

# ROBERT BOILY

C.Q., Ph.D., FRSC, MSX, FInstP, FAPS, FIET, FAAAS, SMIEEE  
Honorary Lieutenant Colonel of the Canadian Armed Forces

*Knight of the National Order of Quebec*  
*Knight of the Order of Academic Palms (France)*  
*Knight of the Order of the Pleiade (France)*  
*Fellow of the Royal Society of Canada - Academy of Science*  
*Member of the Sigma Xi Society (USA)*  
*Fellow of the Institute of Physics (UK)*  
*Fellow of the American Physical Society (USA)*  
*Fellow of the Institution of Engineering and Technology (UK)*  
*Fellow of the American Association for the Advancement of Science (USA)*

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## I. CONTACT INFORMATION

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## II. EDUCATION

### Natural Sciences / Engineering

1980-1987 Optics, Optoelectronics, Micro-Imaging, Eastman Kodak, Rochester, NY, USA  
1980-1983 Physics, Electronics, University of Montreal  
1976-1978 Physics, Electronics, Teccart Institute, Montreal

### Social Sciences

1994-2002 Ph.D. Degree, Psychology of Learning, University of Montreal  
1994-2001 Master of Arts Degree, Psychology of Learning, University of Montreal  
1990-1994 Bachelor Degree in Education, University of Quebec in Montreal (UQAM)

## III. WORK EXPERIENCE

Since 1996 (23 years) Infores Inc.  
President & Founder  
Senior Researcher - Senior Science Advisor

1989-1996 (7 years) Quebec Industrial Research Centre  
Senior Researcher

1980-1989 (10 years) Kodak Canada  
Micro-Imaging Specialist

**IV. SPECIAL APPOINTMENTS & ACTIVITIES**

- 2014 Member of the Government of Canada's Innovation Selection Committee (military technologies, telecom, medical technologies, environment)
- 2013-Present Official advisor to the KILLAM Science Prizes and Research Fellowships, Canada's most prestigious science awards
- 2013 Science Expert with the International Organization of French-Speaking Nations (France)
- 2010-Present Scientific Reviewer, Journal of Medical Imaging and Radiation Sciences
- 2008-2016 Guest Speaker, Engineering & Technology School, Montreal, Canada
- 2009-2012 Member, Nominating Committee, Industrial Science & Technology, American Association for the Advancement of Science (AAAS), Washington, D.C., USA
- 2007-2010 Member of the Dean's Cabinet, Faculty of Education Sciences, University of Montreal
- 2004-2007 Vice President, Multifaculty Committee on Research Ethics, University of Montreal
- 2004 Member, Professor Selection Committee, Engineering & Technology School (ETS)
- 2002 Vice President, Board of Directors, Quorum-CTN (National Research Council of Canada)

**V. HONORS - AWARDS - MEMBERSHIPS**

- 2019 Knight of the National Order of Quebec, Government of Quebec
- 2018 Elected Fellow, American Physical Society (USA)
- 2018 Honorary Lieutenant Colonel of the Canadian Armed Forces, Government of Canada
- 2017 Elected Fellow, Institute of Physics (UK)
- 2017 Elected Fellow, Royal Society of Canada - Academy of Science
- 2017 Outstanding Scientific Reviewer, Journal of Medical Imaging and Radiation Sciences
- 2017 Elected Senior Member, Institute of Electrical and Electronics Engineers - IEEE (USA)
- 2016 Elected Fellow, Institution of Engineering and Technology (UK)
- 2016 Member, Canadian Association of Physicists
- 2014 Knight of the Order of Academic Palms, Government of France (Paris, France)
- 2013 Member of the Order of Francophones of America, Government of Quebec
- 2013 Medal of the National Assembly of Quebec
- 2012 Queen Elizabeth II Diamond Jubilee Medal, Governor General of Canada
- 2008 Knight of the Order of the Pleiade, Parliamentary Association of Francophonie (Paris, France)
- 2008 John P. McGovern Award, Sigma Xi Society (USA)
- 2006 Life Member, Royal Canadian Institute for Science (Toronto, Canada)
- 2005 Elected Fellow, World Academy of Art and Science (San Francisco, USA)
- 2005 Elected Fellow, American Association for the Advancement of Science (Washington, D.C., USA)
- 2005 Elected Member, Sigma Xi Society (USA)
- 2005 Knowledge Award, National Research Council of Canada / Canadian Technology Network
- 2004 Meritorious Service Award, Armed Forces Electronics Association (Washington, D.C., USA)
- 2003 Knowledge Award, National Research Council of Canada / Canadian Technology Network
- 2003 Innovation Award, National Research Council of Canada / Canadian Technology Network
- 2002 Knowledge Award, National Research Council of Canada / Canadian Technology Network
- 2000 Dunamis Prize, for Distinguished Service Rendered to Science and Technology (Canada)
- 2000 RCT Medal, National Research Council of Canada / Canadian Technology Network

