




PERSONAL INFORMATION **Paweł Józia**

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**Date and place of birth** November 18, 1988, Oława, Poland

**Personal status** Engaged, 1 Child | **Nationality** Polish

**Scientific Interests** Functional analysis and operator algebras; locally compact quantum groups: group-theoretic properties, representation theory and approximation properties; applications of these in non-commutative probability and geometry

**EDUCATION**

- II 2013– IV 2017 Doctoral studies in Institute of Mathematics of the Polish Academy of Sciences, Warsaw.
- Fall 2012 Doctoral studies in Institute of Mathematics of the Polish Academy of Sciences, Wrocław.
- Spring 2011 A Trimester at Institut Henri Poincaré in Paris *Von Neumann algebras and ergodic theory of group actions*
- X 2010–VI 2012 Master of Sciences in Mathematics (Pure Mathematics): studies in Mathematical Institute of Wrocław University.
- X 2007–VI 2010 Bachelor of Sciences in Mathematics (Pure Mathematics): studies in Mathematical Institute of Wrocław University.

**PHD THESIS**

- Title** *Hopf images in locally compact quantum groups*
- Supervisors** dr hab. Piotr M. Sołtan, dr hab. Paweł Kasprzak
- Description** The thesis contains a thorough study of the notion of generation of a quantum subgroup (i.e. a Hopf image of a morphism), in particular, we constructively establish existence of the Hopf image of a given morphism. We compare our construction to the concepts already existing in the literature in restricted setting (of compact/discrete quantum groups). We provide a number of equivalent characterizations of the Hopf image of a given morphism and present some results that mimic the classical concept of generating subsets. We provide an example of a quantum generating set in quantum permutation groups, answering a question of Skalski and Sołtan.
- Comment** Thesis defended on 30. March 2017

**MASTER THESIS**

- Title** *Własności spektralne metryk grup (Spectral properties of metrics of groups)*
- Supervisor** Prof. Marek Bożejko
- Description** We study the class of conditionally strictly negative definite kernels. We show that this class carries some surprising rigidity, in particular, the word metric on Coxeter groups belongs to this class if and only if the group is a free product of a number of copies of  $\mathbb{Z}_2$ 's and that the class of conditionally strictly negative definite kernels on a finite set is a one-parameter perturbation of the class of strictly positive definite kernels on this set. We discuss several examples.
- Comment** Thesis defended on 29. June 2012. The thesis won the Grand Prix in the 56<sup>th</sup> J. Marcinkiewicz Competition for the best student paper in mathematics

**TEACHING EXPERIENCE**

- 2016-present Instructor of Olympiad's Preparatory Classes at Akademeia High School in Warsaw
- 2016 Linear Algebra & Geometry, grader, University of Warsaw
- 2014 Mathematics for Chemistry Students, recitations, University of Waraw
- 2012 Elements of Computer Science, recitations, Wrocław University
- 2010 Tutor for BSc student, Wrocław University
- 2008–2010 Tutor for High School Students at various Mathematical Camps
- 2007–2012 Instructor of Olympiad's Preparatory Classes at Stefan Żeromski High School

## ARTICLES

- 1) P. Józiak, *Conditionally strictly negative definite kernels*, Linear Multilinear Algebra **63** (2015), 2406-2418
- 2) P. Józiak, P. Kapsrzak and P. M. Sołtan, *Hopf Images in Locally Compact Quantum Groups*, arXiv:1611.06225
- 3) P. Józiak, *Remarks on Hopf images and quantum permutation groups  $S_n^+$* , arXiv:1611.09211, accepted in Canad. Math. Bull.

AWARDS, GRANTS,  
SCHOLARSHIPS, OLYMPIADS

- 2016 IMPAN Travel grant for young researchers (4400PLN)
- 2016 Participant in Besançon–Warsaw PHC Polonium 35217RD travel grant (leaders: Quanhua Xu, Adam Skalski)
- 2016-present Participant in the grant NCN Opus 2015/17/B/ST1/00085 *Selected topics in the theory of locally compact quantum groups* (leader: Piotr M. Sołtan)
- 2015-present Scholarship of Institute of Mathematics of the Polish Academy of Sciences for the PhD programme
- 2013 Grand Prix in the 56<sup>th</sup> J. Marcinkiewicz Competition for the best student paper in mathematics for MSc thesis
- 2012-2015 Scholarship of Warsaw Center for Mathematics and Computers Science for the PhD programme
- 2012-2015 Participant in the grant NCN Opus 2012/05/B/ST1/00626 *Noncommutative probability and harmonic analysis with applications* (leader: Marek Bożejko)
- 2011-2012 Scholarship of the Wrocław University's rector for achievements in studies
- 2010-2012 Scholarship of the Ministry of Sciences and Higher Education's rector for exceptional achievements in studies
- 2008-2010 Wrocław University scholarship for achievements in studies
- 2009 Participant in the 19<sup>th</sup> Vojtěch Jarník International Mathematical Competition
- 2007 Participant in the 58<sup>th</sup> Polish Mathematics Olympiad, in the 56<sup>th</sup> Polish Physics Olympiad and in the 3<sup>rd</sup> Polish Mathematical Linguistics Olympiad

