

Pawel Hawrylak

Areas of interest:

Theoretical Condensed Matter Physics, Low-dimensional and Nanostructured Materials, Nanophotonics, Nanoelectronics, Nanospintronics, Graphene and 2D crystals, Computational Nanoscience, Strongly Correlated Electrons, Quantum Information.

Google Scholar profile:

http://scholar.google.co.uk/citations?hl=en&user=KUED2dsAAAAJ&view_op=list_works&cstart=0&pagesize=20

Selected publications:

1. T. Scrace, Y. Tsai, B. Barman, L. Schweidenback, A. Petrou, G. Kioseoglou, I. Ozfidan, M. Korkusinski, and P. Hawrylak, "Magnetoluminescence and Valley Polarized State of Two-dimensional Electron Gas in WS₂ Monolayers", *Nature Nanotech* **10**, 603 (2015) .
2. Marek Korkusinski and Pawel Hawrylak, "Quantum strain sensor with a topological insulator HgTe quantum dot", *Nature Scientific Reports* **4**, 4903(2014).
3. Trojnar, M. Korkusinski, E. Kadantsev, P. Hawrylak, "Theory of fine structure of exciton in semiconductor quantum dots in a magnetic field", *Phys.Rev.* **B 84**, 245314 (2011).
4. Yun-Pil Shim, Anand Sharma, Chang-Yu Hsieh, Pawel Hawrylak, "Artificial Haldane gap material on a semiconductor chip", *Solid State Comm.* **150**, 2065(2010).
5. A.D. Guclu, P. Potasz, O. Voznyy, M. Korkusinski, P. Hawrylak, "Magnetism and correlations in fractionally filled degenerate shells of graphene quantum dots", *Phys.Rev.Letters*, **103**, 246805 (2009).
6. F. Qu and P. Hawrylak, "Theory of electron mediated Mn-Mn interactions in quantum dots", *Phys.Rev.Lett.***96**,157201(2006).
7. Pawel Hawrylak and Marek Korkusinski, "Voltage-controlled coded qubit based on electron spin", *Solid State Commun.* **136**, 508 (2005).
8. P. Hawrylak, "Hidden symmetry and correlated states of electrons and holes in quantum dots", *Solid State Com.***127**, 753 (2003).
9. P. Hawrylak "Excitonic artificial atoms: engineering optical properties of quantum dots" *Phys. Rev.* **B60**, 5597 (1999).
10. P. Hawrylak and M. Potemski, "Theory of photoluminescence from an interacting two-dimensional electron gas in strong magnetic fields", *Phys. Rev.* **B56**, 12386 (1997).
11. P. Hawrylak, "Single Electron Capacitance Spectroscopy of Artificial Atoms: Theory and Experiment", *Phys. Rev. Lett.* **71**, 3347 (1993).
12. P. Hawrylak, "From Exciton to Fermi Edge Singularity in Optical Properties of a Quasi Two-dimensional Electron Gas", *Phys. Rev.* **B44**, 3821(1991).
13. P. Hawrylak , "Effective Mass and Lifetime of Electrons in Layered Electron Gas", *Phys. Rev. Lett.* **59**, 485 (1987).
14. P. Hawrylak, "Surface Plasmons in Intercalated Graphite", *Solid State Com.* **63**, 241 (1987).

Education:

Ph.D. - University of Kentucky, Lexington, Ky, USA, 1984.

M.Sc (with Honours) - Wroclaw University of Technology, Wroclaw, Poland, 1979.

Professional Experience:

2014-present: Professor of Physics and University Research Chair in Quantum Theory of Materials, Nanostructures and Devices, University of Ottawa, Ottawa, Canada

2013- visiting professor, World Premiere Institute for Advanced Materials Brain Gain program, Tohoku University, Sendai, Japan (Oct-Nov 2013).

2012-2014: Group Leader, Quantum Theory Group, Security and Disruptive Technologies (SDT), Emerging Technologies Division, National Research Council of Canada (NRC), Ottawa. (plan, lead, and evaluate activities of 4 permanent staff scientists, 2-4 research associates/pdfs and 2-5 students).

2001-2012: Group Leader, Quantum Theory Group, Institute for Microstructural Sciences (IMS), National Research Council of Canada (NRC), Ottawa. (plan, lead, and evaluate activities of 4 permanent staff scientists, 2-4 research associates/pdfs and 2-5 students).

2001-2014, Principal Research Officer, Institute for Microstructural Sciences, NRC.

2001-2005, Quantum Information Project coordinator at IMS (plan, coordinate, and evaluate activities of ~20 experimentalists and theorists).

1998-2014, Adjunct Professor, University of Ottawa, Canada.

1998-2001, Nano-optics Project coordinator at IMS (plan, coordinate, and evaluate activities of ~12 experimentalists and theorists).

1994- 2001, Senior Research Officer, Institute for Microstructural Sciences.

1992- 1996, Adjunct Professor, Brown University, Providence, R.I., USA.

1988 – 1997, Adjunct Professor, University of Colorado at Colorado Springs, USA.

1987-1994, Research Officer, Institute for Microstructural Sciences, NRC.

1986-1987, Assistant Professor-Research, Brown University, Providence, R.I., Visiting Professor, Boston College, Newton, MA, USA.

1984-1986, Research Associate in Physics, Brown University, Providence, R.I., USA.

Awards, Honors:

2014 –Gold Medal with Diamonds, Senate, Wroclaw University of Technology.

2014- Doctor Honoris Causa, Materials Science, University of Crete.

2013- Queen Elizabeth Diamond Jubilee Medal for contribution to Canadian science.

2012-2013 Senior Fellow, Canadian Institute for Advanced Research Nanoelectronics Programme.

2011- IMS NRC Outstanding Research Achievement Team Award for the organic photovoltaics project.

2010- Honorary Professor, Wroclaw University of Technology, Wroclaw, Poland.

2007- IMS NRC Outstanding Research Achievement Award for the optical detection of fractional charge.

2006- Fellow of the Royal Society of Canada: The Academies of Arts, Humanities and Science of Canada.

2006-2012 Fellow, Canadian Institute for Advanced Research Nanoelectronics Programme.

2005- “Professor Titular of Physical Sciences” by the President of Poland.

2003- NRC Outstanding Research Achievement Award for the development of "single spin transistor".

