

Curriculum Vitae

Personal information:

Name: Ivan Limonchenko

Year of birth: February 09, 1989

E-mail: ivan.limonchenko@turing.mi.sanu.ac.rs

Education:

- **2011 – 2014:** Faculty of Mechanics and Mathematics, Lomonosov Moscow State University, Mathematics division (PhD studies)
- **2006 – 2011:** Faculty of Mechanics and Mathematics, Lomonosov Moscow State University, Mathematics division (specialist program)
- **2002 – 2006:** Moscow High School #57, Mathematics class
- **1996 – 2002:** Moscow High School #1253 with intensive learning of foreign languages

Work experience:

- **2023 – present:** Research Assistant Professor at the Mathematical Institute of the Serbian Academy of Sciences and Arts (Belgrade, Serbia)
- **2022:** Head of the International Laboratory of Algebraic Topology and Its Applications, Faculty of Computer Science, HSE University (Moscow, Russia)
- **2021 – 2022:** Research Fellow in the International Laboratory of Algebraic Topology and Its Applications, Faculty of Computer Science, HSE University (Moscow, Russia)
- **2020 – 2021:** Fields-Ontario Postdoctoral Fellow in the Department of Mathematics, Faculty of Arts and Science, University of Toronto (Toronto, Canada)
- **2019 – 2020:** International Postdoctoral Research Fellow in the Faculty of Mathematics, HSE University (Moscow, Russia)
- **2017 – 2019:** Postdoctoral Research Fellow in the School of Mathematical Sciences, Fudan University (Shanghai, China)
- **2013 – 2016:** Academic Assistant in the Department of Higher Geometry and Topology, Faculty of Mechanics and Mathematics, Lomonosov Moscow State University (Moscow, Russia)

Teaching experience:

2022 (Fall term): **HSE University** (Moscow, Russia)

- Introduction to Topology (course instructor: lectures)
- Mathematical Analysis (course instructor: practicals)

2022 (Spring term): **HSE University** (Moscow, Russia)

Ordinary Differential Equations (course instructor: practicals)

2021 (Summer term): **University of Toronto** (Toronto, Canada)

MAT327 – Introduction to Topology (course instructor: lectures)

2020 (Fall term): **University of Toronto** (Toronto, Canada)

MAT135 – Calculus I (course instructor: lectures)

2015 – 2016: Independent Moscow University (Moscow, Russia)

- Topology I (course instructor: practicals)
- Topology II (course instructor: practicals)
- Topology III (course instructor: practicals)

2013 – 2016: Lomonosov Moscow State University (Moscow, Russia)

- Linear Algebra (part-time course instructor: practicals)
- Analytical Geometry (part-time course instructor: practicals)
- Introduction to Topology (part-time course instructor: practicals)

PhD thesis information:

Title: «Combinatorial Commutative Algebra and Topology of Moment-Angle-Complexes»

Scientific advisor: Dr. Sc., Professor Taras E. Panov

Year of defense: 2015

Institution: Lomonosov Moscow State University (Moscow, Russia)

Research grants and academic awards:

2022: Head of the Russian Science Foundation Grant No. 22-71-00106 "Polyhedral products in Topology, Geometry and Combinatorics" (Russia)

2022: Young Russian Mathematics award

2020 – 2021: Fields-Ontario Postdoctoral Grant (Canada)

2016 – 2019: China Postdoctoral Science Foundation General Financial Grant No. 2016M601486 (China)

2011: Lomonosov Moscow State University, diploma summa cum laude

2006: Moscow High School #57, transcript summa cum laude, silver medal

Research interests:

- *Algebraic Topology*: rational homotopy theory, equivariant cohomology of toric spaces
- *Combinatorial Commutative Algebra*: homology theory of Stanley-Reisner rings
- *Geometric Combinatorics*: enumerative combinatorics of triangulated manifolds
- *Applied Topology*: topological data analysis, topological machine learning
- *Theoretical Informatics*: algorithmic complexity of simplicial complexes

Referee reports writing for scientific journals:

- Advances in Mathematics,
- Algebraic & Geometric Topology,
- Arnold Mathematical Journal,
- Homology, Homotopy & Applications,
- Proceedings of the Steklov Mathematical Institute of the RAS,
- Russian Mathematical Surveys,
- Sbornik: Mathematics,
- Topology and its Applications.

List of publications:

1. A.Bahri, I.Yu.Limonchenko, T.E.Panov, J.Song, and D.Stanley, “*A stability theorem for bigraded persistence barcodes*”, accepted in: Discrete and Computational Geometry (2025); arXiv:2303.14694.
2. I.Yu.Limonchenko, M.A.Sergeev, “*Bier spheres and toric topology*”, Proceedings of the Steklov Institute of Mathematics, 326 (2024), 252-268.
3. I.Yu.Limonchenko, T.E.Panov, J.Song, and D.Stanley, “*Double cohomology of moment-angle complexes*”, Advances in Mathematics, 432 (2023), Paper No. 109274, 34 pp.; <https://doi.org/10.1016/j.aim.2023.109274>
4. I.Yu.Limonchenko, L.V.Monin, and A.G.Khovanskii, “*Cohomology rings of quasitoric bundles*”, Filomat, 36:19 (2022), 6513-6537.
5. I.Yu.Limonchenko, T.E.Panov, “*Minimally non-Golod complexes and Massey products*”, Russian Mathematical Surveys, 77:4(466) (2022), 203-204.
6. I.Yu.Limonchenko, L.V.Monin, and A.G.Khovanskii, “*Generalized Virtual Polytopes and Quasitoric Manifolds*”, Proceedings of the Steklov Institute of Mathematics, 318 (2022), 126–149.
7. I.Yu.Limonchenko, G.D.Solomadin, “*On the Homotopy Decomposition for the Quotient of a Moment–Angle Complex and Its Applications*”, Proceedings of the Steklov Institute of Mathematics, 317 (2022), 117–140.