CONFERENCES AND  
WORKSHOPS

- XI 2016 Structure and classification of  $C^*$ -algebras, Warsaw
- XI 2016 Topological quantum groups and Hopf algebras, Warsaw
- X 2016 Non-commutative index theory conference, Warsaw
- X 2016 Cyclic homology conference, Warsaw
- VII 2016 17<sup>th</sup> Workshop: Non-commutative Harmonic Analysis, Będlewo
- VII 2016 7<sup>th</sup> ECM Satellite: Compact quantum groups, Greifswald
- V 2016 Quantum groups: geometry, representations, and beyond, Oslo
- VII 2015 Topological Quantum Groups, Będlewo
- IV 2015 Quantum Probability, Groups and Geometry, Warsaw
- VII 2014 16<sup>th</sup> Workshop: Non-commutative Harmonic Analysis, Będlewo
- IV 2014 Wandering Seminar in Dynamical Systems, Warsaw
- IX 2013 1<sup>st</sup> Heidelberg Laureate Forum, Heidelberg
- IX 2013 Masterclass in Free Probability and Operator Algebras, Münster
- VII 2013 QOP:  $C^*$ -algebras and Banach Algebras, Warsaw
- III 2013 Journée Thématiques: Approximation properties & Harmonic analysis on quantum groups, Cergy-Pontoise
- IX 2012 15<sup>th</sup> Workshop: Non-commutative Harmonic Analysis, Będlewo
- I 2012 Young Geometric Group Theory, Będlewo

- VII 2011 14<sup>th</sup> Workshop: Non-commutative Harmonic Analysis, Będlewo  
 V 2011 Workshop:  $II_1$  Factors: Rigidity, Symmetries and Classification, Paris  
 VII 2010 13<sup>th</sup> Workshop: Non-commutative Harmonic Analysis, Będlewo

#### RESEARCH VISITS AND SEMINAR TALKS

- IV 2017 Young researchers colloquium: IMPAN  
 XII 2016 Operator algebra seminar: University of Warsaw  
 XII 2016 Research visit: Université de Franche-Comté, 1 week  
 XII 2016 Functional analysis seminar: Université de Franche-Comté  
 XI 2016 Theoretical Physics and Astronomy seminar: University of Gdańsk  
 X 2016 Probabilistic seminar: Warsaw University of Technology  
 VI 2016 Operator algebra seminar: University of Warsaw  
 III 2016 Mathematical analysis seminar: University of Wrocław  
 I 2016 Non-commutative geometry seminar: IMPAN  
 V 2015 Geometric group theory seminar: IMPAN  
 I 2015 Geometric group theory seminar: IMPAN  
 I 2015 Young researchers colloquium: IMPAN  
 XII 2013 Geometric group theory seminar: IMPAN  
 III 2013 Geometric group theory seminar: IMPAN  
 XI 2011 Mathematical analysis seminar: University of Wrocław

#### ACTIVITIES

- 2014 Coorganizer of the Workshop *Introduction to the Mathematical Profession* (prud)  
 2014 Member of the Scientific Council of IMPAN (as a PhD students representative)  
 2010 Tutor at annual Summer School in Mathematics for high school students  
 2008-2009 Tutor at annual Winter School in Mathematics for high school students  
 2008-2010 Coorganizer and tutor at annual Spring School in Mathematics for junior high school students  
 2008-2012 Member of the Pure Mathematics Students' Association, then Secretary of PMSA (2009) and president of PMSA (2010-2012), coorganizer of 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> PMSA Winter School in Mathematics and 3<sup>rd</sup> and 4<sup>th</sup> PMSA Summer School in Mathematics

#### REFERENCES

- prof. Marek Bożejko Institute of Mathematics of the Polish Academy of Sciences, Wrocław  
 dr hab. Paweł Kasprzak University of Warsaw, Physics Department  
 dr hab. Adam Skalski Institute of Mathematics of the Polish Academy of Sciences, Warsaw  
 prof. Piotr Śniady Institute of Mathematics of the Polish Academy of Sciences, Toruń  
 dr hab. Piotr M. Sołtan University of Warsaw, Physics Department

#### SPOKEN LANGUAGES

- Mother tongue Polish  
 C1 English  
 A2 French  
 A2 German  
 A1 Norwegian

#### LEISURE ACTIVITIES

- Child A father of a small child has a limited amount of free time  
 Hiking Visited: Tatra Mountains, Sudety Mountains, Carpathia Mountains, Atlas Mountains  
 Music Ability to play: drums, guitar (classical and bass), piano (limited)