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CV (short version)

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Upon the wings of a butterfly,

Chaos and Order will forever lie.

—- *Québec / Freiburg, 2022* —-

I. Curriculum Vitae

Born : yes

Place of birth : Québec, Canada

Nationality : Canadian

I.A *University Degrees*

Period	Degree	University	Subject
1970-1973	**B.Sc.**	**Université Laval** May 1973 (Québec, Canada)	Physics
1973-1974	**M.S.**	**Yale University** May 1974 (Connecticut, USA)	Theoretical Atomic Physics
1974-1978	**Ph.D.**	**Yale Univerity** May 1978 (Connecticut, USA)	Theoretical Atomic Physics [1]
1979-1986	**Dr.rer.nat.habil.** [2]	**Universität Freiburg** May 1986 (Freiburg, Germany)	Theoretical Physics

1 : Title of thesis : *Theory of Electron Molecule Interactions : Case Studies* under the supervision of Prof. Arvid Herzenberg

2 : Exceptionally, the German doctorate (Dr.rer.nat.) was awarded together with the Habilitation (habil.), an academic degree beyond the Ph.D. that certifies excellence in teaching **and** research.

I.B *Scientific Career*

Period	Position	University
May 1974 - Feb. 1978	**Research Assistant**	**Yale University** Department of Applied Science
March 1978 - Aug. 1979	**Research Associate**	**Oxford University** Theoretical Chemistry Department **Atomic Energy Establishment Harwell** Theoretical Physics Division
Sept. 1979 - Sept. 1983	**Wissenschaflicher Angestellter**	**Universität Freiburg** Fakultät für Physik
Oct. 1983 - May 1986	**Hochschulassistent**	**Universität Freiburg** Fakultät für Physik

I.B *Scientific Career* (cont'd)

Period	Position	University
March 1986 - April 1986	**Professeur Associé**	**Université de Bordeaux I** Laboratoire des Collisions Atomiques
June 1986 - May 1990	**Professeur Agrégé**	**Université Laval** Département de Physique
Oct. 1992 - Sept. 1993	**Professeur des Universités** *(titulaire, 2ème classe)*	**Université de Bordeaux I** Unité de Formation et de Recherche (UFR) de Physique
Sept. 2001 - Aug. 2002	**Professeur Associé** *(full time)*	**Université Pierre et Marie Curie** Unité de Formation et de Recherche (UFR) de Physique
Sept. 2002 - Oct. 2008	**Professeur des Universités** *(titulaire, 1ère classe)*	**Université Pierre et Marie Curie** Unité de Formation et de Recherche (UFR) de Physique
Sept. 2009 - Mai 2011 Sept. 2014 - Dec. 2014	**Directeur des programmes de 2ième-3ième cycles**	**Université Laval** **Faculté des sciences et de génie** Département de Physique, de Génie Physique, et d'Optique
Juin 1990 - Août 2017	**Professeur titulaire*** **/ Full Professor**	**Université Laval** Département de Physique, de Génie Physique, et d'Optique
Sept. 2017 - April 2021	**Affiliated Professor**	**Université Laval** Département de Physique, de Génie Physique, et d'Optique

The **periods** in **blue** correspond to **permanent** appointments.

* **Research Years** (U. Laval) : Sept. 1992 – Aug. 1993 ; Sept. 1999 – Aug. 2000 ; Sept. 2008 – Aug. 2009 ; Sept. 2015 – Aug. 2016 ;

Leave of Absence (U. Laval) : Sept. 2001 – Aug. 2003 ;

Active (!) Retirement since Sept. 2017

II. Research Interests (***past*** and **present**)

1975-1981 Theory of electron-molecule collisions

(shape and Feschbach resonances, vibrational and rotational excitation, e-polar molecules scattering)

1980-2001 Theory of ion-atom collisions

(perturbation series (Born and CDW), capture, excitation and ionisation, transport in solids)

1997-now Complex Dynamical Systems

(chaos characterisation and control, non-linear time series analysis, dynamical reconstruction, synchronization, dimensional reduction)

2001-2006 Optical Orientation Dynamics in Nematic Liquid Crystals

2001-now Physics at the Service of Health

(studies of dynamical diseases : Parkinson tremors, epilepsy, cardiac arrhythmia ; contact network epidemiology : propagation of infectious diseases, containment and intervention scenarios)

2006-2015 Optical Cavity-based Photonics

(chaos in optical systems, ray-wave dualism, micro-lasers and -sensors, e-m wave propagation and optimization in complex medium)

2015-2021 Laser Plasma Physics

(e-m wave propagation of femtosecond high-intensity laser pulses, laser induced periodic structures, laser plasma formation in dielectrics)

2008-now Theory of Complex Networks

(propagation dynamics on networks, adaptive networks, co-evolution of networks and dynamical processes, percolation on networks, network growth, communities detection, network synchronization)

More details of our present *Research Activities* and *Publications* can be found on the Web page of our research group Dynamica : **www.dynamica.phy.ulaval.ca**

III. Representative Teaching

undergraduate courses :

Physique mathématique / Mathematical Physics

Physique statistique / Statistical Physics

Dynamique nonlinéaire, chaos, et complexité / Nonlinear Dynamics, Chaos, and Complexity

Physique nunérique / Computational Physics

graduate courses :

Séminaire de dynamique moderne / Modern Dynamics Seminar

Physique statistique avancée / Advanced Statistical Physics

Introduction à l'optique quantique / Introduction to Quantum Optics

Processus stochastiques en sciences de la Nature / Stochastic Processes in the Natural Sciences

Théorie des systèmes complexes / Theory of Complex Systems

IV. Academic and Scientific Leadership / Activities

Leadership

1995-97 Chairman, Division of Atomic and Molecular Physics (DAMP) of Canadian Association of Physicists (CAP)

1997-2002 Scientific Director, Technologies *DYNAMICOS* Inc.

1997-2018 Founder and Director, Research Group **Dynamica**

2009-11, 2014 Director of Graduate Programs in Physics, Université Laval

2016-19 Co-Director, Thematic Project 1 of **Sentinel North** Strategy (Canada First Research Excellence Fund and Fonds de recherche du Québec) : *Complex Systems : Structure, Function and Interrelationships in the North* [3]

2016-19 Co-Principal Investigator : Sub-Project 1.2 of **Sentinel North** Strategy : *The resilience of complex networks : Identifying critical indicators for efficient targeted interventions* [3]

2016-19 Co-Investigator : Sub-Project 1.1 of **Sentinel North** Strategy : *Network analysis of umbrella and indicator species : Assessing the integrity of northern ecosystems* [3]

2017– Founding Membre : **Centre Interdisciplinaire de Modélisation Mathématique de l'Université Laval** (CIMMUL), research axis *Dynamics of Complex Systems and Complex Networks*

Activities

Research Director (1984-2020) **45**

32 M.Sc., 13 Ph.D.

Thesis Examiner (1986-2015) **33**

12 M.Sc., 21 Ph.D.

Refereed Publications (1975-2021) **103**

Book Editor (1995) **1**

Patent (1997) **1**

Conference/Workshop Contributions (1975-2020) **143**

33 Oral Presentations, 92 Posters, 18 Articles

Conference/Workshop Participations (1975-2019) **87**

Invited Talks (1978-2019) **98**

Research Periods at Foreign International Institutes (1981-2016) **18**

Argentina (1), Belgium (1), France (6), Germany (9), Spain (1)

3 : The titles of the research axes are those of the original proposals.