

Curriculum Vitae

Mikhail Gordin

Revised: April 2015, based on the 2011 version

EDUCATION

1970: Ph.D. Leningrad State University

Dissertation: *Some results in the theory of stationary random processes*

Advisor: I. A. Ibragimov

1966: M. Sc. (Diploma) Leningrad State University

EMPLOYMENT

1992–2015: Senior Researcher, V.A. Steklov Institute of Mathematics at St. Petersburg (POMI), Russian Academy of Sciences

1970–1992: Leading researcher, Senior Researcher, Junior Researcher, at the All-Union Research Institute for Electrical Measurements (now Electromera), St. Petersburg, Russia

HONORS AND AWARDS

2014: GaußProfessur, Akademie der Wissenschaften zu Göttingen

2009: Taft Fellow, University of Cincinnati

2006: POMI Award for the Best Scientific Paper of the Year

2004: POMI Award for the Best Scientific Paper of the Year

INVITED PROFESSORSHIPS AND FELLOWSHIPS

2014: University of Göttingen, Germany

2012: Pennsylvania State University, USA

2009: University of Cincinnati, Taft Research Fellowship, USA

2003: University of Strasbourg, France

2001: University of Strasbourg, France

2000: University of Strasbourg, France

1999: University Paris-Sud, France

1996: University Lille-1, France

1995: Institute for Dynamical systems, University of Bremen, Germany

1993: University Paris-Sud, France

1990: Department of Mathematics, Charles University, Prague, Czechoslovakia

PARTIAL LIST OF GRANTS

2009–2011, 2004–2006, 1999–2002, 1996–1997: joint research grants of the Deutsche Forschungsgemeinschaft (DFG) and the Russian Foundation for Basic Research (RFBR)

2010–2012, 2005–2007, 2002–2004, 1999–2001, 1996–1998, 1993–1995: research grants of the RFBR

2003, 1999: travel grants of the RFBR

1999, 1998: joint research grants of the CNRS (France) and the Russian Academy of Sciences

1997–2007: research and travel grants of INTAS (International Association for the promotion of co-operation with scientists from the New Independent States of the Former Soviet Union)

PROFESSIONAL SERVICE

Referee for Probability Theory and its Applications, Annals of Institute Henry Poincare, Stochastic Processes and their Applications, Stochastics and Dynamics, Functional Analysis and its Applications, Saint Petersburg Mathematical Journal, Nonlinearity, Zapiski nauchnykh seminarov POMI (translated in Journal of Mathematical Sciences), Israel Science Foundation Proposal, Ph.D. dissertations in Russia, France and Germany

RESEARCH INTERESTS

- i) Limit theorems for weakly dependent variables: in particular, for random processes produced from hyperbolic or partially hyperbolic dynamical systems; the main ambition here is to avoid using such non-canonical tools as partitions (Markov ones or similar) basing instead on internal structures discussed in the next point;
- ii) Study of internal structures related to hyperbolic and weakly hyperbolic dynamics, in particular, synchronous and asynchronous homoclinic equivalence relations and groupoids related to strictly hyperbolic discrete time dynamical systems; these structures, when we are given a dynamically invariant Gibbs measure, provide a partial substitute for systems of sigma-fields which are more familiar to the probabilists;
- iii) Limit distribution of the spectra of large random matrices, in particular, asymptotics of correlation functions and explanation of the appearance of determinantal processes in the limit; exact probabilistic models of free probability (of which random matrices give, according to D. Voiculescu, an *asymptotical* probabilistic model).

SELECTED INVITED CONFERENCE TALKS

- 2011: Combinatorial, bialgebraic and analytic aspects of free probability (Vienna, Austria)
 Ergodic theorems, group actions and applications (Eilat, Israel)
 Dynamical Systems (Göttingen, Germany)
- 2010: Propriétés stochastiques des systèmes dynamiques et marches aléatoires (Roscof, France)
 Limit Theorems for Dependent Data and Applications (Paris)
 Vilnius Conference on Probability and Mathematical Statistics (Vilnius, Lithuania)
 Free Probability and Random Matrices (Bielefeld, Germany)
- 2007: Workshop on Asymptotic Statistics and Its Applications in Honor of Ildar I. Ibragimov (Bordeaux, France)
 Ergodic Theory and Limit Theorems (Rouen, France)
 Conformal Structures and Related Problems (Goettingen, Germany)
 Asymptotic Statistics and Its Applications (Bordeaux, France)
- 2006: Stochastic Processes and Random Fractals (Lille, France)
 European Meeting of Statisticians (Torun, Poland)
 Prague Conference on Probability, Statistics and Random Processes (Prague, Czech Republic)
- 2005: Analytic Methods in Number Theory, Probability and Mathematical Statistics, Yu.V. Linnik's Memorial (Saint Petersburg, Russia)
 Quantum Chaos and Random Matrices (Bielefeld, Germany)