2002- Canadian Association of Physicists Brockhouse Medal for outstanding contribution to Condensed Matter Physics (for Quantum Dots).

1999- Humboldt Research Prize, Humboldt Foundation, Germany.

1996- Fellow of the American Physical Society for contribution to theory of optical properties of low dimensional systems.

Appointments/Committees/Boards:

2013- Editor-member of Editorial Board, Solid State Communications, Elsevier.

2013- Co-Chair, International Workshop “Nanostructured graphene”, Antwerp, May 2013.

2012- appointed to the European Research Council Starting Grant evaluation panel in “Condensed Matter Physics”.

2011- Member, Rutherford Medal selection committee, Royal Society of Canada.

2011-Co-Chair, International Conference on Fundamental Optical Processes in Semiconductors – 2011, Lake Junaluska, North Carolina, USA, August 2011.

2011- Co-Director, Canadian Institute for Advanced Research 2011 Winter School on New Developments in Quantum Materials, Nanostructures and Information Processing, Whistler, BC, April 2011.

2010- Co-Director, Canada-France Symposium “Controlling spin at the nanoscale”, Ottawa, Canada, October 2010.

2009 – Co-Director, Canada-Poland-Japan Symposium on Nanoscience, Wroclaw, Poland, October 2009.

2009-2014 Co-PI Extreme Photonics CREATE program, University of Ottawa.

2008-2011 Vice-Chair, International Union of Pure and Applied Physics (IUPAP) Commission on Semiconductors (C8).

2005-2011 Secretary and Vice-Chair, Selection Committee, Young Scientist Prize in Semiconductor Physics, International Union of Pure and Applied Physics (IUPAP) Commission on Semiconductors (C8).

2008 - Co-Director, workshop on "Computational approaches to semiconductor, carbon and magnetic nanostructures", Centre Europeen de Calcul Atomique et Moleculaire (CECAM), Lyon, June 2008.

2007 – Co-Editor, with R. Laflamme, special issue of Physics in Canada on Quantum Information.

2007 - Co-Chair, International Workshop on Optical Properties of Low Dimensional Systems: Controlling Spins and Photons at the Nanoscale (OPLDS2007), Ottawa, Canada, May 2007.

2006 – 2008, Member, IUPAP Nanoscience Working Group.

2005-2013 appointed Associate Editor, Solid State Communications, Elsevier.

2005 – Co-Director, Polish-Canadian workshop on Nanospintronics, Warsaw-Wroclaw, October 2005.

2005-Co-Director, Canadian Institute for Advanced Research workshop “Controlling electrons, excitons and photons at the nanoscale”, Banff, Canada, March 2005.

2005- 2008 Secretary, International Union of Pure and Applied Physics (IUPAP) Commission on Semiconductors (C8).

2005- 2008 member, NSERC Grant Selection Committee, Condensed Matter, GSC28.

2004- appointed Secretary of Canadian IUPAP National Liaison Committee.

2004- Chair of the 3rd International Conference "Quantum Dots 2004", Banff, Alberta, Canada, May 2004.

2004 - Co-Director, workshop on "Modeling of self-assembled nanostructures", Centre Europeen de Calcul Atomique et Moleculaire (CECAM), Lyon, June 2004.

2003 – Guest Editor, with S. Das Sarma, Special Issue of Solid State Communications, "Advances in studies of electrons in low dimensional systems".

2002 – 2011, Associate Member, International Union of Pure and Applied Physics (IUPAP) Commission on Low Temperature Physics (C5).

2002-2005 Member, International Union of Pure and Applied Physics (IUPAP) Commission on Semiconductors (C8).

2002- 2008 Associate Editor, Condensed Matter, Canadian Journal of Physics.

2000- appointed to Canadian Institute for Advanced Research (CIAR) as Associate of Nanoelectronics Programme.

2000- appointed Member of Advisory Editorial Board - Materials Science Poland.

1999- Chair of the 13th International Conference on Electronic Properties of Two-Dimensional Electronic Systems (EP2DS), Ottawa, Canada, July 1999.

1996- appointed to Advisory Editorial Board - Physica E: Low dimensional systems.

1994- Chair of the Program Committee for the International Conference on Superlattices, Microstructures, and Microdevices (ICSMM), Banff, Canada, August 1994.

1993- Co-chair, Workshop on Quantum Dots, IMS-NRC, Ottawa, June 1993.

1991– recipient of Max Planck Fellowship.

Visiting Scientist: Technische Physik, Wuerzburg Universitat, Germany; High Magnetic Field Laboratory, Grenoble, France; Wroclaw University of Technology, Poland; Max Planck Institute for Solid State Physics, Stuttgart, Germany; Instituto de Fisica Gleb Wataghin, Campinas, Brazil.

International Committees/Functions:

1. Member of the International Advisory Committee for the 14th International Conference on Optics of Excitons in Confined Systems, OECS14, Jerusalem, Israel, October 2015.
2. Member of the International Advisory Committee for the International School on Physics of Semiconductor Compounds, Jaszowiec, Poland, 2015.
3. Member of the International Advisory Committee for the joint International Conference on Electronic Properties of Two-Dimensional Electronic Systems, EP2DS-22, and Modulated Semiconductor Structures, MSS, Sendai, Japan, July 2015.
4. Member of the International Advisory Committee for the 8th International Conference "Quantum Dots 2014", Pisa, Italy, May 2014.
5. Member of the International Advisory Committee for the International Conference on High Magnetic Fields in the Physics of Semiconductors, Panama City, FL, USA, July 2014.
6. Member of the International Advisory Committee for the 26th International Conference on Low Temperature Physics, LT26, Buenos Aires, Argentina, August 2014.
7. Member of the International Advisory Committee for the 13th International Conference on Optics of Excitons in Confined Systems, OECS13, Rome, Italy, September 2013.
8. Member of the International Advisory Committee for the International School on Physics of Semiconductor Compounds, Jaszowiec, Poland, 2013.
9. Member of the International Advisory Committee for the International Workshop "Dubna Nano2012", Bogoliubov Institute for Theoretical Physics, Dubna, Russia, July 2012.
10. Member of the International Advisory Committee for the 7th International Conference "Quantum Dots 2012", Santa Fe, USA, May 2012.
11. Member of the International Advisory Committee for the International School on Physics of Semiconductor Compounds, Jaszowiec, Krynica Zdroj, Poland, 2012.