**VI. EXAMPLES OF SCIENCE PROJECTS CONDUCTED IN THE PAST 20 YEARS**

119. Tunable Broadband Supercontinuum Laser Generator <i>National Institute of Scientific Research - INRS</i>	In Progress
118. Compressed Optical-Streaking Ultra High-Speed Image Capture <i>National Institute of Scientific Research - INRS</i>	In Progress
117. Frequency-Resolved Optical Switching Metrology <i>National Institute of Scientific Research - INRS</i>	In Progress
116. Infrared Spectrometer for Measuring Ultrashort Laser Pulses <i>National Institute of Scientific Research - INRS</i>	In Progress
115. Laser-Driven Proton Beam for High-Energy Testing of Materials <i>National Institute of Scientific Research - INRS</i>	2019
114. Ultrasonic Exfoliation of Few-Atom-Thick Phosphorene Nanosheets <i>National Institute of Scientific Research - INRS</i>	2019
113. Multi-Channel Fiber Optic Temperature / Humidity Sensor System <i>National Institute of Scientific Research - INRS</i>	2018
112. Laser-Accelerated Proton Induced X-Ray Emission <i>National Institute of Scientific Research - INRS</i>	2018
111. Tunable Source of Remote Optical Emission from Ultraviolet to Terahertz <i>National Institute of Scientific Research - INRS</i>	2018
110. Large-Scale Multilayer Reduced Graphene Oxide Coatings on Metals <i>National Institute of Scientific Research - INRS</i>	2018
109. Nanothermometers Made of Core/Shell Quantum Dots <i>National Institute of Scientific Research - INRS</i>	2017
108. Active Mode-Locking Laser for Quantum Generation of Photon Pairs <i>National Institute of Scientific Research - INRS</i>	2017
107. High-Capacitance Electrode Based on a 3D Architecture <i>National Institute of Scientific Research - INRS</i>	2016
106. Terahertz Detection Using Stokes-Mueller Polarimetry <i>National Institute of Scientific Research - INRS</i>	2016
105. Testing of Aircraft Jet Engines in Transient and Steady-State Modes <i>Quebec Industrial Research Centre</i>	2016
104. Active Phase Stabilization in Fiber Optic Interferometers <i>National Institute of Scientific Research - INRS</i>	2016
103. Pulsed Laser with a Nonlinear Resonant Element in a Loop Mirror <i>National Institute of Scientific Research - INRS</i>	2016
102. Supercontinuum, High Power, Tunable to Mid-Infrared Visible Laser Light Source <i>National Institute of Scientific Research - INRS</i>	2016
101. Active Terahertz Two-Wire Waveguides <i>National Institute of Scientific Research - INRS</i>	2015

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100. Photonic Applications in the Aerospace Industry  
*Canadian Photonics Industry Consortium* 2015
99. Fully-Coherent Terahertz Detection System  
*National Institute of Scientific Research - INRS* 2015
98. Current State of Clean Energy Research, Development and Demonstration in North America  
*Environment Canada* 2015
97. Controlled Release Aluminium Sulfate for Reducing Phosphate in Wastewaters  
*Centre of Chemical Process Studies* 2014
96. Absorption Spectrometry of Poly-2-Acryloxybenzoic Acid  
*Centre of Chemical Process Studies* 2014
95. Electronic Simulation of Unpredictable Energy Sources (Photovoltaic, Wind Power)  
*Industry* 2013
94. Solar Cell Combining Semiconductor P/N Junction and Multiferroic Oxides  
*National Institute of Scientific Research - INRS* 2013
93. Terahertz Detection Using Spectral Domain Interferometry  
*National Institute of Scientific Research - INRS* 2012
92. Fourier-Plane Optical Parametric Amplification of Femtosecond Laser Pulses  
*National Institute of Scientific Research - INRS* 2012
91. Astrophysics and Atmospheric Research in Suborbital Flights  
*Canadian Space Agency* 2012
90. Detection and Characterization of Bacteria and Viruses Using an Evanescent Optical Waveguide  
*National Institute of Scientific Research - INRS* 2012
89. Rare Earth Elements: Praseodymium, Dysprosium, Yttrium, Scandium and Neodymium  
*Industry* 2011
88. Technologies for Producing White Light Using Light-Emitting Diodes  
*Hydro-Quebec* 2011
87. Use of Gallium Compounds in Opto-Electronic Applications  
*Industry* 2011
86. Surface Active Biological Agent Based on "Bacillus Subtilis" Bacteria  
*National Centre of Electrochemistry and Environmental Technologies* 2011
85. Solid-State Lighting for Military Vehicles, Submarines and Navy Ships  
*National Defence Research Laboratory* 2011
84. Robot Guided by Magnetic Resonance Imaging for Biopsy and Internal Radiotherapy  
*University of Sherbrooke* 2011
83. Production of Ultra-High Purity (99,999%) Aluminium Oxide  
*Industry* 2010
82. Computerized Surveillance of Antibiotic Therapy in Hospitals  
*University of Sherbrooke* 2010
81. Deposition of Nanocrystalline Materials on Electrodes for Energy-Efficient Industrial Electrolysis  
*National Institute of Scientific Research - INRS* 2010