SELECTED PUBLICATIONS

- [1] M. Denker, M. Gordin. *Limit theorems for von Mises statistics of a measure preserving transformation*. Probab. Theory Related Fields **160** (2014), 1–45.
- [2] M. Gordin. *CLT for stationary normal Markov chains via generalized coboundaries*. Limit theorems in probability, statistics and number theory, 93–112, Springer Proc. Math. Stat., **42**, Springer, Heidelberg, 2013.
- [3] M. Denker, M. Gordin. *The Poisson limit for automorphisms of two-dimensional tori defined by continued fractions*. (Russian) Zap. Nauchn. Sem. S.-Peterburg. Otdel. Mat. Inst. Steklov. (POMI) **408**

- (2012), *Veroyatnost i Statistika*. **18**, 131–153, 325–326; translation in *J. Math. Sci. (N. Y.)* **199** (2014), 139–149.
- [4] M. Gordin, M. Peligrad. *On the functional CLT via martingale approximation*. *Bernoulli*, vol. **17** (2011), 424–440.
- [5] M.I. Gordin. *Homoclinic processes and invariant measures for hyperbolic automorphisms of tori*, *Zap. Nauchn. Sem. S.-Peterburg. Otdel. Mat. Inst. Steklov. (POMI)*, vol. **368** (2009), P. 501-505 (Russian); transl. in *J. Math. Sci. (N. Y.)* **167** (2010), 501–505.
- [6] M.I. Gordin. *Martingale-co-boundary representation for a class of stationary random fields*, *Zap. Nauchn. Sem. S.-Peterburg. Otdel. Mat. Inst. Steklov. (POMI)*, vol. **364** (2009), P. 88-108 (Russian); transl. in *J. Math. Sci. (N. Y.)* **163** (2009), no. 4, 363–374
- [7] Götze, Friedrich; Gordin, Mikhail. *Limit correlation functions for fixed trace random matrix ensembles*. *Comm. Math. Phys.* **281** (2008), no. 1, P. 203–229.
- [8] Götze, F. ; Gordin, M. I. ; Levina, A. *The limit behavior at zero of correlation functions of random matrices with a fixed trace*. *Zap. Nauchn. Sem. S.-Peterburg. Otdel. Mat. Inst. Steklov. (POMI)* **341** (2007), *Veroyatn. i Stat.* **11**, 68–80, 230, Russian; transl. in *J. Math. Sci. (N. Y.)* **147** (2007), no. 4, P. 6884–6890.
- [9] Mikhail Gordin, Michel Weber. *A borderline Gaussian random Fourier series for the sample convergence in variation*. *J. Math. Anal. Appl.*, **318** (2006): 2, P. 526-551.
- [10] Mikhail Gordin. *A remark on the martingale method for proving the central limit theorem for stationary sequences*. *Zap. Nauchn. Sem. S.-Peterburg. Otdel. Mat. Inst. Steklov. (POMI)*, **311** (2004) *Veroyatn. i Stat.* **7**, 124–132 (Russian); transl. in *J. Math. Sci. (N. Y.)* **133** (2006), no. 3, 1277–1281.
- [11] Mikhail Gordin, Hajo Holzmann. *The central limit theorem for stationary Markov chains under invariant splittings*. *Stoch. Dyn.* **4** (2004): 1, 15–30.

