

Paata Ivanisvili

Curriculum Vitae

Employment

- 2017 – **Postdoctoral Researcher**, *Princeton University*, Algorithms & Geometry.
Fall 2017 **Postdoctoral Fellow**, *Mathematical Sciences Research Institute (MSRI)*.
Geometric Functional Analysis and Applications
Summer 2017 **Postdoctoral Researcher**, *Kent State University (KSU)*.
Spring 2017 **Postdoctoral Fellow**, *MSRI*.
Harmonic Analysis.
2015-2016 **Postdoctoral Researcher**, *KSU*.
2011-2013 **Research Engineer**, *Chebyshev Laboratory at Saint Petersburg State University*,
Russia.

Visiting positions

- Summer 2014 **Hausdorff Research Institute for Mathematics**, *Bonn, Germany*.
Visiting scholar position.

Education

- 2013-2015 **Ph.D.**, *Michigan State University (MSU)*, Mathematics.
2011-2014 **Ph.D.**, *Saint Petersburg State University*, Mathematics.
2006-2011 **B.S., M.S.**, *Saint Petersburg State University*, Mathematics.
Diploma with honor.

Research interests

Analysis, PDE, probability and geometry.

Publications

1. **Correction up to a function with sparse spectrum and uniformly convergent Fourier series**, with *S. Kislyakov*.
Journal of Mathematical Sciences, Vol 172, 2, pp. 195–206, (2011).
2. **On Bellman function for extremal problems in BMO**, with *N. N. Osipov*,
D. M. Stolyarov, *V. I. Vasyunin* and *P. B. Zatitskiy*.
Comptes Rendus Mathematique, Vol. 350, 11-12, pp. 561–564 (2012).
3. **J-closed finite collections of Hardy-type subspaces**.
Journal of Mathematical Sciences, Vol 194, 6, pp. 645–650 (2013).

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4. **Sharp estimates of integral functionals on classes of functions with small mean oscillation**, with *N. N. Osipov, D. M. Stolyarov, V. I. Vasyunin and P. B. Zatitskiy*.
Comptes Rendus Mathematique, Vol. 353, 12, pp. 1081–1085 (2015)
5. **Hessian of Bellman functions and uniqueness of Brascamp–Lieb inequality**, with *A. Volberg*.
J. London Math. Soc., Vol. 92, 3, pp. 657–674 (2015).
6. **Inequality for Burkholder’s martingale transform**.
Analysis & PDE, Vol. 8, No. 4, pp. 765–806 (2015).
7. **Bellman VS Beurling: sharp estimates of uniform convexity for L_p spaces**, with *P. B. Zatitskiy and D. M. Stolyarov*.
St. Petersburg Math. J., Vol. 27, pp. 333–343 (2016).
8. **Bellman function for extremal problems in BMO**, with *N. N. Osipov, D. M. Stolyarov, V. I. Vasyunin and P. B. Zatitskiy*.
Trans. Amer. Math. Soc., Vol. 368, pp. 3415–3468 (2016).
9. **Bellman function for extremal problems in BMO II: evolution**, with *D. Stolyarov, V. Vasyunin and P. Zatitskiy*.
127 pages, to appear *Memoirs of the AMS* (2016).
10. **Bellman function approach to the sharp constants in uniform convexity**.
Advances in Calculus of Variations, ISSN (Online) 1864–8266, ISSN (Print) 1864–8258,
DOI: <https://doi.org/10.1515/acv-2016-00008>
11. **Lower bounds for uncentered maximal function in any dimensions**, with *B. Jaye and F. Nazarov*.
Int. Math. Res. Notices, (2017) Vol. 8, pp. 2464–2479.
12. **Improving Beckner’s bound via Hermite functions**, with *A. Volberg*.
Analysis & PDE, Vol. 10 (2017), No. 4, 929–942
13. **On weak and strong sharp weighted estimates of square function**, with *F. Nazarov and A. Volberg*.
(2015) [preprint].
14. **Bellman partial differential equation and the hill property for classical isoperimetric problems**, with *A. Volberg*.
arXiv:1506.03409, (2015)
15. **Isoperimetric functional inequalities via the maximum principle: the exterior differential systems approach**, with *A. Volberg*, To appear in *Linear and Complex Analysis*, V. P. Havin volume.
arXiv:1511.06895, (2015)
16. **A bundling problem revisited**.
arXiv:1602.00983, (2016) [preprint].
17. **Boundary value problem and the Ehrhard inequality**.
arXiv:1605.04840, Accepted to *Studia Mathematica*.
18. **Poincaré inequality $3/2$ on the Hamming cube**, with *A. Volberg*.
arXiv:1608.04021, (2016)