80. Artificial Blood Vessels Made of Polymer and Human Tissues for Coronary Bypass Surgery  
*National Research Council of Canada* 2010
79. Cross-Chirp Interferometry for Non-Contact Spatial Localization and Measurement  
*National Institute of Scientific Research - INRS* 2010
78. Characteristics, Manufacturing Methods and Industrial Applications of Graphene  
*Industry* 2010
77. Research and Development in Superalloys for Next-Generation Aircrafts  
*Industry* 2009
76. Controlled Release Technologies in Chemical Process Applications  
*Centre of Chemical Process Studies* 2009
75. Continuous Frequency Modulated Signals for Remote Monitoring  
*Industry* 2009
74. Photovoltaic Panels Made of Conductive Nanoparticle Ink  
*Industry* 2009
73. Nitride and Hard Chrome Metal Surface Treatments  
*Industry* 2008
72. Quantum Dot Metallic Nanoparticles  
*Industry* 2008
71. Non-Volatile Electronic Memory Based on Nanolevers (MEMS)  
*Industry* 2008
70. Cooling of Electronic Microchips with Bismuth Nanocoatings  
*Industry* 2008
69. Large Scale Manufacturing of 10-Nanometer Nanospheres  
*National Research Council of Canada* 2007
68. Plate Cooling and Heat Exchange of Moving Liquids  
*Hydro-Quebec* 2007
67. Gasification Processes for Ethanol and Other Biofuels  
*Industry* 2007
66. Low Phase Noise Lasers  
*Industry* 2006
65. Micro-Electro-Mechanical Systems (MEMS) in Silicon Substrates  
*Industry* 2006
64. Ultra-Pure Alumina for Manufacturing Titanium-Sapphire Lasers  
*Industry* 2006
63. Feeding of Alumina in Electrolytic Cells during Aluminium Production  
*Industry* 2006
62. Step-Stare Image Gathering for High Speed Sensing and Targeting  
*National Defence Research Laboratory* 2006
61. Infrared Signature Enhancement of Fighter Jet Engines  
*National Defence Research Laboratory* 2006

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60. Reduction of Heavy Metals and Hazardous Materials in Electronic Products  
*Quebec Industrial Research Centre* 2006
59. Electrokinetic Dewatering and Decontamination of Industrial Sludge  
*Industry* 2006
58. 3D Laser System for Real-Time Vision on 360 Degrees  
*National Defence Research Laboratory* 2006
57. Organic Light Emitting Polymers  
*Industry* 2005
56. Electro-Oxidation of Organic Pollutants in Wastewaters  
*Centre of Chemical Process Studies* 2005
55. Measuring Gamma Radiation with Optically Stimulated Luminescence  
*National Defence Research Laboratory* 2005
54. Radiochromic Dosimeters for Detecting Alpha and Beta Particle Radiation  
*National Defence Research Laboratory* 2005
53. Metal Foams for Heat Exchange and Advanced Cooling  
*Industry* 2005
52. Recycling of Plastics that Contain Brominated Flame Retardants  
*Quebec Industrial Research Centre* 2005
51. Scientific Research onboard the International Space Station  
*Canadian Space Agency* 2004
50. Ceramic Coatings using Thermal and Plasma Spray  
*Industry* 2004
49. Underwater Laser Gated Camera for Exploration and Rescue Missions  
*National Defence Research Laboratory* 2004
48. Superabsorbent Biopolymers  
*Industry* 2004
47. High Performance Laser Power & Energy Meters  
*Industry* 2004
46. Electro-Coagulation of Pollutants in Wastewaters  
*Centre of Chemical Process Studies* 2004
45. Ultra-High Resolution Topographic Displays Systems  
*National Defence Research Laboratory* 2003
44. Digital X-Ray Systems  
*Industry* 2003
43. Coalescent Oil-Water Separation System for Offshore Drilling Platforms  
*Industry* 2003
42. Medical Research aboard the International Space Station  
*Canadian Space Agency* 2003
41. Amino Acids, Peptides and Drug Intermediates  
*Industry* 2003