- [12] Manfred Denker, Mikhail Gordin, Anastasiya Sharova. *A Poisson limit theorem for hyperbolic toral automorphisms*. Illinois J. Math. **48** (2004): 1, 1–20.
- [13] Friedrich Götze, Mikhail Gordin. *Limiting distributions of theta series on Siegel half-spaces*. Algebra i Analiz **15** (2003): 1, 118–147; reproduced in St. Petersburg Math. J. **15** (2004): 1, 81–102.
- [14] Manfred Denker, Mikhail Gordin. *On conditional central limit theorems for stationary processes*. Probability, statistics and their applications: papers in honor of Rabi Bhattacharya; IMS Lecture Notes Monogr. Ser., vol. **41** (2003), 133–151.
- [15] Manfred Denker, Mikhail Gordin, Stefan-M.T Heinemann. *On the relative variational principle for fibre expanding maps*. Ergodic Theory Dynam. Systems **22** (2002), 3, 757–782.
- [16] Mikhail Gordin, Michel Weber. *On the almost sure central limit theorem for a class of \mathbb{Z}^d -actions*. J. Theoret. Probab. **15** (2002): 2, 477–501.
- [17] Mikhail Gordin. *Double extensions of dynamical systems and the construction of mixing filtrations. II. Quasihyperbolic automorphisms of tori* Zap. Nauchn. Sem. S.-Peterburg. Otdel. Mat. Inst. Steklov. (POMI) **260** (1999) Veroyatn. i Stat. **3**:103–118, 318–319 (Russian). Engl. transl. in J. Math. Sci. (N. Y.) **109** (2002): 6, 2103–2114.
- [18] Denker M., Gordin M. *Gibbs measures for fibred systems*. Advances in Mathematics, **148**, 1999, no.2, 161–192.
- [19] Denker M., Gordin M. *The central limit theorem for random perturbations of rotations*. Probab. Theory and Related Fields. **111** 1998, no. 1, 1–16.
- [20] Gordin M. I. *Double extensions of dynamical systems and the construction of mixing filtrations*. (Russian) Zap. Nauchn. Sem. S.-Peterburg. Otdel. Mat. Inst. Steklov. (POMI) **244** (1997), Veroyatn. i Stat. **2**, 61–72, 330–331; transl. in J. Math. Sci. (New York) **99** (2000), no. 2, 1053–1060.

- [21] Denker, Manfred; Gordin, Mikhail. *Remarks on Gibbs measures for fibred systems. Problems on complex dynamical systems* (Kyoto, 1997). Su-rikaiseikikenkyu-sho Ko-kyu-roku No. **1042** (1998), 1–10.
- [22] Gordin M. I. *Extensions of dynamical systems and the martingale approximation method*. (Russian) Zap. Nauchn. Sem. S.-Peterburg. Otdel. Mat. Inst. Steklov. (POMI) **216** (1994), Problemy Teorii Veroyatnost. Raspred. **13**, 10–19, 161; translation in J. Math. Sci. (New York) **88** (1998), no. 1, 7–12.
- [23] Gordin M. I. *Some remarks on homoclinic groups of hyperbolic automorphisms of tori*. (Russian) Zap. Nauchn. Sem. S.-Peterburg. Otdel. Mat. Inst. Steklov. (POMI) **223** (1995), Teor. Predstav. Din. Sistemy, Kombin. i Algoritm. Metody. I, 140–147, 339; translation in J. Math. Sci. (New York) **87** (1997), no. 6, 4067–4071.
- [24] M.I. Gordin, B.A. Lifshits. *Martingale approach in the limit theorems for random walks*. In book *Limit theorems for functionals of random walks. Proceedings of the Steklov Mathematical Institute*, **195** (1994), by A.N. Borodin, I.A. Ibragimov, St Petersburg, Nauka. English transl. (1995) AMS, Providence, Rhode Island USA, 164–176.
- [25] M. Gordin. *Homoclinic approach to the Central Limit Theorem for dynamical systems*. "Doebelin and Modern Probability" (Blaubeuren, 1991), 149–162, Contemp. Math., **149**, Amer. Math. Soc., Providence, RI, 1993.
- [26] M.I. Gordin. *A homoclinic version of the Central Limit Theorem*. Zap. Nauchn. Sem. LOMI (Scientific Seminars Notes of the Leningrad Branch of Steklov Mathematical Institute) **184** (1990), 80–91 (Russian). Engl. transl. in Journ. of Math. Sci. **68**: (1994), no.4, 451–458.
- [27] M.I. Gordin, B.A. Lifshits. *The invariance principle for stationary Markov processes*. Teoriya veroyatnostej i ejo prim. **23** (1978): 4 (1978), 147–148 (Russian).
- [28] M.I. Gordin, B.A. Lifshits. *The Central Limit Theorem for stationary Markov processes*. Doklady Akademii Nauk SSSR, **239** (1978),4, 766–767 (Russian). Engl. transl. in Soviet Math. Dokl., **19** (1978), 2, 392–394.