12. Member of the International Advisory Committee for the International Conference on High Magnetic Fields in the Physics of Semiconductors, Chamonix, France, July 2012.
13. Member of the International Advisory Committee for the International School on Physics of Semiconductor Compounds, Jaszowiec, Krynica Zdroj, Poland, 2011.
14. Member of the International Advisory Committee for the 6th International Conference and School on Spintronics and Quantum Information Technologies, SPINTECH, Japan, August 2011.
15. Member of the International Advisory Committee for the 25^h International Conference on Low Temperature Physics, LT26, Beijing, China, August 2011.
16. Member of the International Advisory Committee for the 12^h International Conference on Optics of Excitons in Confined Systems, OECS11, Paris, France, September 2011.
17. Member of the International Advisory Committee for the 7th International Conference on Low Dimensional Structures and Devices (LDS), Telchac, Mexico, May 2011.
18. Member of the International Advisory Committee for the International Conference on Electronic Properties of Two-Dimensional Electronic Systems, EP2DS-20, Tallahassee, USA, July 2011.
19. Member of the International Advisory Committee for the International School on Physics of Semiconductor Compounds, Jaszowiec, Krynica Zdroj, Poland, 2010.
20. Member of the International Advisory Committee for the 6th International Conference "Quantum Dots 2010", Nottingham, UK, April 2010.
21. Member of the International Advisory Committee for the International Workshop "Dubna Nano2010", Bogoliubov Institute for Theoretical Physics, Dubna, Russia, July 2010.
22. Member of the International Program Committee for the International Conference on Electronic Properties of Two-Dimensional Electronic Systems, EP2DS-19, Kobe, Japan, July 2009.
23. Member of the International Advisory Committee for the International School on Physics of Semiconductor Compounds, Jaszowiec, Krynica Zdroj, Poland, 2009.
24. Member of the International Advisory Committee for the 5th International Conference and School on Spintronics and Quantum Information Technologies, SPINTECH, Krakow, Poland, July 2009

25. Member of the International Advisory Committee for the International Workshop "Dubna Nano2008", Bogoliubov Institute for Theoretical Physics, Dubna, Russia, July 2008.
26. Member of the International Advisory Committee for the International School on Physics of Semiconductor Compounds, Jaszowiec, Poland, 2008.
27. Member of IUPAP Nanoscience Working Group organizing committee for IUPAP Workshop on Ultra cold nano-matter, Toronto, Canada, February 2008.
28. Member of the International Advisory Committee for the 25^h International Conference on Low Temperature Physics, LT25, Leiden, Holland, 2008.
29. Member of the International Advisory Committee for the 5th International Conference "Quantum Dots 2008", Korea, May 2008.
30. Member of the International Advisory Committee for the International Conference on Electronic Properties of Two-Dimensional Electronic Systems, EP2DS-17, Genoa, Italy, July 2007.
31. Member of the International Advisory Committee for the International School on Physics of Semiconductor Compounds, Jaszowiec, Poland, 2007.
32. Member of the International Advisory Committee for the 4th International Conference "Quantum Dots 2006", Chamonix, France, May 2006.
33. Member of the International Advisory Committee for the International School on Physics of Semiconductor Compounds, Jaszowiec, Poland, 2006.
34. Member of the International Advisory Committee for the International Conference on Electronic Properties of Two-Dimensional Electronic Systems, EP2DS-16, Albuquerque, USA, 2005.
35. Member of the International Program Committee for the International Conference on Quantum Electronics 2005, Tokyo, Japan, July 2005.
36. Member of the International Advisory Committee for the International School on Physics of Semiconductor Compounds, Jaszowiec, Poland, 2005.
37. Member of the Program Committee for the 11th International Conference on Modulated Semiconductor Structures, MSS-11, Nara, Japan, 2003.
38. Member of the Program Committee for the International Conference "Quantum Dots 2002", Tokyo, Japan, 2002.

39. Member of the International Advisory Committee for the International Conference on High Magnetic Fields in Semiconductors, Oxford, UK, 2002.
40. Member of the International Program Committee for the International Conference on Electronic Properties of Two-Dimensional Electronic Systems, Prague, 2001.
41. Member of the Program Committee for the International Conference "Quantum Dots 2000", Munich, August 2000.
42. Member of the Program Committee for the Workshop on Infrared Emitters and Detectors, Ottawa, July 1997.
43. Member of the International Program Committee for the International Conference on Modulated Semiconductor Structures (MSS), Santa Barbara, CA, July 1997.
44. Member of the International Program Committee for the International Conference on Superlattices, Microstructures, and Microdevices (ICSMM), Liege, Belgium, July 1996.
45. Member of the International Program Committee for the International Conference on Hot Electrons in Semiconductors, Chicago, USA, July 1995.
46. Member of the Program Committee for the European Canadian Mesoscopic Initiative (ECAMI) Workshop, Glasgow, August, 1995.
47. Member of the International Advisory Committee for the International Conference on Electronic Properties of Two-Dimensional Electronic Systems, Nottingham, UK, August 1995.
48. Member of the International Advisory Committee for the International Conference on Electronic Properties of Two-dimensional Electronic Systems (EP2DS), Newport, R. I., USA, July 1993.

Invited lectures at International Conferences

1. "Elementary Electronic Excitations at the Surface of a Semiconductor Superlattice and their Coupling to External Probes", ICTP Trieste, Italy, 1986 (given by G.F. Giuliani)
2. "Elementary Excitations in Two-dimensional Electron Gas Arrays", Many Body Theories, Argonne National Lab, USA, 1986 (given by J.J. Quinn)
3. "Nonlinear Response of Virtual Excitations in Semiconductor Superlattices"
4. NATO Advanced Research Workshop, Mt. Tremblant, Quebec, Canada, 1989.

