

# ILYA DMITRIEVICH SHKREDOV

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**Languages:** Russian (native), English (fluent), French (B1-B2).

- WoS (ResearcherID): Q-8521-2016
- Scopus: 6507450888
- <http://orcid.org/0000-0002-6445-8390>
- MR Author: 705369

## Scientific interests

- Additive Combinatorics
- Number Theory
- Combinatorial and Ergodic Number Theory
- Combinatorial Ergodic Theory
- Classical Analysis

## Research topics

- Multi-dimensional generalizations of Szemerédi's theorem
- Exponential sums and Fourier analysis
- The sum-product phenomenon
- Inverse results in Additive Combinatorics
- Uniformly distributed sequences
- Continued fractions
- Ordinary and multiple recurrence

## Education and other scientific degrees

- Corresponding Member of Russian Academy of Sciences

April 23, 2016

- Second Russian Scientific Degree (Doctor fiziko–matematicheskikh nauk) June 17, 2009
- PhD in Mathematics, Moscow State University, Moscow, Russia. May 20, 2005  
Thesis: “On some problems of ergodic number theory”.  
Advisor: Prof. N. G. Moshchevitin.
- Master of Science in Pure and Applied Mathematics June 25, 2002  
Moscow State University, Moscow, Russia.
- Moscow State University, Moscow, Russia 1997–2002

## Positions held

- Full professor, Purdue university January 1, 2024 — now
- Corresponding Member of Russian Academy of Sciences April 23, 2016 — now
- Arnold Fellow, London Institute for Mathematical Sciences October 31, 2022 —  
December 31, 2023
- Main Researcher of Steklov Mathematical Institute, RAS June 1, 2017 — May 24, 2023
- Leading Researcher of IITP, RAS December, 2009 — December 31, 2022
- Full Professor of Division of Discrete Mathematics, MIPT Sept., 2015 — June, 2022
- Full Professor of Division of Dynamical Systems, MSU September, 2010 — June, 2022
- Leading Researcher of Steklov Mathematical Institute April 24, 2010 — May, 2017
- Associate Professor of Division of Dynamical Systems, MSU April — September, 2010
- Assistant Professor of Division of Dynamical Systems, MSU Jan. 1, 2006 — April, 2010

## Short Term Positions

- Postdoc, IAS, Princeton 2007  
Term of Arithmetic Combinatorics
- Postdoc, MSRI, Berkeley 2008  
Term ”Dynamical Systems and Additive Combinatorics”
- Consultant, Microsoft Research, Mountain View November–December, 2010  
January, 2011  
January–February, 2012  
January–February, 2013
- Consultant, Microsoft Research, Seattle February–March, 2016
- University of Sydney, Mathematical Research Institute, visitor November 1–30, 2019
- MPIM, Bonn, visitor June 1–30, 2021
- Mathematisches Institut, Göttingen, visitor April 1–September 30, 2022

- London Institute for Mathematical Sciences, London, visitor      May 16–August 15, 2024
- MPIM, Bonn, visitor      May 1–July 31, 2025

## Teaching

- Algebra Honors      2025, fall  
Purdue University
- Galois Theory Honors      2025, 2026, spring  
Purdue University
- An introduction to the sum–product phenomenon      2024, fall  
Purdue University
- Introduction to additive combinatorics      2024, 2026, spring  
Purdue University
- Additive combinatorics      2014–2022  
Yandex, Moscow Institute of Physics and Technology (MIPT)
- Modern theory of sum–product      2022  
Moscow Institute of Physics and Technology (MIPT), elective
- Modern theory of sum–product      2022  
Saint–Petersburg State University, elective
- Introduction to additive combinatorics      2019–2021  
Steklov Mathematical Institute, elective
- Additive combinatorics      2021  
Saint–Petersburg State University, elective
- Ordinary differential equations (lectures and seminars)      2006–2021  
Moscow State University
- Szemerédi’s Theorem and Fourier analysis      2006–2021  
Moscow State University, elective
- Higher Sumsets, Higher Energies, Eigenvalues and Applications to Additive Combinatorics and Number Theory      2015  
Academy of Mathematics and Systems Science & Henan University, mini–course in additive combinatorics
- Higher sumsets, higher energies, eigenvalues and applications      2015  
Chalmers & Göteborg University, mini–course in additive combinatorics
- Introduction to additive combinatorics      2013–2014  
Kolmogorov Boarding School (AESC MSU), elective
- Introduction to additive combinatorics      2012  
Independent University of Moscow, elective
- Some problems of additive combinatorics      2011–2012  
Moscow State University, elective

- Arithmetic progressions 2005  
Moscow State University, elective
- Green and Tao’s theorem on arithmetic progressions 2004  
Independent University of Moscow, elective
- Calculus (seminars, all years) 2004–2005  
Russian Technological University (MIREA)
- Calculus (seminars, all years) 2003  
Moscow Automobile and Road Construction State Technical University (MADI)
- Moscow secondary school N 17 2006–2007  
2010–2011
- Moscow secondary school N 1134 2003–2005