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19. **On the failure of lower square function estimates in the non-homogeneous weighted setting**, with *K. Domelevo, S. Petermichl, S. Treil, A. Volberg*.
arXiv:1705.08376, (2017)
20. **Convolution estimates and number of disjoint partitions**.
The Electronic Journal of Combinatorics, Volume 24, Issue 2 (2017), Paper #P2.43
21. **Square function and the Hamming cube: duality**, with *F. Nazarov, A. Volberg*,
accepted to Discrete Analysis.
arXiv:1705.08529, (2017)
22. **From discrete flow of Beckner to continuous flow of Janson in complex hypercontractivity**, *A. Volberg*.
arXiv:1709.08095, (2017).
23. **The sharp constant in the weak (1,1) inequality for the square function: a new proof**, *I. Holmes, A. Volberg*.
arXiv:1710.01346 (2017)
24. **Hamming cube and martingales**, *F. Nazarov, , A. Volberg*.
Comptes Rendus Mathematique, Vol. 355, Iss. 10, (2017), pp. 1072–1076
25. **Superexponential estimates and weighted lower bounds for the square function**, with *S. Treil*.
arXiv:1711.07084 (2017)
26. **Martingale transform and Square function: some end-point weak weighted estimates**, with *A. Volberg*.
arXiv:1711.10578 (2017)
27. **Bobkov’s inequality via optimal control theory**, with *F. Barthe*.
arXiv:1712.04590 (2017)

Teaching experience

- Fall 2016 Analytic Geometry and Calculus III, KSU.
- Spring 2016 Analytic Geometry and Calculus I, KSU.
- Fall 2015 Linear Algebra with Applications, KSU.
- 2014-2015 Differential Equations, MSU.
- 2013-2014 Multivariable Calculus, MSU.

Talks

2017

- Apr. Mathematical Sciences Research Institute, HA Postdoc Seminar, “*Poincaré inequality $3/2$ on the Hamming cube*”
- Sep. Mathematical Sciences Research Institute, GFA Postdoc Seminar, “*A problem about clustering*”
- Sep. Mathematical Sciences Research Institute, GFA Young Researchers Seminar, “*Gaussian measures, sup-inf convolutions and Monge–Ampère equations*”

2016

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- Feb. University of Wisconsin-Madison, Analysis Seminar, *“Torsion, developable surfaces and BMO space”*
- Mar. AMS sectional meeting, Athens, GA, *“Isoperimetric functional inequalities via maximum principle: the exterior differential systems approach”*
- Jul. Texas A&M University, Workshop in Analysis and Probability, *“Improving Beckner’s bound via Hermite functions”*
- Sep. Michigan State University, Analysis and PDE Seminar, *“Boundary value problem and the Ehrhard inequality”*
- Sep. University of Missouri (2 talks). 1) Analysis Seminar, *“Lower bounds for uncentered maximal functions in any dimension”*. 2) Convex Geometry Seminar, *“Boundary value problem and the Ehrhard inequality”*
- Oct. The University of Akron, PDE and Applied mathematics seminar, *“Monge-Ampere type equations and their applications to functional isoperimetric inequalities”*

2015

- Jan. University of Helsinki, Analysis Seminar, *“Lerner’s inequality in high dimensions”*.
- Feb. Cincinnati, the 5th Ohio River Analysis Meeting, *“Lerner’s inequality in high dimensions”*.
- Apr. Chebyshev Laboratory at St. Petersburg State University, Russia, *“Lerner’s inequality in high dimensions”*.
- Sep. Kent State University, Measure Theory Seminar, *“Semigroups, maximum principles, and isoperimetric inequalities”* (series of talks).
- Nov. Kent State University, Measure Theory Seminar, *“The Gaussian correlation conjecture and related problems”*.

2014

- Jun. Hausdorff institute of mathematics, Trimester program in harmonic analysis and PDE, Germany, *“Bellman functions and Young’s inequality”*.
- Jun. XXIII St.Petersburg Summer Meeting in Mathematical Analysis, Russia, *“Burkholder’s martingale transform”*.
- Nov. Kent State University, Measure Theory Seminar, *“Minimal concave functions”* (series of talks).

2013

- Oct. SUMMER SCHOOL, Optimal Transport and Applications, UCLA, *“An Elementary Introduction to Monotone Transportation”* .
- Dec. Michigan State University, Analysis and PDE seminar, *“Brascamp–Lieb inequality and Bellman function”* .

2012

- Mar. Harmonic and Complex Analysis and its Applications, Tenerife, Canary Islands, *“Bellman function for extremal problems in BMO”* .

2011

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Jun. XX St.Petersburg Summer Meeting in Mathematical Analysis, Russia, “Geometrical evolution of the solution of homogeneous Monge–Ampère equation”.

Professional service

2015–present Reviewer for “*Israel Journal of Mathematics*”, “*Transactions of the AMS*”, “*Studia Mathematica*”, “*The IMA Volumes in Mathematics and its Applications*”, “*Journal of Functional Analysis*”, “*Journal d’Analyse Mathématique*”, “*Journal of Mathematical Analysis and Applications*”

2012 Organizer of seminars “Harmonic measure” and “Bellman function” at Chebyshev Laboratory, Saint Petersburg State University.

Languages

English: Fluent

Georgian: Native speaker

Greek: Basic

Russian: Fluent