5. "Excitonic Effects in Optical Spectra of Modulation Doped Quantum Wells", NATO Advanced Research Workshop London, Ontario, Canada 1991.
6. "Acceptor Related Photoluminescence as a Probe of Many Electron States in
7. Semiconductor Nanostructures", NATO Advanced Research Workshop, Napa Valley, California, USA, 1992.
8. "Reduced Carrier-Lattice Energy Transfer Rates in GaAs Quantum Wells in the Presence of Cold Plasmas: a Direct Measurement via Phonon Population Dynamics", NATO Advanced Research Workshop, St. Felipe de Gioux, Spain, 1992.
9. "Spectroscopy of Correlated Electrons in Quantum Dots", American Physical Society March Meeting, Pittsburgh, USA, 1994.
10. "Many Body Effects in Low-dimensional Semiconductor Structures", International School of Semiconductor Compounds, Jaszowiec, Poland, 1994.
11. "Interacting Electrons in Quantum Dots in Magnetic Fields", Technion Advanced Research Workshop, Israel, 1994.
12. "Electronic and Optical Properties of Self-assembled Quantum Dots", 9th International Winterschool on New Developments in Solid State Physics, Mauterndorf, Austria, 1996.
13. "Quantum Single Electron Transistor", 32nd International Winter School in Theoretical Physics, Karpacz, Poland, 1996.
14. "Optical Properties of a Two-dimensional Electron Gas", International Workshop on New Theoretical Developments in Two-dimensional Electron Gas, Scuola Normala Superiora, Pisa, 1996.
15. "Optical Spectroscopies of Correlated Electrons in Quantum Dots", Adriatico Research Conference on "Electron Liquid in Systems of Reduced Dimension", ICTP, Trieste, Italy, 1996.
16. "Optical probes of elementary excitations in quantum dots", 8th Brazilian Workshop on Semiconductor Physics, Aquas de Lindoia, Brazil, 1997.
17. "Optical properties of Etched and Self-Assembled Quantum Dots in a Magnetic Field", 191 Meeting of Electrochemical Society, Montreal, Canada, 1997.
18. "Electronic properties of self-assembled quantum dots", Annual Congress, Canadian Association of Physicists, Calgary, Canada, 1997.

19. "Electronic correlations in semiconductor quantum dots", International Conference on Strongly Coupled Coulomb Systems, Boston, USA 1997.
20. "Quantum Phenomena in a Single Electron Transistor", 34th International Winter School in Theoretical Physics, Karpacz, Poland, 1998.
21. "Optical Properties of Quantum Dots", International Workshop on Novel Physics in Semiconductor Nanostructures, INFM, Scuola Normala Superiore, Pisa, Italy 1998.
22. "Double quantum well physics in single p-SiGe quantum wells", International Workshop on "Double quantum wells", Torino, 1998, Italy.
23. "Optical properties of charged quantum dots", PHASDOM Meeting, Neuchatel, Switzerland, 1998.
24. "Spin and Correlations in quantum dots", Recontres de Moriond, Les Arcs, France, January 1999.
25. "Correlated electrons and excitons in quantum dots", French-Polish workshop on "Excitons in confined systems", Warsaw, Poland, February 1999.
26. "Optical properties of quantum dots", keynote speaker, NATO Advanced Research Workshop, Jaszowiec, Poland, June 1999.
27. "Quantum dots for Quantum Information Processing", Workshop on quantum dots for quantum computing, Naval Research Laboratory, Washington, DC, USA, Sept. 1999.
28. "Spin structure of artificial atoms", Workshop on "Magneto-electronic materials", CAPEM, Buffalo, USA, Sept. 1999.
29. "Quantum dots", Plenary speaker, XV SIMPOSIO LATINO AMERICANO FISICA DE ESTADO SOLIDO, Cartagena de los Indias, Colombia, Nov. 1999.
30. "Excitonic artificial atoms in quantum dots", 11th International Winterschool on New Developments in Solid State Physics, Mauterndorf, Austria, February 2000.
31. "Quantum dots in intense laser fields: excitonic artificial atoms", International Conference on Atoms, Molecules, and Quantum Dots in Intense Laser Fields, Pisa, Italy, June 2000.
32. "Probing many-electron states by absorption/emission in semiconductor nanostructures", NATO Advanced Research Workshop on "Optical properties of semiconductor nanostructures", Wuerzburg, June 2000.
33. "Excitonic artificial atoms", CERION Workshop, Wuerzburg, July 2000.

34. "Hidden symmetries, decoherence free spaces, and excitonic artificial atoms", 3rd Caribbean Workshop on Quantum Mechanics, Particles, and Fields, Havana, Cuba, Dec. 2000.
35. "Optical properties of quantum dots", plenary talk, Rutherford Advanced Research Workshop on Nanostructures, Queenstown, New Zealand, Feb.2001.
36. "Electrons and excitons in quantum dots", opening invited talk, International Workshop on Trions, Berlin, Germany, April 2001.
37. "Optical properties of self-assembled quantum dots", Pan-American Advanced Study Institute, Costa Rica, June 2001.
38. "Spin and electronic correlations in quantum dots", NATO Advanced Research Workshop on Theory of Phenomena in High Magnetic Fields, Les Houches, France, March 2002.
39. "Magneto-optics of inhomogeneous electron gas", key speaker, NATO Advanced Research Workshop, St. Petersburg, Russia, June 2002.
40. "Quantum Dots", Brockhouse plenary lecture, Canadian Association of Physicists Congress, Quebec City, June 2002.
41. "Spin of electronic droplets in quantum dots", Rashba Symposium on Frontiers in Spintronics, Cambridge, MA, USA, June 2002.
42. "Excitonic artificial atoms for single photon sources", 5'th International Conference on Excitonic Processes in Condensed Matter, Darwin, Australia, July 2002.
43. "Manipulating charge and spin of single electrons and polarisation of single photons in quantum dots", ONR Workshop on Multifunctional Materials, Pucon, Chile, October 2002.
44. "Emission from highly excited self-assembled quantum dots in strong magnetic fields", Workshop on Quantum Optics in Semiconductors, Bremen, Germany, June 2003.
45. "Nanotechnology in semiconductors: controlling electrons, excitons, and photons on nanoscale", plenary lecture, 13th Nanotechnology, Information, Devices Workshop, Athens, Greece, February 2004.
46. "Optical properties of coupled quantum dots", Workshop on Quantum Optics in Semiconductors, Rugen, Germany, April 2004.