**Current and former PhD students:**

1. Dmitrii Frolenkov (PhD in 2013, frolenkov@mi-ras.ru). At the moment he works at Steklov Mathematical Institute, where he has a research position. The best paper of Steklov Institute in 2021, prize of “Basis” contest 2021.  
<https://scholar.google.com/citations?user=wdFR2zQAAAAJ&hl=ru&oi=ao>  
<http://www.mathnet.ru/person/56684>
2. Aleksei Volostnov (PhD in 2024, gyololo@rambler.ru). At the moment he works at MIPT; mathnet profile: <http://www.mathnet.ru/person/122356>
3. Aliaksei Semchankau (PhD student at Carnegie Mellon University, aliaksei.semchankau@gmail.com). He wrote 6 papers and he is ready for his defence. He won a prize of “Basis” contest 2020, mathnet profile: <http://www.mathnet.ru/rus/person119531>
4. Mihail Lyamkin (PhD student at MIPT, mik-mvl@mail.ru). He wrote 1 paper.
5. Aleksei Volobuev (PhD student at ITTP RAS, alex.volobuev@gmail.com). He wrote 1 paper.

**Grants and prizes**

- P. Deligne’s grant 2007 (based on Balzan’s fond 2004).
- The best scientific paper of Steklov Mathematical Institute, 2011/2014/2018.

*Leader of*

- Grant Russian Scientific Fond 14-11-00433, 19–11–00001
- RFFI grant no. 11-01-00759
- Grant mol\_a\_ved 12-01-33080
- President’s of Russian Federation grant MK-1726.2006.1 and MK-1959.2009.1

*Participant of*

- INTAS 03-51-5070.
- RFFI grant no. 02-01-00912, 06-01-00383.

- Leading Scientific Schools grant 136.2003.1, 691.2008.1, 8684.2010.1, 2519.2012.1.
- Russian Government project 11.G34.31.0053.
- Federal Program "Scientific and scientific-pedagogical staff of innovative Russia" 2009–2013.
- Grant Russian Scientific Fond 14-50-00005.
- MegaGrant no. 075-15-2019-1926

## **I am an editor of journals :**

- Combinatorics and Number Theory (former Moscow Journal of Combinatorics and Number Theory), **main editor**
- SIDMA
- International Journal of Number Theory
- Uniform Distribution Theory
- Transactions of the Moscow Mathematical Society
- Online Journal of Analytic Combinatorics

## **Expertise:**

- Zentralblatt reviews 2011–now
- Contest "Basis" (expert) 2019–now
- Referee for: Russian Ac. Sci., Hungarian Ac. Sci., Austrian Ac. Sci., French Ac. Sci., Israel SF
- Referee for: Acta Arithm., Acta Mathematica, Acta Math. Hung., Advances, AJM, Annals of Comb., Annals of Math., Ann. Math. Blaise Pascal, ANT, CJM, CMB, Coll. Math., Comb. Th., Combinatorica, Compositio, CPC, DAS, DCG, Discrete Anal., DM, El.-JC, Eur. J. Comb., FAA, FFA, GAFA, IAS, IJNT, IMRN, Indag. Math., Integers, Israel JM, J. d'Analyse Math., JAMS, JCTA, JLMS, JNT, J. of Math. Research with Appl., Mat. Zametki, Math. Annalen, Mathematics, Mathematika, Mathematische Z., MJCNT (CNT), Problems of Information Transmission, Proc. AMS, Proc. LMS, Revista, RNTB, Rocky Mountain, Sbornik Math., Siberian Math. Journal, SIDMA, Tran. AMS, Trudy MIAN, Trudy MMO
- Russian Science Foundation (expert, number theory) 2022–2025
- Russian Science Foundation (principal expert, pure mathematics) 2017–2021
- Russian Foundation for Basic Research (expert, number theory) 2014–2020
- Experience as an external evaluator/committee member/opponent for dissertations: > 15.

## **I was an organizer of research seminars:**

- *"Modern problems of Number Theory" (with S.V. Konyagin and M.A. Korolev), Steklov Mathematical Institute, 2010–2023*

- "Seminar of Laboratory of Combinatorial and Geometrical Structures" (with J. Pach and A. Kupavskii), MIPT, 2020–2022

### Administrative duties:

- Deputy head of Division of Number Theory, Steklov Mathematical Institute, 2016–2023
- Scientific secretary of Division of Dynamical Systems, Moscow State University, 2006–2010

