

University of Wrocław
Institute of Theoretical Physics
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CURRICULUM VITAE

Education and Qualifications

- 2015** Full Professor, University of Wrocław,
2009 Habilitation, University of Wrocław,
*Differential Geometric Methods in Extended Gravitational and Gauge Theories:
Applications in Cosmology*
1984 Ph. D. in Physics, University of Wrocław under supervision of prof. A. Jadczyk,
thesis: *Relativistic quantum mechanics with a conserved probability current*
1973–1976 Postdiploma Study (Theoretical Physics), Institute of Theoretical Physics,
University of Wrocław

Posts held

- 2012– . . .** extraordinary professor, Wrocław University
1989–2012 associate professor, Wrocław University
1984–1989 assistant professor, Wrocław University
1979–1984 senior instructor, Wrocław University
1976–1979 instructor, Wrocław University

Scientific co-operation

Visits

- University of Iceland, Reykjavik, August 2013 (one month), August-September 2014 (one month);
Ruder Bosovic Institute in Zagreb, visiting professor, March 2009, August 2009, December 2010, September 2012, September 2014;
Sankt Petersburg State University, visiting professor, June 2009, October 2010, October 2012;
University di Napoli, Italy, visiting professor, Socrates-Erasmus Program, September 2008, September 2009;
Joint Institute on Nuclear research, Dubna, Russia, visiting scientist, March 2008 - September 2009 (18 months);
University of Bath, UK, , visitor, , Royal Society ex-agreement, July-August 2004 (2 months);

University of Torino, Italy, visiting professor, ERASMUS (teaching staff mobility), September 2004 (one week);

University of Torino, Italy, visiting professor, INdAM-GNFM, September-October and November-December 2003 (2 months);

L.P.T.L Universite Pierre & Marie Curie Paris VI, France, visiting professor, ERASMUS (teaching staff mobility) September 2003 (one week);

University of Torino, Italy, visiting professor, INdAM-GNFM, July 2002 (1 month);

Facultad de Estudios Superiores Cuautitlan, Estado de Mexico, Mexico, visiting professor, May 2002(two weeks);

Mathematical Department, Czech Technical University, Prague, Czech Republic, visiting professor, November 2001 (one week);

Theoretical Physics Department, University of Lviv, Lviv, Ukraine, visiting professor, October 2001 (one week);

L.P.T.L Universite Pierre & Marie Curie Paris VI, France, visiting professor, April 2001 (one week);

University of Torino, Italy, visiting professor, INdAM-GNFM, October/November 2000 (1 month);

Joint Institute for Nuclear Research, Dubna, Russia, visiting professor, Bogolyubov-Infeld Programme, August 2000 (2 weeks);

University of Torino, Italy, visiting professor, October 1999 (2 weeks);

UNAM, Mexico, visiting professor, June - September 1999 (3 months);

Steklov Mathematical Institute, Moscow, Russia, visiting professor, May 1999 (1 week);

Joint Institute for Nuclear Research, Dubna, Russia, visiting professor, Bogolyubov-Infeld Programme, April 1999 (2 weeks);

University of Torino, Italy, visiting professor of CNR, November 1997 (1 month);

University of Torino, Italy, visiting professor of CNR, October 1996 (2 months);

University of Torino, Italy, visiting professor of CNR, June 1995 (2 months);

University of Torino, Italy, visiting professor of CNR, November 1994 (2 months);

University of Torino, Italy, scholarship of the Italian Government, February–September 1993 (8 months);

University of Torino, Italy, visiting professor of CNR, April 1991 (2 months);

Joint Institute for Nuclear Research, Dubna, Russia, visiting professor, December 1990 (2 weeks);

University of Torino, Italy, scholarship of the Italian Government, February–June 1990 (5 months);

St. John’s College in Oxford, England, Oxford Hospitality Scheme, September 1989 (1 month).

Participation in conferences (in a case of contribution - the last 6 years)

