

## CURRICULUM VITAE

**André D. Bandrauk, Ph.D., O.C., FRSC, FAAAS, FAPS, FCIC, FSIAM**, 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 appointed a **CANADA RESEARCH CHAIR** in Computational Chemistry & Molecular Photonics from 2002 to 2016 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 2012 as an **Officer of the Order of Canada** for pioneering work in Attosecond Chemistry. The MUST (Molecular Ultrafast Science Technology) program of ETH-Zurich has invited him to deliver the **FAST (Femto-AttoSecond Science-Technology) Fellow** lectures in 2014. The Wuhan Institute of Physics and Mathematics of the Chinese Academy of Sciences nominates A.D. Bandrauk to the **Wang T.C. Lecture Professorship** in 2017.

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**André D. Bandrauk, Ph.D., O.C., FRSC, FAAAS, FAPS, FCIC, FSIAM**, 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 de 2002 à 2016 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 2012 le gouverneur général nomme Andre D. Bandrauk **Officier de l'Ordre du Canada** pour ses travaux d'avant-garde en chimie Attoseconde. En 2014 il est invité par l'institut de MUST (Molecular Ultrafast Science Technology) de l'École Polytechnique Fédérale – Zurich à présenter les conférences de **FAST (Femto-AttoSecond Science-Technology) Fellow** et en 2017 il est nommé conférencier au **Wang T.C. Lecture Professorship** du Wuhan Institute of Physics and Mathematics de la Chinese Academy of Sciences.

### CITATION

**André D. Bandrauk, Ph.D., O.C., FRSC, FAAAS, FAPS, FCIC, FSIAM.** – 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 is appointed from 2002 to 2016 **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 2012, the Governor General appoints Andre D Bandrauk as **Officer of the Order of Canada** for pioneering work in Attosecond Chemistry.

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### CITATION

**André D. Bandrauk, Ph.D., O.C., FRSC, FAAAS, FAPS, FCIC, FSIAM** – 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 nommé **Chaire de recherche du Canada** de 2002 à 2016 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 2012 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.,O.C.,FRSC,FAAAS,FAPS,FCIC,FSIAM**  
 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,</b>	External Affiliate (P. Brumer)

		<b>University of Toronto</b>	
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	2015	<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	2016	<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)**
- ◇ **2012 Officer of Order of Canada – Officier de l’Ordre du Canada for (pour) “Attosecond Science”**

- ◇ **2014**      **FAST Fellow – ETH Zurich (Suisse)** – Ultrafast Photonics Institute (host – U. Keller)
- ◇ **2016-17**   **Humboldt Foundation Visiting Scientist** – Technical U Munich, Max Born Institute (Berlin)
- ◇ **2017**      **Wang T.C. Lecture Professorship** – Wuhan Institute of Physics and Mathematics Chinese Academy of Sciences

## 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)
- ◇ **Fellow** – Femto-AttoSecond Science & Technology (ETH Zurich)

## 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 Schrodinger 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
26. Attosecond Science – AAAS Annual Meeting – Boston (USA) - 2013
27. Theoretical and Numerical Methods in Laser Filamentation – Centre de Recherches Mathématiques (Montréal) – March 2014 (with E. Lorin, Carleton U.)
28. Frontiers of Intense Laser Science – Kavli Institute of Theoretical Physics – UC Santa Barbara – July-Aug 2014 (with A. Starace, U Nebraska)
29. Co-organizer – Atto 2015 – (Mt St-Sauveur, Que) – July 2015
30. Co-organizer – COFIL 2016 – (Quebec) – Aug 2016
31. Co-organizer – BIRS Workshop - Oxaca (Mexico) – Aug. 2017
32. Co-organizer – CRM (Montréal) – Numerical Methods for Quantum Systems – Dec. 2018

## **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. (2003-2016).
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 UILS2009 – 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).
32. FCT (Portugal) – Foundation for Science & Technology (2012)
33. Centre de Recherche Mathématiques (Montréal) – Comité scientifique (2013)
34. Editorial Board – Springer Series – Atomic, Optical, Plasma Physics – 2013-2018
35. International Committee – ICOMP 2014 0 Shanghai –
36. International Committee - Ultrafast Intense Laser Science – Hawaii 2015
37. International Committee – COFI 2016 – Québec
38. Coordinator KITP UCSB 2014 – Frontiers Intense Laser Science
39. Springer Series AODP – Science Editor (2017-2022)
40. AAAS Scientific Committee – Annual Conference (2015-2020)

## **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. CACPUS – 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, Photonics
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
49. Iran Minister of Education

## 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 ( $t \leq 5fs$ ) intense ( $I \geq 10^{15} W/cm^2$ ) 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).

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**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.

