, **4**, 20-24 (2007).
- \*\*332.** S. Barmaki, A.D. Bandrauk – Laser Control of Electron Transfer with Ultrashort Intense Laser Pulses – J. Mod. Opt. – **54**, 1047 (2007).
331. A.D. Bandrauk, S. Barmaki, S. Chelkowski, G. Lagmago Kamta – Molecular Harmonic Generation – in Progress in Ultrafast Intense Laser Science, vol. III – Edit K. Yamanouchi (Springer V., N.Y., 2008) 35 pages, Chap. 9.
330. A.D. Bandrauk, S. Barmaki, G. Lagmago Kamta – Laser Phase Control of HHG- The  $H^+ - H_2^+$  System – Phys. Rev. Lett., **98**, 013001 (2007).
- \*\*329.** A. Staudte, D. Pavicic, A.D. Bandrauk, P.B. Corkum – **Attosecond** Strong Field Spectroscopy of  $H_2^+$  Bond Breaking – Phys. Rev. Lett., **98**, 073003 (2007).
328. E. Lorin, S. Chelkowski, A.D. Bandrauk – Maxwell Schroedinger Equations – Numerical Computation – in High Dimensional Partial Differential Equations, edit. A. D. Bandrauk, M. Delfour, C. LeBris, (AMS 2007, Philadelphia) 20 p., vol. 41.
327. A. D. Bandrauk, S. Chelkowski, N. Tremblay – Control of Nuclear Reactions with Super Intense Lasers – Proc. High-Power Laser Beams Conf. – Russ. Acad. Sc. **15** (2006).
326. F.Légaré, D. Villeneuve, P. B. Corkum, A.D. Bandrauk, - Laser Coulomb Explosion Imaging of Ultra-Fast Dynamics - J. Phys. **B39**, 5503 (2006).
325. G. Lagmago Kamta, A. D. Bandrauk – Imaging Molecular Orbitals with Ultrashort Intense Laser Pulses, Phys. Rev. **A. 74** 033415 (2006).
- \*\*324.** S. Chelkowski, G.L. Yudin, A.D. Bandrauk – Observing Electron Motion in Molecules – J. Phys. **B39** S409 (2006).
323. J.P. Dussault, H. Shen, A.D. Bandrauk – Penalty Methods in Optimal Control Theory – Acta Math. Sinica, Oct., **25**, 1-8 (2006).
322. G.L. Yudin, S. Patchkovskii, A.D. Bandrauk - Asymmetric Interference in Molecular Photoprocesses, J. Phys. **B39**, 1537 (2006).
321. A. D. Bandrauk, H.Z. Lu – Singularity-Free Methods for Time-Dependent Schroedinger Equation – A Non-Perturbative Approach – in "High Dimensional Partial Differential Equations", edit A.D. Bandrauk, M. Delfour C. LeBris (AMS, 2007), vol. 41.
320. N. Nguyen, A.D. Bandrauk – Electron Correlation of 1-D  $H_2$  in Intense Laser Field, Phys. Rev. **A73**, 032708 (2006).
319. A.D. Bandrauk, E. Dehghanian, H.Z. Lu – Complex Integration Steps for Quantum Exponential Evolution Operators – Chem. Phys. Lett. **419**, 346 (2006).
- \*\*318.** G. L. Yudin, A.D. Bandrauk, P.B. Corkum – Chirped **Attosecond** Photoelectron Spectroscopy – Phys. Rev. Lett. **96** 063002 (2006).
317. A.D. Bandrauk, H.Z. Lu – Molecules in Intense Laser Fields: Beyond the Dipole Approximation – Phys. Rev. **A73**, 013412 (2006).
316. K. Pronin, A.D. Bandrauk – Coherent Control of Harmonic Generation in Superlattices – Single Mode Response – Phys. Rev. Lett. **97**, 020602 (2006).
- \*\*315.** A.D. Bandrauk, S. Chelkowski, G.L. Yudin – **Attosecond** Control of Electrons – The Basis of **Attosecond** Control of Electrons – in "Nanotechnology, Biophotonics and Applications – edit J. Dubowski, NATO ASI, vol. 239, p. 32-55.

- \*\*314.** A.D. Bandrauk, S.Chelkowski, G.L. Yudin – **Attochemistry** is Coming On – in "Femtochemistry VII"- edit A.W. Castleman (Elsevier, Amsterdam 2006, pp. 553-563) .
313. A. D. Bandrauk, S. Chelkowski, G. L. Yudin – Chirped Photoelectron Attochemistry – in "Current Developments in Atomic, Molecular & Optical Physics" – edit. M. Mohan (Kluwer Academic Press, Amsterdam, 2006) (12 pages).
312. T.S. Zyubina, S.H. Lin, A.D. Bandrauk, A.M. Mebel - Isomerization and Dissociation of Acetylene Dication, *J. Chem. Phys.* **123** 134320 (2005).
311. A.D. Bandrauk, E.W. Sedik, C. Matta – Laser Control of Ion Molecule Reactions – *Molec. Phys.* **104**, 95 (2006).
310. K.A. Pronin, A.D. Bandrauk, P. Reineker – Coherent Control of Field Induced Localization and Harmonic generation – *SPIE Proc. – ICONO 2005*, vol. 6256 (10 pages).
- \*\*309.** A.D. Bandrauk, S. Chelkowski, G.L. Yudin – **Attosecond** Molecular Photoelectron Spectroscopy – *SPIE Proc. – ICONO 2005*, vol. 6256 (11 pages).
308. A.D. Bandrauk, H.Z. Lu – Harmonic Generation in a 1-D Model of  $H_2$  with Single and Double Ionization – *J. Phys.* **B38**, 2529 (2005).
307. A.D. Bandrauk, H.Z. Lu – Electron Correlation and Double Ionization in a 1-D  $H_2$  in Strong Fields– *J. Mod. Opt* **53**, 35 (2006).
306. A.D. Bandrauk, C.A. Ullrich – Time-Dependent Density Functional Theory for Intense Laser Fields – in "Time-Dependent Density Functional Theory" – edit. K. Burke, M. Marques (Springer, N.Y. 2006, p 357-374.
305. G. L. Yudin, S. Chelkowski, A. D. Bandrauk – Universal Coulomb Continuum Effects in Molecular Photoionization – *J. Phys.* **B39**, L17 (2006).
- \*\*304.** G. L. Yudin, S. Chelkowski, A. D. Bandrauk, P. B. Corkum – Coherent **Attosecond** Molecular Photoionization – *Phys. Rev.* **A72**, 051401 (2005).
303. A.D. Bandrauk, H.Z. Lu – Laser Induced Electron Recollision in  $H_2$  - *Phys. Rev. A* – **72**, 023408, (2005).
302. G. Lagmago-Kamta, A.D. Bandrauk – Phase Dependence of Enhanced Ionization in Asymmetric Molecules – *Phys. Rev. Lett.* **94**, 20 3003 (2005).
- 301 G. Lagmago-Kamta, A.D. Bandrauk, P. B. Corkum, - Asymmetry in High-Order Harmonic Generation from Heteronuclear Molecules – *J. Phys.* **B38**, L339 (2005).
300. K.A. Pronin, A.D. Bandrauk – Control of Harmonic Generation in Superlattices: Coherence and Relaxation – *Phys. Rev.* **B** – 71, 195311 (2005).
299. G. Lagmago Kamta, A.D. Bandrauk – Three-Dimensional Time-Profile Analysis of High-Order Harmonic Generation – Nuclear Interferences in  $H_2^+$  - *Phys. Rev. A* **71**, 053407 (2005).
298. S. Chelkowski, A.D. Bandrauk – Asymmetries in Strong-Field Photoionization by Few-Cycle Laser Pulses – *Phys. Rev.* **A71**, 053815 (2005).
297. G. Lagmago-Kamta, A.D. Bandrauk – Time-Profile Analysis of High Order Harmonic Generation in Molecules – *Laser Physics*, **15**, 502 (2005).
296. A. M. Mebel, A.D. Bandrauk, S.H. Lin - Potential Energy Surfaces in Coulomb Explosion of Polyatomics – *Int. J-Quantum. Chem.* 102, 506 (2005).
295. F. Légaré, A.D. Bandrauk, P.B. Corkum, D. Villeneuve – Imaging Ultra-Fast Molecular Dynamics with Few-Cycle Laser Pulses – *PRA* **72**, 052717 (2005).
294. A.D. Bandrauk, S. Chelkowski, H.S. Nguyen – Nonlinear Process in Molecules at High Intensities – Route to XUV-Attosecond Pulse Generation – *J. Molec. Str.* **735C**, 203 (2004).

- \*\*293.** F. Légaré, A.D. Bandrauk, P.B. Corkum, D. Villeneuve – Laser Coulomb Explosion Imaging of Small Molecules – *Phys. Rev.* **A71**, 013415 (2005).
292. A.D. Bandrauk, W. Sedik, C. Matta – Absolute Laser Phase Effects on Reaction Paths – *J. Chem. Phys.* **121**, 7764 (2004).
291. S. Chelkowski, A. D. Bandrauk – Numerical Simulations of Asymmetries in Intense Ultrashort Laser Pulse Photoionization – MHPA Annual Report (Maui, USA, 2004), p. 41-44.
290. F. Légaré, A.D. Bandrauk, D.M. Villeneuve, P.B. Corkum – Laser Coulomb Explosion Imaging – *Photons*, **2**, 19 (2004).
289. A.D. Bandrauk – Supersymmetry in Time-Dependent Molecular Quantum Mechanics in "Universality and Diversity in Science", edit. W. Becker, M. Federov (World Scientific 2004).
288. K. Nagaya, A. D. Bandrauk – Laser Coulomb Explosion Imaging of Linear Triatomic Molecules – *J. Phys.* **B37**, 2829 (2004).
287. S. Chelkowski, A. D. Bandrauk, A. Apolonski – Measurement of Carrier Phase Envelope – CLEO Proceedings 2004, p.10-12.
286. T. Zubina, S.H. Lin, A. Mebel, A.D. Bandrauk – Dissociation Pathways of Cyclohexane Trication – *Chem. Phys. Lett.* **393**, 470 (2004).
285. K.A. Pronin, P. Reineker, A.D. Bandrauk – Electron Localisation in Molecular Wires and Superlattices; Coherence and Relaxation – Submitted to *Phys. Rev.* **B71**, 195311 (2005).
284. G. Lagmago Kamta, A.D. Bandrauk – Time – Profile Analysis of Nuclear Contributions in High Order Harmonic Generation – *Phys. Rev.* **A70**, 011404 (2004).
- \*\*283.** A. D. Bandrauk, S. Chelkowski, S. Goudreau – Control of Harmonic Generation with Femto-**Attosecond** Pulses – *J. Mod. Opt.* **52**, 411 (2005).
- \*\*282.** A.D. Bandrauk, S. Chelkowski, H. S. Nguyen – **Attosecond** Localization of Electrons in Molecules – *Intl. J. Quant. Chem.* **100**, 834 (2004).
- \*\*281.** A. D. Bandrauk, H.S. Nguyen – **Attosecond** Molecular Spectroscopy – *Can. J. Chem.* **82**, 831 (2004).
280. A.D. Bandrauk – Nonlinear Processes in Molecules and Lasers – Lecture Notes, École des Ondes, INRIA, Paris (2004), 4 Chapters.
279. S. Chelkowski, A.D. Bandrauk - A. Apolonski, Phase-Dependent Asymmetries in Strong - Field Ionization – *Phys. Rev.* **A70**, 013815 (2004).
278. S. Chelkowski, A.D. Bandrauk, A. Apolonski – Measurement of Carrier-Envelope Phase - *Opt. Lett.* **29**, 1557 (2004).
277. S. Chelkowski, A.D. Bandrauk, P.B. Corkum – A New Route to Laser Control of Nuclear Processes – *Laser Phys.* **14**, 473 (2004).
276. S. Chelkowski, A.D. Bandrauk, P.B. Corkum – Muonic Molecules in Super Intense Laser Fields – *Phys. Rev. Lett.* **93**, 083602 (2004).
- \*\*275.** A.B. Yedder, C.L. LeBris, O. Atabek, A.D. Bandrauk – Optimal Control of **Attosecond** Pulse Synthesis – *Phys. Rev.* **A69**, 041802 (2004).
274. H.S. Nguyen, A.D. Bandrauk, C.A. Ulrich, - Asymmetric of ATI in Metal Clusters – a TDDFT Study, *Phys. Rev.* **A69**, 063415 (2004).
273. K.A. Pronin, A.D. Bandrauk – Coherent Control of Electric Currents in Molecular Wires, *Phys. Rev.* **B69**, 195308 (2004).
272. A.D. Bandrauk, H.Z. Lu – Controlling Harmonic Generation in Molecules – *Phys. Rev.* **A68**, 043408 (2003).
- \*\*271.** A.D. Bandrauk, S. Chelkowski, H.S. Nguyen - Measurement of Duration of **Subfemtosecond** Pulses Using Asymmetric Photoionization, *Phys. Rev.* **A68** 041802 (2003).