General Relativity: 100 years after Hilbert, 17-21 August 2015, Stara Lesna, Slovakia;
International Conference on New Trend in Field Theories, Varanasi, India, 01-05.11.2014);
IV International Conference "Models in Quantum Field Theory" (MQFT-2012) Institute of Physics (SPbSU), Petergof, 24 - 27 September 2012, Russia;
XX International Conference on Integrable Systems and Quantum Symmetries (ISQS-20) 17 JUNE - 23 JUNE 2012, Prague, Czech Republic; *Noncommutativity and Physics: Spacetime Quantum Geometry*, Bayrischzell, May 25-28, 2012, Niemcy;
Hot topics in Modern Cosmology Spontaneous Workshop VI 7 - 12 May 2012 Cargese, France;
Applied Category Theory Graph-Operad-Logic January, March, 2011, San Antonio, University of Texas, USA, International Workshop;
International Workshop, Applied Category Theory Graph-Operad-Logic, 1-10 January 2010, Universidad Autonoma de Nayarit, Tepic, Mexico;
Integrable Systems and Quantum Groups (ISQG-19), 16-17 June 2010, Praha, Czech Republic;
European Network in Noncommutative Geometry 7th Focused Semester: Quantum groups, 4-11 September 2010, Caen, France;
Models in Quantum Field Theories(MQFT-2010), 18 - 22 December 2010, Sankt Petersburg, Russia;
Quantum Theory and Symmetries 6, 20-25 July 2009, Department of Physics and Astronomy, University of Kentucky, Lexington, USA;
Algebra, Geometry, and Mathematical Physics, 10-15 October 2009, Banach Center, Bedlewo, Poland;
XVIII International Colloquium Integrable Systems and Quantum Symmetries, 18-20 June 2009, Prague, Czech Republic;
XXV Max Born Symposium: The Planck Scale, 29 June – 3 July 2009, Wroclaw, Poland;
6th International Symposium On Quantum Theory And Symmetries (QTS6), 20-25 July 2009, Department of Physics and Astronomy, University of Kentucky, Lexington, USA;

Organizational experience

35th Max Born Symposium The Planck Scale II, Wroc?aw, September 7-12 2015, member of the local organizing committee

The 1st Conference of Polish Society on Relativity (29.06-04.07.2014, Spala), member of the Scientific Committee and co-chairman of the session Cosmology in Homogeneous Spacetime

33rd Max Born Symposium Noncommutative geometry, quantum symmetries and quantum gravity, Wroclaw: July 06 - 10, 2014, Secretary

GR20-Amaldi10 Warsaw, July 7-13, 2013, member of the local organizing committee

49th Karpacz Winter School of Theoretical Physics (co-chairman) "Cosmology and Nonequilibrium Statistical Mechanics" , Ladek Zdroj, 7-14 luty 2013,

29th Max Born Symposium "Quantum, Super and Twistors II", Wroclaw, 2011, chairman;

42nd Karpacz Winter School of Theoretical Physics "Theoretical Physics Current Mathematical Topics in Gravitation and Cosmology", Ladek Zdroj, Poland, February 6-11, 2006, chairman;

19th Max Born Symposium "Fundamental Interactions and Twistor-Like Methods", Wrocław, Poland, 2004;

14th Max Born Symposium "New Symmetries and Integrable Systems", Karpacz, Poland, 1999;

12th Max Born Symposium "Theoretical Physics – Fin de Siecle", Wrocław, Poland, 1998;

Organizing Committee of the 10th Max Born Symposium "Quantum Future", Przesieka Poland, 1997;

Organizing Committee of the 2nd Max Born Symposium, Sobótka, Poland, 1992;

Organizing Committee of the Winter Schools of Theoretical Physics, Karpacz, Poland, in 1981, 1983, 1985, 1986, 1987, 1989, 1991, 1992, 1995, 2005.

Membership in professional organizations

COST Action MP1405 Quantum Structure of Spacetime [QSPACE] - Management Committee Substitute, since 2014

Algebra Geometry Mathematical Physics Network: scientific advisor; since 2008 – 2012.

founding member of the Polish Society on Relativity (PoToR) since 2012

Societatis Mathematicae Polonae (Polskie Towarzystwo Matematyczne) - since 2002;

Catedra de Investigaciones "Algebra y Logica" en UNAM, FESC, México;

International Society on General Relativity and Gravitation 1995 (life membership);

International Association of Mathematical Physics 1994 (# 1254 C);

Polish Physical Society 1985.

Member of the Editorial Board

International Journal of Geometric Methods in Modern Physics (IJGMMP), World Scientific, Singapore; Print ISSN: 0219-8878 Online ISSN: 1793-6977; since 2003 – till present, <http://ejournals.worldscientific.com.sg/ijgmmp/mkt/editorial.shtm>

Journal of Generalized Lie Theory and Applications, Ashdin Publishing, since 2006 – till 2013;

Journal of Physical Mathematics (JPM), Ashdin Publishing: since 2009 – till 2013;

The Open Astronomy Journal, Bentham Open: since 2008 – till present;

ISRN-Geometry, (International Scholarly Research Network) Hindawi Publishing Corporation, since 2010–till 2012.

Awards

Awards of the President of Wrocław University in 2014, 1997, 1996, 1993, 1990;

Award of the President of The University of Wrocław for scientific achievements: one year scholarship in 2003;

Award of the President of The University of Wrocław for scientific achievements: one year scholarship in 2002;

1st degree Award of the President of The University of Wrocław for scientific achievements in 1988;

2nd degree Award of the President of The University of Wrocław for didactic activity in 1985;

Award of the President of The University of Wrocław in 1983, 1981, 1980;

Award of the President of The University of Wrocław for scientific activity in 1979.

