Curriculum vitae

Alexander Reznikov

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Contact information

Name : Alexander Reznikov
Address: 1527 Stevenson Center, Department of Mathematics, Vanderbilt University, Nashville, TN, 37240
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Scientific degrees

Ph.D. in Mathematics, Michigan State University, in 2014
Adviser: Alexander Volberg
Topic of Thesis: Weighted norm inequalities for Calderòn-Zygmund Operators.

Diploma of Mathematician with honor (Masters Degree); obtained from St.-Petersburg State University, Russia in 2009
Adviser: V. P. Havin
Topic of Master Thesis: On sharp constants in the Paneyah–Logvinenko–Sereda theorem.

Personal data

Born on January 30, 1988

Employment

2008-2009 - **Teaching Assistant in St.-Petersburg State University, Russia**
2009-2014 - **Graduate student and TA in Michigan State University, MI, USA (advisor: A. Volberg)**
2014-present - **Assistant Professor (NTT) in Vanderbilt University, Nashville, TN**

Principal fields of interest

Sharp constants in inequalities concerning Uncertainty Principle in Harmonic Analysis; attainability of infima in Sobolev embedding theorems.
Application of Bellman function method for problems in Harmonic Analysis;
Norm estimates for Calderon-Zygmund operators in one measure and two measures setting; two weight norm estmates of Calderón-Zygmund operators; non-homogeneous harmonic analysis and harmonic analysis on metric spaces;
Riesz energy, minimizing configurations; Riesz polarization, covering radius and separation of extreme configurations.

Service and Review

Organized

- Math Circle for school students at Vanderbilt;
- Spesial Session on the Joint AMS Meeting 2017: "Women in harmonic analysis: in honor of Cora Sadosky".

Reviewer for

- St. Petersburg Mathematical Journal;
- Proceedings El Escorial 2012;
- Publicacions Matemàtiques;
- Proceedings of AMS;
- Canadian Mathematical Bulletin;
- Monatshefte für Mathematik;
- Springer Volume in Honor to Cora Sadosky;
- Math Reviews.

Papers

Published and accepted papers

1. Nazarov, A. I.; Reznikov, A. B. **On the existence of an extremal function in critical Sobolev trace embedding theorem** J. Funct. Anal. 258 (2010), no. 11, 3906–3921;
2. Nazarov A., Reznikov A., **Attainability of infima in the critical Sobolev trace embedding theorem on manifolds** — American Mathematical Society Translations–Series 2 Advances in the Mathematical Sciences 2010; 252 pp; hardcover Volume: 229;
3. Reznikov, Alexander **Sharp constants in the Paneyah-Logvinenko-Sereda theorem** C. R. Math. Acad. Sci. Paris 348 (2010), no. 3-4, 141–144;
4. Reznikov, Alexander **Sharp weak type estimates for weights in the class** A_{p_1,p_2}, Rev. Mat. Iberoam. **29** (2013), no. 2, 433–478; doi 10.4171/rmi/726; arXiv:1105.4848v1;
5. Nazarov F., Reznikov A., Volberg A. **The proof of** A_2 **conjecture in a geometrically doubling metric space**, Indiana Univ. Math. J. **62** (2013), no. 5, 1503–1533; arXiv:1106.1342;
6. Nazarov, F., Reznikov, A., Treil, S., Volberg, A. **A Bellman function proof of the** L^2 **bump conjecture**, J. Anal. Math. **121** (2013), 255–277 arXiv:1202.2406;
7. Beznosova O., Reznikov A. **Equivalent definitions of dyadic Muckenhoupt and Reverse Hölder classes in terms of Carleson sequences, weak classes, and comparability of dyadic** $L \log L$ **and** A_∞ **constants**, Rev. Mat. Iberoam. **30** (2014), no. 4, 1191–1236; arXiv:1201.0520;
8. Rey G., Reznikov A., **Extremizers and sharp weak-type estimates for positive dyadic shifts**, Adv. Math. **254** (2014), 706–729; arXiv:1311.2046;
9. Cruz-Uribe D., Reznikov A., Volberg A. **Logarithmic bump conditions and the two weight boundedness of Calderón-Zygmund operators**, Adv. Math. **255** (2014), 706–729; arXiv:1112.0676;

10. Beznosova O., Reznikov A. **Sharp estimates involving A_∞ and $L \log L$ constants, and their applications to PDE**, St. Petersburg Math. J. **26** (2015), no. 1, 27–47 arXiv:1107.1885;

11. Eiderman V., Reznikov A., Volberg V., **Almost-additivity of analytic capacity and Cauchy independent measures**, arXiv:1401.0407; accepted to Journal d'Analyse Mathematique;

12. Reznikov A., Saff E. B. **The covering radius of randomly distributed points on a manifold**, arXiv:1504.03029; accepted to International Math Research Notices.

13. Brauchart J.S., Reznikov A.B., Saff E.B., Sloan I.H., Wang, Y.G., Womersley R.S. **Random Point Sets on the Sphere — Hole Radii, Covering, and Separation**, arXiv:1512.07470, accepted to Experimental Mathematics.

14. Reznikov A., Saff E.B., Vlasiuk O.V. **A minimum principle for potentials with application to Chebyshev constants**, arxiv:1607.07283, submitted to Potential Analysis.

15. Borodachov S.V., Hardin D.P., Reznikov A., Saff E.B. **Optimal discrete measures for Riesz potentials**, arXiv:1606.04128, submitted to Transactions of AMS.

