

Petr Naryshkin

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Academic appointments

- 2025–present **Institute for Advanced Study**, Princeton, New Jersey
Member, School of Mathematics
- 2024–2025 **Alfréd Rényi Institute of Mathematics**, Budapest
Postdoctoral researcher, DYNASNET project

Education

- 2021–2024 **University of Münster**
Ph.D. in Mathematics, *summa cum laude*
Advisor: David Kerr
- 2019–2020 **Texas A&M University**
Doctoral studies in Mathematics; Ph.D. subsequently completed at the University of Münster
- 2014–2019 **Saint Petersburg State University**
Master’s degree in Mathematics

Research interests

Topological dynamics and ergodic theory; operator algebras; Borel equivalence relations.

Mean dimension and shift embeddability; topological Rokhlin lemmas, almost finiteness, and comparison; classifiability of crossed products; hyperfiniteness and Borel asymptotic dimension; quantitative orbit equivalence.

Publications

1. **P. Naryshkin**. URP, comparison, mean dimension, and sharp shift embeddability. *Invent. Math.*, to appear.
2. **P. Naryshkin**, S. Petrakos. Quantitative orbit equivalence for $\mathbb{Z}$ -odometers. *Adv. Math.* **494** (2026), 110957.
3. **P. Naryshkin**, A. Vaccaro. Hyper-u-amenability and hyperfiniteness of treeable equivalence relations. *Forum Math. Sigma* **14** (2026), e29.
4. D. Kerr, **P. Naryshkin**. Elementary amenability and almost finiteness. *Compos. Math.* **161** (2025), 3321–3337.
5. **P. Naryshkin**, S. Petrakos. Almost finiteness and groups of dynamical origin. *Int. Math. Res. Not. IMRN* **2025**, no. 3, rnaf016.
6. **P. Naryshkin**, A. Vaccaro. Hyperfiniteness and Borel asymptotic dimension of boundary actions of hyperbolic groups. *Math. Ann.* **392** (2025), 197–208.
7. E. Gardella, S. Geffen, J. Kranz, **P. Naryshkin**, A. Vaccaro. Tracially amenable actions and purely infinite crossed products. *Math. Ann.* **390** (2024), 3665–3690.

8. **P. Naryshkin**. Group extensions preserve almost finiteness. *J. Funct. Anal.* **286** (2024), no. 7, 110348.
9. E. Gardella, S. Geffen, **P. Naryshkin**, A. Vaccaro. Dynamical comparison and $\mathcal{Z}$ -stability for crossed products of simple C^* -algebras. *Adv. Math.* **438** (2024), 109471.
10. E. Gardella, S. Geffen, J. Kranz, **P. Naryshkin**. Classifiability of crossed products by nonamenable groups. *J. Reine Angew. Math.* **797** (2023), 285–312.
11. **P. Naryshkin**. Polynomial growth, comparison, and the small boundary property. *Adv. Math.* **406** (2022), 108519.
12. L. M. Lerman, **P. E. Naryshkin**, A. I. Nazarov. Abundance of entire solutions to nonlinear elliptic equations by the variational method. *Nonlinear Anal.* **190** (2020), 111590.
13. **P. E. Naryshkin**. A remark on the isomorphism between the Bernoulli scheme and the Plancherel measure. *Zap. Nauchn. Sem. S.-Peterburg. Otdel. Mat. Inst. Steklov. (POMI)* **468** (2018), 98–104; English translation in *J. Math. Sci. (N.Y.)* **240** (2019), no. 5, 567–571.

Preprints

- P1. E. Gardella, S. Geffen, R. Gesing, G. Kopsacheilis, **P. Naryshkin**. Essential freeness, allostery and $\mathcal{Z}$ -stability of crossed products. arXiv:2405.04343 (2024).

Teaching experience

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| 2021–2023 | University of Münster
Led tutorials in Ergodic Theory, Functional Analysis, and Operator Algebras. |
| 2019–2020 | Texas A&M University
Led Calculus recitations and help sessions in Differential Equations and Introduction to Proofs; assisted with Real Analysis qualifying-examination preparation. |
| 2017–2019 | Saint Petersburg Electrotechnical University
Led undergraduate exercise sessions in Real Analysis and Linear Algebra. |

Talks

Invited talks

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| Feb. 2026 | Functional Analysis Seminar, University of Maryland. |
| Jan. 2026 | Dynamics Seminar, Institute for Advanced Study. |
| June 2025 | Summer School “Groupoids from a Measurable, Topological and Geometric Perspective,” Paris. |
| May 2025 | Operator Algebras Oberseminar, University of Göttingen. |
| 2024–2025 | Borel Combinatorics Seminar, Budapest (several talks). |
| Nov. 2024 | Seminar, Weizmann Institute of Science. |
| Sept. 2024 | Operator Algebras Seminar, Chalmers University of Technology, Gothenburg. |
| Apr. 2024 | Kutzsem, Alfréd Rényi Institute of Mathematics, Budapest. |
| Feb. 2024 | Groups, Dynamics & Topology Seminar, Jagiellonian University, Kraków. |
| Jan. 2024 | Operator Algebras Seminar, Friedrich-Alexander University Erlangen-Nürnberg. |

Oct. 2023	Dynamics Seminar, University of California, San Diego.
May 2023	Dynamics Seminar, Ben-Gurion University of the Negev.
May 2023	Operator Theory Seminar, Technion – Israel Institute of Technology.
May 2023	Dynamics Seminar, Hebrew University of Jerusalem.
Nov. 2022	“Group Actions: Dynamics, Measure, Topology,” Münster.
June 2022	Operator Algebras Seminar, KU Leuven.
Apr. 2022	Joint University of Haifa–Technion Noncommutative Analysis Seminar.
Mar. 2022	Séminaire d’Algèbres d’Opérateurs, Institut de Mathématiques de Jussieu–Paris Rive Gauche.
Jan. 2022	“Groups and Dynamics: Topology, Measure, and Borel Structure,” Oberwolfach.

Contributed talks and working seminars

2025–2026	Dynamics Working Seminar, Institute for Advanced Study (several talks).
Mar. 2022	“Noncommutativity in the North,” Gothenburg.

Professional service

2026-present	Co-organizer, Dynamics working seminar, Institute for Advanced Study.
July 2026	Co-organizer, Workshop on Group Actions and Equivalence Relations 2026, Alfréd Rényi Institute of Mathematics, Budapest.
June 2025	Co-organizer, Focused Workshop on Group Actions and Equivalence Relations, Erdős Center, Budapest.
Summer 2022	Co-organizer, Cantor Minimal Systems learning seminar, University of Münster.
Aug. 2021	Co-organizer, Young Mathematicians in C^* -algebras, Münster.

Selected honors and awards

2015, 2016	First Prize, International Mathematics Competition for University Students.
2015	Winner, Saint Petersburg Mathematical Society Student Competition (jointly with D. Klyuev).