

# Leonid Petrov. Publication List

## Preprints (\*), accepted, or published works

- [42] (\*) Leonid Petrov, Mikhail Tikhonov. *Asymptotics of noncolliding  $q$ -exchangeable random walks*, [arXiv:2303.02380](#) [math.PR]. (PDF link). 34 pages.
- [41] (\*) Leonid Petrov, Axel Saenz. *Rewriting History in Integrable Stochastic Particle Systems*, [arXiv:2212.01643](#) [math.PR]. (PDF link). 76 pages.
- [40] Leonid Petrov. *Noncolliding Macdonald walks with an absorbing wall*, [SIGMA 18 \(2022\), 079](#), 21 pages. [arXiv:2204.09206](#) [math.PR]. (PDF link). 21 pages.
- [39] (\*) Matthew Nicoletti, Leonid Petrov. *Irreversible Markov Dynamics and Hydrodynamics for KPZ States in the Stochastic Six Vertex Model*, [arXiv:2201.12497](#) [math.PR]. (PDF link). 59 pages.
- [38] Amol Aggarwal, Alexei Borodin, Leonid Petrov, Michael Wheeler. *Free Fermion Six Vertex Model: Symmetric Functions and Random Domino Tilings*, [Selecta Math.](#), **29**, article 36 (2023). [arXiv:2109.06718](#) [math.PR]. (PDF link). 138 pages.
- [37] Leonid Petrov. *Refined Cauchy identity for spin Hall-Littlewood symmetric rational functions*, [Journal of Combinatorial Theory Ser. A](#), vol. 184 (2021), 105519. [arXiv:2007.10886](#) [math.CO]. (PDF link). 40 pages.
- [36] Matteo Mucciconi, Leonid Petrov. *Spin  $q$ -Whittaker polynomials and deformed quantum Toda*, [Communications in Mathematical Physics](#), **389**, pages 1331-1416 (2022). [arXiv:2003.14260](#) [math.PR]. (PDF link). 86 pages.
- [35] Leonid Petrov, Mikhail Tikhonov. *Parameter symmetry in perturbed GUE corners process and reflected drifted Brownian motions*, [Journal of Statistical Physics](#), **181** (2020), 1996-2010. [arXiv:1912.08671](#) [math.PR]. (PDF link). 15 pages.
- [34] Leonid Petrov. *Parameter permutation symmetry in particle systems and random polymers*, [SIGMA 17 \(2021\), 021](#), 34 pages. [arXiv:1912.06067](#) [math.PR]. (PDF link). 34 pages.
- [33] Leonid Petrov. *PushTASEP in inhomogeneous space*, [Electronic Journal of Probability](#), vol. 25 (2020), paper no. 114. [arXiv:1910.08994](#) [math.PR]. (PDF link). 26 pages.
- [32] Leonid Petrov, Axel Saenz. *Mapping TASEP back in time*, [Probability Theory and Related Fields](#), **182**, pages 481-530 (2022). [arXiv:1907.09155](#) [math.PR]. (PDF link). 50 pages.
- [31] Alexey Bufetov, Matteo Mucciconi, Leonid Petrov. *Yang-Baxter random fields and stochastic vertex models*, [Advances in Mathematics](#) **388** (2021), 107865. [arXiv:1905.06815](#) [math.PR]. (PDF link). 94 pages.

