Joanna Kułaga-Przymus

Contact Information

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Personal Information

Date of birth: 07.01.1985 — Place of birth: Toruń, Poland
Gender: Female — Nationality: Polish

Employment

2012–now: **Assistant Professor** (Polish *adiunkt*), Nicolaus Copernicus University in Toruń, Poland
2017: **Postdoctoral Research Assistant**, Institut de Mathematiques de Marseille, CNRS, University of Aix-Marseille, Marseille, France. Funded by the ERC grant "Intermediate Chaos", postdoctoral mentor: Prof. Alexander Bufetov
2013–2016: **Assistant Professor** (Polish *adiunkt*), Institute of Mathematics, Polish Academy of Sciences, Warsaw, Poland
2011–2012: **Assistant** (Polish *asystent*), Nicolaus Copernicus University in Toruń, Poland

Education

2019, Nicolaus Copernicus University in Toruń, Poland
Habilitation in Mathematics, April 2019.
Möbius function from the point of view of ergodic theory.

2008–2011, Nicolaus Copernicus University in Toruń, Poland
Ph.D. in Mathematics, October 2011.
Ergodic and spectral properties of special flows over rotations and interval exchange transformations (in Polish).

2003–2008, Nicolaus Copernicus University in Toruń, Poland
M.Sc. in Mathematics, with honors, June 2008.
Spectral properties of unitary operators on Fock Spaces (in Polish).

2005, ERASMUS exchange at University of Tampere, Finland

1998–2003, The Academic Secondary School of Nicolaus Copernicus University in Toruń, Poland

Publications

22. V. Bergelson, J. Kułaga-Przymus, M. Lemańczyk, F.K. Richter, A generalization of Kátai's orthogonality criterion with applications. Discrete Contin. Dyn. Syst. 39 (2019), no. 5, Pages 2581–2612 (arXiv: 1705.07322).
21. V. Bergelson, J. Kułaga-Przymus, M. Lemańczyk, F.K. Richter, A structure theorem for level sets of multiplicative functions and applications, published online in International Mathematics Research Notices (arXiv: 1708.02613).
20. L. Flaminio, K. Frączek, J. Kułaga-Przymus, M. Lemańczyk, Approximate orthogonality of powers for ergodic affine unipotent diffeomorphisms on nilmanifolds, Studia Math. 244 (2019), no. 1, Pages 43–97 (arXiv: 1606.09189).
19. J. Kułaga-Przymus, M. Lemańczyk, S. Ferenczi, Sarnak's conjecture – what's new, w Ergodic Theory and Dynamical Systems in their Interactions with Arithmetics and Combinatorics, CIRM Jean-Morlet Chair, Fall 2016 (Springer, Lecture Notes in Mathematics, 2018) (arXiv:1710.04039).
18. J. Kułaga-Przymus, M. Lemańczyk, Möbius disjointness along ergodic sequences for uniquely ergodic actions, published online in Ergodic Theory and Dynamical Systems (arXiv:1703.02347).
17. El H. El Abdalaoui, J. Kułaga-Przymus, M. Lemańczyk, T. de la Rue, Möbius disjointness for models of an ergodic system and beyond, Isr. J. Math. (2018) 228, Pages 707-751 (arXiv: 1704.03506).

