Alexander I. Bufetov

CURRENT POSITION

CNRS
Aix-Marseille Université, Institut de Mathématiques, UMR 7373
Directeur de Recherche 1er grade since 23 February 2020
$2^{\text{ème}}$ grade since 1 October 2012

email: alexander.bufetov@univ-amu.fr

PRIZES AND FELLOWSHIPS

ERC Consolidator Grant ICHAOS, European Research Council, European Commission, 2016-2020.

Gabriel Lamé Chair of the French Embassy in the Russian Federation, Saint-Petersburg University, 2016–2017.

Sofia Kovalevskaya Prize of the Russian Academy of Sciences, awarded *"for the cycle of works 'Ergodic theory and its applications to stochastic processes, representation theory and Teichmüller theory'"*, 2015.

Aix-Marseille Initiative d'Excellence Fellowship, Programme "Investissements d'avenir" of the Government of the French Republic, 2013–2015.

Alfred P. Sloan Research Fellowship, Alfred P. Sloan Foundation, 2010–2012.

Grant of the President of the Russian Federation, 2010–2018

Prize of the Moscow Mathematical Society, awarded *"for the cycle of works applying the techniques of interval exchange maps and hyperbolic theory of dynamical systems to the study of Teichmüller flows"*, September 2005.

ACADEMIC POSITIONS

Russian Academy of Sciences
Steklov Institute of Mathematics
Senior Researcher since 1 June 2009, Leading Researcher since 1 June 2011.

Rice University, Houston, TX
Assistant Professor (tenure-track) and Edgar Odell Lovett Junior Chair,
1 July 2006 – 30 May 2009.

The University of Chicago, Chicago, IL
Dickson Instructor, 1 Sept. 2005- 30 June 2006.

Clay Mathematics Institute, Boston, MA
Liftoff Postdoc, 1 June 2005–30 August 2005.

EDUCATION

Princeton University, Department of Mathematics, Princeton NJ
Ph.D. Student, 1 Sept. 2000-30 May 2005.
Thesis Advisor: **Yakov G. Sinai**.
Thesis jury: Charles Fefferman, Elon Lindenstrauss, Yakov G. Sinai.

Indepent University of Moscow,
Undergraduate Student, 1995– 2000, diploma *cum laude*.

École Normale Supérieure de Paris.
Visiting student, fall 1999.

RESEARCH INTERESTS

Ergodic theory, Point processes, Representation theory, Teichmüller theory

MAIN PUBLICATIONS

A. I. Bufetov, Quasi-symmetries of determinantal point processes, *Annals of Proba.* **46**:2, 2018, 956–1003.

A. I. Bufetov, Limit Theorems for Translation Flows, *Annals of Math.*, **179**:2 (2014), 431–499.

A. I. Bufetov, Y. Qiu. Ergodic measures on spaces of infinite matrices over non-Archimedean locally compact fields. *Compos. Math.* **153**:12 (2017), 2482–2533.

A. I. Bufetov, B. Solomyak. The Hölder property for the spectrum of translation flows in genus two. *Israel J. Math.* **223**:1 (2018), 205–259.

Alexander I. Bufetov, G. Forni, Limit Theorems for Horocycle Flows, *Annales scientifiques de l'École normale supérieure*, **47**:5 (2014), 851–903.

Alexander I. Bufetov, On the Vershik-Kerov Conjecture Concerning the Shannon-Macmillan-Breiman Theorem for the Plancherel Family of Measures on the Space of Young Diagrams, *GAFA (Geometric and Functional Analysis)* **22**:4 (2012), 938–975.

J. Athreya, A. Bufetov, A. Eskin, M. Mirzakhani, Lattice Point Asymptotics and Volume Growth on Teichmueller space, *Duke Mathematical Journal*, **161**:6 (2012), 1055–1111.

Alexander I. Bufetov, Decay of correlations for the Rauzy-Veech-Zorich induction map on the space of interval exchange transformations and the central limit theorem for the Teichmuller flow on the moduli space of abelian differentials. *J. Amer. Math. Soc.* **19**:3 (2006), 579–623.

A.I. Bufetov. Convergence of spherical averages for actions of free groups. *Annals of Math.*, **155**:3 (2002), 929–944.

OTHER PUBLICATIONS

Alexander I. Bufetov, Andrey V. Dymov. A functional limit theorem for the sine-process. *International Mathematics Research Notices*, **2019**:1 (2019), 249–319.