47. "Correlated states of electrons and holes in quasi-2D systems in strong magnetic fields", International Workshop on Optical Properties of Low-dimensional Systems, Warsaw, Poland, June 2004.
48. "Single spin devices", Workshop on Cooperative Phenomena in Optics and Transport in Nanostructures, Max Planck Institute for Complex Systems, Dresden, Germany, June 2004.
49. "Toward microscopic theory of self-assembled quantum dots", Workshop on Modeling of Self-assembled quantum dots, CECAM, Lyon, France, June 2004.
50. "Microscopic theory of self-assembled quantum dots", International Symposium on "Quantum Hall Systems and Quantum Materials", Hamburg, Germany, Sept. 2004.
51. "Multifunctionality of self-assembled quantum dots on patterned substrates", ONR Workshop on Multifunctional Materials ||, Huatulco, Mexico, Oct.2004
52. "Pairing of spin excitons in quantum dots", Advanced Heterostructures Workshop, Hapuna, Hawaii, Dec. 2004.
53. "Designing solid state quantum systems for quantum information processing", International Workshop on Quantum Optics, Obergugl-Innsbruck, Austria, Feb.2005.
54. "Quantum dots, quantum computing, and attosecond pulses", Attosecond Science Workshop, ITAMP, Harvard University, USA, May 2005.
55. "Optical processes in two-dimensional electron gas in the fractional quantum Hall regime", W.I.Heraeus Seminar, Bad Honef Physik Centrum, Germany, June 2005.
56. "Fractionally Charged Quasiparticles in Confined 2D Electron Systems", Tutorial Session, 34th International School on the physics of Semiconductor Compounds, Jaszowiec, Poland, June 2005.
57. "Pairing of spin excitons in lateral quantum dots", International Workshop on Correlations in quantum systems: quantum dots, quantum gases and nuclei, Palma de Mallorca, Spain, Sept.2005.
58. "Nanospintronics with quantum dots", Polish-Canadian Workshop on Nanospintronics, Wroclaw, Poland, Oct.2005
59. "Artificial atoms and molecules as elements of nano-spintronic circuit", California NanoScience Institute and Canadian Institute for Advanced Research workshop "Seeing the end of the NanoRoadMap", Santa Barbara, CA, USA, Nov.2005

60. "Nanospintronics with quantum dots", International Workshop on Spin and Mesoscopic Physics, National Center for Theoretical Science, NCTU, Hsinchu, Taiwan, January 2006.
61. "Controlling magnetism in semiconductor quantum dots with magnetic ions", ONR International Workshop in Multifunctional Materials, Bariloche, Argentina, March 2006.
62. "Nanospintronics with quantum dots", Spintronics Program, Kavli Institute for Theoretical Physics, UCSB, Santa Barbara, CA March 2006.
63. "Quantum information –future of Microelectronics?" International Workshop on Future of Microelectronics, Crete, Greece, June 2006.
64. "Nanoscale semiconductor structures", International Workshop "Perspectives in Nanoscience and Nanotechnology", San Sebastian, Basque Country, Spain, September 2006.
65. "Quantum dots-laboratory for correlated electron systems", 43rd Karpacz International School of Theoretical Physics, Ladek Zdroj, Poland, Feb.2007.
66. "Nanoscience with single electrons, spins and photons", plenary talk, I Krajowa Konferencja Nanotechnologii, Wroclaw, Poland, April 2007.
67. "Quantum information –future of Microelectronics?", 14th Semiconducting and Insulating Materials Conference, Fayetteville, AR, USA, May 2007.
68. "Simulating complex oxides on a chip", European Workshop on MultiFunctional Materials, Haholmen , Norway, June 2007.
69. "Theory of semiconductor nanostructures in high magnetic fields", International School: "Magnetic Fields for Science", Cargese, France, Sept.2007.
70. "Optical control of magnetism in semi-magnetic quantum dots", International Workshop on Spin and Opto-electronics, Berlin, Germany, Sept.2007.
71. "Quantum dot molecules-laboratory for correlated electron systems", International Symposium on Atomtronics, Orenas, Sweden, Nov. 2007.
72. "Electric field tuning of exciton-biexciton cascade in a single quantum dot for entangled photon pair generation", MRS Symposium, Boston, MA,USA, Nov.2007.

73. "From spin excitations to quantum computation with semiconductor quantum dots", Symposium on Magnetic Excitations in Semiconductors, SUNY Buffalo, NY, USA March 2008.
74. "Fractionally charged excitations in optical emission spectroscopy", American Physical Society March Meeting, New Orleans, March 2008.
75. "Quantum dots – from biology to quantum computation", Dubna Nano2008, Russia, July 2008.
76. "Electric field manipulation of multi-exciton complexes for entangled photon pair generation", Workshop on complex nanostructures, MPI Dresden, Germany, July 2008.
77. "Multi-exciton complexes in InAs quantum dots", 28th International Conference on the Physics of Semiconductors, Rio de Janeiro, Brazil, July 2008.
78. "Spin in optical properties of semiconductor and graphene quantum dots in a magnetic field", International Workshop on Semiconductor and Carbon - Based Nanostructures in Magnetic Fields, Grenoble, France, Nov.2008.
79. "Optical control of magnetism in semi-magnetic quantum dots", 13th Advanced Heterostructure and Nanostructure Workshop, Hapuna Beach, Hawaii, Dec 2008.
80. "Theory of multi-million atom multifunctional nanostructures", Multifunctional Materials Workshop, Copper Canyon, Mexico, January 2009.
81. "Quantum circuits based on electron spin", 14th Brazilian Workshop on Semiconductor Physics, Curitiba, Brazil, March 2009.
82. "Carbononics: electronic, magnetic and optical properties of graphene nanostructures", Canadian Institute for Advanced Research Workshop, Whistler, May 2009.
83. "Semiconductor quantum dots for quantum information processing", TheoryCanada, Fredericton, NB, Canada, June 2009.
84. "Building semiconductor nanostructures with atoms", Tutorial lecture, MRS Fall meeting, Boston, MA, USA, Nov.2009.
85. "Nanospintronics with semiconductor and graphene quantum dots", XV Simposio en Ciencia de Materiales, CENTRO DE NANOCIENCIAS Y NANOTECNOLOGÍA UAM, Ensenada, Mexico, Feb.2010.