- [30] Ivan Corwin, Konstantin Matveev, Leonid Petrov. *The  $q$ -Hahn PushTASEP*, [International Mathematics Research Notices](#) (2019), rnz106. [arXiv:1811.06475 \[math.PR\]](#). (PDF link). 40 pages.
- [29] Alisa Knizel, Leonid Petrov, Axel Saenz. *Generalizations of TASEP in discrete and continuous inhomogeneous space*, [Communications in Mathematical Physics](#) 372 (2019), no. 3, pp 797-864. [arXiv:1808.09855 \[math.PR\]](#). (PDF link). 68 pages.
- [28] Christian Gromoll, Mark Meckes, Leonid Petrov. *Quenched Central Limit Theorem in a Corner Growth Setting*, [Electronic Communications in Probability](#) (2018), Vol. 23, paper no. 101, 1-12. [arXiv:1804.04222 \[math.PR\]](#). (PDF link). 12 pages.
- [27] Alexey Bufetov, Leonid Petrov. *Yang-Baxter field for spin Hall-Littlewood symmetric functions*, [Forum of Mathematics Sigma](#) 7 (2019), e39. [arXiv:1712.04584 \[math.PR\]](#). (PDF link). 70 pages.
- [26] Michael Damron, Leonid Petrov, David Sivakoff. *Coarsening model on  $\mathbb{Z}^d$  with biased zero-energy flips and an exponential large deviation bound for ASEP*, [Communications in Mathematical Physics](#) 362 (2018), no. 1, 185-217. [arXiv:1708.05806 \[math.PR\]](#). (PDF link). 33 pages.
- [25] Sevak Mkrtchyan, Leonid Petrov. *GUE corners limit of  $q$ -distributed lozenge tilings*, [Electronic Journal of Probability](#), Volume 22 (2017), paper no. 101, 24 pp. [arXiv:1703.07503 \[math.PR\]](#). (PDF link). 24 pages.
- [24] Alexei Borodin, Leonid Petrov. *Inhomogeneous exponential jump model*, [Probability Theory and Related Fields](#) 172 (2018), 323-385. [arXiv:1703.03857 \[math.PR\]](#). (PDF link). 63 pages.
- [23] Daniel Orr, Leonid Petrov. *Stochastic higher spin six vertex model and  $q$ -TASEPs*, [Advances in Mathematics](#) 317 (2017), 473-525. [arXiv:1610.10080 \[math.PR\]](#). (PDF link). 53 pages.
- [22] Vadim Gorin, Leonid Petrov. *Universality of local statistics for noncolliding random walks*, [Annals of Probability](#) (2019), Vol. 47, No. 5, 2686-2753. [arXiv:1608.03243 \[math.PR\]](#). (PDF link). 68 pages.
- [21] Alexei Borodin, Leonid Petrov. *Lectures on Integrable probability: Stochastic vertex models and symmetric functions*, [Lecture Notes of the Les Houches Summer School](#), Volume 104, July 2015. [arXiv:1605.01349 \[math.PR\]](#). (PDF link). 113 pages.
- [20] Alexei Borodin, Leonid Petrov. *Higher spin six vertex model and symmetric rational functions*, [Selecta Mathematica](#) 24 (2018), no. 2, 751-874. [arXiv:1601.05770 \[math.PR\]](#). (PDF link). 124 pages.
- [19] Konstantin Matveev, Leonid Petrov.  *$q$ -randomized Robinson-Schensted-Knuth correspondences and random polymers*, [Annales de l'Institut Henri Poincaré D: Combinatorics, Physics and their Interactions](#) 4 (2017), no. 1, 1-123. [arXiv:1504.00666 \[math.PR\]](#). (PDF link). 123 pages.

- [18] Ivan Corwin, Leonid Petrov. *Stochastic higher spin vertex models on the line*, [Communications in Mathematical Physics](#) 343 (2016), no. 2, 651-700. [arXiv:1502.07374 \[math.PR\]](#). (PDF link). 50 pages.
- [17] Alexei Borodin, Ivan Corwin, Leonid Petrov, Tomohiro Sasamoto. *Spectral theory for interacting particle systems solvable by coordinate Bethe ansatz*, [Communications in Mathematical Physics](#) 339 (2015), no. 3, 1167-1245. [arXiv:1407.8534 \[math-ph\]](#). (PDF link). 79 pages.
- [16] Alexey Bufetov, Leonid Petrov. *Law of Large Numbers for Infinite Random Matrices over a Finite Field*, [Selecta Mathematica](#) 21 (2015), no. 4, 1271-1338. [arXiv:1402.1772 \[math.PR\]](#). (PDF link). 68 pages.
- [15] Alexei Borodin, Leonid Petrov. *Integrable probability: From representation theory to Macdonald processes*, [Probability Surveys](#), 11 (2014), 1-58. [arXiv:1310.8007 \[math-ph\]](#). (PDF link). 58 pages.
- [14] Alexei Borodin, Ivan Corwin, Leonid Petrov, Tomohiro Sasamoto. *Spectral theory for the  $q$ -Boson particle system*, [Compositio Mathematica](#), 151 (2015), no. 1, 1-67. [arXiv:1308.3475 \[math-ph\]](#). (PDF link). 67 pages.
- [13] Ivan Corwin, Leonid Petrov. *The  $q$ -PushASEP: A New Integrable Model for Traffic in  $1+1$  Dimension*, [Journal of Statistical Physics](#), 160 (2015), no. 4, 1005-1026. [arXiv:1308.3124 \[math.PR\]](#). (PDF link). 22 pages.
- [12] Alexei Borodin, Leonid Petrov. *Nearest neighbor Markov dynamics on Macdonald processes*, [Advances in Mathematics](#), 300 (2016), 71-155. [arXiv:1305.5501 \[math.PR\]](#). (PDF link). 85 pages.
- [11] Leonid Petrov. *The Boundary of the Gelfand-Tsetlin Graph: New Proof of Borodin-Olshanski's Formula, and its  $q$ -analogue*, [Moscow Mathematical Journal](#), 14 (2014) no. 1, 121-160. [arXiv:1208.3443 \[math.CO\]](#). (PDF link). 36 pages.
- [10] Leonid Petrov. *Asymptotics of uniformly random lozenge tilings of polygons. Gaussian free field*, [Annals of Probability](#), 43 (2014), no. 1, 1-43. [arXiv:1206.5123 \[math.PR\]](#). (PDF link). 43 pages.
- [9] Leonid Petrov. *Asymptotics of Random Lozenge Tilings via Gelfand-Tsetlin Schemes*, [Probability Theory and Related Fields](#), 160 (2014), no. 3, 429-487. [arXiv:1202.3901 \[math.PR\]](#). (PDF link). 59 pages.
- [8] Leonid Petrov.  *$sl(2)$  Operators and Markov Processes on Branching Graphs*, [Journal of Algebraic Combinatorics](#) 38 (2013), no. 3, 663-720. [arXiv:1111.3399 \[math.CO\]](#). (PDF link). 58 pages.
- [7] Leonid Petrov. *On Measures on Partitions Arising in Harmonic Analysis for Linear and Projective Characters of the Infinite Symmetric Group*, [Proceedings of the international conference "50 years of IITP"](#). [arXiv:1107.0676 \[math.CO\]](#). (PDF link). 7 pages.