270. A.D. Bandrauk, F. Légaré, H. Yu, - Laser Control of Molecular States – Nonperturbative Examples in *Quantum Control*, edits A.D. Bandrauk, M. Delfour, C. LeBris (American Math. Soc. 2003), Vol. 33, p. 39-55.
269. A.D. Bandrauk, H.Z. Lu – Singularity Free-Method for Molecular Time-Dependent Schroedinger Equations, HPCS 2003 Symposium, edit. D. Senechal (NRC Press, Ottawa, 2003), p. 1-7.
268. J. Paci, D. Wardlaw, A.D. Bandrauk – Multiphoton Dissociation of  $\text{HCl}^+$  - Classical and Quantum Models, *J. Phys.* **B36**, 3999 (2003).
267. F. Légaré, A.D. Bandrauk, P.B. Corkum, D. Villeneuve –Time Resolved Two-Electron Ionization with Few Cycle Pulses - *Phys. Rev. Lett.* **91**, 093002 (2003).
266. T. Zyubin, S.H. Lin, A. Mebel, A.D. Bandrauk – Ab Initio/RKKM Study of Dissociation of Benzene Trication – *J. Theor. & Comp. Chem.* **2**, 205 (2003).
265. A.D. Bandrauk, H.Z. Lu - Numerical Methods for Molecular Time-Dependent Schrödinger Equations – in “Handbook of Numerical Analysis”, edit. P.G. Ciarlet, C. Lebris, vol. 10 – Computational Chemistry (Elsevier Sciences, Amsterdam 2003) p. 803-832.
- \*\*264.** A.D., Bandrauk., S.H. Nguyen – Control of Continuum Harmonic Generation with **Attosecond** Pulses, *Appl. Phys.* **B77**, 337 (2003).
263. J. Lévesque, S. Chelkowski, A.D. Bandrauk, -Role of Dipole Moments in Laser Control of Dissociative Ionization, *J. Phys. Chem.* **107**, 3457 (2003).
262. A.D. Bandrauk, H.Z. Lu, Harmonic Generation with Intense Laser & Magnetic Fields – *International J. Quant. Chem.*, **99**, **431** (2004) .
261. A.D. Bandrauk, S. Chelkowski, I. Kawata – Molecular ATI Spectra – Effect of Moving Nuclei, *Phys. Rev.* **A67**, 013407 (2003).
260. A.D. Bandrauk, S. Chelkowski, H.S. Nguyen – Measuring the Electric Field of Few-Cycle Laser Pulses, *Phys. Rev. Lett.* **89**, 283903 (2002).
259. K. Harumiya, H. Kono, I. Kawata, A.D. Bandrauk – Molecular – Intense Laser Field Ionization of  $\text{H}_2$  – 3-D Simulations, *Phys. Rev.* **A66**, 043403 (2002).
258. A.D. Bandrauk, S. Chelkowski – LIED – Laser Induced Electron Diffraction by Intense Laser-Molecule Interaction – *J. Molec. Structure (Theochem)* **591**, 199 (2002).
257. H. Nikura, F. Légaré, A.D. Bandrauk, P. Corkum – Sub-Laser Cycle Electron Pulses for Molecular Dynamic, *Nature* **417**, 917 (2002).
256. A.D. Bandrauk, S. Chelkowski – Dynamic Imaging of Molecular Motion – in *Curent Development Atom. Molec. Chem. Phys.*, edit – M. Mohan (Kluwer Plenum Pub / London U.K. 2002) 19-24 (2002).
255. S. Chelkowski, H. S. Nguyen, A.D. Bandrauk – Measuring the Absolute Phase of an Ultrashort Intense Pulse – *Laser Phys.* **13**, 871 (2003).
254. A.D. Bandrauk, H. Kono – Molecules in Intense Laser Fields- Nonlinear Multiphoton Spectroscopy – in *Advances in Multiphoton Processes*, edit S.H. Lin, Vol. 15, p. 147. (World Scientific Pub., Singapore 2003).
253. J. Levesque, A.D. Bandrauk – Quasistatic Models of Laser Control of Dissociative Ionization, *J. Mol. Opt.* **50**, 497 (2003).

<b>CRC : 2002-2009</b>
------------------------

- \*\*252.** A. D. Bandrauk, H.S. Nguyen – **Attosecond** Control of Ionization and HOHG – *Phys. Rev.* **A66**, 031401 (2002).
251. A.D. Bandrauk, S. Chelkowski – Imaging Nuclear Motion – *MHP Review*, 32-33 (2002).

250. T.S. Zyubina, S.H. Lin, A.M. Mebel, A.D. Bandrauk – Dissociation of Benzene Trication, *Chem Phys. Lett.* **359**, 253 (2002).
249. A. D. Bandrauk, H.Z. Lu, Numerical Methods for Molecular Photonics, HPCS 2002 Proc. IEE, edit, J. Almhana, V. Bhavsar (Washington 2002), 302-310.
248. A.D. Bandrauk, S. Chelkowski. - Dynamic Imaging of Nuclear Wave Functions with Ultrashort UV Laser Pulse – *Phys. Rev. Lett.*, **87**, 273004 (2002).
247. S. Chelkowski, A.D. Bandrauk - Measuring Moving Nuclear Wave Packets with Ultra UV Laser Pulses – *Appl. Phys.* **B74**, 5113 (2002).
246. S. Chelkowski, A.D. Bandrauk - Measuring Moving Nuclear Wave Packets Using Laser Coulomb Explosion Imaging – LCEI – *Phys. Rev.* **A65**, 023403 (2002).
245. A.D. Bandrauk, J. Levesque, S. Chelkowski – Laser Phase Control of Dissociative Ionization of Molecules in "Laser Control & Manipulation of Molecules", edit. A.D. Bandrauk et al, ACS Symp. **821**, 221 (2002) .
244. A.D. Bandrauk, S. Chelkowski, J. Levesque – Quasistatic Models of the Laser Control of Dissociative Ionization of  $H_2^+$ ,  $HD^+$  at High Intensities – *Laser Physics 2002*, **12**, 468 (2002).
243. A. D. Bandrauk, F. Légaré, CARP – Chirped Adiabatic Raman Passage – Theory and Applications in "Recent Research Development in Raman Spectroscopy “(Transworld Research, India), **1**, 83-104 (2002).
242. I. Kawata, H. Kono, A. D. Bandrauk - Enhanced Ionization of  $H_3^+$  in Intense Laser Fields – *Phys. Rev. A.* **64**, 043411 (2001).
241. F. Légaré, A.D. Bandrauk – Enhanced Alignment via CARP and Photodissociation – *Phys. Rev. A.* **64**, 031406 (2001).
240. A. Becker, A. D. Bandrauk, S.L. Chin, S-matrix Theory of Multiphoton Inner Valence Ionization, *Chem. Phys. Lett.* **343**, 345 (2001).
239. H.Z. Lu, A.D. Bandrauk, Moving Adaptive Grid Methods for Numerical Solution of the TDSE in Laser Fields – *J. Chem. Phys.*, **115** 1670 (2001).
238. S. Chelkowski, M. Zamojski, A.D. Bandrauk, Laser Phase Directional Control of Photo-fragments in Dissociative Ionization of  $H_2^+$ . *Phys. Rev. A* **63**, 023409 (2001).
237. A.D. Bandrauk, H.Z. Lu, Generalized Space Translation Method for Numerical Solutions of Time Dependent Schroedinger Equations, *J. Molec. Str.* **547**, 97 (2001).
236. A.D. Bandrauk, S. Chelkowski – On Laser Coulomb Explosion Imaging of Proton Motion – *Chem. Phys. Lett.*, **336**, 518 (2001).
235. I. Kawata, H. Kono, A.D. Bandrauk, Enhanced Ionization of Two-Electron Molecules – Role of Ionic States as Doorway States – *Laser Phys.* **11**, 181 (2001).
234. S. Talebpour, A.D. Bandrauk, S.L. Chin, Spectroscopy with Intense Femtosecond Laser Pulses, *L. Phys.* **11**, 188 (2001).
233. F. Légaré, S. Chelkowski, A.D. Bandrauk – Alignment of Excited Molecules by Chirped Adiabatic Raman Passage – *Chem. Phys. Lett.* **329**, 469 (2000).
232. I. Kawata, H. Kono, A.D. Bandrauk – Intense Laser Field Enhanced Ionization of Two-Electron Molecules – *Phys. Rev. A-RC* **62**, 031401 (2000).
231. A.D. Bandrauk, H.Z. Lu, Enhanced Ionization of  $H_2^+$  in Intense Laser and Magnetic Fields – *Phys. Rev.* **A62**, 053406 (2000) .
230. A.D. Bandrauk, in "Raman Spectroscopy", edit. S.L. Zhang, B. Zhu (J. Wiley, NY 2000) – CARP- Chirped Adiabatic Raman Passage – Theory and Applications – p. 202-203.
229. S. Talebpour, A.D. Bandrauk, K. Vyayalakabshnai, S.L. Chin, Dissociated Ionization of Benzene with Intense Pulses, *J. Phys.* **B33**, 4615 (2000).