16. V. Bergelson, J. Kułaga-Przymus, M. Lemańczyk, F.K. Richter, Rationally almost periodic sequences, polynomial multiple recurrence and symbolic dynamics, published online in Ergodic Theory and Dynamical Systems (arXiv: 1611.08392).
15. A. Kanigowski, J. Kułaga-Przymus, C. Ulcigrai, Multiple mixing and parabolic divergence in smooth area-preserving flows on higher genus surfaces, to appear in Journal of the European Mathematical Society (arXiv: 1609.00699).
14. A. Dymek, S. Kasjan, J. Kułaga-Przymus, M. Lemańczyk, $\mathscr{B}$-free sets and dynamics, Trans. Amer. Math. Soc. 370 (2018), no. 8, Pages 5425–5489 (arXiv:1509.08010).
13. E. H. El Abdalaoui, J. Kułaga-Przymus, M. Lemańczyk, T. de la Rue, The Chowla and the Sarnak conjectures from ergodic theory point of view, Discrete and Continuous Dynamical Systems - Series A (2017) 37 (6), Pages 2899-2944 (arXiv:1410.1673).
12. S. Ferenczi, J. Kułaga-Przymus, M. Lemańczyk, C. Mauduit, Substitutions and Möbius disjointness, in Ergodic Theory, Dynamical Systems, and the Continuing Influence of John C. Oxtoby, Contemporary Mathematics (2016) 678, Pages 151-173 (arXiv:1507.01123).
11. J. Kułaga-Przymus, M. Lemańczyk, B. Weiss, Hereditary subshifts whose simplex of invariant measures is Poulsen, in Ergodic Theory, Dynamical Systems, and the Continuing Influence of John C. Oxtoby, Contemporary Mathematics (2016) 678, Pages 245-253 (arXiv:1507.00714).
10. A. Kanigowski, J. Kułaga-Przymus, Ratner's property and mild mixing for smooth flows on surfaces, Ergodic Theory and Dynamical Systems, Ergodic Theory and Dynamical Systems (2016) 36 (8), Pages 2512-2537 (arXiv:1409.2987).
9. J. Kułaga-Przymus, M. Lemańczyk, The Möbius function and continuous extensions of rotations, Monatshefte für Mathematik (2015) 178, Pages 553–582 (arXiv:1310.2546).
8. J. Kułaga-Przymus, M. Lemańczyk and B. Weiss, On invariant measures for B-free systems, Proc. London Math. Soc. (2015) 110 (6), Pages 1435-1474 (arXiv:1406.3745).
7. J. Kułaga-Przymus, On embeddability of automorphisms into measurable flows from the point of view of self-joining properties, Fund. Math. 230 (2015), Pages 15-76 (extended version: arXiv:1304.2893).
6. K. Frączek, J. Kułaga-Przymus, M. Lemańczyk, Non-reversibility and self-joinings of higher orders for ergodic flows, Journal d'Analyse Mathematique 122 (2014), Pages 163–227 (arXiv:1206.3053).
5. J. Kułaga-Przymus, On the strong convolution singularity property, Ergodic Theory and Dynamical Systems Proceedings of the Ergodic Theory Workshops at University of North Carolina at Chapel Hill, 2011-2012, Walter de Gruyter (2013), Pages 139-195 (arXiv:1211.4007).
4. K. Frączek, J. Kułaga, M. Lemańczyk, On the self-similarity problem for Gaussian-Kronecker flows, Proc. Amer. Math. Soc. 141 (2013) Pages 4275-4291 (arXiv:1201.5733).
3. J. Kułaga-Przymus, F. Parreau, Disjointness properties for Cartesian products of weakly mixing systems, Colloquium Mathematicum: Volume 128, Issue 2 (2012), Pages 153-177 (arXiv:1112.5545).
2. J. Kułaga, A note on the isomorphism of Cartesian products of ergodic flows, Journal of Dynamical and Control Systems: Volume 18, Issue 2 (2012), Pages 247-267 (arXiv:1101.4975).
1. J. Kułaga, On the self-similarity problem for smooth flows on orientable surfaces, Ergodic Theory and Dynamical Systems: Volume 32, Issue 5 (2012), Pages 1615-1660 (arXiv:1011.6166).

PREPRINTS

- A. Bartnicka, J. Kułaga-Przymus, $\mathfrak{B}$-free integers in number fields and dynamics (arXiv:1507.00855).

Conference materials

- J. Kułaga-Przymus, Recurrence for Hardy sequences, Oberwolfach Reports (Report No. 50/2012, Arbeitsgemeinschaft: Ergodic Theory and Combinatorial Number Theory)

Research visits

- 06.09-12.09.2015, Royal Institute of Technology, Stockholm, Sweden [Danijela Damjanovic] (**seminar talk**).
- 27.02-1.03.2015, University of Crete, Greece [Nikos Frantzikinakis] (**seminar talk**).
- 16-19.11.2014, University of Bristol, Great Britain [Corinna Ulcigrai].
- 21-27.09.2014, University of Rouen, France [Thierry de la Rue].
- 1-7.12.2013, University of Rouen, France [Thierry de la Rue] (**seminar talk**).
- 6-12.05.2012, Universités Pierre et Marie Curie et Denis Diderot, Paris, France [Jean-Paul Thouvenot] (**seminar talk**).
- 27.05-4.06.2011, Ben-Gurion University of the Negev, Izrael [Barak Weiss] (**seminar talk**).
- 20-27.05.2011, Tel Aviv University, Izrael [Jon Aaronson] (**seminar talk**).
- 27.11-4.12.2009, Université Paris XIII, France [François Parreau] (**seminar talk**).
- 18-25.05.2009, Université de Tours, France [Emmanuel Lesigne] (**seminar talk**).
- 15-20.03.2009, University of Bristol, Great Britain [Corinna Ulcigrai].