86. "Spintronics with semiconductor and graphene quantum dots", 16th International Winterschool on New Developments in Solid State Physics: Low Dimensional Systems, "Mauterndorf 2010", Mauterndorf, Austria, Feb.2010.
87. "Quantum dots: from biology to quantum computing", CIFAR-IoP CAS Workshop, Beijing, China, March 2010.
88. "Coded qubits based on electron spin in semiconductor and graphene quantum dots", International Workshop on Quantum information processing with spins and superconductors, IQC, Waterloo, Canada, May 2010.
89. "Semiconductor and graphene quantum dots for quantum information processing", 2010 CMOS Emerging Technologies Workshop, Whistler, BC, Canada, May 2010.
90. "Optical Detection of Spin Polarization in Quantum Dots, "International Workshop on "Ferromagnet-Semiconductor Hybrids", Bochum, June 2010.
91. "QNANO: computational platform for electronic and optical properties of nanostructures", CECAM Workshop on Advances in Empirical Electronic Structure Methods for Nanostructures , Manchester, UK, June 2010.
92. "Electronic correlations in graphene quantum dots", International School in Theoretical Physics: Correlation and Coherence at multiple scales, Ustron, Poland, Sept.2010.
93. "Nanospintronics with quantum dots", Nanomagnetism and spintronics, A colloquium at the 23rd Centre Jacques Cartier Meeting, Grenoble, France, Nov. 2010.
94. "Optical properties of graphene quantum dots", Workshop on Innovative Devices and Structures (WINDS2010), Hapuna, Hawaii, December 2010.
95. "Electronic, magnetic and optical properties of graphene nanostructures", Miniworkshop on Mesoscopic and Spin Physics 2011, National Center for Theoretical Science, Hsinchu, Taiwan, January 2011.
96. "Optical Properties of 2D and 0D Correlated Electron Systems", International Symposium on Nanoscale Transport and Technology 2011, NTT BRL, Atsugi, Japan, January 2011.
97. "Optical properties of graphene quantum dots", keynote speaker, Polish-German workshop on optical properties of semiconductor nanostructures, Wroclaw, Poland, February 2011.

98. "QNANO: computational platform for electronic properties of semiconductor and graphene nanostructures", International Conference Computational and Mathematical Methods in Science and Engineering, Benidorm, Spain, June 2011.
99. "Strongly coupled Coulomb systems in graphene quantum dots", 16th International Conference on Strongly Coupled Quantum Systems, Budapest, Hungary, July 2011.
100. "Hidden symmetry in optical properties of quantum dots", International Conference on Fundamental Optical Processes in Semiconductors – 2011, Lake Junaluska, North Carolina, USA, August 2011.
101. "Graphene based integrated electronic, photonic and spintronic circuit", Future Trends in Microelectronics (FTM-2012) Workshop, Corsica, France, June 2012.
102. "Semiconductor and graphene quantum dots", International Conference Dubna2012, Bogoliubov Laboratory for Theoretical Physics, Dubna, Russia, July 2012.
103. "Atomistic theory of highly excited nanocrystals and quantum dot molecules", International Workshop: Ordered and Non-Ordered Superstructures of Nanosized Objects: Preparation, Properties, Applications, and Modeling, Max Planck Institute for Complex Systems, Dresden, Germany, July 2012.
104. "Electronic and Optical Properties of Semiconductor and Graphene Quantum Dots in High Magnetic Fields", plenary lecture, 20th International Conference on High Magnetic Fields in Semiconductor Physics, Chamonix Mont Blanc, France, July 2012.
105. "Graphene based integrated electronic, photonic and spintronic circuit", Workshop on Innovative Devices and Structures (WINDS2012), Hapuna, Hawaii, December 2012.
106. "Condensed Matter Physics at the nanoscale - challenges and opportunities", University of Ottawa Christmas Symposium, Ottawa, Dec 2012.
107. "Graphene based integrated electronic, photonic and spintronic circuit", SPIE Conference on Defense, Security and Sensing, Baltimore, April 2013.
108. "Topology, e-e interactions and spin blockade in semiconductor and graphene quantum dots", Workshop on "Recent Progress in Nonequilibrium Quantum Many-Body Theory", Buffalo, May 2013.
109. "Computational approaches to electronic properties of million atom semiconductor and graphene nanostructures", International Conference

- “Computational and Mathematical Methods in Science and Engineering”, Almeria, Spain, June 2013.
110. “Semiconductor and graphene quantum dots”, plenary lecture, EP2DS-MSS 2013, Wroclaw, Poland, July 2013.
 111. “Graphene nanostructures”, Plenary lecture, International Conference on Nano to Giga Challenges 2014, Tempe, AR, USA, March 2014.
 112. “Photonics with Graphene Quantum Dots”, CMOS Symposium on Emerging Technologies, MINATEC, Grenoble, France (July 2014).
 113. “Carbonics, e-e correlations and topology”, International Conference on Theoretical Physics: Coherence and Correlations at different length scales, Ustron, Poland (Sept 2014).
 114. “Quantum strain sensor with a HgTe topological insulator quantum dot”, WINDS2014, Hapuna, HI, USA (Dec 2014).
 115. “Spintronics and valleytronics with 2D materials”, Spintronics60, Cancun, Mexico (Aug 2015)
 116. “Multifunctional graphene quantum dots, Workshop on Nanoscale Assemblies of Semiconductor Nanocrystals, Metal Nanoparticles and Single Molecules: Theory, Experiment and Application, Max Planck Institute for Complex Systems, Dresden, Germany, August 2015.
 117. “Semiconductor and Graphene Quantum Dots for Quantum Information Processing”, Physical Science Symposium, Boston, USA (Sept 2015).

Invited lectures at Institutes/Universities

Canada

1. University de Montreal, Montreal, Canada (1994);
2. Simon Fraser University, Canada (1992);
3. University of Alberta, Edmonton, Canada (1996);
4. University of Ottawa, Ottawa, Canada (1992);
5. University of Ottawa, Ottawa, Canada (Sept 2009);
6. University de Sherbrooke, Sherbrooke, Canada (March 1998);
7. IEE EDS, Carleton University, Ottawa, Canada (2008);
8. CMP University of British Columbia, Canada (April 2011);
9. CMP McGill University, Montreal, Canada (Sept 2011).
10. CMP Queen’s University (October 2011);