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40. Laser-Fluorescence Technology for Breast Cancer Tumour Detection  
*Industry* 2003
39. Manufacturing Complex Aircraft Parts with Thermal Spray Forming  
*Industry* 2002
38. Antithrombotics for the Treatment of Cardiovascular Diseases  
*Biotechnology Research Institute - National Research Council of Canada* 2002
37. New Enzymes for Industrial Biocatalysis (Green Chemistry)  
*Biotechnology Research Institute - National Research Council of Canada* 2002
36. High Speed X-Ray Generator for Real-Time Cardiac Imaging  
*Industry* 2002
35. Advanced Optoelectronic Devices  
*Industry* 2002
34. Electro-Biosensors for Biological and Chemical Agents Detection  
*Industry* 2001
33. Laser-Ultrasound Inspection System for Detecting Flaws in Aircraft Structures  
*Industry* 2001
32. Printed Circuit Board Inspection Technology for Ball Grid Arrays Microchips  
*Quebec Industrial Research Centre* 2001
31. Organic and Inorganic Waste Combustion using Plasma Arc  
*Industry* 2001
30. Molecular Imaging Technology for Biological Research In Vivo  
*Industry* 2001
29. Dual Inertial Integrated Navigation System  
*National Defence Research Laboratory* 2001
28. Laser Imaging of Brain Activity  
*Industry* 2001
27. Recovery of Hydrocarbons in Fresh Water and Sea Water  
*Industry* 2001
26. Acoustic Vibrations Technology for Environmental Stress Screening  
*Quebec Industrial Research Centre* 2000
25. Thermal Barrier Coatings for Turbine Blades in Aircraft Jet Engines  
*Industry* 2000
24. Lithium-Polymer Batteries for Electric Cars  
*Industry* 2000
23. Discriminative Human Presence Sensing for Robots  
*Industry* 2000
22. Surface Modification Technologies for Polymer Materials  
*Industry* 2000
21. Vaccinium Bioflavonoids, Derivatives and Antioxidants  
*BioAtlantech* 2000

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20. Research and Development in Photovoltaic Energy  
*Natural Resources Canada* 1999
19. Pharmaceutical Drug Delivery Systems  
*Industry* 1999
18. High-Performance Light Emitting Diodes  
*Quebec Industrial Research Centre* 1999
17. Photovoltaic Energy Systems  
*Natural Resources Canada* 1999
16. In-Flight Calibration of Fiber-Optic Inertial Measurement Units  
*National Research Council of Canada* 1999
15. Production of Electric Power from Biomass Combustion  
*Industry* 1999
14. Biologically Active Clarification of Wastewaters  
*Industry* 1999
13. Energy Use in the Production of Fine Chemicals  
*Quebec Industrial Research Centre* 1998
12. Sequential Biological Reactors for the Treatment of Wastewaters  
*Quebec Industrial Research Centre* 1998
11. Integrated Decision Support Systems for Aircrafts  
*National Research Council of Canada* 1998
10. Seawater Desalination Technology to Produce Drinking Water  
*National research Council of Canada* 1998
9. Integrated Circuit Inspection Technology  
*National Research Council of Canada* 1998
8. 3D Digitizing of Limbs and Joints  
*Industry* 1997
7. Telehealth for Delivering Medical Data to Remote Regions  
*Industry* 1997
6. Research & Development on Intelligent Fabrics  
*Industry* 1997
5. Medical Spectroscopy  
*Industry* 1997
4. Satellite Tracking of Terrestrial Objects  
*Industry* 1997
3. Digital Signal Processing  
*Industry* 1997
2. PLC Automation of Industrial Chemical Processes  
*Quebec Industrial Research Centre* 1996
1. Biofungicide Made of Gliotoxin  
*Quebec Industrial Research Centre* 1996