

Faculty of Mathematics, Informatics, and Mechanics
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1 Education

- Oct 2013 – **University of Warsaw**
PhD student in Mathematics
Adviser: Jarosław Buczyński, formerly together with Jarosław Wiśniewski.
Auxiliary advisor: Weronika Buczyńska.
- Oct 2011 – Sep 2013 **University of Warsaw**
Master's degree in Mathematics, summa cum laude
Master's Thesis *Deformations of zero-dimensional schemes and applications*, see preprints subsection. Adviser: Jarosław Buczyński.
- Oct 2008 – Sep 2011 **University of Warsaw**
Bachelor's degree in Mathematics
Bachelor's Thesis *On commutativity of ideal extensions*, see preprints subsection.
Adviser: Edmund Puczyłowski.

2 Scientific interests

1. Algebraic geometry:

- Hilbert schemes of points on higher dimensional smooth varieties: flat families, zero-dimensional schemes and their smoothability, secant varieties and their applications.
- combinatorial algebraic geometry: tropical geometry, Berkovich spaces.
- birational geometry: geometry of homogeneous varieties.

2. **Commutative algebra:** Gorenstein rings and duality, Macaulay's inverse systems, Waring, cactus and smoothable ranks, syzygies of finite algebras.

3. **Noncommutative algebra:** finite dimensional algebras and their derivations.

3 Publications

3.1 Published

1. *Computing the cactus rank of a general form* with Alessandra Bernardi, Pedro Macias Marques and Kristian Ranestad, *Collectanea Mathematica* (online first), 2017.

2. *Classifying local Artinian Gorenstein algebras.*
Collectanea Mathematica, 68 (2017), no. 1, 101–127.
3. *On the rationality of Poincaré series of Gorenstein algebras via Macaulay’s correspondence*
with Gianfranco Casnati and Roberto Notari.
Rocky Mountain J. Math., 46(2):413–433, 2016.
4. *On commutativity of ideal extensions*, BSc thesis under the supervision of E.R.Puczyłowski.
Communications in Algebra Vol. 44, Iss. 5, 2016.
5. *Irreducibility of the Gorenstein loci of Hilbert schemes via ray families*
with Gianfranco Casnati and Roberto Notari.
Algebra Number Theory, 9(7):1525–1570, 2015.
6. *Local finite dimensional Gorenstein k -algebras having Hilbert function $(1,5,5,1)$ are smoothable.*
Journal of Algebra and Its Applications: Volume 13, 13(8):1450056 (7 pages), 2014.
7. *An upper bound for the Waring rank of a form.*
Archiv der Mathematik: Volume 102, Issue 4 (2014), Page 329-336.

3.2 To appear

1. *Constructions of k -regular maps using finite local schemes* with Jarosław Buczyński, Tadeusz Januszkiewicz and Mateusz Michałek.
Accepted in Journal of European Mathematical Society,
arxiv:1511.05707, 2016.

3.3 ArXiv preprints

1. *Finite schemes and secant varieties over arbitrary characteristic* with Jarosław Buczyński.
arXiv:1703.02770, 2017.
2. *The Hilbert scheme of 11 points in \mathbb{A}^3 is irreducible* with Theodosios Douvropoulos, Bernt Ivar Utslø Nødland and Zach Teitler. A project initiated during apprenticeship weeks at CombAlgGeom semester under the supervision of Greg Smith and Bernd Sturmfels.
arXiv:1701.03089, 2017.
3. *Equations and tropicalization of Enriques surfaces* with Barbara Bolognese, and Corey Harris. A project initiated during apprenticeship weeks at CombAlgGeom semester under the supervision of Greg Smith and Bernd Sturmfels.
arXiv:1701.02799, 2017.
4. *VSPs of cubic fourfolds and the Gorenstein locus of the Hilbert scheme of 14 points on \mathbb{A}^6 .*
arXiv:1611.04345, 2016.

4 Conferences and scientific cooperation

27 May – 3 Jun 2017	Scientific visit to Maria E. Rossi and Shreedevi Masuti, Genova
12 Aug – 11 Sep 2016	<i>Combinatorial Algebraic Geometry</i> semester at Fields Institute, Toronto, Canada.
20 Aug – 3 Sep 2016	Bernd Sturmfels’ apprenticeships at <i>Combinatorial Algebraic Geometry</i> , Toronto, Canada.
15 Aug – 19 Aug 2016	<i>Introductory workshop</i> at <i>Combinatorial Algebraic Geometry</i> , Toronto, Canada.

