

ALEXANDER GORODNIK

1. PERSONAL INFORMATION

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2. PRESENT APPOINTMENT

Professor in Mathematics at the University of Bristol, 09/2013–present

3. PREVIOUS APPOINTMENTS

09/2010–08/2013	University of Bristol	<i>Reader in Mathematics</i>
09/2008–08/2010	University of Bristol	<i>Senior Research Fellow</i>
09/2007–08/2008	University of Bristol	<i>Research Fellow</i>
09/2007–05/2008	Princeton University	<i>Visiting Professor</i>
09/2004–08/2007	California Institute of Technology	<i>Taussky–Todd Instructor</i>
09/2003–08/2004	University of Michigan	<i>Assistant Professor</i>
08/2003–09/2003	California Institute of Technology	<i>Visiting Scholar</i>
09/1998–05/2003	Ohio State University	<i>Teaching Assistant</i>
09/1997–06/1998	DYNA Company	<i>Software Engineer</i>

4. ACADEMIC QUALIFICATIONS

June 2003	PH.D. Ohio State University, Department of Mathematics
June 1997	equivalent of M.S. (with honours) Kiev State University, Department of Mechanics and Mathematics

5. SPECIAL AWARDS, HONOURS AND DISTINCTIONS

2017	Distinguished Lecture Series, TIFR, India
2012–present	Executive editor of the journal “Ergodic theory and dynamical systems”
2011	Whitehead Prize
2010	ERC Starting Independent Researcher Grant
2007	RCUK Fellowship
2004	Rackham Fellowship

6. PUBLICATIONS

Authored Books

- [1] (with A. Nevo) *The ergodic theory of lattice subgroups*, ANNALS OF MATHEMATICS STUDIES 172, Princeton University Press, 2010; 136 pages.

Edited Books

- [2] *Dynamics and Analytic Number Theory*, LONDON MATHEMATICAL SOCIETY LECTURE NOTE SERIES 437, eds. D. Badziahin, A. Gorodnik, N. Peyerimhoff, Cambridge University Press, 2016.

Academic Journal Papers (refereed)

- [3] (with R. Spatzier) *Smooth factors of projective actions of higher rank lattices and rigidity*, accepted to GEOMETRY & TOPOLOGY, 29 pages.
- [4] (with T. Browning) *Power-free values of polynomials on symmetric varieties*, accepted to PROC. LONDON MATH. SOC., 47 pages.
- [5] (with A. Nevo and G. Yehoshua) *Counting lattice points in norm balls on higher rank simple Lie groups*, accepted to MATH. RES. LETT., 17 pages.
- [6] (with S. Kadyrov) *Diophantine approximation with restricted numerators and denominators on semisimple groups*, J. THÉOR. NOMBRES BORDEAUX 29 (2017), no. 1, 1–28.
- [7] (with L. Luzzi and R. Vehkalahti) *Towards a complete DMT classification of division algebra codes, 2016 IEEE International Symposium on Information Theory*, 2993–2997.
- [8] (with P. Vishe) *Diophantine approximation for products of linear forms — logarithmic improvements*, accepted to TRANS. AMER. MATH. SOC., 18 pages.
- [9] (with A. Ghosh and A. Nevo) *Best possible rates of distribution of dense lattice orbits in homogeneous spaces*, J. REINE ANGEW. MATH., DOI 10.1515/crelle-2016-0001, 34 pages.
- [10] (with R. Spatzier) *Mixing properties of commuting nilmanifold automorphisms*, ACTA MATH. 215 (2015), no. 1, 127–159.
- [11] (with F. Paulin) *Counting orbits of integral points in families of affine homogeneous varieties and diagonal flows*, J. MOD. DYN. 8 (2014), no. 1, 25–59.
- [12] (with R. Takloo-Bighash and Y. Tschinkel) *Multiple Mixing for adèle groups and rational points*, EUR. J. MATH. 1 (2015), no. 3, 441–461.
- [13] (with A. Nevo) *Quantitative ergodic theorems and their number-theoretic applications*, BULL. AMER. MATH. SOC. 52 (2015), no. 1, 65–113.
- [14] (with A. Ghosh and A. Nevo) *Metric Diophantine approximation on homogeneous varieties*, COMPOS. MATH. 150 (2014), no. 8, 1435–1456.
- [15] (with R. Spatzier) *Exponential mixing of nilmanifold automorphisms*, J. ANAL. MATH. 123 (2014), 355–396.
- [16] (with A. Nevo) *Ergodic theory and the duality principle on homogeneous spaces*, GEOM. FUNCT. ANAL. 24 (2014), no. 1, 159–244.

