

Michael Boshernitzan

Personal data

Name	Michael Boshernitzan
Born	1950, Chernivtsy, Ukraine (former USSR)
Immigration to US	September 1981. American citizen
	Tel. 713-348-5209. E-mail: michael@rice.edu.

Education

Ph. D.	Weizmann Inst. of Science, Dept. of Mathematics, Rehovot,	Israel, 1981
M. S.	Hebrew University, Dept. of Mathematics, Jerusalem,	Israel, 1974
B. S.	Moscow University, Dept. of Mechanics and Mathematics,	Russia, 1972

Professional appointments

Professor, Department of Mathematics, Rice University, Houston, 1993-present
 Visiting Professor, Princeton University, Princeton, December 2009 (two weeks)
 Research Professor, MSRI, Berkeley, Fall 2008 (3 months, sabbatical)
 Visiting Professor, Institut de Mathematiques, de Luminy, Marseille, France,
 1998, 2000, 2001, 2005 (monthly visits)
 Research Professor, Penn State University, February 1993, 40 days
 Membership at MSRI, Berkeley, May 1992, two weeks
 Visiting Associate Professor, Weizmann Inst. of Science, Rehovot, Israel,
 June & July 1987
 Associate Professor, Dept. of Mathematics, Rice University, Houston, 1985-1993
 Visiting Assistant Professor, Weizmann Inst. of Science, Rehovot, Israel,
 June & July 1984
 Assistant Professor, Dept. of Mathematics, Rice University, Houston, 1982-1985
 Membership, Institute for Advanced Study, Princeton, 1981-1982
 Instructor, School of Agriculture, Hebrew University, Rehovot, Israel, 1977-1981

Areas of research

Ergodic Theory	Dynamical Systems	Hardy Fields
Number Theory	Combinatorics	ADEs

Current support

NSF DMS-1102298 (2011-2014)
 Simon Foundation. Award Number 208492(pC ID) (2011-2016)

Students

1. Jon Chaika, Graduated Spring 2010.
Currently: Dickson instructor and NSF Postdoc Fellow, Univ. of Chicago.
2. David Ralston, Graduated Spring 2008.
Currently: Research Fellow in Ben-Gurion University, Beer-Sheva 84105, Israel

Department service

Chairman, Department Putnam Committee, 1984-present (excluding 2007-2008)

Throughout the last 28 years (excluding 2007-2008) Boshernitzan has been responsible for the selection and coaching the Rice team (and all interested students) for the Putnam mathematical competition.

Member, Department Graduate Committee, many years.

Member, Appointment Committee, many years (not currently)

Selected talks

- Colloquium. Institute of Mathematics, National Academy of Science of Ukraine, Kiev, Ukraine. May 25, 2012.
- Invited Speaker. South Padre Island. Fourth Discrete Geometry and Algebraic Combinatorics Conference April 18-21, 2012.
- Colloquium. University of Chicago. December 9, 2011.
- Special lecture, Ergodic Theory Seminar. University of Illinois Urbana-Champaign, December 6, 2011.
- Invited lecture, BIRS, University of British Columbia. Vancouver, BC, Canada. Workshop Almost Periodic Order: Spectral, Dynamical, and Stochastic approaches, September 2011.
- Invited lecture, Oberwolfach workshop Billiards, Flat Surfaces, and Dynamics on Moduli Spaces, Germany, May 8th - May 14th, 2011.
- Colloquium, Ben-Gurion University, Beer-Sheva, Israel, May 25, 2011.
- Lecture, Workshop, Ergodic Theorems, Group Actions and Applications, Ben-Gurion University of the Negev, Eilat, May 15-20, 2011.
- Special lecture, Ergodic Theory Seminar, Hebrew University, Jerusalem, Israel, June 2, 2011.
- Two lectures, Ergodic Theory Seminar, Princeton University, December 2009.
- Colloquium, Courant Institute, December 2009.
- Dynamical Systems Seminar, Texas A&M University, April 2009.
- Colloquium, SFSU, San-Francisco, October 2008.
- Two lectures, MSRI, Berkeley, October and November 2008.
- Principal Speaker, International Conference in Combinatorics of Words, CIRM, Marseille, France, July 2007.
- Invited Address, International Conference in Dynamics in the Teichmuller Space and Applications to Rational Billiards, Marseille, France, July 2003.
- Minicourse (3 talks), Institut de Mathematiques de Luminy, Marseille, France, June 2002.
- Special AMS session in Geometric and Symbolic Dynamical Systems, San Francisco, CA, October 2000.
- Minicourse (2 talks), IV Joint Meeting AMS-SMM, University of North Texas, Denton, TX, May 1999.
- Colloquium Lecture, University of South California, LA, November 1999.
- Two lectures, Institut de Mathmatiques de Luminy, Marseille, France, June-July 1998.
- Colloquium, Ben-Gurion University, Beer-Sheva, Israel, August 1998.
- Invited Address, International Workshop on Modern Ergodic Theorems, Technion, Haifa, Israel, March 1997.

