

# Mikhail Kornev

Steklov Mathematical Institute of RAS

Nationality: Russian

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## RESEARCH AREAS

Homotopy Theory, Higher Geometry, Group Theory, and Combinatorics

## APPOINTMENTS

Sep. 2022 –	PhD student and research assistant at Steklov Mathematical Institute of RAS Department of Geometry and Topology
Sep. 2021 – 2025	Research assistant at HSE University Laboratory of Algebraic Topology and Applications

## EDUCATION

Sep. 2016 – May 2022	Specialist degree Diploma with honors in Mathematics (equivalent to M.S.) Lomonosov Moscow State University
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## RESEARCH PAPERS

### Mathematics

Jan. 2026	<i>n</i> -Valued Monoids on $\mathbb{C}P^1$ and Discriminants joint with Victor Buchstaber Uspekhi Mat. Nauk, 81:1(487) (2026), 207–208 <a href="https://doi.org/10.4213/rm10280">https://doi.org/10.4213/rm10280</a>
Jan. 2026	<i>On the Classification of n-Valued Monoids and Groups of Order 3</i> Mat. Zametki, 119:2 (2026), 244–252 <a href="https://doi.org/10.4213/mzm14803">https://doi.org/10.4213/mzm14803</a>
Jan. 2024	<i>n</i> -Valued Coset Groups and Dynamics Mathematical Notes, 116:1 (2024), 66–76, 2024 <a href="https://doi.org/10.4213/mzm14243">https://doi.org/10.4213/mzm14243</a>
Sep. 2023	<i>Homology Spheres</i> Transactions of the Moscow Mathematical Society, 84 (2023), 197–239 <a href="https://doi.org/10.1090/mosc/352">https://doi.org/10.1090/mosc/352</a>

### Mathematics and Music

Sep. 2025	<i>The Technique of Musical Icosahedra</i> Music Academy, no. 3, 2025, pp. 64–83 <a href="https://doi.org/10.34690/479">https://doi.org/10.34690/479</a>
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## PREPRINTS

- Oct. 2025      *Algebraic  $n$ -Valued Monoids on  $\mathbb{C}P^1$ , Discriminants and Projective Duality*  
joint with Victor Buchstaber  
[arXiv:2510.14010](https://arxiv.org/abs/2510.14010)
- Aug. 2025      *On the Classification of  $n$ -Valued Monoids and Groups of Order 3*  
[arXiv:2508.04454](https://arxiv.org/abs/2508.04454)
- May 2025       *$n$ -Valued Groups, Kronecker Sums, and Wendt's  $(x, y, z)$ -Matrices*  
joint with Victor Buchstaber  
[arXiv:2505.04296](https://arxiv.org/abs/2505.04296)
- Jan 2024       *$n$ -valued Coset Groups and Dynamics*  
[arXiv:2401.12718](https://arxiv.org/abs/2401.12718)

## CONFERENCE TALKS

- Aug. 2025       *$n$ -Valued Groups, Kronecker Sums, and Wendt Matrices*  
Joint work with Victor Buchstaber  
5th Conference of Mathematical Centers of Russia
- May 2024      *Homology Spheres, Acyclic Groups and Kan-Thurston Theorem*  
Conference “From Analysis to Homotopy Theory”, University of Greifswald,  
Greifswald, Germany
- Apr. 2023      *Dynamics and multivalued groups*  
Conference “SIMC Youth Race”, Steklov Mathematical Institute of RAS, Moscow,  
Russia
- Oct. 2022      *Inconcreteness of homotopy categories*  
International School “Toric topology, combinatorics and data analysis”, Euler  
International Mathematical Institute, Saint Petersburg, Russia
- Apr. 2022      *Acyclic groups and spaces*  
29th International Scientific Conference for Undergraduate and Graduate Students  
and Young Scientists “Lomonosov”, Moscow, Russia
- Nov. 2021      *Acyclic groups and Kan-Thurston theorem*, International School “Toric Topology and  
Combinatoric”, Sirius Mathematics Center, Sochi, Russia

## SEMINAR TALKS

- Dec. 2025      *Fermat hypersurfaces, projective duality, and algebraic  $n$ -valued monoids*  
Seminar of the Department of Geometry and Topology “Geometry, Topology and  
Mathematical Physics”, Steklov Mathematical Institute of RAS (Novikov Seminar),  
Moscow, Russia
- Dec. 2025      *Discrete and Algebraic  $n$ -Valued Groups*  
Seminar on Discrete Geometry and Geometry of Numbers, Moscow State University
- Nov. 2025       *$n$ -Valued Algebraic Monoids, Cubics, and Discriminants*  
The Seminar of International Laboratory of Algebraic Topology and Its Applications,  
HSE University, Moscow, Russia
- May 2025       *$n$ -Valued Groups, Kronecker Sums, and Wendt Matrices*  
Joint work with Victor Buchstaber

Seminar of the Department of Geometry and Topology “Geometry, Topology and Mathematical Physics”, Steklov Mathematical Institute of RAS (Novikov Seminar), Moscow, Russia

- Apr. 2023      *Acyclic groups and Kan-Thurston theorem*  
Seminar by I. G. Lysenok and A. L. Talambutsa “Seminar on geometric group theory”, Steklov Mathematical Institute of RAS, Moscow, Russia
- Dec. 2022      *Fundamental groups of homology spheres*  
Seminar “Geometry, Topology and their applications” at Sobolev Institute of Mathematics