### Publications

130. *Beyond Threshold Security: Additive Secret Sharing under Hamming-Weight Leakage*, (with A. Biswas, J. Hwang, H.K. Maji and X. Ye), 67th IEEE Symposium On Foundations Of Computer Science, submitted.
129. *On the Balog–Szemerédi–Gowers theorem for real numbers*, Acta Math. Hungarica, submitted.
128. *On new configurations in sumsets*, (with C. Elsholtz and L. Wurzinger), Mathematika, submitted.
127. *On some results of Rogers*, CNT, submitted.
126. *Structure theory of set addition with two operations*, (with A. Semchankau), Combinatorica, submitted; arXiv:2601.12457 [math.CO] 18 Jan 2026.
125. *On some results of Korobov and Larcher and Zaremba’s conjecture*, 2025, submitted; arXiv:2603.14116 [math.NT] 14 Mar 2026.
124. *On common energies and sumsets II*, submitted; arXiv:2502.20702v1 [math.CO] 28 Feb 2025.
123. *Some applications of representation theory to the sum-product phenomenon*, submitted; arXiv:2307.03156 [math.NT] 6 Jul 2023.
122. *On a paucity result in Incidence Geometry*, Forum Mathematicum, accepted; arXiv:2201.08037v1 [math.NT] 20 Jan 2022.
121. *On Fourier coefficients of sets with small doubling*, E–JC, accepted; arXiv:2412.11368v1 [math.CO] 16 Dec 2024.
120. *On universal sets and sumsets*, Israel Journal of Math., accepted; arXiv:2404.01529 [math.CO] 1 Apr 2024.
119. *On the exceptional set in Littlewood’s discrete conjecture*, Bull. LMS, **58**:5 (2026) 1–10; DOI:10.1112/blms.70359
118. *On Korobov bound concerning Zaremba’s conjecture*, (with N.G. Moshchevitin and B. Murphy), IMRN, Volume 2026, Issue 6 (2026); <https://doi.org/10.1093/imrn/rnag048>

117. *Uncertainty for convolutions of sets*, Proc. AMS, **154**:2 (2026) 615–627; <https://doi.org/10.1090/proc/17485>
116. *Some new results on the higher energies*, JNT, **281** (2026) 110–138; <https://doi.org/10.1016/j.jnt.2025.09.018>
115. *On common energies and sumsets*, JCTA, **213** (2025) 106026; <https://doi.org/10.1016/j.jcta.2025.106026>
114. *The sum-product problem for integers with few prime factors*, (with B. Hanson, M. Rudnev and D. Zhelezov), Compositio Mathematica, **161**:3 (2025) 427–446; doi:10.1112/S0010437X24007735
113. *On the determinants of matrices with elements from arbitrary sets*, (with I.E. Shparlinski), Mathematika, **71**:2 (2025) 1–18; doi.org/10.1112/mtk.70018
112. *On the distribution of quadratic residues*, FFA, **103** (2025) 102577, 1–19.
111. *Energy bounds for modular roots and their applications*, (with B.Kerr, I.E. Shparlinski, A. Zaharescu), Journal of the Institute of Mathematics of Jussieu, (2024) 1–42; doi:10.1017/S1474748023000397
110. *Additive dimension and the growth of sets*, Discrete Mathematics, **347**:9 (2024) 114077; <https://doi.org/10.1016/j.disc.2024.114077>
109. *On the distribution of modular square roots of primes*, (with I.E. Shparlinski, A. Zaharescu), Math. Z., **306**:43 (2024) 1–17; <https://doi.org/10.1007/s00209-024-03436-5>
108. *On some multiplicative properties of large difference sets*, Canadian Journal of Mathematics, **76**:5 (2024) 1538–1555; <https://doi.org/10.4153/S0008414X23000500>
107. *The popularity gap*, (with V. Lev), Journal of Algebraic Combinatorics, **58** (2023) 1155–1172; <https://doi.org/10.1007/s10801-023-01268-w>
106. *On the random Chowla conjecture*, (with O. Klurman, M.W. Xu), GAFA, **33** (2023) 749–777; <https://doi.org/10.1007/s00039-023-00641-y>
105. *On multiplicative Chung–Diaconis–Graham process*, Mat. Sbornik, **24**:6 (2023), 136–154; <https://doi.org/10.4213/sm9811>
104. *On an application of higher energies to Sidon sets*, Combinatorica, **43** (2023), 329–345; <https://doi.org/10.1007/s00493-023-00013-y>
103. *On a girth-free variant of the Bourgain–Gamburd machine*, FFA, **90** 102225 (2023), 1–26; <https://doi.org/10.1016/j.ffa.2023.102225>
102. *Bilinear forms with modular square roots and averages of twisted second moments of half integral weight Dirichlet series*, (with I.E. Shparlinski, A. Zaharescu), International Mathematics Research Notices, Volume 2022, Issue 22 (2022) 17431–17474; <https://doi.org/10.1093/imrn/rnab220>