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A.D. Bandrauk, S. Chelkowski, Phys. Rev. Lett. **87**, 273004 (2002).

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K. Harumiya, H. Kono, Y. Fujimura, A.D. Bandrauk, Phys. Rev. **A66**, 043403 (2002);  
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A.D. Bandrauk, H.S. Nguyen, S. Chelkowski, Phys. Rev. **A68**, 041802 (2003); Phys. Rev. Lett. **89**, 283903 (2002).

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

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- 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.

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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.

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

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- 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).
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### Livres / Books

1. A.D. Bandrauk, E. Lorin, J.V. Moloney – Filamentation – Mathematical and Numerical Methods (Springer, N.Y. 2015)
2. A.D. Bandrauk, M.Y. Ivanov – Quantum Dynamic Imaging – (Springer, NY, 2011)
3. K. Yamanouchi, G. Gerber, A.D. Bandrauk – Progress in Ultrafast Intense Laser Science, vol VI (Springer, Tokyo, 2010).
4. A.D. Bandrauk, M. Delfour, C. LeBris – High-Dimensional Partial Differential Equations (American Mathematical Society, NY, 2007), CRM Proceeding & Lecture Notes, vol. 41.

5. A.D. Bandrauk, M.V. Fedorov, E. giacobino, S. Kilim, Physics of Intense and Superintense Laser Fields – ICONO 2007 – SPIE (Jul. 2007)
6. H. Bachor, A.D. Bandrauk, P.B. Corkum, M. Drescher – Ultrafast Phenomena and Physics of Super Intense Laser Fields – ICONO 2005 – SPIE (Bellingham, USA – May 2006).
7. A.D. Bandrauk, M. Delfour, C. LeBris – Quantum Control, Lecture Notes – Centre de Recherches Mathématiques (American Mathematical Society, N.Y.- 2003), vol. 33.
8. A.D. Bandrauk, R.J. Gordon, Y. Fujimura. Laser Control + Manipulation of Molecules, ACS Symposium, **281**, (Washington, N.Y. 2002).
9. J. Laan, Y. Takahashi, A.D. Bandrauk. Structure and Dynamics of Excited States, (Springer Verlag, Berlin, 1998).
10. A.D. Bandrauk. Molecules in Laser Fields. (Marcel Dekker, N.Y., 1994).
11. A.D. Bandrauk, S.C. Wallace. Coherent Phenomena in Atoms & Molecules in Laser Fields. NATO ASI, vol. **287B**, Plenum Press, N.Y., 1990.
12. A.D. Bandrauk. Atomic & Molecular Processes with Short Intense Laser Pulses. NATO ASI, vol. **171B**, Plenum Press, N.Y. 1989.

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### 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).
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<b>J. Lévesque</b>	M.Sc.	2001-2003	Étudiant Ph.D. – INRS – EMT Varennes (QC).
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<b>E. Dehghanian</b>	Ph.D.	2007-2011	Lecturer – Iran – Univ. of Sistan
<b>D. Tchitchekova</b>	Ph.D.	2006-2010	Lecturer – Iran – Univ. of Sistan

<b>T. Bretmann</b>	Ph.D.	2009-2013	(co-direction – FU Berlin)
<b>M. LeRoux</b>	M.Sc.	2013-2016	
<b>W. L. Ho</b>	Ph.D.	2011-2015	(co-direction, Univ. Malaya - Physics)
<b>M. Jensen</b>	M.Sc.	2016-2018	
<b>M. Lytova</b>	Ph.D.	2015-2018	(co-direction Carleton University - Mathematics)



### Summer (coop) Students

<b>J. Deschamps</b>	2015
<b>S. Beaulieu</b>	2012
<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. G��linas</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) – Max- Born Institute (Berlin, Germany)
<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	Associate Prof – Physics – University of Colorado (USA)
<b>S. Talepour</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 Dépôt – 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 Physique – Univ. de Moncton
<b>E. Grandmaison</b>	2005-2007	Professeur Math Dept. – Carleton Univ., Ottawa
<b>G. Yudin</b>	2005-2008	SIMS – NRC (Ottawa) (deceased)
<b>S. Kawaii</b>	2006-2009	JSPS Fellow – Hokkaido - Japan
<b>E. Penka Fowe</b>	2009-2013	(Banque Nationale)
<b>K. Yuan</b>	2009-2013	(R.A. – U de S)
<b>M. Becher</b>	2009-2010	Professeur – Lycée – Nancy (Fr)
<b>X.B. Bian</b>	2009-2013	Univ. Professor - China
<b>C. Lefebvre</b>	2009-2011	Chercheur – INRS-FMT (Que)
<b>E. M. Zaoui</b>	2016-2018	Professeur – École Polytechnique – Rabat (Maroc)
<b>F. Filion</b>	2011-2013	Chercheur – INRS-EMT (Que)
<b>M. Noh</b>	2012-2013	Assistant Professor – Univ. of Malaya
<b>F. Mauger</b>	2013-2016	Research Assistant – LSU (USA)
<b>J.Guo</b>	2016-2018	Ass. Prof – Physics – Jilin University (China)