USA

11. ATT Bell Laboratories, USA(1994);
12. IBM T. J. Watson Research Center, USA(1989);
13. Brown University, Providence, USA(1994);
14. Boston College, Boston, USA(1986);
15. Indiana University, Bloomington, IN, USA(1986);
16. University of Colorado, Colorado Springs, CO, USA(1989);
17. Colorado State University, Fort Collins, CO, USA(1987);
18. State University of New York at Buffalo, USA(1993);
19. University of Tennessee, Knoxville, USA(1989);
20. University of Rochester, Rochester, USA(1996);
21. University of California, Santa Barbara, USA (2003);
22. Stanford University, Palo Alto,USA (May 2008);
23. Hewlett-Packard Labs, Palo Alto, USA (May2008);
24. Pennsylvania State University, College Station, PA (April 2008);
25. UCalfornia at Berkeley, Berkeley, CA (Nov2011);
26. Michigan State University, E. Lansing,MI (Nov2012);
27. University of Michigan, Ann Arbor, MI (Nov2012);
28. Columbia University, New York, NY (April 2013);
29. City University of New York College of Technology,NY(April 2013);
30. CMP Seminar, Notre Dame University, South Bend, IN (April 2014);

UK

31. Oxford University, Oxford, UK(Nov1992);
32. Oxford University, Oxford, UK(1997);
33. Imperial College, London, UK(Nov1992);
34. Exeter University, Exeter, UK(1996);
35. University of Sheffield, Sheffield, UK(1999);
36. Nottingham University, Nottingham, UK(1998);
37. Cavendish Laboratory, Cambridge University, UK(1999);

Germany/Austria

38. Max-Planck Institute, Stuttgart, Germany(1991);
39. Max-Planck Institute, Stuttgart, Germany(2000);
40. Ludwig-Maximilian University, Munich, Germany(2000);
41. Max-Planck Institute for Complex Systems, Dresden, Germany(1999);
42. RWTH Aachen, Germany(1998);
43. Wurzburg University, Germany(1999);
44. Wuppertal University, Wuppertal, Germany(1999);
45. Universitat Regensburg, Regensburg, Germany(2000);
46. Universitat Regensburg, Regensburg, Germany2006);
47. Universitat Erlangen, Nurnberg, Germany(2000);
48. Universitat Hamburg, ITP, Hamburg, Germany (2003);
49. Universitat Hamburg, ITP, Hamburg, Germany (2007);
50. Universitat Karlsruhe,ITP, Karlsruhe, Germany (2007);
51. Ludwig-Maximilian University, Munich, Germany(2008);
52. Walter Schottky Institute, Munich, Germany(2008);
53. Universitat Hamburg, ITP, Hamburg, Germany (2013);

54. Johannes Keppler University, Linz, (May 2013);
55. Technical University of Berlin, Berlin, Germany (July 2014).

France

56. Saclay, Paris, France(1997);
57. High Magnetic Field Laboratory-Grenoble, France(1997);
58. CNRS-Bagneux, Bagneux Paris, France(2000);

Belgium

59. University of Antwerp, Antwerp, Belgium (2001);

Spain

60. Autonoma Universidad de Madrid, Madrid, Spain (2002);
61. CSIC, Madrid, Spain (2006);
62. Catalan Institute for Nanotechnology, Barcelona, Spain (Oct2012)
63. Autonoma Universidad de Madrid, Madrid, Spain (Oct2012);
64. University Jaime I, Castellon, Spain(Oct2012);

Brazil

65. University of Campinas, Campinas, Brazil (1997);
66. University of Brasilia, Brasilia, Brazil (March 2012);

Poland

67. Institute of Theoretical Physics, Warsaw University, Warsaw, Poland (1997);
68. Institute of Physics, Wroclaw University of Technology, Wroclaw, Poland (1999);
69. Institute of Physics, Wroclaw University of Technology, Wroclaw, Poland (2003);
70. Institute of Theoretical Physics, Warsaw University, Warsaw, Poland (2003);
71. Institute of Physics, Wroclaw University of Technology, Wroclaw, Poland (2005);
72. Institute of Physics, Wroclaw University of Technology, Wroclaw, Poland (2006);
73. Institute of Theoretical and Physical Chemistry, WUT, Wroclaw, Poland (2008);
74. Institute of Physics, Wroclaw University of Technology, Wroclaw, Poland 2009);

Japan

75. NTT BRL Atsugi, Japan (Nov.2004);
76. NTT BRL Atsugi, Japan (Jan.2006);
77. Tohoku University, Sendai, Japan (October 2008);
78. WPI on Advanced Materials, Tohoku U, Sendai (Nov 2013).
79. University of Tokyo, (Nov2013)

Physics Colloquia

- 1) University of Missouri, Columbia, USA (Nov 1994);
- 2) Walter Schottky Colloquium, WSI, Munich, Germany(May 1997);
- 3) University of British Columbia, Vancouver, Canada (Feb 1999);
- 4) University of Georgia, Athens, USA (March 1999);
- 5) University of Miami, Miami, USA (Nov 1999);
- 6) Wurzburg University, Germany (May 2000);
- 7) ETH, Zurich, Switzerland (June 2000);
- 8) MacMaster University, Hamilton, Canada (May 2000);
- 9) University of Alberta, Edmonton, Canada (Nov 2001);
- 10) University of Waterloo, Waterloo, Canada (Sept 2002);
- 11) Vienna University of Technology, Vienna, Austria (Dec 2002);
- 12) Pontifica University de Santiago de Chile, Chile (Nov 2002);