Alexander I. Bufetov, Andrey V. Dymov, Hirofumi Osada. The logarithmic derivative for point processes with equivalent Palm measures, *J. Math. Soc. Japan*, **71**:2 (2019), 451–469

Alexander I. Bufetov, Alexey Klimenko, Caroline Series, Convergence of spherical averages for actions of Fuchsian Groups, preprint, 2018 , 56 pp., arXiv: 1805.11743

Alexander I. Bufetov, Shilei Fan, Yanqi Qiu. Equivalence of Palm measures for determinantal point processes governed by Bergman kernels, *Probab. Theory Relat. Fields*, **172**:1 (2018), 31–69

Alexander I. Bufetov, Boris Solomyak. On ergodic averages for parabolic product flows, *Bulletin de la SMF*, **146**:4 (2018), 675–690.

Alexander I. Bufetov, Yoann Dabrowski, Yanqi Qiu. Linear rigidity of stationary stochastic processes. *Ergodic Theory Dynam. Systems*. **38** (2018), no. 7, 2493–2507.

Alexander I. Bufetov, Yanqi Qiu. J-Hermitian determinantal point processes: balanced rigidity and balanced Palm equivalence. *Math. Ann.* **371**:1–2 (2018), 127–188.

Alexander I.Bufetov, Boris Solomyak. The Hölder property for the spectrum of translation flows in genus two. *Israel J. Math.* **223**:1 (2018), 205–259.

Alexander I. Bufetov, Yanqi Qiu. Ergodic measures on spaces of infinite matrices over non-Archimedean locally compact fields. *Compos. Math.* **153**:12 (2017), 2482–2533.

Alexander I. Bufetov, Yanqi Qiu. Conditional measures of generalized Ginibre point processes. *J. Funct. Anal.* **272**:11 (2017), 4671–4708.

Alexander I. Bufetov, Yanqi Qiu. Determinantal point processes associated with Hilbert spaces of holomorphic functions. *Comm. Math. Phys.* **351**:1 (2017), 1–44.

Alexander I. Bufetov, Tomoyuki Shirai. Quasi-symmetries and rigidity for determinantal point processes associated with de Branges spaces. *Proc. Japan Acad. Ser. A* **93**:1 (2017), 1–5.

Alexander I. Bufetov. A Palm Hierarchy for Determinantal Point Processes with the Bessel Kernel. *Proc. Steklov Inst. Math.*, **297** (2017), 90 – 97.

Alexander I. Bufetov. Infinite determinantal measures and the ergodic decomposition of infinite Pickrell measures III. The infinite Bessel process as the limit of radial parts of finite-dimensional projections of infinite Pickrell measures. (Russian) *Izv. Ross. Akad. Nauk Ser. Mat.* **80**:6 (2016), 43–64; translation in *Izv. Math.* **80**:6 (2016), 1035–1056

Alexander I. Bufetov, Yanqi Qiu. The explicit formulae for scaling limits in the ergodic decomposition of infinite Pickrell measures. *Ark. Mat.* **54**:2 (2016), 403–435.

Alexander I. Bufetov. Infinite determinantal measures and the ergodic decomposition of infinite Pickrell measures. II. Convergence of determinantal measures. (Russian) *Izv. Ross. Akad. Nauk Ser. Mat.* **80**:2 (2016), 16–32; translation in *Izv. Math.* **80**:2 (2016), 299–315

Lewis Bowen, Alexander I. Bufetov, Olga Romaskevich. Mean convergence of Markovian spherical averages for measure-preserving actions of the free group. *Geom. Dedicata* **181**:1 (2016), 293–306.

Alexander I. Bufetov. Rigidity of determinantal point processes with the Airy, the Bessel and the gamma kernel. *Bull. Math. Sci.* **6**:1 (2016), 163–172.

Vítor Araújo, Alexander I. Bufetov, Simion Filip. On Hölder-continuity of Oseledets subspaces. *J. Lond. Math. Soc.* **93**:1 (2016), 194–218.

Alexander I. Bufetov. On the action of the diffeomorphism group on determinantal measures. (Russian) *Uspekhi Mat. Nauk.* **70** (2015), no. 5 (425), 175–176; *translation in Russian Math. Surveys* **70** (2015), no. 5, 953–954

Alexander I. Bufetov. Infinite determinantal measures and the ergodic decomposition of infinite Pickrell measures. I. Construction of infinite determinantal measures. (Russian) *Izv. Ross. Akad. Nauk Ser. Mat.* **79**:6 (2015), 18–64; translation in *Izv. Math.* **79**:6 (2015), 1111–1156

Alexander I. Bufetov, Yanqi Qiu. Equivalence of Palm measures for determinantal point processes associated with Hilbert spaces of holomorphic functions. *C. R. Math. Acad. Sci. Paris.* **353**:6 (2015), 551–555.