- [29] M.I. Gordin. *On the behavior of the variances of sums composed from stationary connected random variables* Teorija verovatnostej i ejo prim. **16**:4(1971), 484–494 (Russian). Engl. transl. in Probability theory and its applications.
- [30] M.I. Gordin. *Exponentially fast mixing*. Doklady Akademii Nauk SSSR **196**(1971): 6, 1255–1258 (Russian). Engl. transl. in Soviet Math. Dokl. **12** (1971): 1, 331–335.
- [31] M.I. Gordin, M.Kh. Resnik. *The Law of the Iterated Logarithm for the denominators of continued fractions*. Vestnik Leningrad Univ. **25** (1970): 13, 28–33 (Russian). Engl. transl. in Vestnik Leningrad Univ. Math. **3** (1976), 207–213.
- [32] M.I. Gordin. *On the Central Limit Theorem for stationary processes*. Doklady Akademii Nauk SSSR **188** (1969): 4, 739–741 (Russian) Engl. transl. in Soviet Math. Dokl. **10**(1969): 5, 1174–1176.
- [33] M.I. Gordin. *Stochastic processes generated by number - theoretic endomorphisms*. Doklady Akademii Nauk SSSR **182** (1968): 5, 1004–1006 (Russian). Engl. transl. in Soviet Math. Dokl. **9** (1968): 5, 1234–1237.

PUBLISHED ABSTRACTS OF CONFERENCES TALKS

1. M. Gordin. *Stationary fields, martingale approximation, tensor spaces and von Mises statistics*. 10th Vinius Conference on Probability Theory and Mathematical Statistics, 28th June – 2th July, 2010, Vilnius, Lithuania. Abstracts of Communications. Vilnius, 2010, P. 40-41.
2. M. Gordin. *An application of multiparameter martingale approximation*. Prague Stochastics 2010. Book of Abstracts. Prague, P. 87.
3. Mikhail Gordin, Michel Weber. *Degeneration in the central limit theorem for a class of multidimensional actions*. Abstracts of 9-th Vilnius Conference on Probab. Theory, 2006, P. 151.
4. Mikhail Gordin. *Homoclinic approach to the central limit theorem*. 11th Prague Conference on Information Theory, Statistical Decision Functions and Random Processes, Abstracts, Prague, 1990.

6. M.I. Gordin. *Homoclinic transformation and the central limit theorem.*(Russian) Abstracts of 5-th Vilnius Conference on Probab. Theory and Math. Stat., vol. **3**, Vilnius 1989, P.156–157.
7. Mikhail Gordon. *Ergodic properties of a class of a queueing systems.* Abstracts of Communications of the First World Congress of the Bernoulli Society, vol. **2**. Moscow, 1986, P. 546.
8. M.I. Gordin, B.A. Lifshits. *Central Limit Theorem for periodograms of stationary sequences related to a class of Markov chains.* (Russian). Abstracts of 4-th Vilnius Conference on Probab. Theory and Math. Stat., vol. **1**, Vilnius 1985, P.182–183.
9. M.I. Gordin, B.A. Lifshits. *A remark on Markov processes with normal transition operators.* The Third Vilnius International Conference on Probability and Mathematical Statistics, Abstracts of Communications. vol. **1**, Vilnius, 1981,147-148 (Russian).
10. M.I. Gordin. *The Central Limit Theorem for stationary processes without the finiteness of variance assumption.* The First Vilnius International Conference on Probability and Statistics, Abstracts of communications. vol. **1**, Vilnius, 1973,173-174 (Russian).
11. Yu.A. Davydov, M.I. Gordin, I.A. Ibragimov, V.N. Soley. *Stationary processes: limit theorems, regularity conditions.* In "Soviet–Japanese Symposium on Probability Theory", Novosibirsk, 1989.

PAPERS IN PREPARATION

1. (with Michel Weber) *Degeneration in the Central Limit Theorem for a class of multidimensional actions.*
2. *The Central Limit Theorem for stationary Markov chains with normal transition operator.*
3. (with Friedrich Götze) *Wigner matrix ensembles via external source matrix models.*
4. *Limit theorems for hyperbolic non-homomorphic actions on tori.*

PAPERS IN APPLIED MATHEMATICS AND COMPUTER SCIENCE

There are more than 20 papers and technical reports (1970 – 1992) on statistical theory of measurements and mathematical models of parallelism and interaction.