228. K. Vyayalakashnai, S.L. Chin, A. Talebpour, T.T. Nguyen-Dang, A.D. Bandrauk. Perpendicular Dissociative Ionization of D<sub>2</sub> in Intense Laser Fields. *PRA*, **62**, 042708 (2000).
227. A.D. Bandrauk, S. Chelkowski, M. Zamojski - Laser Phase Control of Electron-Nuclear Dynamics in Dissociative Ionization – *Z.F. Phys. Chem.* **214**, 1393 (2000).
226. A. Talebpour, K. Vijayalakshmi, A.D. Bandrauk, S.L. Chin. Dissociative Ionization of D<sub>2</sub> in Intense Laser Pulses – *Phys. Rev.* **A62**, 053408 (2000).
225. A.D. Bandrauk, S.L. Chelkowski, Asymmetric ATI and ATD in  $\omega+2\omega$  Dissociative Ionization, *Phys. Rev. Lett.* **84**, 3562 (2000).
224. A.D. Bandrauk, S. Chelkowski, P.B. Corkum. Measuring Dissociating Wave Packets by Laser Coulomb Explosion Imaging. *Proc. Lasers '99*, edit. V.J. Corcoran (STS Press, VA, USA, 2000), p. 254-260.
223. A. Talebpour, A.D. Bandrauk, S.L. Chin, "Benzene In Intense Lasers", *Multiphoton Processes*, A.I.P. vol. 525, edit. L.F. DiMauro, p.508-518 (2000).
222. A.D. Bandrauk, S. Chelkowski – Asymmetric Molecular Electron – Nuclear Dynamics in Two-Colour Laser Fields, *Multiphoton Processes*, A.I.P. vol. **525**, edit. L.F. DiMauro, p.547-558.
221. A.D. Bandrauk, S. Chelkowski, H.Z. Lu – Molecules in Intense Laser Fields, *RIKEN Review* # **20**, 55-59 (June 2000).
220. A.D. Bandrauk – Molecules in Intense Laser Fields – From Enhanced Ionization to Coulomb Explosions – *Proc. ICPEAC'99*, edit. Y. Itikawa, (A.I.P.-CP500, 2000) p. 102-117.
219. S. Chelkowski, A.D. Bandrauk – Electron Nuclear Dynamics of H<sub>2</sub><sup>+</sup> in Intense Two-Color Laser Fields – *Laser Phys.* **10**, 216 (2000).
218. A. Talebpour, A.D. Bandrauk, S.L. Chin – Fragmentation of Benzene in an Intense Laser Pulse – *Laser Phys.* **10**, 210 (2000).
217. A. Talebpour, A.D. Bandrauk, S.L. Chin – Multiphoton Ionization of Inner Shell Electrons and Fragmentation of Ethylene – *Chem. Phys. Lett.* **313**, 789 (1999).
216. A.D. Bandrauk, S. Chelkowski – Measuring Nuclear Wave Functions by LCEI – *Internatl. J. Quant. Chem.* **75**, 951 (1999).
215. A.D. Bandrauk. *Molecular Processes in Intense Laser Fields. Physics in Canada* – Sept. 1999, p. 215-218.
214. F. Légaré, S. Chelkowski, A.D. Bandrauk. Laser Pulse Control of Raman Processes. *J. Raman Spectry.* **31**, 1500 (2000).
213. A.D. Bandrauk, H. Yu. Laser Control of Molecular Ionization. *Intl. J. Mass Spectry.* **192**, 375 (1999).
212. D. MUSAEV, K. MOROKUMA, A.D. BANDRAUK. Electronic States of N<sub>2</sub><sup>3+</sup>. *Phys. Rev.* **A59**, 4309 (1999).
211. A.D. Bandrauk. Intense Field Ionization of Molecules by Ultrashort Laser Pulses. *Comments Atom. Molec. Phys.* **1** (3)D, 97 (1999).
210. C.M. Dion, A.D. Bandrauk, O. Atabek. Two Frequency IR Laser Orientation of Polar-Molecules. *Chem. Phys. Lett.* **302**, 215 (1999).
209. S. Chelkowski, P.B. Corkum, A.D. Bandrauk. Femtosecond Coulomb Explosion Imaging of Vibrational Wavefunctions. *Phys. Rev. Lett.* **82**, 3416 (1999).
208. A.D. Bandrauk, S. Chelkowski, C. Foisy. Controlling Electrons in Molecules with Intense Lasers. *Maui HPC Application Brief Review*, 29-30 (1999).
207. S. Chelkowski, A.D. Bandrauk, P.B. Corkum. Coulomb Explosion imaging of H<sub>2</sub><sup>+</sup>. *Proceed. Ultrafast Conference, Garmisch '98*, 3 pages.

206. A.D. Bandrauk, J. Ruel. Charge Resonance Enhanced Ionization – Geometric and Orientational Effects. *Phys. Rev.* **A59**, 2153 (1999).
205. A.D. Bandrauk, H. Yu. Dynamics of High Order Harmonic Generation in Extended Molecular Systems. *Laser Phys.* **9**, 155 (1999).
204. T. Watanabe, H. Umeda, Y. Fujimura, A.D. Bandrauk. Photon Polarization Effects on Quantum Control of Isomerization. *Theo. Chem.* **462**, 317 (1999).
203. C. Dion, A. Keller, O. Atabek, A.D. Bandrauk. Dynamics of Alignment of Molecules in Intense IR Pulses. *Phys. Rev.* **A59**, 1382 (1999).
202. C. Dion, A. Keller, O. Atabek, A.D. Bandrauk. Alignment of HCN by Short-Intense IR Pulses. *SPIE Proc. (San Jose) – LASE'98 – to appear 1999.*
201. A.D. Bandrauk, H. Yu. High Order Harmonic Generation by One and Two Electrons Systems. *Phys. Rev.* **A59**, 539 (1999).
200. K.A. Pronin, a.A. Ovchinnikov, A.D. Bandrauk, Field Induced Localization and Nonlinear Response of a 1-D Conductor. *Chem. Phys.* **235**, 93 (1998).
199. T. Walsh, S.L. Chin, S. Chelkowski, A.D. Bandrauk, T.T. Nguyen-Dang. Laser-Induced Processes During Coulomb Explosion of H<sub>2</sub>. *Phys. Rev.* **A58**, 3922 (1998).
198. A.D. Bandrauk, H. Yu. High Order Harmonic Generation at Long Range in Intense Laser Fields. *J. Phys.* **B31**, 4243 (1998).
197. A.D. Bandrauk, H. Yu. High Order Harmonic Generation by Molecular Ions in Intense Laser Fields. *Ukr. J. Phys.* **43**, 435 (1998).
196. K. Mishima, K. Yamashita, A.D. Bandrauk. Isomers and Transition States of Na<sub>4</sub><sup>+</sup> Isomers. *J. Phys. Chem.* **102**, 3157 (1998).
195. H. Yu, T. Zuo, A.D. Bandrauk. Intense Field Ionization of Molecules by Ultrashort Laser Pulses. *J. Phys.* **B31**, 1533 (1998).
194. K. Pronin, A. Ovchinnikov, A.D. Bandrauk. Electron Localization by Lasers in 1D-Conductors. *Phys. Lett.* **A233**, 447 (1997).
193. S. Chelkowski, C. Foisy, A.D. Bandrauk. Electron-Nuclear Dynamics in Dissociative Ionization in Intense Laser Fields. *Phys. Rev.* **A57**, 1176 (1997).
192. A.D. Bandrauk. Problem integrals in multiphoton phenomena. *SIAM Review* **39**, 317 (1997).
191. A. D. Bandrauk, S. Chelkowski, E. Constant. Enhanced Harmonic Generation in Extended Systems by Two-Colour Excitation. *Phys. Rev.* **A56**, R2537 (1997).
190. A.D. Bandrauk, H. Yu. Laser-Control of Electrons in "Structure, Dynamics and Control of Excited States", edit. J. Laane, H. Takahashi, A.D. Bandrauk (Springer-Verlag, 1998).
189. S. Chelkowski, A.D. Bandrauk. Exact Electron – Nuclear Dynamics of H<sub>2</sub><sup>+</sup> in Intense Laser Fields. *ICPEAC'97 Proc.*, 156 (1997).
188. A. D. Bandrauk, J. Ruel, T. Zuo, H. Yu. Controlling Electrons with Intense Laser and Magnetic Fields. *Intntl. J. Quant. Chem.* **64**, 613 (1997).
187. S. Chelkowski, A.D. Bandrauk. ATI Electron Spectra from a Dissociating Molecular Ion. *Laser Phys.* **7**, 797 (1997).
186. S. Chelkowski, A.D. Bandrauk. Exact Simulation of Dissociative Ionization in Intense Laser Fields. *Intntl. J. Quant. Chem.* **65**, 503 (1997).
185. S. Chelkowski, A.D. Bandrauk. Raman Chirped Adiabatic Passage. A New Method for Selective Excitation. *J. Raman Spectry.* **28**, 459 (1997).
184. S. Chelkowski, A.D. Bandrauk, A. Conjusteau. Control of Molecular Vibrations and Rotations. *Proceed. ICOMP VII, Munich, Intl. Phys. Conf. Ser.* 154, 192-201 (1997).

183. H. Yu, A.D. Bandrauk. Molecules in Intense Laser Fields: Enhanced Ionization in 1 and 2-electron Linear Triatomics. *Phys. Rev.* **A56**, 685 (1997).
182. K.A. Pronin, A.A. Ovchinnikov, A.D. Bandrauk. One-Band Conductor – localization Induced by Periodic Fields. *SynMet* **85**, 1169 (1997).
181. A. Conjusteau, A.D. Bandrauk, P.B. Corkum. Barrier Suppression in Intense IR field dissociation of molecular ions. *J. Chem. Phys.* **106**, 9095 (1997).
180. C. Dion, S. Chelkowski, A.D. Bandrauk, H. Umeda, Y. Fujimura. Numerical Simulation of HCN Isomerization by Two Perpendicular IR Lasers. *J. Chem. Phys.* **105**, 9083 (1996).
179. T. Zuo, A.D. Bandrauk, P.B. Corkum. Laser-Induced Electron Diffraction. *Chem. Phys. Lett.* **259**, 313 (1996).
178. S. Chelkowski, A.D. Bandrauk. Wave Function Splitting Technique for Calculating ATI Spectra. *Int. J. Quant. Chem.* **30**, 473 (1996).
177. A.D. Bandrauk, S. Chelkowski, T. Zuo, H. Yu. Charge Resonance Enhanced Ionization (CREI) of molecules in intense fields. *Proc. RIS-96, AIP Conf. – Proc.* **388**, 37 (1996).
176. C. Foisy, A.D. Bandrauk, S. Chelkowski. Scalable Parallel Program for Solutions of the Schroedinger Equation in Intense Laser Fields. *Proc. High Performance computing 96 (Ottawa, Ont.)* – 6 pages.
175. H. Yu, T. Zuo, A.D. Bandrauk. Molecules in Intense Laser Fields. Enhanced Ionization in a 1D Model of H<sub>2</sub>. *Phys. Rev.* **A54**, 3290 (1996).
174. S. Chelkowski, A. Conjusteau, A.D. Bandrauk. Dissociative Ionization of H<sub>2</sub><sup>+</sup> at 600 nm. *Phys. Rev.* **A54**, 3235 (1996).
173. T. Zuo, A.D. Bandrauk. Phase Control of Molecular Ionization. H<sub>2</sub><sup>+</sup> and H<sub>3</sub><sup>2+</sup> in Intense 2-Colour Laser Fields. *Phys. Rev.* **A54**, 3254 (1996).
172. A.D. Bandrauk, H. Yu. Coherent control of electrons in molecules. *Can. J. Chem.* **74**, 100 (1996).
171. A.D. Bandrauk, S. Chelkowski, C. Foisy. A Parallel Multidimensional Program for Time Dependent Schroedinger Equations. *Proc. Intntl Conf. Parallel Computing*, edit. H. Arabnia, Univ. of Georgia, Nov. 1995 – 356-361.
170. A.D. Bandrauk, T. Zuo. Laser Control of Harmonic Generation and Electrons. *SPIE* **2521** (1995) – 145-157.
169. S. Chelkowski, A.D. Bandrauk. Two step model of Coulomb explosions of diatomics. *J. Phys.* **B28**, L723 (1995).
168. A.D. Bandrauk, E.E. Aubanel. Electron control in Photodissociation by Two-Color Multiphoton Processes. *Chem. Phys.* **198**, 159 (1995).
167. T. Zuo, A.D. Bandrauk. Charge Resonance Enhanced Ionization of Diatomic Molecular Ions by Intense Lasers. *Phys. Rev.* **A52**, R2511 (1995).
166. J. Zauhar, A.D. Bandrauk, K.D. Truong. Synthesis of Dicyanomethyl and Nitro Substituted p-Polyphenyls and Their Salts. *Synthesis*, June 1995, 43.
165. Y. Liu, S.L. Chin, H. Yu, A.D. Bandrauk. Harmonic Generation in H<sub>2</sub> Experiment and Theory. *J. Phys.* **B28**, 3661 (1995).
164. T. Zuo, A.D. Bandrauk. High Order Harmonic Generation in Intense Laser and Magnetic Fields. *Intl. J. Nonl. Opt. Phys.* **4**, 533 (1995).
- \*\*163. T. Zuo, A.D. Bandrauk, M. Ivanov, P.B. Corkum. Control of High Order Harmonic Generation in Combinations of High Intensity Laser Fields. *Phys. Rev.* **A51**, 3991 (1995).
162. S. Chelkowski, T. Zuo, O. Atabek, A.D. Bandrauk. Dissociation, Ionization and Coulomb Explosion of H<sub>2</sub><sup>+</sup> in Intense Laser Fields. *Phys. Rev.* **A52**, 2977 (1995).