Alexander I. Bufetov, Limit Theorems for Translation Flows, *Annals of Mathematics*, **179**:2 (2014), 431–499.

X. Bressaud, A. Bufetov, P. Hubert, Deviation of ergodic averages for substitution dynamical systems with eigenvalues of modulus one, *Proceedings of the London Mathematical Society*, **109**:2 (2014), 483–522.

Alexander I. Bufetov and Giovanni Forni, Limit Theorems for Horocycle Flows, *Annales scientifiques de l'École normale supérieure*, **47**:5 (2014), 851–903.

Alexander I. Bufetov, Finiteness of Ergodic Unitarily Invariant Measures on Spaces of Infinite Matrices, *Ann. Inst. Fourier (Grenoble)*, **64**:3 (2014), 893–907.

Alexander I. Bufetov, Finitely-additive measures on the asymptotic foliations of a Markov compactum, *Mosc. Math. J.*, **14**:2 (2014), 205–224.

A. I. Bufetov, Ergodic decomposition for measures quasi-invariant under a Borel action of an inductively compact group, *Sb. Math.*, **205**:2 (2014), 192–219

Alexander I. Bufetov, B. Solomyak, On the modulus of continuity for spectral measures in substitution dynamics, *Advances in Mathematics*, **260** (2014), 84–129.

A. Bufetov, S. Mkrtchyan, M. Shcherbina, A. Soshnikov, Entropy and the Shannon-McMillan-Breiman Theorem for beta random matrix ensembles, *Journal Stat. Phys.*, **152**:1 (2013), 1–14.

A. I. Bufetov, Limit theorems for suspension flows over Vershik automorphisms, *Russian Math. Surveys*, **68**:5 (2013), 789–860.

A. Bufetov, B. Solomyak, Limit theorems for self-similar tilings, *Comm. Math. Physics* **319**:3 (2013), 761–789.

A. I. Bufetov, Infinite determinantal measures, *Electr. Res. Ann. Math. Sci.*, 20 (2013), 12–30.

J. Athreya, A. Bufetov, A. Eskin, M. Mirzakhani, Lattice Point Asymptotics and Volume Growth on Teichmueller space, *Duke Mathematical Journal*, **161**:6 (2012), 1055–1111.

Alexander I. Bufetov, On the Vershik-Kerov Conjecture Concerning the Shannon-Macmillan-Breiman Theorem for the Plancherel Family of Measures on the Space of Young Diagrams, *GAFA (Geometric and Functional Analysis)* **22**:4 (2012), 938–975.

A. Bufetov, M. Khristoforov, A. Klimenko, Cesàro convergence of spherical averages for measure-preserving actions of Markov semigroups and groups, *International Math. Research Notices* **2012**:21 (2012), 4797–4829.

A. I. Bufetov, A. V. Klimenko, On Markov operators and ergodic theorems for group actions, *European Journal of Combinatorics*, **33**:7 (2012), 1427–1443.

A. I. Bufetov, A. V. Klimenko, Maximal inequality and ergodic theorems for Markov groups, *Proc. Steklov Inst. Math.*, **277** (2012), 27–42.

A. I. Bufetov, A. V. Klimenko, M. I. Khristoforov, Cesàro convergence of spherical averages for Markov groups and semigroups, *Russian Math. Surveys*, **66**:3 (2011), 633 – 634.

A. I. Bufetov, Multiplicative functionals of determinantal processes, *Russian Math. Surveys*, **67**:1 (2012), 181–182.

A. Bufetov, B.M. Gurevich, Existence and Uniqueness of the Measure of Maximal Entropy for the Teichmueller Flow on the Moduli Space of Abelian Differentials, *Matematicheskij Sbornik*, **202**:7 (2011), 3 –42.

V. Araujo, A. Bufetov, A large deviations bound for the Teichmueller flow, *Ergodic*

Theory and Dynamical Systems, **31**:4 (2011), 1043–1071.

Alexander I. Bufetov, Caroline Series, A pointwise ergodic theorem for Fuchsian groups, *Mathematical Proceedings of the Cambridge Philosophical Society*, **151**:1 (2011), 145–159.

A. I. Bufetov, Ergodic integrals of translation flows on flat surfaces, *Russian Math. Surveys* **65**:6 (2010), 1173 – 1174.

A. I. Bufetov, On the Vershik–Kerov conjecture concerning the entropy of the Plancherel measure, *Russian Math. Surveys*, **65:1** (2010), 175 – 176.