Conferences, workshops, schools

Conferences

- 27.02-3.03.2017, Random Matrices and Determinantal Process, CIRM, Luminy, France.
- 13-17.02.2017, Teichmüller Space, Polygonal Billiard, Interval Exchanges, CIRM, Luminy, France.
- 12-16.12.2016, Ergodic Theory and its Connections with Arithmetic and Combinatorics, CIRM, Luminy, France.
- 17-21.10.2016, Applications of Ergodic Theory in Number Theory, CIRM, Luminy, France.
- 17-20.09.2014, Joint Meeting of the German Mathematical Society (DMV) and the Polish Mathematical Society (PTM), Poznań, Poland (**talk**).
- 12-16.05.2014, Ergodic Theory and Dynamical Systems, Toruń, Poland.
- 16.09-18.09.2013, 5. Forum Matematyków Polskich, Rzeszów, Poland (**talk**).
- 1.09-5.09.2013, 5th Visegrad Conference on Dynamical Systems, Olsztyn, Poland (**talk**).
- 28.05-1.06.2013, International Conference Beyond Uniform Hyperbolicity, Będlewo, Poland.
- 15-20.05.2011, Ergodic Theorems, Group Actions and Applications, Eilat, Israel.
- 3.10-10.10.2010, Spectral Theory of Dynamical Systems, Warsaw, Poland (**talk**).
- 22-27.11.2009, Progress in Dynamics, Paris, France.
- 6.09.-13.09.2009, Dynamical Systems Jeseniky 2009, Kouty nad Desnou, Czech Republic (**talk**).
- 22-26.06.2009, Dynamics and Geometry of Teichmüller Space, Marseille, France.
- 23-29.05.2009, Dynamical Systems Meeting Trzebieszowice, Poland.

Workshops/schools

- 6-10.02.2017, Homogeneous Spaces, Diophantine Approximation and Stationary Measures (CNRS Thematic School), CIRM, Luminy, France.
- 30.01-3.02.2017, New Advances in Symbolic Dynamics (CNRS Thematic School), CIRM, Luminy, France.
- 05-09.12.2016, Ergodic Theory and Möbius Disjointness, CIRM, Luminy, France (**talk**).
- 10-14.10.2016, Spectral Theory of Dynamical Systems and Related Topics, CIRM, Luminy, France.
- 30.06-4.07.2014, "Workshop on Tiling Dynamical Systems", Bielefeld University, Bielefeld, Germany (**talk**).
- 31.03-4.04.2014, Easter School 2014 "Dynamics and Analytic Number Theory", Durham, England.
- 9-15.02.2014, Workshop "Prime numbers: new perspectives", CIRM, Luminy, France (**talk**).
- 18.09-21.09.2013, XVI International Workshop for Young Mathematicians "Ergodic Theory and Dynamical Systems", Kraków, Poland.
- 21-24.03.2013, A workshop in Ergodic Theory and Dynamical Systems, Chapel Hill, USA (**talk**).
- 7-13.10.2012, Arbeitsgemeinschaft mit aktuellem Thema: Ergodic theory and combinatorial number theory, Mathematisches Forschungsinsitut Oberwolfach, Germany (**talk**).
- 22-25.03.2012, A workshop in Ergodic Theory and Dynamical Systems, Chapel Hill, USA (**talk**).
- 26.06-17.07.2011, Summer School "Modern Dynamics and its Interaction with Analysis, Geometry and Number Theory", Będlewo, Poland.
- 5-8.05.2011, Spring School of Dynamical Systems, Będlewo, Poland.
- 30.04-3.05.2010, Spring School of Dynamical Systems, Będlewo, Poland.
- 23.01-6.02.2010, School "Periodic Approximation in Dynamics", Pisa, Italy.
- 12-26.07.2009, Summer School on Dynamical Systems, Göttingen, Germany.
- 7-13.06.2009, Workshop of 12th Internet Seminar, Ergodic Theory: an Operator-Theoretic Approach, Blaubeuren, Germany (**talk**).
- 30.04-3.05.2009, Spring School of Dynamical Systems, Będlewo, Poland (**talk**).
- 23.04.2009, Ergodic Theory Day, Toruń, Poland.
- 21-25.07.2008, Summer School in Dynamical Systems, Coimbra, Portugal (**short communication**).
- 6-19.07.2008, Summer School: Geometric Structures and Rigidity, Będlewo, Poland.
- 30.04-4.05.2008, Spring School of Dynamical Systems, Będlewo, Poland.
- 16-22.09 2007, X International Workshop for Young Mathematicians "Combinatorics", Kraków, Poland.
- 19-22.04.2007, Spring School of Dynamical Systems, Będlewo, Poland.
- 17-23.09.2006, IX International Workshop for Young Mathematicians "Topology", Kraków, Poland.
- 28.04-01.05.2006, Spring School of Dynamical Systems, Będlewo, Poland.
- 18.03.2006, Pomorskie Warsztaty Kół Matematycznych, Gdańsk, Poland.

Other

- 11.04.2014, Young Researchers Colloquium, IMPAN, Warsaw, Poland (**talk**).

Grants

15-19.05.2017, Research in Pairs grant Sarnak's conjecture – what's new?, CIRM, Luminy, France (**team member**).

2016-2020, European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement No 647133 (ICHAOS)) (**team member**, February-July 2017).