Publications

1. An extension of Hardy's class of orders of infinity, *J. d'Analyse Math.* **39**(1981), 235-255.
2. New orders of infinity, *J. d'Analyse Math.* **41** (1981), 130-167.
3. (with A.Fraenkel) Nonhomogeneous spectra of numbers, *Discrete Mathematics* **34** (1981), 325-327.
4. Homogeneously distributed sequences and Poincare sequences of integers of sublacunary growth, *Monatshefte für Mathematik* **96** (1983), 173-181.
5. Orders of infinity generated by difference equations, *Amer. J. Math.* **106** (1984), 1067-1089.
6. Discrete orders of infinity, *Amer. J. Math.* **106** (1984), 1147-1198.
7. (with A. Fraenkel) A linear algorithm for nonhomogeneous spectra of numbers, *Journal of Algorithms* **5** (1984), 187-198.
8. A unique ergodicity of minimal symbolic flows with linear block growth, *J. d'Analyse Math.* **44** (1985), 77-96.
9. A condition for minimal interval exchange maps to be uniquely ergodic, *Duke Math. J.*, **52**(3) (1985), 723-752.
10. Hardy fields and existence of transexponential functions, *Aequationes Mathematicae* **30** (1986), 258-280.
11. Universal formulae and universal differential equations, *Ann. of Math.* **124** (1986), 273-291.
12. (with L. A. Rubel) Coherent families of polynomials, *Analysis* **6** (1986), 339-389.
13. Second-order differential equations over Hardy fields, *J. Lon. Math. Soc.* **35**(2) (1987), 109-120.
14. Rank two interval exchange maps, *Erg. Theory and Dynam. Sys.* **8** (1988), 379-394.
15. Billiards and rational periodic directions in polygons, *Amer. Math. Monthly* **99**(6) (1992), 522-529.
16. A condition for unique ergodicity of minimal symbolic flow, *Erg. Theory and Dynam. Sys.* **12** (1992), 425-428.
17. Dense orbits of rationals, *Proc. AMS*, vol.117, **4** (1993), 1201-1203.
18. Quantitative recurrence results, *Invent. Math.* **113** (1993), 617-632.
19. (with V. Bergelson and J. Bourgain) Some results on non-linear recurrence, *J. d'Analyse Math.*, **62** (1994), 30-46.
20. Uniform distribution and Hardy fields, *J. d'Analyse Math.* **62** (1994), 225-240.
21. (with D. Berend) On a result of Mahler on the decimal expansion of (nx) , *Acta Arithm.*, **66** (1994), 315-322.