A.Bufetov, Logarithmic asymptotics for the number of periodic orbits of the Teichmueller flow on Veech's space of zippered rectangles, *Moscow Mathematical Journal*, **9**:2 (2009), 17–39.

A. I. Bufetov, B. M. Gurevich, On the Measure with Maximal Entropy for the Teichmueller Flow on the Moduli Space of Abelian Differentials, *Funct. Anal. Appl.*, **42:3** (2008), 224 – 226.

A. Avila, A. Bufetov, Exponential decay of correlations for the Rauzy-Veech-Zorich induction map, *Fields Institute Communications*, **51**, 2007.

A. Bufetov, Y. G. Sinai, C. Ulcigrai, A condition for continuous spectrum of an interval exchange transformation, *Representation theory, dynamical systems, and asymptotic combinatorics, Amer. Math. Soc. Transl. Ser. 2, Amer. Math. Soc., Providence, RI*, **217**(2006), pp. 23 – 35.

Alexander I. Bufetov, Decay of correlations for the Rauzy-Veech-Zorich induction map on the space of interval exchange transformations and the central limit theorem for the Teichmuller flow on the moduli space of abelian differentials. *J. Amer. Math. Soc.* **19**:3 (2006), 579–623.

A.I. Bufetov. Convergence of spherical averages for actions of free groups. *Ann. Math.*, **155**:3 (2002), 929–944.

A.I. Bufetov, Markov averaging and ergodic theorems for several operators, in *Topology, Ergodic Theory, and Algebraic Geometry*, *AMS Transl.* **202** (2001), 39–50.

A. I. Bufetov, Skew products and ergodic theorems for group actions, *Notices of the Saint-Petersburg Department of the Steklov Institute of Mathematics*, 2000, traduction anglaise dans *J. Math. Sci. (N. Y.)* **113:4** (2003), 548 – 557.

A.I. Bufetov, Operator ergodic theorems for actions of free semigroups and groups, *Funct. Anal. Appl.* **34** (2000), 239–251.

Bufetov, A. I. Ergodic theorems for actions of several mappings, (Russian) *Uspekhi Mat. Nauk*, **54** (1999), no. 4 (328), 159–160, translation in *Russian Math. Surveys*, **54** (1999), no. 4, 835–836.

A. Bufetov, Topological entropy of free semigroup actions and skew-product transformations, *J. Dynam. Control Systems*, **5:1** (1999) 137–143

Alexander Bufetov; A. Ya. Kanel, A new elementary solution of the Waring problem. *Fundam. Prikl. Mat.* 3 (1997), no. 4, 1239—1252.

TEXTBOOK

A. Bufetov, N. Gontcharouk, Yu. Ilyashenko, Ordinary Differential Equations, part 1, *Lomonossov Moscow State University Press.*

MENTORING POST-DOCS

Sergey BEREZIN, Post-Doc ERC since 2019

Adrien BOULANGER, Post-Doc ERC since 2018

Johanna KULAGA-PRZYMUS, Post-Doc ERC 2017,
currently Asst. Prof. at Nicolaus Copernicus University in Torun.

Shilei FAN, ERC Post-doc 2016, currently Asst. Prof. at Wuhan University

Alba Marina MALAGA SABOGAL, Post-Doc A*MIDEX, 2015; currently ATER at Paris 8.

Pavel NIKITIN, Post-Doc A*MIDEX et ERC, 2015–2017,
currently tenure researcher at Steklov Institute of Mathematics in Saint-Petersburg.

Yanqi QIU, Post-Doc A*MIDEX, 2013–2015;
currently CR2 at CNRS since 2015, Institut mathématique de Toulouse.

Alexander PRIHODKO, Post-Doc A*MIDEX, 2013–2014;
currently assistant professor at Moscow Institute of Physics and Technology sicne 2014.

Sevak MKRTCHYAN, G.C. Evans Instructor at Rice University, 2009 – 2012,
currently Assistant Professor at Rochester University

ADVISING PhD STUDENTS

Juan MARSHALL, ERC PhD student since 2018
jointly advised with Pascal HUBERT

Pierre LAZAG, ERC PhD student since 2016
jointly advised with Alexander BORITCHEV

Dmitry ZUBOV, PhD student since 2015.

EDITORIAL BOARDS

Moscow Mathematical Journal (since 2013)

Izvestya Mathematics of the Russian Academy of Sciences (since 2013)

SERVICE AT AIX-MARSEILLE UNIVERSITY

Member of the Scientific Committee of the Institut de mathématiques de Marseille, 2016 – 2018.