- [6] Leonid Petrov. *Pfaffian Stochastic Dynamics of Strict Partitions*, [Electronic Journal of Probability](#) 16 (2011), 2246-2295. [arXiv:1011.3329 \[math.PR\]](#). ([PDF link](#)). 50 pages.
- [5] Leonid Petrov. *Random Strict Partitions and Determinantal Point Processes*, [Electronic Communications in Probability](#) 15 (2010), 162-175. [arXiv:1002.2714 \[math.PR\]](#). ([PDF link](#)). 14 pages.
- [4] Leonid Petrov. *Random Walks on Strict Partitions*, *Journal of Mathematical Sciences* 168 (2010), no. 3, 437-463. [arXiv:0904.1823 \[math.PR\]](#). ([PDF link](#)). 27 pages.
- [3] Leonid Petrov. *Limit Behavior of Certain Random Walks on Strict Partitions*, *Russian Mathematical Surveys* 64 (2009), no. 6, 1139-1141. ([PDF link](#)). 3 pages.
- [2] Leonid Petrov. *A Two-parameter Family of Infinite-dimensional Diffusions in the Kingman Simplex*, *Functional Analysis and Its Applications* 43 (2009), no. 4, 279-296. [arXiv:0708.1930 \[math.PR\]](#). ([PDF link](#)). 18 pages.
- [1] Leonid Petrov. *Asymptotic Behavior of a Certain Collection of Particles on a Line Under Synchronization*, *Proceedings of the XXVIII Conference of Young Scientists of Department of Mechanics and Mathematics of the Lomonosov Moscow State University* (2006), 152-156, in Russian. ([PDF link](#)). 4 pages.

## Errata

- [18] Ivan Corwin, Leonid Petrov. *Correction to "Stochastic higher spin vertex models on the line"*, [Commun. Math. Phys.](#) 371, 353-355 (2019). ([PDF link](#)). 3 pages.
- [17] Alexei Borodin, Ivan Corwin, Leonid Petrov, Tomohiro Sasamoto. *Correction to "Spectral theory for interacting particle systems solvable by coordinate Bethe ansatz"*, [Commun. Math. Phys.](#) 370, 1069-1072 (2019). ([PDF link](#)). 4 pages.

## Unpublished lecture notes

- [6] Asymptotic Representation Theory, graduate topics course at University of Virginia, Fall 2022. [Course webpage with lecture notes](#). ([PDF link](#)).
- [5] Particle systems, graduate topics course at University of Virginia, Spring 2021. [Lecture notes in Obsidian format on github](#). ([PDF link](#)).
- [4] Random matrices, graduate topics course at University of Virginia, Fall 2019. [Course webpage with lecture notes](#). ([PDF link](#)).
- [3] Random matrices, graduate topics course at University of Virginia, Spring 2016. [Lecture notes on github](#). ([PDF link](#)).
- [2] Topics in Probability, graduate topics course at Northeastern University, Fall 2012. [Lecture notes at AMS Open Notes](#). ([PDF link](#)).

- [1] Course notes "Asymptotic representation theory", taught by G. Olshanski at the Independent University of Moscow, Fall 2009 and Spring 2010 (in Russian) . [Webpage with notes](#). ([PDF link](#)).

## Other works

- [1] Sihan Li, Andrew Mecca, Jeewoo Kim, Giusy Caprara, Elizabeth Wagner, Ting-Ting Du, Leonid Petrov, Wenhao Xu, Runjia Cui, Ivan Rebustini, Bechara Kachar, Anthony Peng, and Jung-Bum Shin, *Myosin-VIIa is expressed in multiple isoforms and essential for tensioning the hair cell mechanotransduction complex*. [Nature Communications](#), **11**, Article number: 2066 (2020). ([PDF link](#)). 15 pages.