## GRANTS AND AWARDS

### Prizes, fellowships and grants

- 2021 –      *The Russian Science Foundation Grant No. 23-II-00143*
- 2019      *Winner of the olympiad on Partial Differential Equations*  
Moscow State University
- 2018      *Winner of the olympiad on Ordinary Differential Equations*  
Moscow State University

## STUDY SEMINAR TALKS

### Texas Tech Quantum Homotopy Seminar

- Dec. 2024      *An Introduction to Cartan Geometries*
- Mar. 2024      *Euler-Lagrange dynamics via the  $\infty$ -jet bundle (2 talks)*

### Seminar On Homotopy Theory and Applications at Independent University of Moscow

- Dec. 2023      *Principal  $\infty$ -bundles*
- Apr. – May 2023      *A mini-course on the  $\infty$ -category of motivic coarse spaces (4 talks)*
- Apr. 2023      *Elements of unstable motivic homotopy theory*
- Feb. – Apr. 2023      *A mini-course on  $\infty$ -cosmoi (4 talks)*
- Dec. 2022      *Applications of Reedy theory*
- Nov. 2022      *Weighted (co-)limits, Gambino’s theorem, Reedy model structures*
- Nov. 2022      *Homotopically final functors and examples of calculations with homotopy (co-)limits*
- Nov. 2022      *Nerve—realization adjunction and bar construction*
- Apr. 2022      *A series of 4 talks on sheaves of sets*
- Apr. 2022      *Kan extensions. Additional topics*
- Oct. 2021      *The categorical meaning of the Kan-Thurston theorem*
- Jul. – Aug. 2021      *Quillen’s theorem, a closed model structure on  $sSet$*

### Study And Scientific Seminar “Geometry And Topology” at Moscow State University

- Sep. 2020      *Andreev’s theorem on hyperbolic polyhedra*
- Nov. 2019      *The intersection form of 4-manifolds*
- May 2019      *Nilmanifolds and Massey product in bigraded cohomology rings*

## CONFERENCES, WORKSHOPS AND SCHOOLS

May 2024	<i>Conference “From Analysis to Homotopy Theory”</i> University of Greifswald, Greifswald, Germany
Jul. 2023	<i>Summer School “Algebra and Geometry”</i> HSE University, Steklov Mathematical Institute of RAS, Suzdal, Russia
Jul. 2023	<i>Summer school on non-commutative and derived geometry of matrix factorisations</i> Centre of Pure Mathematics, Moscow Institute of Physics and Technology, Dolgoprudny, Russia
Jun. 2023	<i>Conference on algebra, algebraic geometry, and number theory on the occasion of academician Igor Rostislavovich Shafarevich 100th birthday</i> Steklov Mathematical Institute of RAS, Moscow, Russia
Apr. 2023	<i>Conference “Geometry, topology and mathematical physics” on the occasion of the 85th anniversary of S. P. Novikov and the 80th anniversary of V. M. Buchstaber</i> Steklov Mathematical Institute of RAS, Moscow, Russia
Mar. 2023	<i>Conference “SIMC Youth Race”</i> Steklov Mathematical Institute of RAS, Moscow
Oct. 2022	<i>International School “Toric topology, combinatorics and data analysis”</i> Euler International Mathematical Institute, Saint Petersburg, Russia
Jul. 2022	<i>Summer School “Algebra and Geometry”</i> HSE University, Steklov Mathematical Institute of RAS, Suzdal, Russia
Apr. 2022	<i>29th International Scientific Conference for Undergraduate and Graduate Students and Young Scientists “Lomonosov”</i> Lomonosov Moscow State University, Moscow, Russia
Nov. 2021	<i>International School “Toric Topology and Combinatorics”</i> HSE University, Sirius Mathematics Center, Sochi, Russia
Nov. 2020	<i>Topology and Geometry of Group Actions</i> HSE University, online
Nov. 2019	7th Summer School On Geometrical Methods Of Mathematical Physiques Landau Institute for Theoretical Physics, Lomonosov Moscow State University, Chernogolovka, Russia
Nov. 2019	<i>Geometry, Topology And Mathematical Physics</i> Landau Institute for Theoretical Physics, Lomonosov Moscow State University, Chernogolovka, Russia
Nov. 2018	<i>Geometry, Topology And Mathematical Physics</i> Landau Institute for Theoretical Physics, Lomonosov Moscow State University, Chernogolovka, Russia
Jul. 2018	<i>Summer school “Modern Mathematics”</i> HSE University, Lomonosov Moscow State University, Independent University of Moscow, Dubna, Russia
Jul. 2017	<i>Summer school “Modern Mathematics”</i> HSE University, Lomonosov Moscow State University, Independent University of Moscow, Dubna, Russia

## **TEACHING**

- May 2022 – *Teaching various courses (e. g., Algebraic Geometry, Algebraic Topology, Abstract Algebra, Differential Geometry, Linear Algebra, Probability Theory, Discrete Mathematics, Calculus, etc.) on Profi*  
<https://profi.ru/profile/KornevMI3/>
- Sep. 2016 – 2022 *Little Mech-Math courses*  
An olympiad Math class at Lomonosov Moscow State University  
<http://mmmf.msu.ru/about/person.html>

## **SERVICE**

- June 2021 – 2024 *Co-organization of the study seminar “Homotopy Theory and Applications” at Independent University of Moscow*  
<https://researchseminars.org/seminar/HomotopyTheoryAndApps>

## **REFERENCES**

*Victor Buchstaber*, Steklov Mathematical Institute of RAS  
[buchstab@mi-ras.ru](mailto:buchstab@mi-ras.ru)

## **LANGUAGES**

- Russian* (native)  
*English* (fluent)  
*French* (intermediate)  
*Latin* (basic)