- 13) University of Southern California, Los Angeles, USA (Jan 2003);
- 14) University of Central Florida, Orlando, USA (March 2004);
- 15) Clarkson University, Potsdam, NY (Nov 2004);
- 16) Ohio University, Athens, OH, USA (May 2004);
- 17) University of Toronto, Toronto, Canada (Oct 2004);
- 18) University of Wisconsin-Madison (May 2005);
- 19) NIST, Gaithersburg, USA (May 2005);
- 20) Dalhousie University, Canada (Sept 2006);
- 21) NEST-Scuola Normala Superiore, Pisa, Italy (May 2006);
- 22) Nicolas Copernicus University, Torun, Poland (Oct 2006);
- 23) LPA Ecole Normal Superior, Paris, France (March 2007);
- 24) National Nanotechnology Laboratory, Lecce, Italy (July 2007);
- 25) Institute Neel, Grenoble, France (June 2008);
- 26) Institute for Nano Quantum Electronics, University of Tokyo, (Oct. 2008);
- 27) University at Buffalo, Buffalo, USA, (Sept. 2009);
- 28) Penn State University, State College, PA, USA (Sept. 2009).
- 29) 170th Zhong Guan Cun Forum on Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing, China, (Oct. 2009).
- 30) 101th Huang Kun Forum, Institute of Semiconductors, Chinese Academy of Sciences, Beijing, China (Oct. 2009).
- 31) Fudan University, Shanghai, China (Oct. 2009).
- 32) University of Vermont, Burlington, VT, USA. (Nov 2010).
- 33) University of Georgia, Athens, GA, USA (March 2011).
- 34) HMFL Florida State University, Tallahassee, FL, USA (March 2011).
- 35) Paul Drude Institute, Berlin, Germany (July 2011).
- 36) University of Campinas, UNICAMP, Campinas SP, Brazil (March 2012).
- 37) University Federal de RJ, Rio de Janeiro, Brazil (March 2012).
- 38) Institute for Quantum Information Science, University of Calgary (Sept 2012).
- 39) Department of Physics, University of Alberta, Edmonton, Alberta (Sept 2012).
- 40) Department of Physics, University of Tennessee, Knoxville, TN (Feb 2013).
- 41) Joint Quantum Institute, NIST-UMaryland, Washington, DC (March 2013).
- 42) Peter Grunberg Institute Colloquium, Julich, Germany (April 2013).
- 43) Faculty of Science Colloquium, University of Crete, Greece (Feb 2014).
- 44) University of Campinas, UNICAMP, Campinas SP, Brazil (March 2014).
- 45) Center for Nanoscale Materials, Argonne Natl Lab, Chicago (April 2014).
- 46) SFB Integrated Nanostructures, HU zu Berlin, Berlin, Germany (July 2014).
- 47) Institute of Physics, Wroclaw University of Technology (Nov 2014).
- 48) Konwersatorium, Institute of Physics, PAN, Warsaw (Nov 2014).

Teaching/Education/Training Highly Qualified Personnel:

Undergraduate students who did undergraduate project in my group:

P. Wilson, L. Lamoroux, J. Cieniak, S. Guindon, G. Greer, R. Cheriton, A. Rene, A. Forte, J. Thibert-Leduc.

Graduate students who worked/are working with me toward their PhD:

A. Wojs-PhD 1993-1996 (Wroclaw-Ottawa),
now full Professor, Wroclaw University of Technology,
L. A. Rego- PhD 1997-1998 (Campinas-Ottawa),
now Professor, Universidad de Santa Catarina, Florianopolis, Brazil.
G.Narvaez-PhD 1999-2000 (Campinas-Ottawa),
now Patent Officer, Atlanta, USA
A. Wensauer-PhD 2002-2003(Regensburg-Ottawa),
now at Nuclear Energy Company, AON, Germany
M. Korkusinski- PhD 2000-2004 (Ottawa), now staff member at IMS NRC.
W.Dybalski (Ottawa, 2005) – now Group Leader , Emmy Noether Program, Zentrum fur
Mathematics, Technische Universität München, Germany.
I. Puerto Gimenez – PhD 2007-2009 (La Laguna-Ottawa) now PDF at the European
Astrophysics Institute, LaLaguna, Spain.
Y-C. Hsieh- PhD 2006-2011(Ottawa) now Research Associate, MIT-USingapore
P. Potasz – PhD 2009-2012 (Wroclaw - Ottawa) –now Assistant Professor, Wroclaw
University of Technology.
A. Trojnar – PhD 2008-2013 (Ottawa), now RA, uOttawa
I. Ozfidan – PhD student (Ottawa) – 2011-2015 –now RA U Alberta
M. Vladislavljevic – Msc student (Ottawa) – 2013- 2014
U. Mendes – PhD (Campinas and Ottawa) – 2013- 2014 –now RA Universite de Paris
N. Rogers - Msc student (Ottawa) – 2013 – 2015
J. Thibert-Leduc – Msc student (Ottawa) – 2014 – 2015
Helder Faria Andriolo - Msc student (Campinas and Ottawa)-2015

Research associates past/present:

B. van Zyl ,2001-2001 (now Assoc. Prof. St.Xavier University, Canada)
J. Kyriakidis, 2001-2002 (now Assoc. Professor, Dalhousie University, Canada),
S.-J. Cheng ,2002-2003 (now Assoc. Professor, NCTU Taiwan, RChina),
W. Sheng, 2003-2006 (now Professor, Fudan University, Shanghai, China),
M. Florescu, 2002-2003 (now Assistant Professor, GuilfordU, UK),
R. Abolfath, 2003-2006 (now RA, Yale University, USA),
F. Qu, 2004-2005 (now Professor , University of Brasilia, Brasilia, Brazil),
M. Korkusinski, 2004-2005 (Ottawa) (now staff member at SDT NRC),
Y.P. Shim, 2006-2009 (now RA, LPS UMaryland, USA).
M. Zielinski, 2006-2009 (now Asst. Prof, Physics,Copernicus University,Torun, Poland).
F. Delgado, 2006-2008 (now RA, Iberian Lab for Nanotechnology, Braga, Portugal).
E. Kadantsev, 2008-2011 (now software engineer, industry, Ottawa)
A. Sharma, 2008-2010 (now RA, University of Frankfurt)
O. Voznyy, 2008-2011 (now Principal Materials Scientist, Sargent Group, UToronto)
D. Guclu, 2008-2012 (now Assoc. Prof, Physics, Izmir Institute of Technology, Turkey)
A. D. Gran, 2015-present

I have been involved in putting together a Visitor Programme in Condensed Matter
Theory Group at NRC. The following visitors worked with me on a variety of topics:
N. Pulsford (Philips Research, Holland); D. Pfannkuche (Max -Planck Institute, Stuttgart,
Germany);M. Grabowski (U. of Colorado, USA); J. J. Palacios (AU Madrid, Spain);

P. A. Schulz (Campinas, Brasil); A. S. Plaut (Exeter, UK); A. Wojs (TU Wroclaw, Poland); J. A. Brum (Campinas, Brasil); L. A. Rego (Campinas, Brasil); M. Potemski (HMFL Grenoble, France); A. Brown (U Alberta, Canada); L. Quiroga (ULA, Colombia), W. Czart (AMU, Poland). G. Narvaez (Campinas, Brasil), A. Wensauer (Regensburg, Germany), A. Olaya-Castro (Bogota, Columbia), C. Tejedor (Madrid, Spain), J. I. Climente (Castelano, Spain), A. Delgado (Havana, Cuba), F. Qu (Uberlandia, Brazil), A. Gladysiewicz (TU Wroclaw), H. Tamura (NTT Japan), A. Trojnar (TU Wroclaw), Udson Mendes (Campinas, Brazil).