161. T. Zuo, A.D. Bandrauk. Superdressed  $H_2^+$  and  $H_3^{++}$  in Intense High frequency Laser Fields. *Phys. Rev.* **A51**, R26 (1995).
- \*\*160. M. Ivanov, P.B. Corkum, T. Zuo, A.D. Bandrauk. Routes to Control of Intense-Field Atomic and Molecular Processes. *Phys. Rev. Lett.* **74**, 2933 (1995).
159. S. Chelkowski, A.D. Bandrauk. Picosecond Isomerization of a Linear Triatomic Molecule with Intense Laser Pulses. *Chem. Phys. Lett.* **233**, 185 (1995).
158. A.D. Bandrauk. *Frontiers of Chemical Dynamics*. NATO ASI, edit. E. Yurtsever (Kluwer Publisher, Holland (1995)), "Molecules in Laser Fields", p. 131-150.
157. A.D. Bandrauk. "Control of Multiphoton IR Dissociation" – Femtosecond Workshop Report, edit. K. Kompa, R.D. Levine, *MPQ 191*, 31-34 (1994) (Max Planck Institute, Munich).
156. A.D. Bandrauk. Computational Methods for Multiphoton Transitions. *Proc. 14-International Raman Conf.* Edit. N.T. Yu (J. Wiley, NY, NY, 1994), p. 48-50.
155. K.A. Pronin, A.D. Bandrauk, A.A. Ovchinnikov. Electron Localization and Nonperturbative Response of a 1D-One Band Conductor. *Synth. Met.* **69**, 707 (1995).
154. K.A. Pronin, A.D. Bandrauk, A.A. Ovchinnikov. Nonlinear Nonstationary Response of a 1-D One Band Conductor. *Synth. Met.* **71**, 1687 (1995).
153. H. Yu, A.D. Bandrauk. 3-D Finite Element Method for Time Dependent Schroedinger Equation of Molecules in Laser Fields. *J. Chem. Phys.* **102**, 1257 (1995).
152. K.D. Truong, P. Grenier, D. Houde, A.D. Bandrauk. Studies of Organic Solid State Neutral-Ionic Transitions by Time-Resolved Four-Wave Mixing. *Synth. Met.* **71**, 1707 (1995).
151. E.E. Aubanel, A.D. Bandrauk. Orbital Alignment and Electron Control in Photodissociation Products by Two Color-Laser Interference. *Chem. Phys. Lett.* **229**, 169 (1994).
150. A.D. Bandrauk, T. Zuo, H. Shen. Computation in Molecular Time Dependent Quantum Mechanics in Laser Fields. *Supercomp. Symp'94* (University of Toronto Press), Proc. 37-48 (1994).
149. K.A. Pronin, A.D. Bandrauk, A.A. Ovchinnikov. Harmonic Generation in One Dimensional Conductors. Exact results. *Phys. Rev. B*, **R50**, 3473 (1994).
148. H. Yu, A.D. Bandrauk, V.J. Sonnad. 3-dimensional finite element method for electronic properties of  $H_2^+$ ,  $H_2$ ,  $H_3^{++}$ ,  $H_3^+$ . *Chem. Phys. Lett.* **222**, 387 (1994).
147. K.A. Pronin, A.D. Bandrauk, A.A. Ovchinnikov. Electric field induced localization and optical response of a one-dimensional conductor. *J. Phys.* **C. 6**, 4721 (1994).
146. K.A. Pronin, A. Ovchinnikov, A.D. Bandrauk – Electric and Optical Response of 1-D Conductors – *Proc. 6th International Conference Multiphoton Processes*, edit S.L. Chin (Springer, N.Y. 1994).
145. A.D. Bandrauk, E. Aubanel, S. Chelkowski. *Molecules in Intense Laser Fields – Theory and Applications*. "Femtosecond Chemistry", edit. J. Manz, Springer-Verlag (Berlin 1994), Chap. 25, p. 731-741.
144. A.D. Bandrauk. *Molecules in Laser Fields. Fundamentals*. "Femtosecond Chemistry", edit. J. Manz, Springer-Verlag (Berlin, 1994), Chap. 6, p. 261-271.
- \*143. H. Shen, J.P. Dussault, A.D. Bandrauk. Optimal Pulse Shaping for Coherent Control by the Penalty Algorithm. *Chem. Phys. Lett.* **221**, 498 (1994).
142. E. Aubanel, T. Zuo, A.D. Bandrauk. Molecular Spectroscopy in Strong Laser Fields. Vibrational and Rotational Effects in Harmonic Generation. *Phys. Rev.* **A49**, 3776 (1994).
141. T. Zuo, S. Chelkowski, A.D. Bandrauk. Photon-Emission Spectra of  $H_2^+$  in Intense Laser Fields. *Phys. Rev.* **A49**, 3943 (1994).
140. A.D. Bandrauk, J.M. Gauthier, J.F. McCann. Laser Control of Photopredissociation and Photoionization. *SPIE Proc.* **2124-46**, 152-166 (1994).

139. H. Shen, J.P. Dussault, A.D. Bandrauk. The Augmented Lagrangean Method for Laser Coherent Control. *SPIE Proceedings* **2124-47**, 167-179 (1994).
138. H. Yu, A.D. Bandrauk, V. Sonnad. Finite-Element Approach for Calculating High-Order Nonlinear Optical Susceptibilities. II. Molecules. *J. Math. Chem.* **119**, 1 (1994).
137. E.E. Aubanel, A.D. Bandrauk. Efficient Vibrational Inversion and Harmonic Generation of  $H_2^+$  at High Intensities. *Can. J. Chem.* **72**, 673 (1994).
- \*136. A.D. Bandrauk, H. Shen. Exponential Operator Methods for Coupled Time-Dependent Nonlinear Schroedinger Equations. *J. Phys.* **A27**, 7147 (1994).
135. H. Yu, A.D. Bandrauk, V. Sonnad. Finite-Element Approach for Calculating High-Order Nonlinear Optical Susceptibilities. I. *J. Math. Chem.* **115**, 1 (1994).
134. E. Aubanel, A. Conjusteau, A.D. Bandrauk. Rotational Effects on High Laser Intensity Molecular Stabilization. *Phys. Rev.* **A**, **48**, R4011 (1993).
133. P.D. Harvey, K.D. Truong, K.T. Aye, M. Drouin, A.D. Bandrauk. Resonance Enhanced Intraligand and Metal-Metal Raman Modes in Platinum(II) Complexes. *Inorg. Chem.* **33**, 2347 (1994).
132. A.D. Bandrauk, J.M. Gauthier, J.F. McCann. Laser Control of Photopredissociation and Photoionization in  $Cl_2$  by Two Color Interference. *J. Chem. Phys.* **100**, 340 (1994).
131. A.D. Bandrauk. Molecular multiphoton transitions. Computational Spectroscopy for Perturbative and Non-Perturbative Regimes. *Internatl. Rev. Phys. Chem.* **13**, 123 (1994).
130. E. Aubanel, A.D. Bandrauk. Rapid Vibrational Inversion Via Time-Gating of Laser. Induced Avoided Crossings. *J. Phys. Chem.* **97**, 12620 (1993).
- \*129. T. Zuo, S. Chelkowski, A.D. Bandrauk. Harmonic Generation by  $H_2^+$  in Intense Laser Fields. *Phys. Rev.* **A48**, 3837 (1993).
- \*128. E. Aubanel, J.M. Gauthier, A.D. Bandrauk. Molecular Stabilization and Angular Distribution in Photodissociation of  $H_2^+$  in Intense Laser Fields. *Phys. Rev.* **A48**, 2145 (1993).
127. K.D. Truong, A.D. Bandrauk, P. Grenier, D. Houde. Time-Resolved Third-Order Nonlinear Optical Susceptibility of Langmuir-Blodgett Films of Porphyrins by Femtosecond Laser Spectroscopy, *in Thin Solid Films* **244**, 981 (1994).
126. A.D. Bandrauk, H. Shen. Exponential Operator Method for Coupled Time-Dependent Linear and Nonlinear Schroedinger Equations. *Proc. High Performance Computing '93*, edit. L. Bauwens 239-245 (1993) (University of Calgary Press).
125. A.D. Bandrauk, S. Chelkowski, T. Zuo. Molecular Harmonic Generation, *OSA Proc. Short Wavelengths*, ed. P.B. Corkum, M. Revy **17**, 159 (1993).
124. A.D. Bandrauk, E. Aubanel, T. Zuo, S. Chelkowski. High Order Harmonic Generation in  $H_2^+$ . *SPIE Proc.* **2041-22**, 173-181 (1993).
123. E. Aubanel, A. Conjusteau, A.D. Bandrauk. Effect of Rotations on Molecular Stabilization in High Intensity Photodissociation of  $H_2^+$ . *ICOMP-VI*, Edit. S.L. Chin, K. McDonald, Springer-Verlag, N.Y. 1994, 4 p.
122. K.A. Pronin, A.D. Bandrauk, A.A. Ovchinnikov. Electric and Optical Response of a One-Dimensional Conductor to an External Field. *ICOMP-VI*. Edit. S.L. Chin, K. McDonald, Springer-Verlag, N.Y. 1994, 4 p.
121. S. Chelkowski, A.D. Bandrauk. Harmonic Generation by N-Level Systems. *ICOMP-VI*. Edit. S.L. Chin, K. McDonald, Springer-Verlag, N.Y. 1994, 4 p.
120. T. Zuo, S. Chelkowski, A.D. Bandrauk, P.B. Corkum. Phase Control of Harmonic Generation. *ICOMP-VI*. Edit. S.L. Chin, K. McDonald, Springer-Verlag, N.Y. 1994, 4 p.

- \*119. S. Chelkowski, A.D. Bandrauk. Rotational Effects on Chirped Multiphoton Absorption. *J. Chem. Phys.* **99**, 4279 (1993).
- \*118. A.D. Bandrauk, H. Shen. Exponential Split Operator Methods for Coupled Schroedinger Equations. *J. Chem. Phys.* **99**, 1185 (1993).
117. J.F. McCann, A.D. Bandrauk, J.M. Gauthier. Stabilization and Coherence in Photodissociation by Intense Lasers. NATO ASI SILAP III, edit. B. Peraus, vol. B316 (1993), p. 64-75.
116. K.D. Truong, P. Grenier, D. Houde, A.D. Bandrauk. Third Order Optical Nonlinearity of BEDTTF Complexed by 4-Wave Mixing. *Synth. Metals* **57**, 3968 (1993).
115. A.D. Bandrauk, E. Aubanel, J.M. Gauthier. Laser-Induced Avoided Crossings and Resonance Stabilization. *Laser Physics* **3**, 381 (1993).
114. E. Aubanel, A.D. Bandrauk, P. Rancourt. Pulse Shape Effects and Laser Induced Avoided Crossings. *Chem. Phys. Lett.* **197**, 419-424 (1992).
113. A.D. Bandrauk, J.M. Gauthier, J.F. McCann. Laser Control of Predissociation by 2+4 Photon Interference. *Chem. Phys. Lett.* **200**, 399 (1992).
112. S. Chelkowski, T. Zuo, A.D. Bandrauk. Numerical Calculation of Ionization Rates of  $H_2^+$  at High Intensities. *Phys. Rev. A* **R46**, 5342-45 (1992).
111. K.D. Truong, P. Grenier, D. Houde, A.D. Bandrauk. Studies of 3<sup>rd</sup>-Order HG via Femtosecond 4-Wave Mixing in Organic Metal-Insulator Phase Transitions. *Chem. Phys. Lett.* **196**, 280-286 (1992).
110. S. Miret-Artes, O. Atabek, A.D. Bandrauk. Multiphoton Absorption Line Shapes in Intense Laser Fields. *Phys. Rev.* **45A**, 8056-61 (1992).
109. Y. Daknovskii, A.D. Bandrauk. Nonlinear Optics of  $(A-B)_x$  Polymers. *Synth. Metals* **43**, 3741-42 (1992).
108. E. Aubanel, A.D. Bandrauk. Analytic Models of Two Photon Molecular Processes Induced by Time Delayed Pulses. NATO ASI, Edit, A.D. Bandrauk, S.C. Wallace (Plenum Press, N.Y. 1992) 357-366.
107. S. Chelkowski, A.D. Bandrauk. Controlled Photochemistry and Photophysics with Chirped Laser Pulses. NATO ASI, Edit. A.D. Bandrauk, S.C. Wallace (Plenum Press, N.Y. 1992), 333-347.
106. H. Yu, A.D. Bandrauk, V. Sonnad. Application of Finite Element Methods to the Hydrogen Atom in Intense Laser Fields. NATO ASI, Edit. A.D. Bandrauk, S.C. Wallace (Plenum Press, N.Y. 1992) 31-43.
105. J.F. McCann, A.D. Bandrauk. Laser Induced Stabilization and Alignment in Multiphoton Dissociation of Diatomics. *J. Chem. Phys.* **96**, 903-910 (1992).
104. A.D. Bandrauk, H. Shen. Higher Order Exponential Split Operator Methods for Solving Time-Dependent Schroedinger Equations, *Can. J. Phys.* **70**, 535-539 (1992).
103. S. Chelkowski, A.D. Bandrauk. Control of Vibrational Excitation and Dissociation by Chirped Intense IR Laser Pulses. *Chem. Phys. Lett.* **186**, 264-269 (1991).
102. A.D. Bandrauk, E. Constant, J.M. Gauthier. Above threshold photodissociation in  $H_2$  and  $H_2^+$ . *J. Phys. II (France)* **1**, 1033-1051 (1991).
101. K.D. Truong, A.D. Bandrauk, A. Michel, M. Banville. A Study of the Phase Transition in Semiconducting 1:2 TCNQ Charge Transfer Complexes with Dipropylamine Derivatives. *Can. J. Chem.* **69**, 1804-1811 (1991).
100. A.D. Bandrauk. The Electron and Dressed Molecules in "The Electron 1990", Fundamental Theories of Physics, Edit. A. Weingartshofer, D. Hestenes, Kluwer Academic Pub. (Netherlands 1991), p. 191-217.

