

Polona Durcik

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Research interests: Harmonic analysis and its connections with ergodic theory, arithmetic combinatorics and PDE.

Employment

2017/09–now Harry Bateman Instructor, California Institute of Technology, CA, USA

Education

2017/07 Ph.D. Mathematics, University of Bonn, Germany
Advisor: Christoph Thiele
2014/02 M.Sc. Mathematics, University of Bonn, Germany
2011/09 B.Sc. Mathematics, University of Ljubljana, Slovenia

Publications and preprints

11. (with L. Cladek, B. Krause, J. Madrid) *Directional maximal function along the primes*, preprint (2019). arXiv:1909.13319.
10. (with C. Thiele) *Singular Brascamp-Lieb: a survey*, (2019), submitted to Proceedings of Geometric Aspects of Harmonic Analysis. arXiv:1904.08844.
9. (with J. Roos) *Averages of simplex Hilbert transforms*, preprint (2018), submitted. arXiv:1812.11701.
8. (with V. Kovač) *Boxes, extended boxes, and sets of positive upper density in the Euclidean space*, preprint (2018), submitted. arXiv:1809.08692.
7. (with C. Thiele) *Singular Brascamp-Lieb inequalities*, preprint (2018), submitted. arXiv:1809.08688.
6. (with S. Guo and J. Roos) *A polynomial Roth theorem on the real line*, Trans. Amer. Math. Soc. 371 (2019), no. 10, 6973-6993.
5. (with V. Kovač and L. Rimanić) *On side lengths of corners in positive density subsets of the Euclidean space*, Int. Math. Res. Not. 2018, no. 22, 6844-6869.
4. (with V. Kovač and C. Thiele) *Power-type cancellation for the simplex Hilbert transform*, accepted for publication in J. Anal. Math. (2016).
3. (with V. Kovač, K. A. Škreb and C. Thiele) *Norm-variation of ergodic averages with respect to two commuting transformations*, Ergodic Theory Dynam. Systems 39 (2019), no. 3, 658-688.
2. *L^p estimates for a singular entangled quadrilinear form*, Trans. Amer. Math. Soc. 369 (2017), no. 10, 6935-6951.
1. *An L^4 estimate for a singular entangled quadrilinear form*, Math. Res. Lett. 22 (2015), no. 5, 1317-1332.

Talks

Invited talks (seminars and conferences)

- 2020/03 (upcoming) AMS sectional meeting, special session 'Recent Advances in Harmonic Analysis', University of Virginia, VA.
- 2020/01 (upcoming) AMS Joint Mathematics Meeting, special session 'The Interplay of Harmonic Analysis and Geometry', Denver, CO.
- 2019/11 (upcoming) Analysis seminar, Georgia Tech, GA.
- 2019/10 (upcoming) Analysis seminar, IU Bloomington, IN.
- 2019/09 Colloquium, CSU Fullerton, CA.
- 2019/09 AMS sectional meeting, special session 'Recent Developments in Harmonic Analysis', Madison, WI.
- 2019/09 PANTHA seminar, Purdue University, IN.
- 2019/07 Analysis seminar, University of Nantes, France.
- 2019/07 Analysis seminar, ICTP, Trieste, Italy.
- 2019/05 RTG Workshop in Fourier Analysis, Madison, WI.
- 2019/04 Analysis and PDE seminar, USC, CA.
- 2019/02 Analysis seminar, UC Irvine, CA.
- 2018/11 Graduate Seminar on Advanced Topics in PDE, Univ. of Bonn, Germany.
- 2018/10 Analysis seminar, UW Madison, WI.
- 2018/09 Analysis seminar, Cornell, Ithaca, NY.
- 2018/05 RTG Workshop in Fourier Analysis, Madison, WI.
- 2017/11 Analysis Seminar, UNM, Albuquerque, NM.
- 2017/10 Caltech/UCLA Joint Analysis Seminar, Caltech, CA.
- 2017/09 Harmonic Analysis and Related Areas, Clay Research Workshop, Oxford, UK.
- 2017/07 Real Analysis, Harmonic Analysis, and Applications, Oberwolfach, Germany.
- 2017/06 Workshop on harmonic analysis, The Chinese University of Hong Kong.
- 2017/05 Seminar for Complex Analysis, University of Ljubljana, Slovenia.
- 2017/03 Atelier d'Analyse Harmonique, Nantes, France.
- 2017/02 Harmonic Analysis and Differential equations seminar, UC Berkeley, CA.
- 2017/01 Analysis and PDE seminar, UCLA, CA.
- 2017/01 Analysis and PDE seminar, USC, CA.
- 2017/01 Harmonic Analysis seminar, University of British Columbia, Canada.
- 2016/12 Graduate Seminar on Advanced Topics in PDE, Univ. of Bonn, Germany.
- 2016/04 Real Analysis seminar, Paul Sabatier University, Toulouse, France.
- 2016/02 Probability seminar, University of Zagreb, Croatia.
- 2015/11 Graduate Seminar on Advanced Topics in PDE, Univ. of Bonn, Germany.