101. *Growth in Chevalley groups relatively to parabolic subgroups and some applications*, Rev. Mat. Iberoam. **38**:6 (2022), 1945–1973; DOI 10.4171/RMI/1344
100. *Character sums estimates and an application to a problem of Balog*, (with T. Schoen), Indiana Univ. Math. J., **71**:3 (2022), 953–964.
99. *On multiplicative energy of subsets of varieties*, Canad. J. Math. (2022): 1–19; <http://dx.doi.org/10.4153/S0008414X21000687>
98. *On growth rate in  $SL_2(\mathbf{F}_p)$ , the affine group and sum-product type implications*, (with Misha Rudnev), Mathematika, **68**:3 (2022) 738–783; DOI: 10.1112/mtk.12120
97. *Number of  $A + B \neq C$  solutions in abelian groups and application to counting independent sets in hypergraphs*, (with A. Semchankau, D. Shabanov), European Journal of Combinatorics Volume 100, February 2022, 103453, 13pp.; <https://doi.org/10.1016/j.ejc.2021.103453>
96. *On sums and products of combinatorial cubes*, Finite fields and their applications, Volume 77, January 2022, 101948, 17pp.; <https://doi.org/10.1016/j.ffa.2021.101948>
95. *On some applications of GCD sums to Arithmetic Combinatorics*, JNT, 231 (2022): 433–450; <https://doi.org/10.1016/j.jnt.2021.05.011>
94. *Noncommutative methods in Additive Combinatorics and Number Theory*, Uspekhi Mat. Nauk, 76:6 (462) (2021): 119–180.
93. *The Uniformity Conjecture in Additive Combinatorics*, (with J. Solymosi), SIAM Journal on Discrete Mathematics 35.1 (2021): 307–321.
92. *Tilted Corners in Integer Grids*, (with J. Solymosi), INTEGERS Journal, Ron Graham Memorial Volume 21A (2021), A20, 10 pages.
91. *Sets of transfer times with small densities*, (with M. Björklund, A. Fish), Journal de l'École polytechnique–Mathématiques 8 (2021): 311–329; DOI: 10.5802/jep.147
90. *On the spectral gap and the diameter of Cayley graphs*, Proc. Steklov Inst., **314** (2021) 318–337.
89. *Modular hyperbolas and bilinear forms of Kloosterman sums*, JNT, 20 (2021) 182–211; <https://doi.org/10.1016/j.jnt.2020.06.014>
88. *On a modular form of Zaremba's conjecture*, (with N.G. Moshchevitin), Pacific J. of Math., **309**:1 (2020), 195–211; DOI 10.2140/pjm.2020.309.195
87. *Bounds of trilinear and trinomial exponential sums*, (with S. Macourt, G. Petridis, I.E. Shparlinski), SIAM J. Discrete Math., **34**:4 (2020), 2124–2136; <https://doi.org/10.1137/20M1325502>
86. *On popular sums and differences of sets with small products*, (with K.I. Olmezov, A.S. Semchankau), Math. Notes, **108**:4 (2020), 561–571.

85. *Popular Products and Continued Fractions*, (with B. Murphy, N.G. Moshchevitin), Israel J. Math., **238** (2020) 807–835; <https://doi.org/10.1007/s11856-020-2039-3>
84. *L-functions and sum-free sets*, (with T.Schoen), Acta Mathematica Hungarica, 161(2), 427–442, (2020).
83. *Small doubling in prime-order groups: from 2.4 to 2.6*, (with V.F. Lev), JNT, Volume 217, 278–291 (2020); <https://doi.org/10.1016/j.jnt.2020.05.009>.
82. *A remark on sets with small Wiener norm*, In: Raigorodskii A., Rassias M. (eds) "Trigonometric Sums and Their Applications", Springer, Cham (2020) 261–272; [https://doi.org/10.1007/978-3-030-37904-9\\_12](https://doi.org/10.1007/978-3-030-37904-9_12).
81. *Stronger sum-product inequalities for small sets*, (with George Shakan, Misha Rudnev), Proc. Amer. Math. Soc. 148 (2020), 1467–1479; <https://doi.org/10.1090/proc/14902>.
80. *Any small multiplicative subgroup is not a sumset*, Finite Fields and Their Applications, 63(2020), 1–15, 101645; <https://doi.org/10.1016/j.ffa.2020.101645>.
79. *On the energy variant of the sum-product conjecture*, (with M. Rudnev, S. Stevens), Revista Matemática Iberoamericana **36**:1 (2020), 207–232; doi 10.4171/rmi/1126.
78. *On the few products, many sums problem*, (with Brendan Murphy, Misha Rudnev, Yurii N. Shteinikov), Journal de Théorie des Nombres de Bordeaux, Issue 3, vol. 31 (2019) p. 573–602.
77. *Some remarks on products of sets in the Heisenberg group and in the affine group*, Forum Mathematicum **32**:1 (2019), 189–199; <https://doi.org/10.1515/forum-2019-0181>.
76. *An upper bound for weak  $B_k$ -sets*, (with T. Schoen), SIAM J. Discrete Math., Vol. 33, No. 2, (2019) pp. 837–844; DOI: 10.1137/18M1189439.
75. *New results on sum-product type growth over fields*, (with Brendan Murphy, Giorgis Petridis, Oliver Roche-Newton, Misha Rudnev), Mathematika, Volume 65, Issue 3, 2019, pp. 588–642.
74. *Some remarks on the asymmetric sum-product phenomenon*, MJCNT, **8**:1 (2019) 15–41; [dx.doi.org/10.2140/moscow.2019.8.15](https://doi.org/10.2140/moscow.2019.8.15).
73. *If  $A + A$  is small then  $AAA$  is superquadratic*, (with Oliver Roche-Newton), J. Number Theory, 201 (2019), 124–134.
72. *On the size of the set  $AA + A$* , (with Oliver Roche-Newton, Imre Z. Ruzsa, Chun-Yen Shen), J. LMS, **99**:2, (2019), 477–494.
71. *A note on the set  $A(A + A)$* , (with P.-Y. Bienvenu, F. Hennecart), MJCNT, **8**: 2 (2019), 179–188; [dx.doi.org/10.2140/moscow.2019.8.179](https://doi.org/10.2140/moscow.2019.8.179).
70. *A short note on the multiplicative energy of the spectrum of a set*, Mat. Zametki, **105**:3 (2019), 444–454.