- [17] (with U. Bader, A. Furman, and B. Weiss) *Rigidity of group actions on homogeneous spaces III*, DUKE MATH. J. 164 (2015), no. 1, 115–155.
- [18] (with F. Ramirez) *Limit theorems for rank-one groups*, PROC. AMER. MATH. SOC. 142 (2014), no. 4, 1359–1369.
- [19] (with S. Kadyrov) *Algebraic numbers, hyperbolicity, and density modulo one*, J. NUMBER THEORY 132 (2012), 2499–2509.
- [20] (with A. Ghosh and A. Nevo) *Diophantine approximation and automorphic spectrum*, INT. MATH. RES. NOT. 2013, no. 21, 5002–5058.
- [21] (with A. Nevo) *Lifting, restricting and sifting integral points on affine homogeneous varieties*, COMPOS. MATH. 148 (2012), no. 6, 1695–1716.
- [22] (with A. Nevo) *On Arnold’s and Kazhdan’s equidistribution problems*, ERGODIC THEORY DYNAM. SYSTEMS 32 (2012), no. 6, 1972–1990.
- [23] (with A. Nevo) *Counting lattice points*, J. REINE ANGEW. MATH. 663 (2012), 127–176.
- [24] (with A. Nevo) *Splitting fields of elements in arithmetic groups*, MATH. RES. LETT. 18 (2011), no. 06, 1281–1288.
- [25] (with H. Oh) *Rational points on homogeneous varieties and equidistribution of adelic periods*, GEOM. FUNCT. ANAL. 21 (2011), 319–392.
- [26] (with N. Shah) *Khinchin theorem for integral points on quadratic varieties*, MATH. ANN. (2011), 357–380.
- [27] (with H. Oh and N. Shah) *Strong wavefront lemma for affine symmetric spaces*, ISRAEL J. MATH. 176 (2010), 419–444.
- [28] (with H. Oh and N. Shah) *Integral points on symmetric varieties and Satake compactifications*, AMERICAN JOURNAL OF MATHEMATICS 131 (2009), 1–57.
- [29] (with T. Hitchman and R. Spatzier) *Regularity of conjugacies of algebraic actions of Zariski dense groups*, JOURNAL OF MODERN DYNAMICS 2 (2008), 509–540.
- [30] (with F. Maucourant and H. Oh) *Manin’s conjecture on rational points of bounded height and adelic mixing*, ANNALES SCIENTIFIQUES DE L’ÉCOLE NORMALE SUPÉRIEURE 41 (2008), 383–435.
- [31] (with V. Bergelson) *Ergodicity and mixing of noncommuting epimorphisms*, PROC. LONDON MATH. SOC. 95 (2007), 329–359.
- [32] (with H. Oh) *Orbits of discrete subgroups on a symmetric space and the Furstenberg boundary*, DUKE MATH. J. 139 (2007), no. 3, 483–525.
- [33] *Open problems in dynamics and related fields*, JOURNAL OF MODERN DYNAMICS 1 (2007), no. 1, 1–35.
- [34] (with B. Weiss) *Distribution of lattice orbits on homogeneous varieties*, GEOM. FUNCT. ANAL. 17 (2007), no. 1, 58–115.
- [35] (with F. Maucourant) *Proximity and equidistribution on the Furstenberg boundary*, GEOM. DEDICATA 113 (2005), 197–213.
- [36] *Uniform distribution of orbits of lattices on spaces of frames*, DUKE MATH. J. 122 (2004), no. 3, 549–589.
- [37] *Oppenheim-type conjecture for systems of quadratic forms*, ISRAEL J. MATH. 140 (2004), 125–144.

- [38] *Oppenheim conjecture for pairs consisting of a linear form and a quadratic form*, TRANS. AMER. MATH. SOC. 356 (2004), no. 11, 4447–4463.
- [39] *Lattice action on the boundary of $SL(n, \mathbb{R})$* , ERGODIC THEORY DYNAM. SYSTEMS 23 (2003), no. 6, 1817–1837.
- [40] *Local near-rings with commutative groups of units*, HOUSTON J. MATH. 25(2) (1999), 223–234.
- [41] *The product of an abelian group and a nilpotent group*, UKRAINIAN MATH. J. 51(9) (1999), 1314–1320.