Preprints

16. Reznikov A., Vasyunin V., Volberg A. **An observation: cut-off of the weight w does not increase the A_{p_1,p_2}-"norm" of** w arXiv:1008.3635;

17. Nazarov F., Reznikov A., Vasyunin V., Volberg V. **A Bellman function counterexample to the A_1 conjecture: the blow-up of the weak norm estimates of weighted singular operators**, 2010, arXiv:1506.04710;

18. Reznikov A., Treil S., Volberg A. **A sharp estimate of weighted dyadic shifts of complexity 0 and 1**, arXiv:1104.5347;

19. Reznikov A., Volberg A. **Random "dyadic" lattice in geometrically doubling metric space and A_2 conjecture**, arXiv:1103.5246;

20. Nazarov, F., Reznikov, A., Treil, S., Volberg, A. **Carleson–Buckley measures beyond the scope of A_∞ and their applications**, arXiv:1202.2931;

21. Nazarov F., Reznikov A., Volberg A. **Bellman approach to the one-sided bumping for weighted estimates of Calderón–Zygmund operators**, arXiv:1306.2653.

Talks

1. Mathematics seminar in the University of Seville, 2010
   Topic: Bellman Function and distribution function for A_{p_1,p_2}-weights. Methods of finding the Bellman Function using Monge-Ampère equation.

2. 19th Summer St. Petersburg Meeting in Mathematical Analysis, 2010
   Topic: Bellman Function and distribution function for A_{p_1,p_2}-weights.

3. SUMMER/FALL SCHOOL Weighted estimates for singular integrals , 2010
   Topic: The Bellman function, the two-weight Hilbert Transform, and embedding of the model spaces K_θ. (After paper by F. Nazarov and A. Volberg)

4. Analysis and PDE seminar in Michigan State University, 2010
   Topic: Properties of A_{p_1,p_2}-weights: sharp estimates via Bellman Function.

5. Sectional AMS meeting, Southern Georgia, 2010
   Topic: Solution of the A_1 conjecture and estimates of the related Bellman Function.

6. Analysis and PDE seminar in Michigan State University, 2011
   Topic: A_1 conjecture: solution and relation to the A_p conjecture.

7. Workshop in Harmonic Analysis, Metric Spaces and Applications to PDE, Seville, Spain, 2011
   Topic: A_2 conjecture in a geometrically doubling metric spaces: taking care of the main difficulty.

8. IWOTA 2011, Seville, Spain, 2011
   Topic: Solution of the A_1 conjecture.

9. Colloquium at Baylor University, Waco, Texas, 2011
   Topic: A_2 conjecture in a geometrically doubling metric space: an overview of weighted estimates on Euclidian spaces, and main difficulties in the metric setting.

10. St.-Petersburg Seminar "Operator Theory and Theory of Functions", Russia, 2012
    Topic: Calderon-Zygmund operators in non-homogeneous setting, and the A_2-conjecture.

11. Harmonic analysis meeting in Toulouse, France, 2012
    Topic: Separated bump conjecture and boundedness of Calderon-Zygmund operators.

12. 21st Summer St. Petersburg Meeting in Mathematical Analysis, Russia, 2012
    Topic: Bump conditions, two weight Muckenhoupt conjecture and its weak version.

13. Analysis and PDE seminar in Michigan State University, 2012
    Topic: Bump Conjecture and how to stop the time properly.

14. Measure theory seminar in Kent State University, 2012
    Topic: Bump conjecture for Calderon-Zygmund operators, part 1.

15. Measure theory seminar in Kent State University, 2012
    Topic: Bump conjecture for Calderon-Zygmund operators, part 2.

16. Analysis Seminar in Georgia Tech, 2013
    Topic: One sided bump conditions and two weight boundedness of Calderon-Zygmund operators.

17. The Third Ohio River Analysis Meeting, 2013
    Topic: One sided bump conditions and weak and strong two weight boundedness of Calderón-Zygmund operators.

18. Analysis Seminar in St. Petersburg Department of V.A.Steklov Institute of Mathematics, 2013
    Topic: Two weight estimates for Calderón-Zygmund operators, and the one-sided bump conjecture.

19. Analysis Seminar in University of Missoury, 2013
    Topic: Solution to the A_1 conjecture.

20. Calderón-Zygmund Analysis Seminar in University of Chicago, 2013
    Topic: Solution to the A_1 conjecture.

21. Analysis Seminar in University of Rochester, 2014
    Topic: Solution to the A_1 conjecture.

22. Colloquium in University of Alabama, 2014
    Topic: Covering Properties of Random Points.

23. The Fifth Ohio River Analysis Meeting, 2015
    Topic: Covering properties of random points.

24. Midwestern Workshop on Asymptotic Analysis, 2015
Topic: Covering properties of random points (slides available at `http://math.iupui.edu/~maxyatts/workshop/Slides/reznikov.pdf`).

25. AMS sectional meeting in Athens, GA, 2016
Topic: Asymptotics of maximal discrete polarization on the unit cube.

26. Discrepancy meeting at Villa Cipressi in Varenna, Italy, 2016
Topic: Discretizing sets via maximal discrete polarization.

27. 12th International Conference on Monte Carlo and Quasi-Monte Carlo Methods in Scientific Computing, 2016
Topic: Covering Radii of Various Point Configurations Distributed over the Unit Sphere.

28. Prairie Analysis Seminar, 2016
Topic: Distributing points over a manifold via maximal discrete polarization.

29. Analysis Seminar at Georgia Tech, 2016
Topic: Weak limits of optimal discrete measures for Riesz potentials.

30. Analysis Seminar at Michigan State University, 2016
Topic: Discretizing manifolds via discrete Riesz polarization.

Awards

Academic awards

1. First "Young mathematician prize", awarded by St.Petersburg Department of V.A.Steklov Institute of Mathematics of the Russian Academy of Sciences.

2. Herbert T. Graham Scholarship Award, Michigan State University.

Teaching awards

3. Graduate Teaching Assistant Award, Michigan State University.