69. *On the restriction problem for discrete paraboloid in lower dimension*, (with M. Rudnev), *Advances in Mathematics*, **339** (2018), 657–671. DOI: 10.1016/j.aim.2018.10.002.
68. *Multiplicative Energy of Shifted Subgroups and Bounds On Exponential Sums with Trinomials in Finite Fields*, (with S. Macourt, I.E. Shparlinski) *Canadian Journal of Mathematics* **70**:6 (2018) 1319–1338; <http://dx.doi.org/10.4153/CJM-2017-044-2>.
67. *Double character sums with intervals and arbitrary sets in finite fields*, (with I.E. Shparlinski), *Proc. Steklov Inst.*, **303** (2018), 1–21.
66. *On asymptotic formulae in some sum–product questions*, *Tran. Moscow Math. Soc.*, **79**:2 (2018), 271–334; English transl. *Trans. Moscow Math. Society* 2018, pp.231–281.
65. *On additive bases of sets with small product set*, (with D. Zhelezov), *International Mathematics Research Notices* (2018):5, 1585–1599; <https://doi.org/10.1093/imrn/rnw291>.
64. *Differences of subgroups in subgroups*, *International Journal of Number Theory* Vol. 14, No. 4 (2018) 1111–1134; DOI: 10.1142/S1793042118500690
63. *An application of the sum-product phenomenon to sets having no solutions of several linear equations*, *Sbornik: Mathematics*, **209**:4 (2018) 117–142; <https://doi.org/10.1070/SM8907>.
62. *On subgraphs of random Cayley sum graphs*, (with S.V. Konyagin), *European Journal of Combinatorics*, Volume 70 (2018) 61–74.
61. *Packing sets over finite abelian groups*, (with Oliver Roche-Newton, Arne Winterhof), *Integers* 18, (2018) 1–9.
60. *Variations on the sum–product problem II*, (with Brendan Murphy, Oliver Roche-Newton), *SIAM J. Discrete Math.* 31 (2017), no. 3, 1878–1894.
59. *On some multiple character sums*, (with I.E. Shparlinski), *Mathematika*, **53**:2 (2017) 553–560; doi:10.1112/S0025579317000055.
58. *Sums of multiplicative characters with additive convolutions*, (with A.S. Volostnov), *Proceedings of the Steklov Institute of Mathematics*, **296** (2017) 265–279.
57. *Some remarks on the Balog–Wooley decomposition theorem and quantities  $D^+$ ,  $D^\times$* , *Proceedings of the Steklov Institute of Mathematics* **298**:1 (2017), 74–90.
56. *Growth Estimates in Positive Characteristic via Collisions*, (with E. Aksoy Yazici, B. Murphy, M. Rudnev), *International Mathematics Research Notices*, Volume 2017, Issue 23 (2017), 7148–7189, <https://doi.org/10.1093/imrn/rnw206>
55. *On the number of unit–area triangles spanned by convex grids in the plane*, (with Orit E. Raz, Micha Sharir), *Computational Geometry: Theory and Applications*, volume 62, issue 1, (2017) 25–33; <http://dx.doi.org/10.1016/j.comgeo.2016.12.002>
54. *On the additive energy of Heilbronn’s subgroup*, (with E. Solodkova, I. Vyugin), *Mat. Zametki*, **101**:1 (2017), 43–57; English transl. *Mat. Zametki*, **101**:1 (2017), 58–70.