Conference Contributions (refereed)

- [42] (with A. Ghosh and A. Nevo) *Diophantine approximation exponents on homogeneous varieties*, in RECENT TRENDS IN ERGODIC THEORY AND DYNAMICAL SYSTEMS, S. Bhattacharya, T. Das, A. Ghosh, R. Shah, eds., Contemporary Mathematics 631, AMS, 2015.
- [43] *Lie groups, algebraic groups, and lattices*, to appear in PROCEEDINGS OF BEDLEWO SCHOOL, arXiv:1210.0222, 45 pages.
- [44] (with V. Bergelson) *Weakly mixing group actions: a brief survey and an example*, in MODERN DYNAMICAL SYSTEMS AND APPLICATIONS, B. Hasselblatt, M. Brin, Y. Pesin, eds., Cambridge University Press, New York, 2004.

Other publications

- [45] (with V. Bergelson) *Trieste lectures on ergodic theorems and applications*, <http://www.maths.bris.ac.uk/~mazag/research.html>, 31 pages.

Forthcoming Publications

- [46] (with M. Björklund and M. Einsiedler) *Quantitative multiple mixing*, arXiv:1701.00945, 49 pages.
- [47] (with M. Björklund) *Central Limit Theorems for group actions which are exponentially mixing of all orders*, arXiv:1706.09167, 20 pages.
- [48] (with M. Björklund) *Central limit theorems in the geometry of numbers*, arXiv:1706.09218, 12 pages.

7. RESEARCH GRANTS (AS PRINCIPAL INVESTIGATOR)

- 2010–2015 ERC Starting Independent Researcher Grant 239606
- 2009–2012 EPSRC Standard Grant EP/H000091/1
- 2008 LMS Scheme 4 Grant 4730
- 2007–2012 RCUK Fellowship in Dynamical Systems and Number Theory
- 2007–2008 US National Science Foundation Grant DMS-0654413
- 2004–2007 US National Science Foundation Grants DMS-0400631
- 2004 Rackham Fellowship

8. INVITED PLENARY LECTURE SERIES

- Distinguished Lecture Series,
5 lectures, TIFR, India, April 2017
- Summer School “*Number Theory and Dynamics*”,
3 lectures, Institut Fourier, Grenoble, France, June 2013
- Summer School “*Rigidity and Group Actions*”,
5 lectures, Institut de Mathématiques de Jussieu, Paris, France, June 2013
- Summer School “*Flows on homogeneous spaces*”,
4 lectures, Technion Institute of Technology, Haifa, Israel, September 2012
- Conference “*Combinatorics, Number Theory, and Dynamical Systems*”,
3 lectures, Schrödinger Institute, Vienna, Austria, October 2011
- *Summer School on Modern Dynamics*,
10 lectures, Bedlewo, Poland, June 2011
- Lecture series “*Theorie ergodique des action de groupe*”,
3 lectures, Tours, France, April 2011
- Summer School “*Analytic Questions in Arithmetic*”,
7 lectures, Mumbai, India, July 2010
- Summer School “*School on dynamical systems*”,
5 lectures, Trieste, Italy, July 2008

9. INVITED PLENARY TALKS ON INTERNATIONAL CONFERENCES

- Diophantine approximation and related fields
University of York, York, UK, June 2017
- Atkin Memorial Workshop
University of Illinois at Chicago, Chicago, USA, April 2017
- Conference “Ergodic Theory and its Connections with Arithmetic and Combinatorics”
CIRM, Marseille Luminy, France, December 2016
- Workshop “*Interactions between Ergodic Theory and Number Theory*”,
University of Chalmers, Gothenburg, Sweden, August 2016
- Conference “*Ergodic Theory and its application*”,
University of Sydney, Sydney, Australia, July 2016
- Conference “*Dynamics of geometric group actions*”,
University of Bonn, Bonn, Germany, January 2016
- Conference “*Ergodic Theory, Groups and Fractals*”,
Hebrew University, Jerusalem, Israel, October 2015

- *Linnik Centennial Conference*,
Steklov Institute, St. Petersburg, Russia, September 2015
- Workshop “*Advances in homogeneous dynamics*”,
MSRI, USA, May 2015
- Conference “*Recent progress in dynamical systems and related fields*”,
Banff Centre, Banff, Canada, August 2014
- Conference “*Dynamics and Numbers*”,
Max Plank Institute, Bonn, Germany, July 2014
- Conference “*Homogeneous dynamics, unipotent flows and applications*”,
Hebrew University, Jerusalem, Israel, October 2013
- Conference “*Ergodic theory and connections with arithmetic*”,
University of Crete, Heraklion, Greece, June 2013
- Conference “*Dynamics on homogeneous spaces and applications*”,
University of Lyon, Lyon, France, June 2013
- Conference “*Equidistribution in number theory*”,
ETH, Zurich, Switzerland, March 2013
- Conference “*Recent trends in ergodic theory and dynamical systems*”,
University of Baroda, India, December 2012
- Conference “*Modern trends in ergodic theory*”,
Uppsala University, Sweden, June 2012
- Conference “*Dynamics on homogeneous spaces and number theory*”,
Ohio State University, USA, September 2011
- Conference “*Modern Dynamics and its Interaction with Analysis, Geometry and Number Theory*”,
Bedlewo, Poland, July 2011
- EPSRC Symposia “*Geometry and Arithmetic of lattices*”,
Durham, UK, July 2011
- Workshop “*Group actions in number theory*”,
EPFL, Laussane, Switzerland, June 2011
- Conference “*Ergodic geometry*”,
University of Paris XIII, France, May 2011
- Conference “*Number theory days*”,
EPFL, Laussane, Switzerland, May 2011
- Conference “*Dynamical systems and number theory*”,
Warwick University, UK, April 2011
- Conference “*Group actions on measure spaces*”,
Texas A&M University, USA, March 2011

