

Joachim Jelisiejew

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1 Employment

Oct 2017 – **Polish Academy of Sciences**
assistant professor

2 Education

Oct 2013 – Sep 2017 **University of Warsaw**
PhD student in Mathematics
PhD Thesis *Hilbert schemes of points and their applications* (summa cum laude)
Advisor: Jarosław Buczyński. Auxiliary advisor: Weronika Buczyńska.

Oct 2011 – Sep 2013 **University of Warsaw**
Master's degree in Mathematics
Master's Thesis *Deformations of zero-dimensional schemes and applications*
(summa cum laude), see preprints subsection. Advisor: 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.
Advisor: Edmund Puczyłowski.

3 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.
- torus actions and Bialynicki-Birula decompositions.

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.

4 Publications

4.1 Published

1. *On polynomials with given Hilbert function and applications* with Alessandra Bernardi, Pedro Macias Marques and Kristian Ranestad, *Collectanea Mathematica*, 69 (2018), no. 1, 39-64.
2. *The Hilbert scheme of 11 points in \mathbb{A}^3 is irreducible* with Theodosios Douvropoulos, Bernt Ivar Utstøl Nødland and Zach Teitler. Appeared in: Smith G., Sturmfels B. (eds) *Combinatorial Algebraic Geometry*. Fields Institute Communications, vol 80. Springer, New York, NY.
3. *Equations and tropicalization of Enriques surfaces* with Barbara Bolognese, and Corey Harris. Appeared in: Smith G., Sturmfels B. (eds) *Combinatorial Algebraic Geometry*. Fields Institute Communications, vol 80. Springer, New York, NY.
4. *Finite schemes and secant varieties over arbitrary characteristic* with Jarosław Buczyński. *Differential Geom. Appl.* 55 (2017), 13-67.
5. *Classifying local Artinian Gorenstein algebras*. *Collectanea Mathematica*, 68 (2017), no. 1, 101–127.
6. *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.
7. *On commutativity of ideal extensions*, BSc thesis under the supervision of E.R.Puczyłowski. *Communications in Algebra* Vol. 44, Iss. 5, 2016.
8. *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.
9. *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.
10. *An upper bound for the Waring rank of a form*. *Archiv der Mathematik: Volume 102, Issue 4* (2014), Page 329-336.

4.2 To appear

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

4.3 ArXiv preprints

1. *VSPs of cubic fourfolds and the Gorenstein locus of the Hilbert scheme of 14 points on \mathbb{A}^6* .
arXiv:1611.04345, 2016.
2. *Elementary components of Hilbert schemes*.
arXiv:1710.06124, 2017.

5 Conferences and scientific cooperation

- 30 Nov – 2 Dec 2017 *Genova-Torino-Milano meeting: Some Topics in Commutative Algebra and Algebraic Geometry*, Torino, Italy (**invited talk**)
- 18-22 Sep 2017 *8 Forum of Polish Mathematicians*, Lublin (**invited talk** at the arithmetic geometry session).
- 5 May – 8 Jul 2017 *Deformations in Turin*, Torino (**contributed talk**).
- 27 May – 3 Jun 2017 Scientific visit to Maria E. Rossi and Shreedevi Masuti, Genova.
- 12 Aug – 11 Sep 2016 *Combinatorial Algebraic Geometry* semester at Fields Institute, Toronto, Canada.
- 28 Nov – 2 Dec 2016 *Algebra Geometry Meeting*, Barcelona (**invited talk**).
- 20 Aug – 3 Sep 2016 *Bernd Sturmfels' apprenticeships at Combinatorial Algebraic Geometry*, Toronto, Canada.
- 15 Aug – 19 Aug 2016 *Introductory workshop at Combinatorial Algebraic Geometry*, 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 talk** 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 (**contributed talk**).
- 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.

6 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>

7 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>