99. S. Chelkowski, A.D. Bandrauk. Harmonic and Nonharmonic Frequency Generation by Molecular Vibrations. *Phys. Rev.* **A44**, R788 (1991).
98. A.D. Bandrauk, H. Shen. Improved Exponential Split Operator Method for Solving the Time-Dependent Schroedinger Equation. *Chem. Phys. Lett.* **176**, 428-432 (1991).
97. A.D. Bandrauk, H. Shen. Split Exponential Operators and Numerical Solutions of Parabolic Partial Differential Equations. *Proc. Vth Intntl. Symp. On Comput. And Inform. Sciences*, Edit. E. Harmanci, Technical Univ. Istanbul, pp. 3200-3210 (1990).
96. A.D. Bandrauk, S. Chelkowski, H.B. Wang. Optical Pulse Propagation in Nondegenerate Multilevel Systems. *Physica-D50 (Nonlinearity)* 31-41 (1991).
95. S. Chelkowski, A.D. Bandrauk, P.B. Corkum. Efficient Molecular Dissociation by a Chirped Ultrashort Infrared Laser Pulse. *Phys. Rev. Lett.* **65**, 2355-58 (1990).
94. K.D. Truong, A.D. Bandrauk, J. Zauhar, C. Carlone. Vibrational Spectra of Two New Organic Semiconductors: TTF and TMTSF salts of Paranitrophenylmalanonitrile. *Can. J. Chem.* **69**, 901-907 (1991).
93. J.C. McCann, A.D. Bandrauk. Eigenvalues of the Zakharov-Shabat equations by semiclassical approximation. *Phys. Lett.* **A151**, 509-514 (1991).
92. A.D. Bandrauk. Nonperturbative Multiphoton Transitions in Molecules. A Coupled Equations Approach Study of LiF – in "Intense Laser Phenomena", Ed. I. Kiyon, M. Ivanov, vol. 3, series in Optics and Photons, (Wared Scientific, N.J. 1991), p. 259-287.
91. J.F. McCann, A.D. Bandrauk. Two Color Photodissociation Angular Distributions of Diatomic Fragments at High Laser Intensities. *Phys. Rev.* **42A**, 2806-16 (1990).
90. S. Chelkowski, A.D. Bandrauk. Coherent interaction of a Zero Area Laser Pulse with a Morse Oscillator. *Phys. Rev.* **A41A**, 6480-84 (1990).
89. A.D. Bandrauk, J.M. Gauthier. Above Threshold Molecular Photodissociation in Ionic Molecules. A Numerical Simulation. *J. Opt. Soc. Am.* **B7**, 1420-27 (1990).
88. A.D. Bandrauk. Multiphoton Processes in Molecules. A nonperturbative Approach. Vol. 6, *Advances in Multiphoton Processes and Spectroscopy*. Edit. S.H. Lin (World Scientific Publishing Co. N.Y. 1990), p. 160-203.
87. S. Chelkowski, A.D. Bandrauk. Multilevel Nonlinear Effects in High Intensity Pulse Amplification. *J. Opt. Soc. Am. Sept. B7*, 90-100 (1990).
86. A.D. Bandrauk. Nonperturbative Treatment of Molecular Radiative Interactions, Atoms in Strong Fields. Ed. C. Nicolaidis. *NATO ASI vol. B212*, p. 337-352 (Plenum Press, N.Y. 1990).
85. A.D. Bandrauk, J.M. Gauthier. Infrared Multiphoton Dissociation of LiF by a Coupled Equation Method. *J. Phys. Chem.* **93**, 7552-54 (1989).
84. K.D. Truong, A.D. Bandrauk, M. Aubin. Observation of an Inverse Spin-Peierls Transition. *Solid State Commun.* **72**, 1145-48 (1989).
83. A.D. Bandrauk, J. McCann. Semiclassical Description of Dressed Molecular States in Strong Fields. *Comments At. And Molec. Phys.* **22**, 325-343 (1989).
82. A.D. Bandrauk, K.D. Truong, C. Carlone. Properties of a new 1D Semiconducting Ternary Compound, TEDA I<sub>2.5</sub>TCNQ. *Can. J. Chem.* **67**, 619-625 (1989).
81. S. Chelkowski, A.D. Bandrauk. Non Resonant Effects in High Intensity Amplification of Ultra Short Pulses in "Disorder and Nonlinearity", edit. A. Bishop, D.K. Campbell (Springer Verlag, N.Y. 1989), p. 134-139.
80. S. Chelkowski, A.D. Bandrauk. Coherent Propagation of Intense Ultrashort Laser Pulses in a Molecular Multi-Level Medium. *J. Chem. Phys.* **81**, 3618-28 (1988).
79. A.D. Bandrauk, L. Claveau. Molecular Rotation Coherence at High Intensities. *J. Phys. Chem.* **93**, 107-113 (1989).

78. K.D. Truong, A.D. Bandrauk, J. Zauhar, M. Aubin. New Conduction Paranthrophenylmalanotrile Complexes with TTF and TMSF. *Synthetic Metals* **27B**, 439-444 (1988).
77. A.D. Bandrauk, S. Chelkowski. Pulses Instabilities in Molecular Amplifying Media. SPIE Proceedings – High Intensity Symposium, Los Angeles **913**, 9-17 (1988).
76. S. Chelkowski, A.D. Bandrauk. Propagation of Ultrashort Laser Pulses in an N-level Medium in *Atomic and Molecular Processes with Short Intense Laser Pulses*, NATO ASI, ed. A.D. Bandrauk (Plenum Press, N.Y. 1988), vol. **171**, 57-67.
75. A.D. Bandrauk, L. Claveau. Rotational Coherences in the IR Excitation of Molecular Rotations at High Intensities, in *Atomic and Molecular Processes with Short Intense Laser Pulses*, NATO ASI, Ed. A.D. Bandrauk (Plenum Press, N.Y. 1988), vol. **171**, 417-431.
74. A.D. Bandrauk, N. Gélinas. Above Threshold Photodissociation with Intense IR Lasers – A Coupled Equations Study, in *Atomic and Molecular Processes with Short Intense Laser Pulses*, NATO ASI, ed. A.D. Bandrauk (Plenum Press, N.Y. 1988), vol. **171**, 263-273.
73. A.D. Bandrauk, K.D. Truong, M. Aubin. Phase Transitions in the Organic Semi-conductor Dipropylamine TCNQ. *Can. J. Chem.* **66**, 938-943 (1988).
72. A.D. Bandrauk, K.D. Truong, C. Carlone. Resonance Raman Spectra of TEDA I<sub>2.5</sub>TCNQ and  $\beta$ (BEDT-TFF)<sub>2</sub>I<sub>3</sub> – 6 pages – in *Organic and Inorganic Low Dimensional Materials*, Edit. P. Delhaes, M. Drillon (Plenum Press, N.Y. 1988), vol. **168**, NATO ASI, 329-333.
71. A.D. Bandrauk, O. Atabek. Coupled Equation Method for Multiphoton Transitions in Diatomic Molecules. Bridging the Weak & Intense Field Limits in *Lasers Molecules & Methods* – Advances in Chemical Physics, Ed. J. Hirschfelder (John Wiley & Sons, 1988), vol. 73, chap. 19.
70. A.D. Bandrauk, N. Gélinas. Coupled Equations Approach to Multiphoton Molecular Processes. *J. Camp. Chem.* **8**, 313-323 (1987).
69. A.D. Bandrauk, O. Atabek. Semiclassical Methods in Multiphoton Diatomic Spectroscopy – Beyond Perturbation Theory. *J. Phys. Chem.* **91**, 6469-6478 (1987).
68. A.D. Bandrauk. Resonance Raman Spectra of Organic Conductors. *Low Dimensional Conductors*, edit. D. Jerome, L. Caron (Plenum Press, N.Y. 1987) Vol. 155, NATO ASI, 295-305.
67. A.D. Bandrauk. Bloch Nordsieck Approach to Intense Field Problems and Coupled Equations, in *Photons and Continuum States*, edit. by N.K. Rahman (Harwood Academic Press, 1987) 141-149.
66. A.D. Bandrauk, K.D. Truong, C. Carlone, A.W. Hanson. Polyiodides of Triethylenediamine. Single Crystal Resonance Raman Spectra and X-ray Structure. *J. Phys. Chem.* **91**, 2063-2069 (1987).
65. A.D. Bandrauk, N. Gélinas. Nonadiabatic Effects in Multiphoton Processes. A Coupled Equations Study. *J. Chem. Phys.* **86**, 5257-66 (1987).
64. T.T. Nguyen Dang, A.D. Bandrauk. Higher Oder Adiabatic Separation of Strongly Coupled Systems. *J. Chem. Phys.* **85**, 7224-31 (1986).
63. A.D. Bandrauk, N. Gélinas. Nonadiabatic Effects in Third-Harmonic Generation. *Chem. Phys. Lett.* **129**, 362 (1986).
62. A.D. Bandrauk, L. Claveau. Effect of Rotations on Absorption in Intense Fields. SPIE Proceedings (1986), 217-222.
61. A.D. Bandrauk, N. Gélinas. Coupled Equations Approach to Multiphoton Processes in Strong Fields. SPIE Proceedings **669**, 161-68 (1986).
60. A.D. Bandrauk, O. Kalman, T.T. Nguyen-Dang. Molecular Dynamics in Intense Fields IV – Beyond the Dipole Approximation. *J. Chem. Phys.* **87**, 6761-70 (1986).

