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# Dmitrii Pavlov

## Academic employment

08/24 – **Postdoctoral researcher**, *Max Planck Institute for Mathematics in the Sciences, Numerical Nonlinear Algebra group*.

## Education

08/22–08/24 **PhD in Mathematics**, *Max Planck Institute for Mathematics in the Sciences*, *Thesis: Real Algebraic Geometry for Physcis and Optimization*, *Advisors: Bernd Sturmfels and Simon Telen*.

09/16–06/22 **Specialist (equivalent to Masters) in Fundamental Mathematics**, *Moscow State University*, *Advisors: Yury P. Razmyslov and Gleb Pogudin*.
*GPA: 5.0/5.0*

## Non-academic employment

2021–2022 **Huawei Russian Research Institute, Moscow Optic Algorithm Laboratory**, *Junior research engineer*.
Research in digital signal processing, discrete optimization and numerical methods for solving the Nonlinear Schrödinger equation.

2019–2021 **Moscow Center for Continuous Mathematical Education**, *Editor of interactive courses and textbooks in mathematics*.

2019–2020 **Yandex.Math**, *Consultant of interactive courses in mathematics*.

2018–2019 **Mathematical Circle of MSU Faculty of Mechanics and Mathematics**, *Tutor*.

## Scholarships

2021 **Kolmogorov Scholarship for Academic Excellence**, Moscow State University

## Preprints

**Santaló Geometry of Convex Polytopes** D. Pavlov and S. Telen, `https://arxiv.org/abs/2402.18955`, 2024.

**Algebraic Geometry of Quantum Graphical Models** E. Duarte, D. Pavlov, and M. Wiesmann, `https://arxiv.org/abs/2308.11538`, 2023.

**Combinatorics of $m = 1$ Grasstopes** Y. Mandelshtam, D. Pavlov, and E. Pratt, `https://arxiv.org/abs/2307.09603`, 2023.

**On real and observable realizations of input-output equations** S. Falkensteiner, D. Pavlov, and J. R. Sendra, `http://arxiv.org/abs/2303.16799`, 2023.

## Published articles

**Logarithmically Sparse Symmetric Matrices** D. Pavlov, *Beiträge zur Algebra und Geometrie*, https://doi.org/10.1007/s13366-024-00753-y, 2024.

**Gibbs Manifolds** D. Pavlov, B. Sturmfels, and S. Telen, *Information Geometry*, https://doi.org/10.1007/s41884-023-00111-2, 2023.

**On realizing differential-algebraic equations by rational dynamical systems** D. Pavlov and G. Pogudin, *Proceedings of the ACM International Symposium on Symbolic and Algebraic Computation (ISSAC 2022)*, https://doi.org/10.1145/3476446.3535492, 2022.

**From algebra to analysis: new proofs of theorems by Ritt and Seidenberg** D. Pavlov, G. Pogudin, and Yu. Razmyslov, *Proceedings of the American Mathematical Society*, https://doi.org/10.1090/proc/16065, 2022.

## Talks

29 Apr 2024 **Santaló Geometry of Convex Polytopes**, *Algebra Seminar*, Brown University, Providence.

17 Apr 2024 **Santaló Geometry of Convex Polytopes**, *Discrete Mathematics and Discrete Geometry Seminar*, TU Berlin.

8 Mar 2024 **What is a Grasstope?**, *What is... talks*, MPI CBG, Dresden.

31 Jan 2024 **Combinatorics of $m = 1$ Grasstopes**, *Quantum Field Theory Group Seminar*, MPI for Physics, Munich.

5 Dec 2023 **Combinatorics of $m = 1$ Grasstopes**, *Geometry Seminar*, TU Dresden.

29 Nov 2023 **Algebraic Geometry of Quantum Graphical Models**, *InterCity Seminar*, Universität Konstanz.

20 Oct 2023 **Realizations of input-output equations: rational, observable, and real**, *Kolchin Seminar in Differential Algebra (online)*.

11 Jul 2023 **Gibbs manifolds**, *SIAM AG23, Minisimposium on Geometric and Algebraic Methods in Qunatum Information, Eindhoven*.

10 May 2023 **Real realizations of algebraic differential equations**, *Nonlinear Algebra Seminar, MPI MiS*.

21 Mar 2023 **Gibbs manifolds**, *New Directions in Real Algebraic Geometry, Mathematisches Forschungsinstitut Oberwolfach*.

9 Mar 2023 **What is a Gibbs manifold?**, *Algebra, Geometry and Computation, CWI Amsterdam*.

1 Mar 2023 **What is a Gibbs manifold?**, *Nonlinear Algebra Seminar, MPI MiS*.

5 Oct 2022 **Realizability of algebraic differential equations by rational dynamical systems**, *Nonlinear Algebra Seminar, MPI MiS*.

12 Apr 2022 **Realizability of algebraic differential equations by rational dynamical systems**, *Algebra and Model Theory Seminar, Moscow State University*.

8 Dec 2020 **Analytic spectrum of a differential $\mathbb{C}$-algebra with several commuting derivations**, *Algebra and Model Theory Seminar, Moscow State University*.

8 May 2019 **Differentially flat systems**, *Algebra and Model Theory Seminar, Moscow State University*.

## Events organized

May 2024 **Combinatorial Algebraic Geometry from Physics Summer School**, *Leipzig*.

Nov 2023 **1st IMPRS COMBO Autumn School**, *Leipzig*.

## Computer skills

Languages: Python, Julia, Macaulay2, Sage, C/C++

Software: LaTex, GitLab, Linux

## Language proficiency

Russian (native), English (C2), French (B2), German (B1)