- 1 – 4 Jul 2015 *Theory and applications of syzygies* on the occasion of Frank-Olaf Schreyer’s 60th birthday, Saarbrücken, Germany.
- 28 – 30 Jun 2015 Scientific meeting with J. Elias on Artin Gorenstein algebras, Barcelona.
- 25 – 26 Jun 2015 Scientific meeting with Maria E. Rossi on Artin Gorenstein algebras, Genova.
- 19 – 24 Jun 2015 Scientific cooperation with G. Casnati and R. Notari on smoothability of zero-dimensional schemes, Torino.
- 14 – 19 Jun 2015 *AGaFe* conference in honour of Philippe Ellia, Ferrara.
- 9 – 14 Jun 2015 *AMS-EMS-SPM meeting* in Porto, Portugal (invited speaker on a special session).
- 16 – 20 Jun 2014 *Nordfjordeid Summer school 2014: Toric degenerations and mirror symmetry*, Nordfjordeid, Norway.
- 7 – 11 Apr 2014 Scientific visit to Bonn.
- 26 Feb – 4 Mar 2014 Scientific cooperation with G. Casnati and R. Notari on smoothability of zero-dimensional schemes, Warsaw.
- 23 – 26 Nov 2013 Scientific visit to A.A. Iarrobino, Northeastern University, Boston, MA, USA.
- 18 – 22 Nov 2013 *Graduate Workshop on Geometry of Hilbert schemes*, Stony Brook, NY, USA.
- 1 – 7 Sep 2013 36th Autumn School *Power sum decompositions and apolarity, a geometric approach*, Łukęcin, Poland (organiser).
- 14 – 20 Jul 2013 *Classical Aspects of Ring Theory and Module Theory*, Będlewo, Poland.
- 27 – 31 May 2013 *Syzygies in Berlin* summer school of Freie Universität Berlin, Berlin.
- 15 – 22 May 2013 Scientific cooperation with G. Casnati and R. Notari on smoothability of zero-dimensional schemes, Politecnico di Torino, Torino, Italy.
- 16 – 24 Jan 2013 Scientific cooperation with G. Casnati and R. Notari on smoothability of zero-dimensional schemes, Politecnico di Torino, Torino, Italy.
- 23 – 29 Sep 2012 35th Autumn School *Subgroups of Cremona groups*, Łukęcin, Poland.
- 8 – 14 Jul 2012 SMI Summer Course *Tensors: Waring problems and Geometric Complexity Theory*, Cortona, Italy.
- 17 – 24 Sep 2011 34th Autumn School *Geometric Invariant Theory, old and new.*, Łukęcin, Poland.

5 Participation in scientific projects

1. “Local geometry of the Hilbert scheme of points and its applications” a “Preludium” grant for PhD students funded by the National Science Centre of Poland, 2015 – 2017.
2. “Computational complexity, generalised Waring type problems and tensor decompositions” the project within “Canaletto”, the executive program for scientific and technological cooperation between Italy and Poland, 2013-2015.
<http://www.mimuw.edu.pl/~jabu/projects/canaletto/canaletto.html>
3. “Secant varieties, computational complexity, and toric degenerations” project within the Homing Plus programme of Foundation for Polish Science, co-financed from European Union, Regional Development Fund.
<http://www.mimuw.edu.pl/~jabu/projects/homing/homing.html>

6 Outreach

Oct 2006 – Jun 2014 **I LO, Białystok**

Teacher of High school mathematical circle

The circle was viewed toward Polish Math Olympiad and met each week for two hours. Homepage: <http://www.mimuw.edu.pl/~jjelisiejew/matma/>.

2008 – 2013

I LO, Białystok

Main organiser of math summer camps

Weekly summer camps for people interested in math and/or math olympiads.

2009 – present

Białystok University of Technology

Coorganizer of local mathematical competition

The competition is designed as an intermediate step between school and Mathematical Olympiad, four relatively easy proof tasks are given/4h.

<http://konkurs.wi.pb.edu.pl>