## CONFÉRENCES – INVITATIONS 2018

- 1. May** Ottawa – NRC-CNRC – Recollision Symposium – Attosecond Science Present and Future.
- 2. May** Fort Lauderdale (USA) – APS-DAMOP - Circularly Polarised Attosecond Science.
- 3. June** University of Geneva – Filamentation 2018 – Circularly Polarized ATI-HHG at High Intensities.
- 4. July** University College London, UCL – Atto-FEL 2018 – Circularly Polarized Attosecond Pulses – Generation and Applications.
- 5. July** Halifax – Quantum Crystallography Conference – Attosecond X-Ray Science.
- 6. August** Boston – ACS Annual Meeting – Circularly Polarized Attosecond Pulses in Chemistry.
- 7. August** Boston – MIT – Department of Chemistry – Attosecond Pulses – Science and Applications.
- 8. October** Berlin – Max Born Institute – Circularly Polarized Attosecond Science.
- 9. November** N.Y. University (USA) – Nonlinear, Physics- Nonlinear Optics at Attosecond Time Scale.
- 10. December** Montréal – CRM – Time Dependent Quantum Mechanics Workshop – Nonlinear Nonperturbative Quantum Optics.

## CONFÉRENCES – INVITATIONS 2017

- 1. April** New Orleans, USA – APS Annual Meeting – Bichromatic Circularly Polarized Pulses – Co- and Counter – Rotating HHG
- 2. May** FU Berlin – Circularly Polarized Attosecond Spectroscopy
- 3. May** Technical University Munich – Circularly Polarized Attosecond Pulses – HHG & Attosecond Magnetism
- 4. May** ETH Zurich – Bichromatic HHS – Circularly Polarized Attosecond Pulses and Molecular Symmetry
- 5. June** Ottawa – Photonics North Conf. – Circularly Polarized Harmonics – New Attosecond Physics
- 6. August** Oaxaca, Mexico – BIRS 2017 Workshop – Time Dependent Quantum Mechanics – Numerical Methods in Strong Field Chemical Physics
- 7. September** Bonn, Germany – Conference Intense Tailored Laser Pulses – Bichromatic Circularly Polarized HHG Generation of Attosecond Pulses and Magnetism
- 8. November**
  - a) Lijang, China – ISUILS 2017 – Discussion Leader – Attosecond Science
  - b) Wuhan Institute of Physics and Mathematics – Advances in Attosecond Science
  - c) Beijing University – Center of Nonlinear Optics & Photonics – Bicircular Bichromatic Harmonic Generation

## CONFÉRENCES – INVITATIONS 2016

- 1. April** Fields Institute – U of Toronto – “Advanced Numerical Methods for Quantum Dynamics”
- 2. May** APS-DAMOP Meeting – Providence, RI-USA – “Circularly Polarized Attosecond Pulses Generation by Bichromatic Circular Laser Pulses”.
- 3. June** Multiphoton Gordon Conference – Amherst-USA “Circularly Polarized Attosecond Pulses Generation and Applications”
- 4. September** COFIL 2016 – Québec “Recollision and Harmonic Generation with Bicircular Pulses in Filamentation”
- 5. October** UILS 15e – Cassis (France) “Intense Circular Pulses – Generation and Applications”
- 6. October** Technical University – Munich “Circularly Polarized Attosecond Pulses – Generation and Applications”
- 7. November** University of Berlin “Circularly Polarized Attosecond Pulses – Generation and Applications”
- 8. November** MaxBorn Institute – Germany “Attosecond Magnetism – Generation and Applications”

## CONFÉRENCES – INVITATIONS 2015

1. **February** International Quantum Chemistry – Brunswick, GA USA – “Attosecond Science”.
2. **March** APS Meeting – San Antonio USA – “Attosecond Magnetic Pulses”.
3. **May** CRM (Montréal, Qc) – “Numerical Methods in Computational Chemistry”.
4. **June** ALLS (St-Sauveur, Qc) – “Momentum Transfer in Laser Fields”.
5. **July** Atto 2015 (St-Sauveur, Qc) – “Circularly Polarized Attosecond Pulses”.
6. **July** Super Intense Laser Science – Heidelberg – MPI (Germany) – Maxwell-Dirac Equations  
– Numerical Methods
7. **August** Univ. Nebraska, USA – Starace Symposium – “Attosecond Science”.
8. **December** Kawai (Hawaii) – “Attosecond Pulses”.
9. **December** Pacifichem 2015 – Hawaii – “Circularly Polarized Attosecond Science”

