Leonid Petrov. Brief CV

Full version is at https://lpetrov.cc/research/petrovCV.pdf

Department of Mathematics, University of Virginia
petrov@virginia.edu
https://lpetrov.cc
https://orcid.org/0000-0003-4607-7399

Research areas

Probability, Mathematical Physics, Algebraic Combinatorics, Representation Theory.

Education

2010: Ph.D., Institute for Information Transmission Problems.

2007: Diploma, Lomonosov Moscow State University, Department of Mathematics and Mechanics (specialization in Probability).

Appointments

Since 2014: University of Virginia, Department of Mathematics (Assistant Professor 2014–19, Associate Professor 2019–24, Professor since 2024).

2011–2014: Research Instructor
at Department of Mathematics, Northeastern University, Boston, MA, USA.

2009–2011: Research associate
at Dobrushin Mathematics Laboratory, Institute for Information Transmission Problems, Moscow, Russia.

Visiting Appointments

Spring 2024: Senior Fellow
IPAM Program "Geometry, Statistical Mechanics, and Integrability"

Fall 2021: Research Professor
MSRI Program "Universality and Integrability in Random Matrix Theory and Interacting Particle Systems"

2017–2018: Visiting Assistant Professor
at Department of Mathematics, MIT, Cambridge, MA, USA.

Recent prizes/funding

2025–2030: Simons Foundation International Travel Support for Mathematicians SFI-MPS-TSM-00013561 "Combinatorial Structures at Large Scale through Integrability", $42,000.

2022–2026: NSF DMS grant 2153869 "Random Systems from Symmetric Functions and Vertex Models", $320,654.

2022–2024: 4-VA at UVA Collaborative Research Grant program "Randomness by algebraic structures", $30,000.

2020–2025: Simons Collaboration Grant for Mathematicians 709055 "Distributional symmetries in stochastic systems", $42,000.

2019: The 2020 Bernoulli prize for an outstanding survey article in probability (jointly with Alexei Borodin for the paper *Integrable probability: From representation theory to Macdonald processes*)

2018-2019: PI, NSF DMS conference grant 1839534 "Workshop on Representation Theory, Combinatorics, and Geometry", amount $15,000.

2017–2022: PI, NSF DMS grant 1664617 "FRG: Collaborative Research: Integrable Probability". Joint with PIs Jinho Baik (University of Michigan), Alexei Borodin, Vadim Gorin (MIT), and Ivan Corwin (Columbia University). Total collaborative award: $1.2M; UVA part: $193,453.

Selected publications (full list at `lpetrov.cc/research`)

[51] David Anderson, Greta Panova, Leonid Petrov. *Computation and sampling for Schubert specializations*, arXiv preprint. arXiv:2603.20104 [math.CO].

[49] Alisa Knizel, Leonid Petrov. *Random Lozenge Waterfall: Dimensional Collapse of Gibbs Measures*, arXiv preprint. arXiv:2507.22011 [math.PR].

[48] Alexey Bufetov, Leonid Petrov, Panagiotis Zografos. *Domino Tilings of the Aztec Diamond in Random Environment and Schur Generating Functions*, arXiv preprint. arXiv:2507.08560 [math.PR].

[45] Alejandro H. Morales, Greta Panova, Leonid Petrov, Damir Yeliussizov. *Grothendieck Shenanigans: Permutons from Pipe Dreams via Integrable Probability*, Advances in Mathematics, 480 (2025), Part C, 110510.. FPSAC 2025 poster. arXiv:2407.21653 [math.PR].

[44] Amol Aggarwal, Matthew Nicoletti, Leonid Petrov. *Colored Interacting Particle Systems on the Ring: Stationary Measures from Yang–Baxter Equation*, Compositio Math. 161 (2025), no. 8, 1855–1922. arXiv:2309.11865 [math.PR].

[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].

[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].

[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].

[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].

[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]. [Includes correction: Commun. Math. Phys. 371, 353–355 (2019).]

[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]. [Includes correction: Commun. Math. Phys. 370, 1069–1072 (2019).]