- Conference “*Discrete methods in Ergodic Theory*”, Northwestern University, USA, February 2011
- Conference “*Dynamics and geometry in spaces of negative curvature*” Bangalore, India, August 2010.
- Workshop “*Homogeneous Dynamics and Number Theory*” Oberwolfach, Germany, July 2010
- Conference “*A Workshop on Infinite Ergodic Theory and Related Fields*” Rehovot, Israel, June 2010
- Conference “*Dynamical Numbers: Interplay between Dynamical Systems and Number Theory*” Bonn, Germany, July 2009
- Workshop “*Representation growth*” Sde Boker, Israel, June 2009
- “*Semianual workshop in Dynamical Systems*”, Penn State University, October 2008
- Workshop “*Ergodic theory and geometry*” Manchester, UK, April 2008
- Workshop “*Shrinking target properties*” Boston, USA, February 2008
- *AMS Meeting*, Tucson, Arizona, April, 2007
- Conference “*Measures and Dynamics on groups and homogeneous spaces*” Mumbai, India, December 2007
- Workshop “*Ergodic theory of Lie group actions on parameter spaces*” Sde Boker, Israel, January 2007
- Workshop “*Ergodic theory on homogeneous spaces*” Haifa, Israel, December 2006
- Summer School “*Analysis and Ergodic Theory*” Lake Arrowhead, USA, August 2006
- Working Group “*Dynamical approach to rigidity of automorphisms*” Banff, Canada, June 2006
- Workshop “*Effective equidistribution*” Bristol, UK, July 2006
- Workshop “*Rational and Integral points on higher-dimensional varieties*” Berkeley, USA, April 2006
- Workshop “*Rigidity, dynamics, group actions*” Banff, Canada, June 2005

- Workshop “*Emerging applications of measure rigidity*”
Palo Alto, USA, June 2004
- Conference “*Ergodic properties of geometric group actions*”
Tegernsee, Germany, July 2003

10. INVITED SEMINAR TALKS

- 04/2017, Dynamics Seminar, KTH, Sweden
- 10/2016, Colloquium, University of Sheffield, UK
- 05/2016, Colloquium, University of Durham, UK
- 11/2015 Dynamical Systems Seminar, University of Warwick, UK
- 09/2015, Dynamical System Seminar, University of Rennes, France
- 06/2015, London Number Theory seminar, Kings College, UK
- 03/2015, Public Lecture, University of York, UK
- 11/2014, Colloquium, Indian Institute of Technology, India
- 11/2014, Dynamical Systems Seminar, Imperial College, UK
- 11/2014, Colloquium, Tata Institute, India
- 10/2014, Topology Seminar, University of Michigan, USA
- 06/2014, Number Theory Seminar, University of York, UK
- 05/2014, Dynamical Systems seminar, University of Liverpool, UK
- 02/2014, Number Theory seminar, Royal Holloway University, UK
- 02/2014, Analysis seminar, University of Central London, UK
- 11/2013, Group actions Seminar, Hebrew University, Israel
- 11/2013, Geometry Seminar, Technion, Haifa, Israel
- 11/2013, Dynamical Systems Seminar, Tel Aviv University, Israel
- 03/2013, Number Theory Seminar, University of York, UK
- 02/2013, Algebra Seminar, Oxford, UK
- 01/2013, Number Theory Seminar, University of East Anglia, UK
- 01/2013, Colloquium, Durham University, UK
- 11/2012, Geometry Seminar, University of Heidelberg, Germany
- 09/2012, Geometry Seminar, ETH, Switzerland
- 12/2011, Number Theory Seminar, Brandeis University, USA
- 12/2011, Lie groups Seminar, Yale University, USA
- 11/2011, London/Paris Number Theory Seminar, University of Jussieu, France
- 11/2011, Dynamical Systems Seminar, University of Manchester, UK
- 11/2011, Ergodic Theory Meeting, Queen Mary University, UK

