

CURRICULUM VITAE

Alexander Petrov

E-mail: alexander.petrov.57@gmail.com

Webpage: <https://math.mit.edu/~apetrov/>

Research interests: algebraic geometry, number theory, homological algebra.

Employment:

2022—2027: Clay Research Fellow, based at:

- 2022—2023 Max Planck Institute for Mathematics, Bonn
- 2023—2024 Institute for Advanced Study, Princeton
- 2024— MIT, Cambridge

Education:

- 2017—2022 Ph. D. in Mathematics, Harvard University
- 2013—2017 B. Sc. in Mathematics, Higher School of Economics, Moscow

Papers and preprints:

- appendix to *Boundedness of the p -primary torsion of the Brauer group of products of varieties* by A. Skorobogatov, [arxiv:2404.19150](#)
- *Non-decomposability of the de Rham complex and non-semisimplicity of the Sen operator*, [arxiv:2302.11389](#)
- *Universality of the Galois action on the fundamental group of $\mathbb{P}^1 \setminus \{0, 1, \infty\}$* , to appear in the Journal of the European Mathematical Society, [arxiv:2109.09301](#)
- appendix to *Hodge numbers are not derived invariants in positive characteristic* by N. Addington and D. Bragg, *Math. Ann.* **387**, 847–878 (2023). [doi:10.1007/s00208-022-02474-w](#) [arxiv:2106.09949](#)
- *Geometrically irreducible p -adic local systems are de Rham up to a twist*. *Duke Math. J.* 172 (5) 963 - 994, 1 April 2023. [doi:10.1215/00127094-2022-0027](#), [arxiv:2012.13372](#)
- *Rigid-analytic varieties with projective reduction violating Hodge symmetry*. *Compositio Mathematica*, 157(3), 625-640. [doi:10.1112/S0010437X20007708](#), [arxiv:2005.02226](#)
- with V. Vologodsky, *On the periodic topological cyclic homology of DG categories in characteristic p* , [arxiv:1912.03246](#)
- with D. Vaintrob and V. Vologodsky, *The Gauss-Manin Connection on periodic cyclic homology*, *Sel. Math. New Ser.* (2018) 24: 531. [doi:10.1007/s00029-018-0388-0](#)

Talks: (past and future)

- Berkeley Arithmetic Geometry Seminar, February 2025
- Harvard-MIT algebraic geometry seminar, November 2024
- MIT Number theory seminar, November 2024
- Colloquium, Michigan State University, November 2024
- MIT Topology Seminar, October 2024
- Yale University, Geometry and Physics Seminar, October 2024
- Workshop on p -adic geometry at UChicago, September 2024
- Harvard Number Theory Seminar, September 2024
- University of Duisburg-Essen Oberseminar, July 2024

- Conference ‘Algebraic K-theory and Arithmetic’, Bedlewo, Poland, July 2024
- Stanford University, Number Theory Seminar, June 2024
- Ohio State University, 4 lectures on ‘ p -adic Riemann-Hilbert correspondence’ at RTG Workshop ‘Local Systems in Algebraic Geometry’, May 2024
- IHES, Arithmetic Geometry - A Conference in Honor of Hélène Esnault on the Occasion of Her 70th Birthday, April 2024
- IAS, Spring Workshop on p -adic Arithmetic Geometry, March 2024
- IAS, Special Year Seminar, November 2023
- IHES, ‘A Conference in Arithmetic Algebraic Geometry in Memory of Jan Nekovář’, October 2023
- Hausdorff Institute, Trimester Seminar Series, July 2023
- University of Münster, Mittagsseminar, July 2023
- University of Strasbourg, Séminaire ”Arithmétique et géométrie algébrique”, June 2023
- University of Bielefeld, Algebraic and Arithmetic Geometry Seminar, June 2023
- Northwestern University, Workshop ‘Algebraic geometry and cohomology in mixed characteristic’, May 2023
- Simons Conference on Higher Dimensional Geometry, May 2023
- Belgian-Dutch Algebraic Geometry Seminar, March 2023
- UChicago Number Theory seminar, February 2023, online
- HU Berlin, 4 lectures on ‘Local systems of geometric origin from the arithmetic point of view’, February 2023
- Copenhagen Algebra/Topology seminar, February 2023
- Orsay Séminaire Arithmétique et Géométrie Algébrique, January 2023
- Regensburg AG-Seminar, November 2022
- London Geometry & Topology seminar, October 2022
- Azat Miftakhov days against the war, July 5th 2022
- Franco-Asian School on Arithmetic Geometry, CIRM, June 2022
- Berkeley Arithmetic Geometry and Number Theory Seminar, November 2021
- Algebra-Number Theory Seminar at the University of Maryland, November 2021
- *Automatic de Rham-ness of p -adic local systems and Galois action on the pro-algebraic completion of the fundamental group*, Geometric Langlands Seminar, University of Chicago, October 2021, online, ([link to the recordings](#))
- *Galois action on the pro-algebraic completion of the fundamental group*, Harvard Number Theory Seminar, September 2021
- *Automatic de Rhamness of arithmetic local systems*, ”Séminaires de Géométrie Arithmétique et Motivative” at Université Sorbonne Paris Nord, May 2021, online
- *Geometrically irreducible p -adic local systems are de Rham up to a twist*, Recent Advances in Modern p -Adic Geometry (RAMpAGe) Seminar, March 2021, online
- *Geometrically irreducible p -adic local systems are de Rham up to a twist*, ”Arbeitsgemeinschaft Arithmetische Geometrie” in Bonn, January 2021, online
- *Geometrically irreducible p -adic local systems are de Rham up to a twist*, University of Georgia algebraic geometry seminar, December 2020, online

- *Irreducible p -adic local systems are de Rham up to a twist*, University of Michigan algebraic geometry seminar, October 2020, online
- *Periodic cyclic crystalline cohomology*, Geometric Langlands Seminar, University of Chicago, February 2020
- *Crystalline cohomology of DG categories*, Algebra seminar, University of Oregon, March 2017

Teaching:

- Math 157, "Mathematics in the world", Spring 2022, Harvard
- Math 157, "Mathematics in the world", Spring 2021, Harvard (remotely)
- Math 1b, Fall 2020, Harvard (remotely)
- Math 1b, Fall 2019, Harvard
- Math 1b, Fall 2018, Harvard

Awards:

- Clay Research Fellowship, 2022-27
- Harvard University Certificate of Distinction in Teaching x4: Fall 2019, Fall 2020, Spring 2021, Spring 2022
- Daniel and Raphael Salem Fellowship, 2020-21
- Pierce Fellowship, 2017
- Arnold stipend, 2016-2017
- Dobrushin stipend (second half of 2015, first half of 2016, second half of 2016, first half of 2017)

Service and mentoring:

- Directed reading program for undergraduates at Harvard, Spring 2020
- Taught a mini-course on p -adic Riemann-Hilbert correspondence at the RTG instructional workshop at Ohio State University, May 2024
- Reading course with Eunsu Hur (undergraduate student at MIT), Fall 2024