22. Elementary proof of Furstenbergs diophantine result, *Proc.AMS*, **122** (1994), 67-70.
23. Density mod 1 of dilations of sublacunary sequences, *Adv. in Math.* **108** (1994), 104-117.
24. (with D. Berend) On sequences of reals with complicate decimal expansions, *Acta Math. Hungar.* **66** (1994), 97-104.
25. (with D.Berend) Densing sets, *Advances in Mathematics* **11** (1995), 286-299.
26. (with I.Kornfeld) Interval translation maps, *Erg. Theory and Dynam. Sys.* **15** (1995), 821-831.
27. (with D.Berend, G.Kolesnik) Distribution modulo 1 of some oscillating sequences II, *Israel J. of Math.* **92** (1995), 113-129.
28. (with R.Jones and M.Wierdl) Integer and Fractional parts of Good Averaging Sequences in Ergodic Theory, *Conference in Ergodic Theory and Probability*, Eds.: Bergelson/March/Rosenblatt, by Walter de Gruyter & Co., Berlin, New York 1996.
29. (with M.Wierdl) Ergodic Theorems Along Sequences and Hardy fields, *Proc. of Nat. Acad. Sci. U.S.A.* **93** (1996), no. 16, 8205–8207. (Presented by Colderön.)
30. (with C. R. Carroll) A generalization of Lagranges theorem to interval exchange tranformations, *J.d’Analyse Math.* **72** (1997), 21–44.
31. (with G. Galperin, T. Kruger, S. Troubetzkoy) Periodic billiard orbits are dense in rational polygons, *Trans. Amer. Math. Soc.* **350** (1998), 3523–2535.
32. (with D. Berend, G. Kolesnik) Distribution modulo 1 of some oscillating sequences III, *Acta Math Hungar.* **95** (2002), 1–20.
33. (with A. Goetz) A dichotomy for a two-parameter piecewise rotation, *Erg. Theory and Dynam. Systems*, **23** (2003), 759–770.
34. (with D. Berend, G. Kolesnik) Irrational Dilations of Pascal’s Triangle, *Mathematika*, **48** (2003), 159–168.
35. (Y. Cheung) Hausdorff dimension of the set of nonergodic directions, with an appendix by M. Boshernitzan, *Annals of Math.* **158**(2) (2003), 661–678.
36. (with A. Nogueira) Generalized eigenfunctions of interval exchange maps. *Ergodic Theory Dynam. Systems* **24** (2004), no. 3, 697-705.
37. (with G. Kolesnik, A. Quas, M. Wierdl) Ergodic Averaging Sequences, *J. d’Analyse Math.* **95** (2005), 63–103.
38. (with M. Wierdl) Almost-everywhere convergence and polynomials. *J. Mod. Dyn.* **2** (2008), no. 3, 465–470.
39. (with D. Damanik) Generic continuous spectrum for ergodic Schrdinger operators. *Comm. Math. Phys.* **283** (2008), no. 3, 647-662.
40. (with D. Berend) Nilpotent groups are round. *Israel J. Math.* **167** (2008), 49–61.
41. (with D. Ralston) Continued fractions and heavy sequences. *Proc. Amer. Math. Soc.* **137** (2009), no. 10, 3177–3185.

42. (with D. Damanik) The repetition property for sequences on tori generated by polynomials or skew-shifts. *Israel J. Math.* **174** (2009), 189–202.
43. (with E. Glasner) On two recurrence problems, *Fund. Math.* **206** (2009), 113–138.
44. (with D. Damanik) Pinned repetitions in symbolic flows: preliminary results, *Discrete Contin. Dyn. Syst., Dynamical Systems, Differential Equations and Applications. 7th AIMS Conference, suppl.* (2009), 869–878.
45. (with J. Chaika) Borel-Cantelli sequences, *Journal d’Analyse Mathématique* **17** (1), (2012) 321–345.
46. A condition for weak mixing of induced interval exchange transformations, *Contemporary Mathematics* **567** (2012), p. 53–65. (Special volume Dynamical Systems and Group actions, dedicated to Anatoli Stepin on the occasion of his 70th birthday).
47. (with J. Chaika) Diophantine properties of IETs and general systems: Quantitative proximality and connectivity, to appear in *Invent. Math.*, 2012, DOI: 10.1007/s00222-012-0413-4
48. (with A. Besbes, and D. Lenz) Delone sets with finite local complexity: linear repetitivity versus positivity of weights, accepted in *Discrete and Computational Geometry*.

Preprints

49. A dichotomy for projections of planar sets, preprint 2011 (new version).
50. Subgroup of interval exchanges generated by torsion elements and rotations, preprint 2012
51. Approximate embedding of large polygons into Z^2 , preprint 2012
52. (with J. S. Athreya) Ergodic properties of compositions of interval exchange maps and rotations, preprint 2012.
53. (with D. Berend and G. Kolesnik) Analytic examples of relatively equidistributed sequences in R^n and Z^n , preprint 2011 (new version)