59. A.D. Bandrauk, T.T. Nguyen-Dang. Molecular Dynamics in Intense Fields III – Nonadiabatic Effects. *J. Chem. Phys.* **83**, 2840 (1985).
58. A.D. Bandrauk, M. Giroux, G. Turcotte. Coupled Equations Approach to Multiphoton Processes in Molecules II. *J. Phys. Chem.* **89**, 4473-83 (1985).
57. A.D. Bandrauk, G. Turcotte. Coupled Equations Approach to Multiphoton Processes in Molecules – I. *J. Phys. Chem.* **89**, 3039 (1985).
56. A.D. Bandrauk, K. Ishii, K.D. Truong, M. Aubin, A.W. Hanson. Hydrogen Bonding and Properties of Organic Conductors – II. *J. Phys. Chem.* **89**, 1478 (1985).
55. A. Comtet, A.D. Bandrauk, D.K. Campbell. Semiclassical Supersymmetry. *Phys. Lett.* **150B**, 159-163 (1985).
54. A.D. Bandrauk, K. Ishii, K.D. Truong. Hydrogen Bonding and Properties of Organic Conductors. II. *J. Phys. Chem.* **89**, 434 (1985).
53. A.D. Bandrauk, K.D. Truong, K. Ishii. Effect of Hydrogen Bonding in 2:3 TCNQ Compounds. *Molec. Cryst. Liq. Cryst.* **20**, 105-110 (1985).
52. K. Ishii, K.D. Truong, A.D. Bandrauk. Proc. 9<sup>th</sup> International Raman Conference (Tokyo) – pages 440-444 (Aug. 1984).
51. T.T. Nguyen-Dang, A.D. Bandrauk. Molecular Dynamics in Intense Fields. II. *J. Chem. Phys.* **80**, 4926-4939 (1984).
50. A.D. Bandrauk. Photodissociation and Raman Scattering of Diatomics in Intense Fields. *Collisions in Lasers* (edit. K. Rahman, Harwood Academic Publishers) pages 351-373 (1984).
49. A.D. Bandrauk. La Chimie Laser: Rencontre de la théorie et de l'expérience. *Chemistry in Canada*, Jan. 1983, 29-31 et *La Physique au Canada*, Jan. 1983, 6-9.
48. T.T. Nguyen-Dang, A.D. Bandrauk. Molecular Dynamics in Intense Laser Fields – I. *J. Chem. Phys.* **79**, 3256-68 (1983).
47. A.D. Bandrauk, G. Turcotte. Photodissociation Angular Distribution of Diatomics in Intense Fields. *J. Phys. Chem.* **87**, 5098-5106 (1983).
46. A.D. Bandrauk, K.D. Truong, C. Carlone, S. Jandl. Resonance Raman Spectrum of an Organic Metal TMAITCNQ. *Journal of Phys.* **44C3**, 1472-1477 (1983).
45. G. Turcotte, A.D. Bandrauk. Strong Field Depolarization in RRS by a Molecular Continuum. *Chem. Phys. Lett.* **94**, 175-179 (1983).
44. A.D. Bandrauk, K.D. Truong, C. Carlone, S. Jandl. Resonance Raman Spectrum of the  $I_3^-$  Ion and the Phase Transition in TMA I TCNQ. *Chem. Phys. Lett.* **95**, 78-82 (1983).
43. A.D. Bandrauk, G. Turcotte. Les orbitales moléculaires. *Spectre – Revue de l'Association des Professeurs de Sciences du Québec*, **11**, 35-41 (1982).
42. A.D. Bandrauk, G. Turcotte. Intense field resonance Raman scattering by a molecular continuum. A coupled equations study. *J. Chem. Phys.* **77**, 3867-3877 (1982).
41. A.D. Bandrauk, K.D. Truong, S. Jandl. Single Crystal Raman Spectra of an Organic Semiconductor: KTCNQ. *Can. J. Chem.* **60**, 1881-1890 (1982).
40. A.D. Bandrauk, G. Turcotte. Coupled Equations Approach to Strong Field RRS dans *Raman Spectroscopy, Linear and Nonlinear Processes* (aut. J. Lascombe, P.V. Huong, edit. Wiley, Paris 1982) pages 11-13.
39. A.D. Bandrauk, K.D. Truong, C. Carlone. Temperature Dependence of Single Crystal Raman Spectra of (Perylene)<sub>3</sub>TCNQ. *Chem. Phys.* **66**, 293-301 (1982).
38. A.D. Bandrauk, K.D. Truong, C. Carlone. Optical and Raman Spectra of the (Perylene)<sub>3</sub>TCN. Charge transfer complex. *Can. J. Chem.* **60**, 488-495 (1982).
37. A.D. Bandrauk, K.D. Truong, S. Jandl. Raman Spectra of the Phase Transition in KTCNQ. *Molec. & Liquid Crystals* **85**, 1687-1695 (1982).

36. A.D. Bandrauk, G. Turcotte, R. Lefebvre. Resonance Raman Scattering by a Predissociative State. A Study of Nonadiabatic Effects. *J. Chem. Phys.* **76**, 225-233 (1982).
35. K. Kodama, A.D. Bandrauk. Excitation Profiles of Resonance Raman Spectra in Condensed Media. *Chem. Phys. Letters* **80**, 248-252 (1981).
34. K. Kodama, A.D. Bandrauk. Analytical and Numerical Approach to Multidimensional Predissociation and Resonance Scattering. *Chem. Phys.* **57**, 461-474 (1981).
33. A.D. Bandrauk, M.L. Sink. Photodissociation in Intense Laser Fields. *J. Chem. Phys.* **74**, 1110-1117 (1981).
32. M.L. Sink, A.D. Bandrauk, R. Lefebvre. Theoretical Analysis of the Predissociation of the  $A^{2+}\Sigma$  State of OH. *J. Chem. Phys.* **73**, 4451-4459 (1980).
31. A.D. Bandrauk, K.D. Kodama, G. Turcotte. Exact Numerical Calculations of Resonance Raman Spectra, 308-309, *Proceedings 7<sup>th</sup> International Raman Conf.* (Ottawa, Aug. 1980).
30. A.D. Bandrauk, K.D. Truong. Resonant Raman Spectra of Charge Transfer Complexes of TCNQ, 104-105, *Proceedings 7<sup>th</sup> International Raman Conf.* (Ottawa, Aug. 1980).
29. M.L. Sink, A.D. Bandrauk. Scattering Theory of Multipredissociation in the  $A^2\Sigma^+$  State of OH. *Chem. Phys. Letters* **65**, 246-251 (1979).
28. M.L. Sink, A.D. Bandrauk. A Theoretical Study of the  $B^2\Sigma^+-X^2\Sigma^+$  Band System in MgH, MgD. *Can. J. Phys.* **57**, 1178-1184 (1979).
27. A.D. Bandrauk, W.H. Miller. Analysis of the General Stueckelberg Method of Non-Adiabatic Transitions. *Molec. Phys.* **38**, 1893-1907 (1979).
26. A.D. Bandrauk, K.D. Truong. V.R. Salares, H.J. Bernstein. Raman Spectra of Solid Perylene-TCNQ Complexes. *J. Raman Spectr.* **8**, 5-10 (1979).
25. M.L. Sink, A.D. Bandrauk. The Harmonic Oscillator Model in Predissociation. *Chem. Phys.* **33**, 205-217 (1978).
24. A.D. Bandrauk, M.L. Sink. Laser Induced Preassociation and Natural Predissociation. *Chem. Phys. Letters* **57**, 569-572 (1978).
23. K.D. Truong, A.D. Bandrauk. Spectra of the 1:1 and 3:1 Solid Complexes of Coronene-TCNQ. *Can. J. Chem.* **55**, 3712-3716 (1977).
22. M.L. Sink, A.D. Bandrauk. Predissociation of the harmonic oscillator. *Chem. Phys. Letters* **49**, 508-511 (1977).
21. A.D. Bandrauk. Predissociation and the Landau-Zener Model Revisited. *Colloque Int. Du CNRS France* **273**, 2741 (1977).
20. J.P. Laplante, A.D. Bandrauk, C. Carlone. Unified Description of Spectroscopic Interferences in Predissociation. *Can. J. Phys.* **55**, 1-22 (1977).
19. A.D. Bandrauk, J.P. Laplante. The Reflection Method in Predissociation. *Can. J. Chem.* **55**, 1333-1341 (1977).
18. M.L. Sink, A.D. Bandrauk. Predissociation Linewidths and Level Shifts for Double-Curve Crossing Models. *J. Chem. Phys.* **66**, 5315 (1977).
17. J.P. Laplante, A.D. Bandrauk. An Analytical Model of Resonance Raman Scattering by a Continuum. *J. Raman Spectr.* **5**, 373-389 (1976)
16. K.D. Truong, A.D. Bandrauk. A New TCNQ Complex: (Perylene)<sub>3</sub>TCNQ. *Chem. Phys. Letters* **44**, 232-235 (1976).
15. A.D. Bandrauk, J.P. Laplante. Fano Line Shapes in Predissociation. *J. Chem. Phys.* **65**, 2602-2608 (1976).
14. A.D. Bandrauk, J.P. Laplante. Line Profiles in Predissociation. *J. Chem. Phys.* **65**, 2592-2601 (1976).

13. J.P. Laplante, A.D. Bandrauk. On the Reflection Method and Impulse Approximation. *Chem. Phys. Letters* **42**, 184-186 (1976).
12. M.L. Sink, A.D. Bandrauk, W.H. Henneker, H. Lefebvre-Brion. Theoretical Study of the Low-Lying Electronic States of MgH. *Chem. Phys. Letters* **39**, 505-510 (1976).
11. A.D. Bandrauk. Les orbitales moléculaires. *Canadian Chemical Education* **9**, 6-11 (1974).
10. A.D. Bandrauk. Scattering Theory of One and Two-Photon Molecular Processes. *Molec. Phys.* **28**, 1259-1273 (1974).
9. J.P. Laplante, A.D. Bandrauk. Electric Field Gradients in Alkali Halides. *Can. J. Chem.* **52**, 2143-2156 (1974).
8. A.D. Bandrauk. Integral Transform Functions and Separable Potentials. *J. Quant. Chem.* **8**, 209-221 (1973).
7. A.D. Bandrauk. On Long-Range Curve Crossings. *Molec. Phys.* **24**, 661-664 (1972).
6. A.D. Bandrauk. On Unitarized Born Approximation. *Chem. Phys. Letters* **12**, 253-258 (1971).
5. A.D. Bandrauk, M.S. Child. Analytic Predissociation Linewidths from Scattering Theory. *Molec. Phys.* **19**, 95-111 (1970).
4. A.D. Bandrauk. Inelastic Scattering of Alkali Atoms from Halogens. *Molec. Phys.* **17**, 523-534 (1969).
3. R.F.W. Bader, A.D. Bandrauk. Relaxation of Molecular Charge Distributions and Vibrational Force Constant. *J. Chem. Phys.* **49**, 1666-1675 (1968).
2. R.F.W. Bader, A.D. Bandrauk. Molecular Charge Distribution and Chemical Binding. *J. Chem. Phys.* **49**, 1653-1665 (1968).
1. W.R. Thorson, A.D. Bandrauk. Coriolis Shifts in Elastic Scattering Potential. *J. Chem. Phys.* **41**, 2503-2507 (1964).

#### **Non-refereed**

1. A.D. Bandrauk – Book Review - Explorations in Quantum Interference – *J. Am. Chem. Soc.* **118**, 7871 (1996).
2. A.D. Bandrauk – Book Review - Theory and Applications of Computational Chemistry – *J. Am. Chem. Soc.* (2006).
3. A.D. Bandrauk – Book Review – Advances in Quantum Chemistry – vol 60 – *Intn J. Quant. Chem.* (2011)

#### **Livres / Books**

1. A.D. Bandrauk, M.Y. Ivanov – Quantum Dynamic Imaging – (Springer, NY, 2011)
2. K. Yamanouchi, G. Gerber, A.D. Bandrauk – Progress in Ultrafast Intense Laser Science, vol VI (Springer, Tokyo, 2010).
3. A.D. Bandrauk, M. Delfour, C. LeBris – High-Dimensional Partial Differential Equations (American Mathematical Society, NY, 2007), CRM Proceeding & Lecture Notes, vol. 41.
4. M. Fedorov, A.D. Bandrauk, P.B. Corkum, M. Drescher – Ultrafast Phenomena and Physics of Super Intense Laser Fields – ICONO 2005 – SPIE (Bellingham, USA – May 2006).
5. A.D. Bandrauk, M. Delfour, C. LeBris – Quantum Control, Lecture Notes – Centre de Recherches Mathématiques (American Mathematical Society, N.Y.- 2003), vol. 33.
6. A.D. Bandrauk, R.J. Gordon, Y. Fujimura. Laser Control + Manipulation of Molecules, ACS Symposium, **281**, (Washington, N.Y. 2002).
7. J. Laan, Y. Takahashi, A.D. Bandrauk. Structure and Dynamics of Excited States, (Springer Verlag, Berlin, 1998).