Contributed conference talks and posters

- 2019/09 Women in Mathematics in Southern California, CSU Channel Islands, CA. (talk)
- 2016/08 Conference Harmonic Analysis, Complex Analysis, Spectral Theory and all that, Bedlewo, Poland. (talk)
- 2016/05 Conference in Harmonic Analysis in honor of M. Christ, Madison, WI. (poster)

Teaching experience

Instructor at Caltech

Spring 2020	Ma 110c (Analysis)
Winter 2020	Ma 108b (Classical Analysis) Ma 191b (Topics)
Spring 2019	Ma 110c (Analysis)
Winter 2019	Ma 108b (Classical Analysis) Ma/CS 6b (Introduction to Discrete Mathematics)
Fall 2018	Ma 098 (Individual reading course)
Spring 2018	Ma 191c (Topics in Harmonic Analysis)
Winter 2018	Ma 108b (Classical Analysis) Ma/CS 6b (Introduction to Discrete Mathematics)

Teaching assistant at the University of Bonn

2013–14 WT	Mathematics for Geoscientists
2013 ST	Analysis for Computer Scientists
2012–13 WT	Linear Algebra I

Awards

- AMS–Simons travel grant, 2018–2020
- DAAD–MZO bilateral grant: Multilinear singular integrals and applications; joint with V. Kovač, J. Rupčić, K. A. Škreb, C. Thiele, 2017
- Hausdorff scholarship; doctoral scholarship by Bonn International Graduate School of Mathematics, 2014–2017
- Zois scholarship; Slovenian national merit scholarship, 2008–2014

Community and outreach

Seminars and conferences organized

- Coorganizer of Caltech/UCLA joint Analysis seminar, joint with L. Cladek. Winter 2018 – now.
- Coorganizer of the conference "Young Women in Harmonic Analysis and PDE", joint with L. Onkes. Bonn, 12/2016.
- Coorganizer of the Basic Notions seminar, joint with J. Roos, M. Sauerwein, C. Stroppel. University of Bonn, WT 2014–15 and ST 2015.

Other activities

- Panel discussion with S.M.A.R.T. Girls club. CSU Fullerton, 09/2019.
- Associate mentor to two summer undergraduate research projects. Caltech, 2018 and 2019.
- Category Award judge at California Science and Engineering Fair 2019. Los Angeles, CA, 04/2019.
- Talks in Math 20 – Frontiers in Mathematics (seminar to present research at an introductory level to first year students). Caltech, 11/2017 and 12/2018.

Other summer schools and conferences attended

- 2020/07 (upcoming) Real Analysis, Harmonic Analysis, and Applications, Oberwolfach, Germany.
- 2020/07 (upcoming) European Mathematical Congress, Portorož, Slovenia.
- 2020/05 (upcoming) Restriction, Keakeya, and Carleson-Type Problems, Banff, AB, Canada.
- 2019/05 Madison Lectures in Fourier Analysis, Madison, WI.
- 2018/06 Geometric Aspects of Harmonic Analysis, on the occasion of Fulvio Ricci's 70th birthday, Cortona, Italy.
- 2017/07 Harmonic analysis and its interactions: in honour of Tony Carbery, The University of Edinburgh, UK.
- 2017/01-02 MSRI program in Harmonic Analysis, Berkeley, CA.
Introductory Workshop and Connections for women: Harmonic Analysis.
- 2016/09 Summer school "Paraproducts and Analysis of Rough Paths", Kopp, Germany. (Gave an expository talk.)
- 2016/06 Summer school "Harmonic Analysis at its boundaries", Nantes, France.
- 2016/06 6th Croatian Mathematical Congress, Zagreb, Croatia.
- 2016/05 Analysis and beyond: Celebrating Jean Bourgain's Work and Impact, IAS Princeton, NJ.
- 2015/09 Summer school "Sharp Inequalities in Harmonic Analysis", Kopp, Germany. (Gave an expository talk.)
- 2015/06 Joint international meeting of the AMS, EMS and SPM, Porto, Portugal.
- 2015/06 Frontiers of singular integrals, Helsinki, Finland.
- 2015/01 Workshop on Harmonic Analysis, PDE and Geometric Measure Theory, ICMAT, Madrid, Spain.
- 2014/08 Summer school "Dyadic Harmonic Analysis and Related topics", Santander, Spain.
- 2014/05 Summer school "Carleson theorems and Radon type behaviour", Bonn, Germany. (Gave an expository talk.)
- 2013/07 Summer school "T(1) and T(b) theorems and applications", Kopp, Germany. (Gave an expository talk.)

Date: September 30, 2019