Participation in grants and projects

NCN 2014/13/B/ST2/04043 *Non-standard approaches to the description of fundamental interactions: noncommutative and twistor geometries*, (2015-2017),

NCN 2013/09/B/ST2/03455 *Early Universe from fundamental interactions*, (2014-2016)

NCN -2012/05/N/ST9/03857 *Statistical analysis of extended gravity cosmological models and models with a scalar field*, (2012-2013)

NCN 2011/01/B/ST2/03354 *Quantum deformations, noncommutative geometries and deformations of dynamical models* (2011-2014)

MNiSW NN202 238540 *k-Minkowski spacetime and k-deformed gravity* (2011)

MNiSW NN202 318534 *Quantum spacetime symmetries and supersymmetries: formalism and applications*, (2008 - 2011)

KBN P03B 01828 , *Quantum modifications of symmetries and supersymmetries: formalism and applications*, (2005-2008)

Grant UNAM, DGAPA (México),
Programa de Apoyo a Proyectos de Investigación e Innovación Tecnológica, Proyecto IN-109599, 2000-2002;

Project for scientific cooperation among:

Laboratoire de Gravitation et Cosmologie Relativistes, University of Pierre-et-Marie-Curie (Paris, France); Institute of Pure Mathematics & Institute of Theoretical Physics, University of Tartu (Estonia); Institute of Theoretical Physics, University of Wrocław (Poland), 2001;

Grant KBN #2 P03B 144 19,
Complex Geometry and New Class of Einstein Metrics, 15.07.2000–14.07.2001, head;

Grant CONACyT (México) #27670 E, , 1999–2001;

Bogolyubov-Infeld grant, 1999-2000;

Bogolyubov-Infeld grant, 1998-1999;

Grant KBN #2 P03B 10915,

Contravariant Formulation of Noncommutative Differential Calculi, 15.06.1998–14.06.1999, head;

Grant KBN #2 P302 023 07,

Noncommutative Differential Geometry and Field Theory, 1.07.1994–30.06.1997, head;

Grant KBN (Polish Committee for Scientific Researches) #2 2 2419 92 03,

Geometric and Algebraic Methods and Field Theory, 15.07.1992–14.07.1994.

Languages: English, Russian, working knowledge of Italian

Teaching experience:

classical mechanics, quantum mechanics, electrodynamics, algebra, mathematical analysis, mathematical methods in physics, differential geometry, tensor calculus, general relativity and gravitation, geometry of field theories.

Supervisor of 2 completed doctoral thesis (2011, 2014). Currently a supervisor of one PhD student and one graduate student.

Scientific experience

relativistic quantum mechanics, localization problem, covariant wave equations, Dirac equation;

differential geometry and topological methods in field theory and classical mechanics, variational principles, conservation laws, Lagrangian and Poincare–Cartan formalism, natural and gauge–natural field theories, topological field theories;

general relativity and gravitation, energy–momentum complex, Nöther currents, variational formulations, Palatini first order formalism, extended theories of gravitation, alternative Lagrangians for Einstein equations, Chern–Simons gravity, cosmology based on extended gravitational theories;

unified field theories, Kaluza–Klein type of unification, Yang-Mills theories;

differential-geometric structures on manifolds, G–structures, almost product and almost complex structures, Einstein–Kähler manifolds, spinors, twistors, Clifford algebras and Dirac operator;

geometry of differential equations, exterior differential systems, jet bundle formulation of PDEs and field theory, invariance of PDEs;

noncommutative differential geometry (NCDG), noncommutative differential calculi, calculi on quantum planes: constructive approach, consistency conditions, covariant and contravariant formulation, vector fields and differential operators in NCDG, quantum groups and quantum spaces, Hopf algebras and their quantizations, monoidal categories and abstract Tannaka–Krein duality, classical and quantum Yang–Baxter equations.

Current scientific interest & fields of expertise

Mathematical and theoretical physics, geometric and algebraic techniques, special and general relativity, extended theory of gravity, cosmology, Yang-Mills theory, Chern-Simons theory

noncommutative geometry, quantum groups and quantum spaces (Hopf algebras and Hopf module algebras), quantum deformations and twisted tensor techniques in application to quantum gravity.

Complete list of publications can be found at

the Institute of Theoretical Physics of Wroclaw University web page

http://www.ift.uni.wroc.pl/publications?author=Borowiec&division=all&from=1975&to=2015&sort=date&list_type=list

<http://scholar.google.com/citations?hl=en&user=bhP2LT0AAAAJ>

ResearchGate :

http://www.researchgate.net/profile/A_Borowiec

Inspire-hep database:

<http://inspirehep.net/author/profile/A.Borowiec.1?ln=en>

MathSciNet (Mathematical Reviews):

<http://www.ams.org/mathscinet/mrcit/individual.html?mrauthid=39765>