## CONFÉRENCES – INVITATIONS 2014

- 1. March** CRM (Montreal) – Filamentation en champs intenses
- 2. April** APS April Meeting – Savannah (USA) – Pair Production with Molecules Super Intense Lasers
- 3. April** Université de Sherbrooke – Sciences Femto-Atto-Zepto-Seconde en Temps - FAZST
- 4. May** Université de Genève – Impulsions circulaires et laser intense
- 5. May** ETH Zurich – FAST Fellow Lectures
  - i) Molecules in Intense Laser Fields
  - ii) Circularly Polarized Pulses with Intense Lasers
- 6. June** Multiphoton Gordon Conference Boston USA – Momentum Transfer by Intense Lasers
- 7. June** CIC-CSC Annual Meeting – Montreal – Time Dependent Quantum Mechanics with Intense Lasers
- 8. July** HPSC Annual Meeting – Halifax – Numerical Methods for Time Dependent Quantum Mechanics
- 9. Aug** KITP – UC Santa Barbara – Circular Polarized Attosecond Pulses
- 10. Nov** Ecuador (Univ. Quito) – Photonique moléculaire à haute intensité



## CONFÉRENCES – INVITATIONS 2013

- 1. Feb.** Boston (USA) AAA Annual Meeting – Attosecond Science
- 2. Feb.** Varennes, Que – INRS – EMT (Que) – Attosecond Science – Present & Future
- 3. April** U Ottawa – Molecular Harmonic Generation
- 4. May** U Laval – SL Chin Symposium – Molecular Harmonic Generation
- 5. May** Munich (DE) CLEO 2013 – Attosecond Magnetic Fields
- 6. May** Quebec - CIC – CSC annual meeting - Plenary Lecture – Attosecond Science & Molecular Photonics
- 7. June** Quebec – APS DAMOP – Attosecond Science
- 8. July** Paris (Fr) – Atto 2013 – Circularly Polarized Attosecond Pulses
- 9. July** Prague (Cz) – Laser Phys 2013 – Circularly Polarized Attosecond Pulses
- 10. Sept** Rostock (DE) – Many Body Conf – Triatomics in Intense Laser Fields
- 11. Oct** Salamanca (Spain) – UILS XII – Circular Polarized Harmonics

## CONFÉRENCES – INVITATIONS 2012

- 1. Jan.** Banff Int. Res. Station – “Numerical Solutions of Maxwell-Schrodinger-Dirac PDE’s”
- 2. Fev.** Vancouver – AAAS Annual Meeting – “Ultrafast Few Cycle Laser Pulses in Imaging and Control of Molecules”
- 3. March** Boston (USA) – APS Meeting – “Time Dependent Electron Localisation Functions in Intense Laser Fields”
- 4. April** Atlanta (USA) – APS Meeting – “Numerical Solutions of Laser Induced Nuclear Fusion”
- 5. May** Berlin (Germany) – J. Manz Symposium – “Attosecond Electron Fluxes in Chemistry”
- 6. May** Munich – Max Planck Institute “Circularly Polarized Attosecond Science”
- 7. May** Calgary – CIC-CSC Meeting – “FAZST – Femto – Atto – Zepto Second Science & Technology”
- 8. June** L A (USA) – DAMOP – APS Meeting – i) “Attosecond Monitoring of Electron Motion”;  
ii) “Time Dependent Dirac Equation in Strong Fields”
- 9. June** Montreal – Photonics North – “Monitoring Attosecond Electron Motion”
- 10. June** Montreal (McGill) – Cross-Border Workshop – “Attosecond Electron Motion in Coherent Electron Wave Packets”
- 11. July** Banff Int. Res. Station – Molecular Harmonic Generation
- 12. July** Univ. Laval – Laser Colloquium – “Circularly Polarized Harmonics”
- 13. July** Calgary – Laser Physics 2012 – i. “Attosecond Electron – Nuclear Motion in Molecules”  
ii. “Relativistic Effects in Strong Fields”
- 14. Oct** Tucson (USA) – Filamentation Workshop – “Circularly Polarized Pulse Effects in Filamentation”
- 15. Oct** Jeju (Korea) – ISUILS (2012) – “Circularly Polarized Attosecond Science”
- 16. Nov** Humboldt Foundation – Toronto – “Attosecond Science”
- 17. Dec** Montreal – Société Mathématique du Canada – “Imagerie Quantique”

## ÉVALUATEURS / REFEREES

**Pour/for – André D. Bandrauk**

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