Selection Committee for the position of *professor* in Pure Mathematics (Section 25), Member, 2016.

Selection Committee for the position of *maître de conférences* in Pure Mathematics (Section 25), Member, 2014.

Selection Committee for the position of *maître de conférences* in Pure Mathematics (Section 25), Member, 2013.

THESIS COMMITTEE WORK

Member of the Jury, PhD Thesis of Marco STEVENS, 2019 *(planned)*.

Member of the Jury, PhD Thesis of Franck MAUNOURY, 2018.

Member of the Jury, PhD Thesis of Adrien BOULANGER, 2018.

Member of the Jury, PhD Thesis of Jordan EMME, 2016.

Member of the Jury, PhD Thesis of Sylvie JOURDAN, 2011.

SERVICE TO THE EMS

Meetings Committee of the European Mathematical Society, Member since 2014

SERVICE TO THE COMMUNITY

Expert, Israel-US Binational Science Foundation, 2009, 2011, 2016.

Expert, Russian Science Foundation, since 2014.

Expert for Selection of Chairs of Excellence, Russian Ministry of Education and Science, 2011.

Expert, Russian Foundation for Basic Research, since 2011.

REFEREE

Inventiones Mathematicae, Journal of the American Mathematical Society, Acta Mathematica, GAFA, Moscow Mathematical Journal, Annales de l'Institut Fourier, Annales scientifiques de l'ENS, Advances in Mathematics, Duke Mathematical Journal, Ergodic Theory and Dynamical Systems, Journal of Modern Dynamics, Theory of Computing Systems, Russian Mathematical Surveys, Matematicheskie zametki.

INVITED TALKS

"Stochastic analysis, random fields and integrable probability", Kyushu University, 31 July – 9 August 2019.

Open public lecture "Andrei Kolmogorov", CIRM Luminy, 13 March 2019.

"Stochastic Processes and Applications", 24 – 28 July 2017.

"27th Nordic congress of mathematicians" dedicated to the 100 year anniversary of the Mittag-Leffler Institute, 16–20 March 2016.

conferences in France, Russia, Switzerland, Italy, Sweden, Ukraine, Brazil, Poland, Spain, Germany, Israel, UK, USA and Japan.

ORGANIZATION OF MEETINGS

Workshop "Integrability and Nonlinear Dispersive Equations", CIRM Luminy, 24–28 June 2019

Conference "Integrability and Randomness in Mathematical Physics and Geometry", CIRM Luminy, 8–12 April 2019

School "Coulomb Gas, Integrability and Painlevé Equations", CIRM Luminy, 11–15 March 2019

Chaire Jean-Morlet semester "Integrability and Randomness in Mathematical Physics", local coordinator for the chair of Prof. Tamara Grava, CIRM Luminy, 2019

Workshop "From order to chaos", Centre des recherches mathématiques Ennio De Giorgi, Ecole normale supérieure de Pise, 9 – 13 avril 2018.

School "Random Matrices and Determinantal Processes", CIRM Luminy, 26 février – 3 mars 2017.

School on Algebraic, Geometric and Probabilistic Aspect of Dynamical Systems and Control Theory, ICTP, Trieste, July 2016 , with A. Agrachev, S. Luzzatto, A. Tahzibi.

School and Workshop on Group Representations in Dynamical Systems and Geometry, CIRM, Marseille, France, July 2015, with M. G. Kuhn, P. Nikitin, L. Paoluzzi, Y. Qiu.

School on Geometry and Dynamics, CIRM, Marseille, France, April 2014, with N. Bedaride, M. Duchin, B. Hasselblatt, P. Hubert, F. Rodrigues Hertz.

ICTP-SISSA-Moscow School " Geometry and Dynamics", ICTP, Trieste, June 2013, with A.Agrachev, V. Timorin, S.Luzzatto.

Conference "Foliations, attractors, limit cycles", Jan. 2014, Laboratoire J.-V. Poncelet, UMI 2615 du CNRS, member of the programme committee, with Ya. Sinai, D.Anosov (co-chairs) and S. Yakovenko.

Conference "Flows on surfaces, symbolic dynamics and dynamics in moduli space", Dec. 2011, Laboratoire J.-V. Poncelet, UMI 2615 du CNRS, with A. Glutsyuk, P. Hubert, A. Zorich.

Dynamical Systems Year 2011–2012, Laboratoire J.-V. Poncelet, UMI 2615 du CNRS, with A. Glutsyuk.

Texas Ergodic Theory Workshop 2011, University of Houston, march 2011, with A. Török

LANGUAGES Russian, English, French, Italian, German, Spanish, Portuguese