53. *Some remarks on sets with small quotient set*, Sbornik: Mathematics, **208**:12, (2017) 144–158; <https://doi.org/10.1070/SM8733>.
52. *New results on sum-products in  $\mathbb{R}$* , (with S.V. Konyagin), Proceedings of the Steklov Institute of Mathematics, 294, (2016), 87–98.
51. *Difference sets are not multiplicatively closed*, Discrete Analysis, 17, (2016), 1–21. DOI: 10.19086/da.913.
50. *A remark on  $A + B$  and  $A - A$  for compact sets in  $\mathbb{R}^n$* , (with T. Schoen), Integers #A75 **16** (2016) 1–4.
49. *Intersections of Shifts of Multiplicative Subgroups*, (with E. Solodkova, I. Vyugin), Mat. Zametki, **100**:2 (2016), 185–195; English transl. Mathematical Notes, **100**:2 (2016), 189–198.
48. *On tripling constant of multiplicative subgroups*, Integers #A75 **16** (2016) 1–9.
47. *Additive dimension and a theorem of Sanders*, (with T. Schoen), J. Aust. Math. Soc., **100**:1 (2016), 124–144; doi:10.1017/S1446788715000324.
46. *New sum-product type estimates over finite fields*, (with O. Roche-Newton & M. Rudnev), Advances in Mathematics, **293** (2016), 589–605.
45. *Quantitative version of Beurling–Helson theorem*, (with S.V. Konyagin), Function Anal. & Appl., **49**:2, (2015), 39–53.
44. *Variations on the sum-product problem*, (with B. Murphy & O. Roche-Newton), SIDMA, Vol. 29, No. 1, (2015), 514–540.
43. *On some problems of Euclidean Ramsey theory*, Analysis Mathematica, **41** (2015), 1–12; DOI: 10.1007/s10476-015. Also, see Analysis Math., **42**:3 (2016), 295. DOI: 10.1007/s10476-016-0305-8.
42. *On sum sets of sets, having small product sets*, (with S.V. Konyagin), Proceedings of the Steklov Institute of Mathematics, **3**:290 (2015), 304–316.
41. *On a question of A. Balog*, Pacific Journal of Mathematics, **280**:1 (2015), 227–240; [dx.doi.org/10.2140/pjm.2015..101](http://dx.doi.org/10.2140/pjm.2015..101).
40. *Kolmogorov Width of Discrete Linear Spaces: an Approach to Matrix Rigidity*, (with A. Samorodnitsky & S. Yekhanin), CCC, (2015), 1–18; DOI: 10.4230/LIPIcs.CCC.2015.p; ISSN 1433-8092.
39. *Structural theorems in Additive Combinatorics*, Uspekhi Mat. Nauk, v.70 **421**:1 (2015), 46–99; English transl. Russian Math. Surveys **70**:1 (2015) 123–178.
38. *On sums of Szemerédi–Trotter sets*, Proceedings of the Steklov Institute of Mathematics, **289**, (2015), 300–309.
37. *On exponential sums over multiplicative subgroups of medium size*, Finite Fields Appl., **30** (2014), 72–87.

36. *On Wiener norm of subsets of  $\mathbf{Z}_p$  of medium size*, (with S.V. Konyagin), Fund. and Applied Math., **19**:5 (2014), 75–87.
35. *Sumsets in quadratic residues*, Acta Arith., **164**:3 (2014) 221–244.
34. *Energies and structure of additive sets*, Electronic Journal of Combinatorics, **21**:3 (2014), #P3.44, 1–53.
33. *Roth’s theorem in many variables*, (with T. Schoen), Israel J. Math., **199**:1 (2014), 287–308.
32. *Some new results on higher energies*, Transactions of MMS, **74**:1 (2013), 35–73.
31. *On Heilbronn’s exponential sum*, Q. J. Math., **64**:4 (2013), 1221–1230; doi: 10.1093/qmath/has037.
30. *Some new inequalities in additive combinatorics*, MJCNT, **3**:2 (2013), 237–288.
29. *Higher moments of convolutions*, (with T. Schoen), J. of Number Theory, **133** (2013), 1693–1737.
28. *On additive shifts of multiplicative subgroups*, (with I.V. Vyugin), Mat. Sbornik **203**:6 (2012), 81–100. English transl. Mat. Sb. **203**:6, 81–100 (2012).
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## Other texts

- [1] *Direct and inverse results for popular differences in trees of positive dimension (a joint Appendix Stability in an inverse theorem for return times of ergodic systems)*, (with A. Fish, L. Jiang), *Ergodic Theory and Dynamical Systems*; 1–28; <https://doi.org/10.1017/etds.2023.18>
- [2] *Combinatorics: lectures for students of bio–engeneering and informatics departement of MSU* (with Raigorodskii A.M., Savvateev A.V.), MAKS–press, Moscow, 2005, 135 pages.
- [3] *An introduction to higher energies and sumsets*, arXiv:1512.00627
- [4] *A few words on applications of Number Theory to Cryptography*, accepted.