2015-2018, Teoria ergodyczna: rozłączność, typowość poprzez niekonwencjonalne twierdzenia ergodyczne oraz związki z teorią liczb, NCN grant UMO-2014/15/B/ST1/03736 (**team member**).

2011-2015, Własności ergodyczne i spektralne układów dynamicznych na powierzchniach i zagadnienia pokrewne, NCN grant 2011/03/B/ST1/00407 (**team member**)

2008-2011, Teoria ergodyczna układów miarowych, topologicznych i różniczkowych, MNiSW grant N N201 384834 (**team member**)

Teaching

Student advising: co-advisor of A. Kanigowski (PhD obtained in 2015, *Ergodic properties of smooth flows on surfaces*), co-advisor of A. Dymek (PhD expected in 2020).

Tutorials: Linear Algebra with Geometry (2017/18), Mathematical Analysis I (2011/12, 2012/13, 2017/18), Elementary Mathematics (2010/11-2012/13), Complex Analysis (2008/09, 2017/18).
5-week practical teaching training at Zespół Szkół Muzycznych w Toruniu – elementary school and middle school (2006).

Honors and awards

- Special prize of PTKM (Association of Polish Women in Mathematics) in the competition for the prize of Edyta Szymańska, 2019.
- START scholarship for young researchers (with a distinction), founded by FNP (Foundation for Polish Science), 2017.
- Kazimierz Kuratowski Award for mathematicians under 30 (Polish Academy of Sciences and Polish Mathematical Society), 2015.
- Prize for young mathematicians (Polish Mathematical Society), 2012.
- Distinction in the competition "The International Stefan Banach Prize for a Doctoral Dissertation in the Mathematical Sciences", 2013.
- Polish Prime Minister Award for PhD Thesis, 2012.
- Kuyavian-Pomeranian Voivodeship Marshall Scholarship for Ph.D students, 2008/2009.
- Best Alumnus Award of Nicolaus Copernicus University in Toruń, Poland in the year 2007/2008.
- Best Alumnus of Faculty of Mathematics and Computer Science of Nicolaus Copernicus University in Toruń, Poland in the academic year 2008/2008.
- Scholarships of the Minister of Science and High Education in academic years 2005/2006, 2006/2007 and 2007/2008.
- Scholarship of GFPS-Polska for a Polish-German language course Tandem, 29.07 - 26.08.2006.
- Finalist of Polish Mathemathical Olympiad, 2003.

Professional activities

- 2016-2019, Jury Member of the Kazimierz Kuratowski Award, (deputy chairwoman in 2018, chairwoman in 2019).
- Member of the scientific committee:
  - Ergodic Theory and Möbius Disjointness, CIRM, Luminy, Francja, 5-9.12.2016.
  - Spectral Theory of Dynamical Systems and Related Topics, 10-14.10.2016.
- Member of the organizing committee:
  - Ergodic aspects of modern dynamics, Będlewo, Poland, 10-16.06.2018.
  - Ergodic Theory and its Connections with Arithmetic and Combinatorics, CIRM, Luminy, Francja, 12-16.12.2016.

  - Ergodic Theory and Möbius Disjointness, CIRM, Luminy, Francja, 5-9.12.2016.
  - Applications of Ergodic Theory in Number Theory, CIRM, Luminy, Francja, 17-21.10.2016.
  - Spectral Theory of Dynamical Systems and Related Topics, 10-14.10.2016.
  - Simons semester workshops *Ergodic Theory and Dynamical Systems* and *Translation Surfaces and Dynamics*, Będlewo, Poland, 22-27.11.2015.
  - Conference Ergodic Theory and Dynamical Systems, Toruń, Poland, 12-16.05.2014.
  - Workshop IV Matematyczne Warsztaty KaeNeMów: Z Mikołajem w tle, Toruń, Poland, 15–16.12.2007.
  - Workshop II Matematyczne Warsztaty KaeNeMów, Toruń, Poland, 25–26.11.2006.
- Co-organization of a series of lectures (6-11 hours) of visiting professors at Nicolaus Copernicus University in Toruń: Jerzy Kaczorowski (2015), Jon Aaronson (2014), Alexandre Danilenko (2013), Jean-Paul Thouvenot (2012).
- 2010/2011, member of PhD Students' Union of NCU Board.
- 08.2006–08.2007, internship in GFPS-Polska (co-organizer of a Polish-German language course Tandem).
- 2005–2008, active member of Student Mathematical Society of the Nicolaus Copernicus University (among others co-author of two talks given during Toruń Festival of Science and Art in 2007 and 2008, co-organizer of lectures on history of mathematics).

Professional memberships

- Polish Mathematical Society.

Languages

Polish (native), English (fluent), German (fluent), French (intermediate), Russian (basic).

Last update: May 31, 2019