[15] Alexei Borodin, Leonid Petrov. *Integrable probability: From representation theory to Macdonald processes*, Probability Surveys, 11 (2014), 1-58. arXiv:1310.8007 [math-ph].

[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].

[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].

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). https://www.nature.com/articles/s41467-020-15936-z. 15 pages.

Software and simulations

Gallery of interactive web simulations (60+) illustrating random tilings, vertex models, random matrices, particle systems, and other topics in integrable probability. Images from these simulations were featured in an art exhibition at the Radcliffe Institute, Harvard (2016).

Students and postdocs

1. Yizhen Li, UVA Ph.D. student 2024-29
2. Mikhail Tikhonov, UVA Ph.D. student 2020-26 (postdoc at Oregon State University starting Fall 2026)
3. Daniel Slonim, UVA postdoc 2022-24 (to be Tenure Track at Hillsdale College)
4. Svetlana Gavrilova, HSE bachelor thesis, 2020-21 (now Ph.D. student at MIT)
5. Milind Hegde, MSRI postdoc 2021 (now Tenure Track at NTU Singapore)
6. Axel Saenz, UVA postdoc 2016-19 (now Tenure Track at Oregon State)

Recent organization and service

University and departmental service

Senior Advisor to Chair (Analysis); UVA-wide AI Research Initiative Committee (2026–27); College Fellows (2025–27); AI Faculty Guide (Provost initiative, 2024–25); Tenure-track and postdoc hiring committees; Chair selection committee; Graduate admissions committee; Peer review committee; Nominations committee; IMS (Institute of Mathematical Sciences) committee; Digital accessibility coordinator; Department website development and administration; Probability Seminar co-organizer.

Conference and workshop organization

Organized 15+ conferences, workshops, and summer schools since 2017, including two editions of the Virginia Integrable Probability Summer School (2019, 2024) and an AIM workshop at Caltech (2025). Full list in CV. Events in 2026:

- Coin Flippers 2026: The ICM Satellite Edition, University of Delaware, July 21–22, 2026.
- AMS Special Session on Random Tilings, Random Permutations, and Particle Systems, JMM, Washington, DC, January 4–7, 2026.

Invited talks

Over 150 invited talks at conferences and university seminars (including 10 colloquia), including Simons Symposia (2019, 2023), IPAM tutorial mini-course (2024), and a lecture series at Texas A&M (2023). Full list in CV.

Teaching

University of Virginia (since 2014)

Asymptotic representation theory (graduate topics course); Particle Systems (graduate topics course); Random matrices (graduate topics course); Real Analysis and Linear Spaces (graduate); Calculus III; Complex Variables; Introduction to Probability; Introduction to Stochastic Processes; Building Truth from Scratch (first-year seminar).

Northeastern University (2011–2014)

Topics in Probability (graduate topics course); Probability 1 (graduate course); Calculus II for Sci&Eng; Probability and Statistics; Statistics and Stochastic Processes.

Other service

- I am broadening access to AI tools for working mathematicians by sharing best practices and participating in panel discussions. I also served as an AI faculty guide for the Department of Mathematics, University of Virginia (2024–25).
- Advancing digital accessibility of mathematical content (WCAG 2.1 Level AA): redesigning the UVA Math Department website for accessibility compliance, and developing a tool for converting mathematical PDFs to accessible HTML with MathML.
- Member of the editorial boards at "**Mathematical Physics, Analysis and Geometry**" (2019–25), "**Combinatorial Theory**", and "**Electronic Journal/Communications of Probability**".
- Program committee member for FPSAC (Formal Power Series and Algebraic Combinatorics), 2017, 2021, and 2024.
- Regular referee for journals including J. Amer. Math. Soc., Comm. Pure Appl. Math., Invent. Math., Ann. Prob., Adv. Math., Comm. Math. Phys., Prob. Theory Rel. Fields, and J. Eur. Math. Soc.; reviewer for Mathematical Reviews; NSF DMS panel member; grant reviewer for Simons Foundation, ERC (Europe), NSERC (Canada), FWF (Austria), and RGC (Hong Kong).