8. A.D. Bandrauk. Molecules in Laser Fields. (Marcel Dekker, N.Y., 1994).
9. A.D. Bandrauk, S.C. Wallace. Coherent Phenomena in Atoms & Molecules in Laser Fields. NATO ASI, vol. **287B**, Plenum Press, N.Y., 1990.
10. A.D. Bandrauk. Atomic & Molecular Processes with Short Intense Laser Pulses. NATO ASI, vol. **171B**, Plenum Press, N.Y. 1989.

## ÉTUDIANTS GRADUÉS – GRADUATE STUDENTS

			Postes occupés – Current positions
<b>J.P. Laplante</b>	M.Sc. & Ph.D.	1973-1978	Directeur – Département de chimie et génie chimique – Royal Military College – Kingston (ON).
<b>T.H. Nguyen</b>	M.Sc.	1973-1975	
<b>K.D. Truong</b>	M.Sc. & Ph.D.	1976-1981	Assistante de recherche – Département de physique – Université de Sherbrooke (QC).
<b>G. Turcotte</b>	M.Sc. & Ph.D.	1979-1984	PdG, Environment Systems – Ottawa (ON).
<b>V. Hurtubise</b>	M.Sc.	1979-1981	Ph.D. - University of Chicago (USA).
<b>M. Giroux</b>	M.Sc.	1984-1986	Professeur – Cégep de Victoriaville
<b>N.Gélinas</b>	M.Sc.	1985-1987	
<b>L. Claveau</b>	M.Sc.	1988-1990	Professeur – Cégep de Jonquière (QC).
<b>J.M. Gauthier</b>	M.Sc.	1989-1991	Ph.D. - Université de Montréal (QC).
<b>H. Shen</b>	M.Sc. & Ph.D.	1989-1993	Telecom Research – (California, USA).
<b>E. Constant</b>	Ph.D.	1995-1999	Chercheur - Laboratoire de Laser Intense – CNRS – (Bordeaux -France).
<b>A. Conjusteau</b>	M.Sc.	1996-1998	Ph.D. (Princeton Univ.); Research assistant (California Inst. Technology).
<b>C. Dion</b>	M.Sc. & Ph.D.	1995-2000	Professeur – University Umea – (Suède/Sweedon).
<b>J. Ruel</b>	M.Sc.	1997-1999	Professeur – Cégep de Sherbrooke (QC).
<b>F. Légaré</b>	M.Sc. & Ph.D.	1999-2004	NSERC Post-Doc. (Harvard University, USA). – Professeur – INRS – EMT (QC).
<b>J. Lévesque</b>	M.Sc.	2001-2003	Étudiant Ph.D. – INRS – EMT Varennes (QC).
<b>E. Sedik</b>	Ph.D.	2003-2006	Research Assistant - Egypt
<b>E. Dehghanian</b>	Ph.D.	2007-2011	Lecturer - Iran

<b>D. Tchitchekova</b>	Ph.D.	2006-2010	Post-doc – UC (London, UK)
<b>T. Bretmann</b>	Ph.D.	2008-2012	(co-direction – FU Berlin)
<b>M. Roux</b>	Ph.D.	2011-2015	

### Summer (coop) Students

<b>E. Couture-Bienvenue</b>	2011, 2012
<b>M. Poulin</b>	2009
<b>M. Ziou</b>	2009, 2008
<b>E. Dehghanian</b>	2007
<b>D. Tchitchekova</b>	2006
<b>N. Tremblay</b>	2006
<b>S. Gaudreau</b>	2005
<b>M. Zamojski</b>	2001, 2000
<b>J. Ruel</b>	1997
<b>K. Mishima</b>	1997
<b>A. Conjusteau</b>	1996, 1995
<b>C. Dion</b>	1995
<b>H. Shen</b>	1993
<b>E. Constant</b>	1992
<b>P. Rancourt</b>	1990
<b>H. R. Wang</b>	1990
<b>J. M. Gauthier</b>	1988
<b>L. Claveau</b>	1988
<b>N. Gélinas</b>	1986
<b>M. Giroux</b>	1984
<b>G. Turcotte</b>	1982, 1981

## STAGIAIRES POST-DOCTORAUX - POST-DOCTORAL FELLOWS

<b>M.L. Sink</b>	1976-1980	Computer Consultant - Ottawa (ON).
<b>K.D. Kodama</b>	1980-1983	Software Industry – Tokyo (Japan).
<b>T.T. Nguyen-Dang</b>	1983-1986	Professeur de chimie théorique, Université Laval (QC).
<b>K. Ishii</b>	1984-1986	Professor of Chemistry - Gakushuin University, Tokyo (Japan).
<b>O. Kalman</b>	1985-1987	
<b>S. Chelkowski</b>	1988-1990	Assistant de recherche – Laboratoire de chimie théorique – Université de Sherbrooke (QC).
<b>J. McCann</b>	1989-1991	Professeur de physique théorique - Queen's University, Belfast (N. Ireland).
<b>E. Aubanel</b>	1992-1995	Professeur – Informatique – Université du N.Brunswick à Frédéricton (N.B.)
<b>H. Yu</b>	1991-1994	
<b>Y. Dakhnovskii</b>	1992-1995	Professor of Physics – University of Montana (USA).
<b>S. Miret-Artes</b>	1992-1993	Professeur – Université Valencia (Espagne).
<b>T. Zuo</b>	1992-1995	Telecom Research – Chicago (USA).
<b>K.A. Pronin</b>	1994-1997	Research Officer – Institute of Biochemical Physics – Russian Academy of Science (Moscow).
<b>M.Y. Yvanov</b>	1994-1996	Director – Theory Division – National Research Council, Ottawa (ON).
<b>C. Foisy</b>	1995-1998	Informaticien – Erikson Industries – Montréal (QC).
<b>K. Mishima</b>	1998-1999	Researcher – Quantum Computing – University of Tokyo (Japan).
<b>D. Musaev</b>	1999-2000	Computer Analyst, Emory Univ. Atlanta (USA)
<b>H.Z. Lu</b>	2000-2003	Analyste en informatique – Centre de Calcul – Université de Sherbrooke (QC).

<b>I. Kawata</b>	2000-2003	Research Officer Nikon Electronics – Tokyo (Japan).
<b>A. Becker</b>	2001-2003	Research Director – Max Planck Institute – Dresden (Germany).
<b>S. Talepbour</b>	2000-2002	Biomedical Optics, NOVX Systems, Toronto.
<b>H.S. Nguyen</b>	2002-2003	Décédé.
<b>A.B. Yedder</b>	2003-2004	Informaticien - Caisse Nationale de Dépot – Paris (France).
<b>K. Nagaya</b>	2002-2004	Research Officer – Institute of Atomic & Molecular Physics (Taiwan).
<b>G. Lagmago-Kamta</b>	2002-2005	Chercheur – Hôpital Lemoyne - Longueuil
<b>N.A. Nguyen</b>	2004-2007	Mathematical Finance – Ernst-Young Co.
<b>S. Barmaki</b>	2004-2007	Professeure de Physique théorique – Univ. de Moncton
<b>E. Grandmaison</b>	2005-2007	Professeur Math Dept. – Carleton Univ., Ottawa
<b>G. Yudin</b>	2005-2008	SIMS – NRC (Ottawa)
<b>S. Kawaii</b>	2006-2009	JSPS Fellow – Hokkaido - Japan
<b>E. Penka Fowe</b>	2008-2011	(R.A. – U de S)
<b>K. Yuan</b>	2008-2011	(R.A. – U de S)
<b>M. Becher</b>	2009-2010	Professeur – Lycée – Nancy (Fr)
<b>X.B. Bian</b>	2009-2012	
<b>C. Lefebvre</b>	2009-2011	Chercheur – Institut National d’Optique (Que)
<b>E. M. Zaoui</b>	2010-2011	Professeur – École Polytechnique – Rabat (Maroc)
<b>F. Filion</b>	2011-2013	
<b>M. Noh</b>	2012	Professor – Univ. of Malaysia

## CONFÉRENCES – INVITATIONS 2012

- 1. Jan.** Intl Res. Station – “Numerical Solutions of Maxwell-Schroedinger-Dirac PDE’s”
- 2. Fev.** Vancouver – AAAS Annual Meeting – Discussant: “Ultrafast Few Cycle Laser Pulses in Imaging and Control of Molecules”
- 3. March** (USA) – APS Meeting – “Time Dependent Electron Localisation Functions in Intense Laser Fields”
- 4. April** Atlanta (USA) – PTPS Meeting – “Numerical Solutions of Laser Induced Nuclear Fusion”
- 5. May** Berlin (Germany) – J. Manz Symposium – “Attosecond Electron Fluxed in Chemistry”
- 6. May** Calgary – CIC-CSC Meeting – “FAZST – Femto – Atto – Zepto Second Science & Technology”
- 7. June** L A (USA) – DAMOP – APS Meeting – “Attosecond Monitoring of Electron Motion”
- 8. July** Calgary – Laser Physics 2012 – “Attosecond Electron – Nuclear Motion in Molecules”
- 9. Aug** Helsinki (Finland) – Quantum Molecular Science – “Measuring Attosecond Electron Motion”

## CONFÉRENCES – INVITATIONS 2011

- 1. Feb.** Advanced Laser Light Source Meeting – Que – “Attosecond Science – Present and Future”
- 2. March** Univ. British Columbia – “Attosecond Electron Dynamics in Molecules”
- 3. April** Banff Intl Res. Station (Alta) – “Electron Control on Attosecond Time Scale”
- 4. May** Chemical Physics Institute – Dahlian (China) – “Attosecond Science in Molecules”
- 5. May** Kavli Institute – Beijing (China) – “Attosecond Science in Molecules”
- 6. May** ACFAS – Université de Sherbrooke – “Science Attoseconde Moléculaire”
- 7. June** F U Berlin (Germany) – FASZST – “Femto – Atto – ZeptoSecond Simulations & Theory”
- 8. June** APS – DAMOP meeting (Atlanta – USA) – “Effect of Nuclear Motion on Attosecond Electron Dynamics”
- 9. July** ICOMP 2011 (Sapporo – Japan) – “Attosecond Coherent Electron Wave Packets”
- 10. July** FemtoChem 2011 (Madrid – Spain) – “Coherent Electron Wave Packets in Molecules – Attosecond Dynamics”
- 11. Sept** Oct – Concordia University – Science at Loyola College 50 years ago
- 12. Oct** UILS 2011 (Jena, Germany) – “Molecules in Intense Laser Fields”
- 13. Nov** Univ. of Malaya (Kuala Lumpur) – MOVIE Molecular Optical Vizualization – Imaging of Electrons
- 14. Nov** Stevens Institute of Technology, NJ (USA) – MOVIE – Molecular Optical Vizualization – Imaging of Electrons

## CONFÉRENCES – INVITATIONS 2010

1. **Jan** Concordia University (Montreal) – « Molecular in Intense Laser Fields »
2. **March** American Physical Society – Portland, USA – Molecular Attosecond Electron Wave Packets » - (cancelled due to accident)
3. **May** American Physical Society – DAMOP – Houston, USA – « Einstein Podolsky-Rosen Paradox in Molecular Dissociation » (cancelled due to accident)
4. **May** CSC-CIC – Univ. of Toronto – « Coherent Molecular Electron Wave Packets » - (cancelled due to accident)
5. **June** CAP – Univ of Toronto – « FAZST-Femto-Atto-Zeptosecond Science & Technology »
6. **June** Heraklion (Greece) – Filamentation Conference – « Maxwell-Schroedinger Simulations of Pulse Propagation at High Intensities » (cancelled due to accident)
7. **June** Univ. of London (UK) - « FAZST-Femto-Atto-Zeptosecond Simulations and Theory » (cancelled due to accident)
8. **Aug** KITP – UC Santa Barbara (USA) - « CEWP's – Coherent Electron Wave Packets » - (cancelled due to accident)
9. **Sept** FU Berlin (DE) - « Coherent Electron Wave Packets and Attosecond Evolution » (cancelled due to accident)
10. **Oct** Kos (Greece) – Numerical Methods in Science - « Maxwell-Schroedinger – Dirac Simulations at High Laser Intensities »
11. **Nov** Univ Laval, Que – CPA International Conference – « Maxwell-Schroedinger – Dirac Equations for Intense Laser Pulses »
12. **Dec** Honolulu (Hawai) – PACIFICHEM 2010 – « CEWP'S – Coherent Electron Wave Packets »
13. **Dec** Maui (Hawai) – ISUILS09 - « Maxwell-Schroedinger – Dirac Equations for Intense Laser Pulse Propagation