- 09/2011, Geometry Seminar, University of Paris XIII, France
- 05/2011, Groups and Geometry Seminar, University of Geneva, Switzerland
- 04/2011, Number Theory Seminar, EPFL, Laussane, Switzerland
- 02/2011, Dynamical Systems Seminar, Penn State University, USA
- 02/2011, Colloquium, University of Bordeaux, France
- 01/2011, Dynamical Systems Seminar, Hebrew University, Israel
- 12/2010, Ergodic Theory Seminar, Warwick University, UK
- 12/2010, Dynamical Systems Seminar, University of Surrey, UK
- 11/2010, Ergodic Theory Seminar, University of Rennes, France
- 10/2010, Number Theory Seminar, University of Oxford, UK
- 09/2010, Lie Groups Seminar, University of Michigan, USA
- 06/2010, Action Now Seminar, Ben Gurion University, Israel
- 04/2010, Dynamics Seminar, Northwestern University, USA
- 04/2010, Geometry Seminar, University of Michigan, USA
- 03/2010, Group Actions Seminar, ETH Zurich, Switzerland
- 12/2009, Colloquium, Durham University, UK
- 11/2009, Colloquium, KTH Stockholm, Sweden
- 10/2009, Seminar, Hausdorff Institute, Germany
- 04/2009, Seminar, Ohio State University, USA
- 03/2009, Geometry Seminar, University of Paris XIII, France
- 06/2008, Ergodic Theory Meeting, University of Bristol, UK
- 03/2008, Analysis Seminar, Technion University, Israel
- 12/2007, Dynamical Systems Seminar, Texas A&M University
- 11/2007, Number Theory Seminar, University of Texas at Austin, USA
- 08/2007, Colloquium, Technion University, USA
- 05/2007, Group actions seminar, Brown University, USA
- 03/2007, Colloquium, Indiana University, USA
- 02/2007, Colloquium, Brandeis University, USA
- 02/2007, Colloquium, University of Oregon, USA
- 01/2007, Colloquium, University of Notre Dame, USA
- 01/2007, Colloquium, Binghamton University, USA
- 01/2007, Colloquium, Ohio State University, USA
- 12/2006, Colloquium, University of Illinois of Chicago
- 07/2006, Dynamical Systems Seminar, Warwick University, UK
- 02/2006, Dynamical Systems Seminar, Ohio State University, USA

- 01/2006, Number Theory Seminar, Tata Institute, India
- 08/2005, Geometry Seminar, University of Michigan, USA
- 05/2005, Colloquium, Ben Gurion University, Israel
- 04/2005, Colloquium, Technion University, Israel
- 04/2005, Group Actions Seminar, Princeton University, USA
- 03/2005, Dynamical Systems Seminar, Penn State University, USA
- 02/2005, Colloquium, Rice University, USA
- 02/2005, Geometry Seminar, University of Chicago, USA
- 01/2005, Colloquium, Brandeis University, USA
- 10/2004, Number Theory Seminar, California Institute of Technology, USA
- 02/2004, Dynamical Systems Seminar, Ohio State University, USA
- 12/2003, Number Theory Seminar, California Institute of Technology, USA
- 10/2003, Geometry Seminar, University of Michigan, USA
- 06/2003, Analysis Seminar, Technion University, Israel
- 02/2003, Lie Groups Seminar, University of Michigan, USA
- 11/2002, Seminar, Ben Gurion University, Israel
- 10/2002, Ergodic Theory Seminar, Hebrew University, Israel

11. CONFERENCES ORGANISED

- Conference “*Groups, Orbits, and Diophantine approximation*”, International Centre, Goa, India, January 2016
- Workshop “*Ergodic theory and combinatorics*”, University of Agder, Norway, June 2015
- Research programme “*Group actions in number theory*”, Newton Institute, UK, June–July 2014
- Workshop “*Workshop Groups, Numbers, and Dynamics*”, Newton Institute, UK, June 2014
- Spring school “*Dynamics and analytic number theory*”, Durham University, UK, March 2014
- Conference “*Recent advances in modern dynamics*”, Warwick University, UK, December 2011
- Workshop “*Density of Rational and Integral Points*”, Ein Gedi, Israel, January 2011
- Summer School “*Analytic Questions in Arithmetic*”, Mumbai, India, July 2010
- AMS special section “*Discrete Groups, Homogeneous Spaces, Rigidity*”, Lubbock, USA, October 2004.