## Conferences

- **Organizer:** Connected counting: illuminating relationships in number theory July 3, 2023, LIMS, London, UK.
- **Organizer:** Vilnius Conference in Combinatorics and Number Theory July 16–22, 2017 Vilnius, Lithuania.
- Virtual Workshop in Arithmetic Combinatorics January 24–25, 2026  
session of CMS meeting, USA.
- Prime numbers and arithmetic randomness June 23–27, 2025  
Marseille, France.
- New Trends in Arithmetic Combinatorics and related Fields June 1–6, 2025  
Granada, Spain.
- Combinatorial and Additive Number Theory May 23–25, 2025  
New York, USA.
- Symposium on Number Theory and its Applications In Honor of Olivier Ramaré’s 60th Birthday May 22–23, 2025  
Linz, Austria.
- Asymptotic Counting and L–Functions May 5–9, 2025  
Bonn, Germany.
- Pointwise Ergodic Theory and Connections, II June 24–28, 2024  
Bristol, UK.
- Fourier analysis and additive problems June 17–21, 2024  
Bupadest, Hungary.
- Combinatorial and Additive Number Theory May 22–24, 2024  
New York, USA.
- UK-Vietnam mathematics joint meeting December 4–8, 2023  
Edinburgh, UK.

- Combinatorial and Additive Number Theory  
New York, USA. May 23–26, 2023
- Diophantine Analysis, Dynamics and Related Topics  
Haifa, Israel. February 5–10, 2023
- Specialisation and Effectiveness in Number Theory  
Vancouver, Canada. August 28–September 2, 2022
- Petrovskii Conference (24-th meeting)  
Moscow, Russia. December 26–30, 2021
- MoCCA  
Dolgoprodni, Russia. May 31–June 4, 2021
- Combinatorial and Additive Number Theory  
New York, USA. May 24–28, 2021
- Diophantine Problems, Determinism and Randomness  
Marseille, France. November 23–27, 2020
- Additive Combinatorics in Marseille  
Marseille, France. September 7–11, 2020
- CANT 2020  
New-York, USA. June 1–5, 2020
- Combinatorics and Geometry days II  
Dolgoprudni, Russia. April 13–16, 2020
- Scientific visit  
Poznan', Poland. September 8–30, 2019
- Baikal Number Theory  
Olkhon, Russia. August 26–30, 2019
- 3rd BRICS Mathematical Conference  
Kazan, Russia. July 22–25, 2019
- Transcendence and Diophantine Problems  
Moscow, Russia. June 10–14, 2019
- Workshop Groups and Group Rings  
St.-Peterburg, Russia. June 3–8, 2019
- 3rd Hungarian-Russian Combinatorics workshop  
Petrozavodsk, Russia. May 20–25, 2019, Moscow,
- Combinatorial and Additive Number Theory  
New York, USA. May 21–24, 2019
- The Second Vietnam Workshop on Graph Theory and Discrete Geometry  
January 9-12, 2019  
Hanoi, Vietnam.
- Pseudo-Randomness and Finite Fields  
Linz, Austria. October 15–19, 2018

- Additive combinatorics and its applications  
San Jose, USA. August 20–24, 2018
- 2nd Russian–Hungarian workshop  
Budapest, Hungary. June 27–29, 2018
- Number Theory Week 2017  
Poznan, Poland. September 4–8, 2017
- Numbers, forms and geometry  
Sochi, Russia. August 21–26, 2017
- Vilnius Conference in Combinatorics and Number Theory  
Vilnius, Lithuania. July 16–22, 2017
- Journées palisiennes de combinatoire additive  
Paris, France. June 29–30, 2017
- Conference dedicated to A.A. Karatsuba  
Moscow, Russia. May 22–27, 2017
- First Russian–Hungarian Workshop on Discrete Mathematics  
Moscow, Russia. April 21–23, 2017
- 5th International Conference on Uniform Distribution Theory  
Sopron, Hungary. July 5–8, 2016
- Conference of RAS professors  
Moscow, Russia. June 14–16, 2016
- Scientific visit  
Poznan', Poland. May 10–30, 2016
- Additive Combinatorics in Bordeaux  
Bordeaux, France. April 11–15, 2016
- Dynamics and Graphs over Finite Fields: Algebraic, Number Theoretic and Algorithmic Aspects  
Marseille, France. March 29–April 2, 2016
- Conference dedicated to A.A. Karatsuba  
Moscow, Russia. January 28–30, 2016
- Chinese–Russian Workshop on Exponential Sums and Sumsets  
Beijing, China. November 6–12, 2015
- Yu.V.Linnik Centennial Conference  
St. Petersburg, Russia. September 14–18, 2015
- Additive Combinatorics in Marseille  
Marseille, France. September 7–11, 2015
- Scientific visit  
Poznan', Poland. August 16–30, 2015
- Scientific visit  
Budapest, Hungary. July 27–August 15, 2015