## CONFÉRENCES – INVITATIONS 2009

1. **Février** Centre de Recherches Mathématiques (Montréal) – « Maxwell-Schroedinger Propagation at High Laser Intensities »
2. **Février** U of Western Ontario – Dept. Of Chemistry – « Fast » - « Femto-Attosecond Simulations & Theory »
3. **March** Institute of Mathematics & Applications – Minneapolis (USA) – « Maxwell-Schroedinger Partial Differential Equations in Laser Chemistry »
4. **March** American Chemical Society – Salt Lake City (USA) – « Measuring Electron Motion on Attosecond Time Scale »
5. **April** University of Vermont (USA) – Math Dept – « High Order Split Operator Methods for PDE's »
6. **May** Extreme Laser Infrastructure – Paris (Fr) – Laser Induced Nuclear Fusion
7. **May** KITP – U C Santa Barbara (USA) – « Attosecond Molecular Science »
8. **May** National Laser Center – Frascati (Italy) – « Laser Nuclear Fusion with Single Molecules »
9. **June** CIC-CSC-Hamilton – « Femto Second – Attosecond Molecular Science
10. **June** HPCS 2009 – Queen's U. Kingston (ON) – Fast – Femto – Attosecond Simulations & Theory
11. **July** TDDFT Gordon Research Conference, NH (USA) – « Nonlinear TDDFT for Molecules in Intense Fields »
12. **July** Canadian Computational Chemistry – Dalhousie Univ – Computations in Laser Chemistry
13. **July** Attosecond Science 90 – KSU – USA – Molecular Attosecond Science
14. **Sept.** Schlumberger Research – Boston – USA – Numerical Methods in Laser Science
15. **Sept.** Université de Paris VI – Science Attoseconde - Femtoseconde
16. **Oct.** Centre de Recherches Mathématiques - Dynamic Imaging Conference –Chair
17. **Oct.** IUILS 2009 – Heraklion (Crete) – Attosecond Science – Honorary Chair
18. **Nov.** Technical Univ.- Vienna – Coherence – Decoherence in el-nuclear dynamics
19. **Nov.** University of Munich – Decoherence and Molecular Cats
20. **Dec.** University of Rostok (Germany) – Molecules in Intense Laser Fields
21. **Dec.** University of Berlin (Germany) – FAZST – Femto-Atto-ZeptoSecond Science & Technology

## CONFÉRENCES – INVITATIONS 2008

1. **Janvier** Quantum Optics Conference – Snow Bird, Utah (USA) – Attosecond Science in Molecular Physics”
2. **Feb.** Innsbruck University (Austria) – Effect of Nuclear Motion on Strong Field Processes
3. **Mars** NSERC (Ottawa) – J.C. Polanyi Prize – Attosecond Science
4. **Avril** Humboldt Foundation (Bamberg, Germany) – Attosecond Science, A New Frontier
5. **Mai** Harvard University (USA) – Chirped Attosecond Interferometry (Discussion Leader)
6. **Mai** CIC Annual Meeting (Edmonton, Canada) – Attosecond Science & Chemistry
7. **Mai** DAMOP-APS Annual Meeting – Pennsylvania State University (USA) – Effect of Nuclear Motion in Strong Field Processes – FAPS Lecture
8. **Mai** ACFAS (Quebec, Canada) – Simulations de génération d’impulsions Attosecondes
9. **Juin** Multiphoton Gordon Conference, (New Hampshire, USA) – (Discussion leader) – Molecular Strong Field Processes
10. **Juillet** Free University of Berlin – Honorary Doctorate Lecture – “Attosecond Science”
11. **Juillet** Nizhny Novgorod (Russia) – Effect of Nuclear Motion on High Order Harmonic Generation
12. **Août** IMS – Okazaki (Japan) – Nuclear Motion in Molecular Harmonic Generation
13. **Août** Singapour – Maxwell-Schrodinger Equations – Numerical simulations by Parallel Computing
14. **Sept.** Filamentation 2008 (Paris) – Attosecond Pulse Generation from Maxwell-Schrodinger Simulations by Parallel Computing
15. **Sept.** ICOMP 2008 (Heidelberg) – Effect of Nuclear Motion on MHOHG and Attosecond Pulse Generation
16. **Sept.** University of Berlin – Theory of Femto Second Chemistry
17. **Oct.** DESY (Hamburg – Germany) – Attosecond Compton Effect
18. **Nov.** Kyoto (Japan) – UCLS (2008) – Molecular High Order Harmonic Generation
19. **Nov.** Tokyo (Japan) – COAST Meeting – Maxwell – Schrodinger Simulations at High Intensities

## CONFÉRENCES – INVITATIONS 2007

- 1. Janvier** Quantum Optics Conference – Snow Bird, Utah (USA) – Attosecond Science in Molecular Physics”
- 2. Mars** COAST meeting – Université Laval. “i) Attosecond Science. ii) Imaging Molecular Orbitals. iii) Transition State Theory for Laser Reactions”.
- 3. Avril** Theoretical Chemistry Meeting – Concordia University, Montreal. “Time-Dependent Density Functional Theory for Intense Fields”.
- 4. Avril** Laser Centre, Univ. Nebraska, USA – i) “Attosecond Electron Phenomena in Molecular Physics; ii) Molecules in Intense Laser Fields”.
- 5. Mai** Theoretical Chemistry Symp. Tohoku Univ., Sandai – Japan. “Nonadiabaticity in Intense Laser Fields”
- 6. Mai** Dept of Chemistry, University of Tokyo – Imaging Molecular Orbitals with Ultrashort Intense Laser Pulses.
- 7. Mai** ICONO 2007 – Minsk, Biélorussia – “i) Maxwell Schroedinger Equations for Strong Fields ii) Highorder Harmonic Generation at Nonadiabatic Crossings”, iii) Coherence Effects in Coulombs Explosion of Molecules”
- 8. Juin** DAMOP 2007 – Calgary. “i) Maxwell Schroedinger Equations for Attosecond Science ii) Imaging Molecular Orbitals”.
- 9. Juin** Humboldt Foundation – Berlin, Germany – “Attosecond Science”.
- 10. Juin** Ultrafast Science School – SLAC – Stanford University. “Attosecond Science for Molecules”.
- 11. Juillet** Northern Conference on Multiphoton Processes – Iceland. “Attosecond Interferometry in Molecules”.
- 12. Juillet** Gordon Research Conference – “Time Dependent Density Functinal Theory” – Discussion Leader.
- 13. Juillet** Université de Montréal – Dept. of Chemistry – “Molecules in Intense Laser Fields”.
- 14. Août** Attosecond Workshop – Max Planck Inst. Dresden – “Attosecond Interferometry in Molecules”.
- 15. Sept.** UCLS 2007. Pisa – Italy – “Attosecond Photochemistry and Photophysics”.
- 16. Oct.** Wuerzburg University (Germany) – “Attosecond Molecular Physics”.
- 17. Oct.** Humboldt Lecture – Free University – Berlin – i) Attosecond Molecular Science” ii) “Molecules in Intense Cash Fields” iii) “Gauges in Laser Chemistry”.
- 18. Nov.** Marburg University (Germany) – “Molecules in Intense Laser Fields”.

- 19. Nov.** Max Born Institute (Berlin) – “Attosecond Molecular Physics”.
- 20. Nov.** F. Haber Institute – Berlin (Germany) – “Attosecond Molecular Physics”.
- 21. Nov.** MaxPlanck Institute – Dresden (Germany) – “Attosecond Molecular Physics”.
- 22. Déc.** Heidelberg University (Germany) – Dept. of Theoretical Chemistry – i) “Attosecond Science & Molecular Physics”; ii) Molecules in Intense Laser Fields”.

## ÉVALUATEURS / REFEREES

**Pour/for – André D. Bandrauk**

1. Thomas F. GEORGE  
Chancellor/Professor of Chemistry and Physics  
401 Woods Hall  
University of Missouri-St-Louis  
One University Boul.  
St-Louis, MO 63121, USA  
Tel : (314) 516-5252 Fax : (314) 516-5378  
Email: [tfgeorge@umsl.edu](mailto:tfgeorge@umsl.edu)
  
2. Paul B. CORKUM  
Senior Scientist  
Director – Femtoscience  
Steacie Institute for Molecular Science  
National Research Council of Canada  
100 Sussex Drive  
Ottawa (ON), K1A 0R6  
Tel: (613) 993-7390 Fax: (613) 991-3437  
Email: [paul.corkum@nrc.ca](mailto:paul.corkum@nrc.ca)
  
3. Paul W. BRUMER  
University Professor  
Department of Chemistry  
University of Toronto  
80 St-George St.  
Toronto (ON), M5S 1A1  
Tel: (416) 978-3569 Fax: (416) 978-8775  
Email: [pbrumer@tikva.chem.utoronto.ca](mailto:pbrumer@tikva.chem.utoronto.ca)
  
4. Osman ATABEK  
Directeur de recherche  
Photophysique Moléculaire – CNRS  
Bat. 210 – Campus d'Orsay  
Université Paris-Sud  
91405 – Orsay – Cedex – France  
Tel: 33-1-69-15-61-32  
Fax: 33-1-69-15-67-77  
Email: [osman.atabek@ppm.u-psud.fr](mailto:osman.atabek@ppm.u-psud.fr)
  
6. Alfred MAQUET  
Laboratoire de chimie physique (UMR-CNRS)  
Université Pierre et Marie-Curie  
11, rue Pierre et Marie-Curie  
75231 – Paris - Cedex – 05- France  
Tel: 33-1-44-27-62-77  
Fax: 33-1-44-27-62-26  
Email: [alfred.maquet@u-pmc.fr](mailto:alfred.maquet@u-pmc.fr)

7. Turgay UZER  
School of Physics  
Georgia Institute of Technology  
Atlanta, GA, 30333-0430, USA  
Tel: 404-894-4986  
Email: [turgay.uzer@physics.gatech.edu](mailto:turgay.uzer@physics.gatech.edu)
8. Anthony STARACE  
Dept of Pysics – Astronomy  
University of Nebraska  
116 Brace Laboratory  
Lincoln, NE 68588-111, USA  
Tél : 402-472-2795  
Fax : 402-472-2879  
Email : [astarace1@unl.edu](mailto:astarace1@unl.edu)
9. Albert STOLOW  
Femto Science  
SIMS/National Research Council  
100 Sussex Drive, Rm 2067  
Ottawa, ON, K1A 0R6  
Tél : 613-993-7388  
Fax : 613-991-3437  
Email : [albert.stolow@nrc.ca](mailto:albert.stolow@nrc.ca)
10. Joern MANZ  
Freie Universitaet Berlin  
Fachbereich Biologie, Chemie, Pharmazie  
Physikialische und Theoretische chemie  
Takustrasse 3  
D-14195 – BERLIN-GERMANY  
Tél : 49-30-838-53338  
Fax : 49-30-838-54792  
Email : [jmanz@chemie.fu-berlin.de](mailto:jmanz@chemie.fu-berlin.de)
11. L. FRASINSKI  
Dept of Laser Physics  
Imperial College  
South Kensington Campus  
London, SW7 2AZ, UK  
Email : [l.j.frasinski@imperial.ac.uk](mailto:l.j.frasinski@imperial.ac.uk)
12. Thomas BRABEC  
Dept. Of Physics  
University of Ottawa  
150, Louis Pasteur  
Ottawa, ON, K1N 6N5  
Tél : 613 562-5800, #6756  
Fax. : 613 562-5190  
Email : [brabec@UOttawa.ca](mailto:brabec@UOttawa.ca)