- Number Theory and Dynamics July 6–10, 2015  
Stockholm, Sweden.
- Journée Arithmétiques July 5–8, 2015  
Debrecen, Hungary.
- Higher sumsets, higher energies, eigenvalues and applications April 12–30, 2015  
Göteborg, Sweden.
- Scientific visit March 22–28, 2015  
Bristol, England.
- Scientific visit March 8–13, 2015  
St. Petersburg, Russia.
- Conference dedicated to A.A. Karatsuba January 30–31, 2015  
Moscow, Russia.
- Arithmetic and allied subjects on the banks of the Neva November 24–28, 2014  
St. Petersburg, Russia.
- Mathematical Methods: Applications to Earth Science November 15–19, 2014  
Moscow, Russia.
- Conference on Number Theory November 1–11, 2014  
Hong Kong, China.
- Summit 240 July 7–11, 2014  
Budapest, Hungary.
- Workshop on Extremal Graph Theory June 6, 2014  
Moscow, Russia.
- Finding Algebraic Structures in Extremal Combinatorial Configurations May 19–23, 2014  
Los Angeles, USA.
- Unlikely Intersections February 3–7, 2014  
Marseille, France.
- Workshop on Combinatorics and Number Theory January 27–February 2, 2014  
Moscow, Russia.
- Conference dedicated to A.A. Karatsuba January 31, 2014  
Moscow, Russia.
- Harmonic Analysis and Theory of Functions December 23–24, 2013  
Moscow, Russia.
- Emerging Applications of Finite Fields December 9–13, 2013  
Linz, Austria.
- Conference on Number Theory November 1–2, 2013  
Hong Kong, China.
- Conference in Combinatorics and Number Theory September 1–7, 2013  
Palanga, Lithuania.

- Workshop on Fourier Analysis and additive problems August 26–30, 2013  
Budapest, Hungary.
- Erdős Centennial Conference July 1–5, 2013  
Budapest, Hungary.
- Chinese–Russian conference on Number Theory October 8–12, 2012  
Moscow, Russia.
- Discrete Geometry August 13–17, 2012  
Yaroslavl, Russia.
- Diophantine Analysis July 30–August 3, 2012  
Astrakhan, Russia.
- Additive combinatorics in Paris July 9–13, 2012  
Paris, France.
- Uniform distribution theory June 25–29, 2012  
Slovakia, Smolenice.
- Flows on surfaces, symbolic dynamics and dynamics in moduli spaces December 5–9,  
2011  
Moscow, Russia.
- Scientific conference dedicated to M.V. Lomonosov November 14–23, 2011  
Moscow, Russia.
- Conference on Number Theory November 3–9, 2011 Hong Kong, China.
- Paul Turán Memorial Conference August 22–26, 2011  
Budapest, Hungary.
- 50 years of IPPI July 25–29, 2011  
Moscow, Russia.
- Journée Arithmétiques June 27–July 1, 2011  
Vilnius, Lithuania.
- Arithmetic Days in Moscow (ETH-MIAN) June 13–17, 2011  
Moscow, Russia.
- Seminar Number Theory Study Group’ February 15–24, 2011  
York, UK.
- ICM 2010 August 19–28, 2010  
Hyderabad, India.
- Uniform distribution theory July 4–11, 2010  
Strobl, Austria.
- XXXIV Far East conference mathematical school–seminar dedicated to academician E.V.  
Zolotov June 25–30, 2009  
Khabarovsk, Russia.
- Modern problems of mathematics, mechanics and their applications March 30 — April  
1, 2009  
Moscow, Russia.

- Young Mathematics of Russia (conference of prizewinners of P.Deligne and V.Zimin's contests) January 12–13, 2009  
Moscow, Russia.
- Discrete Rigidity Phenomena in Additive Combinatorics November 3–7, 2008  
Berkeley, USA.
- Building bridges August 5–9, 2008  
Budapest, Hungary.
- Uniform distribution January 21–25, 2008  
Marseille, France.
- Probability and Ergodic Theory Workshop February 15–18, 2007  
Chapel Hill, USA.
- Diophantine and Analytical Problems of Number Theory January 29–February 2, 2007  
Moscow, Russia.
- Analytical and Combinatorial Methods in Number Theory and Geometry May 25–31, 2006  
Moscow, Russia.
- Workshop on Additive Combinatorics April 6–12, 2006  
Montreal, Canada.
- School on Additive Combinatorics March 30–April 5, 2006  
Montreal, Canada.
- Probability and Ergodic Theory Workshop February 16–19, 2006  
Chapel Hill, USA.
- Additive Combinatorics September 5–9, 2005  
Bristol, England.
- Workshop on Geometrical Methods in Physics June 26–July 2, 2005  
Belowieza, Poland.
- Recent Trends in Additive Combinatorics September 9–12, 2004  
Palo Alto, USA.
- Diophantine analysis, uniform distributions and applications August 25–30, 2003  
Minsk, Belarus.
- XXIIIrd Journée Arithmétiques July 6–12, 2003  
Graz, Austria.
- Algebra and Number Theory: Modern Problems and Applications May 19–24, 2003  
Tula, Russia.
- Modern Theory of Dynamical Systems and Applications to Theoretical Celestial Mechanics December 23–28, 2002  
Moscow, Russia.

## References

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