8. I.Yu.Limonchenko, D.V.Millionshchikov, "*Higher order Massey products and applications*", Contemporary Mathematics, 772 (2021), 209–240.
9. Dj.Baralic, J.Grbic, I.Yu.Limonchenko, and A.Vucic, "*Toric objects associated with the dodecahedron*", Filomat, 34:7 (2020), 2329—2356.
10. V.M.Buchstaber, I.Yu.Limonchenko, "*Massey products, toric topology and combinatorics of polytopes*", Izvestiya: Mathematics, 83:6 (2019), 3–62.
11. G.S.Chernykh, I.Yu.Limonchenko, and T.E.Panov, "*SU-bordism: structure results and geometric representatives*", Russian Mathematical Surveys, 74:3 (2019), 461–524.
12. I.Yu.Limonchenko, "*On higher Massey products and rational formality for moment-angle manifolds over multiwedges*", Proceedings of the Steklov Institute of Mathematics, 305 (2019), 174–196.
13. I.Yu.Limonchenko, Z.Lu, and T.E.Panov, "*Calabi—Yau hypersurfaces and SU-bordism*", Proceedings of the Steklov Institute of Mathematics, 302 (2018), 270–278.
14. I.Yu.Limonchenko, "*Topology of moment-angle-manifolds arising from flag nestohedra*", Chinese Annals of Mathematics, 38B(6) (2017), 1287–1302.
15. I.Yu.Limonchenko, "*Massey products in cohomology of moment-angle manifolds for 2-truncated cubes*", Russian Mathematical Surveys, 71:2 (2016), 376–378.
16. I.Yu.Limonchenko, "*Families of minimally non-Golod complexes and polyhedral products*", Far Eastern Mathematical Journal, 15:2 (2015), 222–237.
17. I.Yu.Limonchenko, "*Stanley-Reisner rings of generalized truncation polytopes and their moment-angle manifolds*", Proceedings of the Steklov Institute of Mathematics, 286 (2014), 188–197.
18. I.Yu.Limonchenko, "*Bigraded Betti numbers of certain simple polytopes*", Mathematical Notes, 94:3 (2013), 351–363.

Preprints:

1. I.Yu.Limonchenko, M.Timotijevic, and R.Zivaljevic, "On a class of toric manifolds arising from simplicial complexes" (2025); arXiv:2506.13547.
2. I.Yu.Limonchenko, A.Vavpetic, "*Chromatic numbers, Buchstaber numbers and chordality of Bier spheres*" (2024); arXiv:2412.20861.

3. I.Yu.Limonchenko, R.Zivaljevic, “*Simplicial vs. cubical spheres, polyhedral products and the Nevo-Petersen conjecture*” (2024); arXiv:2411.14036.

Organizer of scientific events:

- **2025** (Fall term): **Mathematical Institute SASA** (Belgrade, Serbia)

International Workshop "Geometry, Probability and Topology in Applications" (member of the Organizing Committee)

- **2023** (Fall term): **Sirius Mathematics Center** (Sochi, Russia)

International School "Toric Topology and Applications" (member of the Organizing Committee)

- **2023** (Fall term): **Sirius Mathematics Center** (Sochi, Russia)

International Conference "Algebraic Topology, Combinatorics, and Mathematical Physics" (member of the Organizing Committee)

- **2022** (Fall term): **Euler International Mathematical Institute** (St.-Petersburg, Russia)

International School "Toric Topology, Combinatorics, and Data Analysis" (chair of the Organizing Committee)

- **2022** (Fall term): **HSE University** (Moscow, Russia)

International Conference "Computer methods of Cognitive analysis" (member of the Program Committee)

- **2020** (Spring term): **Fields Institute** (Toronto, Canada)

Research seminar "Toric Topology Postdoc Seminar" (co-organizer)

Scientific advisor of students:

- **2022/2023** academic year: **HSE University** (Moscow, Russia)

Vladislav Nozdrin - 2nd year bachelor student (coursework title: "A New Proof of the Dehn-Sommerville Equations for Star-Shaped Spheres")

Matthew Sergeev - 3rd year bachelor student (coursework title: "Quasitoric Manifolds And Small Covers Of Two-dimensional Bier Spheres")

Zhaoyu Guo - 2nd year master student (diploma title: "Topological Data Analysis")

Selected research talks:

- *Fields Institute, University of Toronto* (Toronto, Canada): **invited** talk “On the moment-angle manifolds over Bier spheres” at the international workshop on Polyhedral Products, July 29 – August 2, 2024.
- *University of Belgrade* (Belgrade, Serbia): a talk at the 15th Serbian Mathematical Congress, June 19 - 22, 2024.
- *University of Nis* (Vrnjacka Banja, Serbia): **invited** talk “Polyhedral products and the Aanderaa-Karp-Rosenberg conjecture” at the “XXII Geometrical Seminar” international conference, May 26 - 31, 2024.
- *University of Belgrade* (Belgrade, Serbia): a talk at the 13th Symposium “Mathematics and applications”, Dec. 1 - 2, 2023.
- *International Polyhedral Products Seminar* (Princeton University, USA): a talk “Polyhedral products and the Aanderaa-Karp-Rosenberg conjecture”, Feb. 2, 2023.
- *Lomonosov Moscow State University* (Moscow, Russia): **invited** talk “On polyhedral products with free loop homology algebras” at the “2nd Conference of Mathematical Centers of Russia”, Nov. 7 – 11, 2022.
- *Euler International Mathematical Institute* (St.-Petersburg, Russia): **invited** talk “The Golod property of face rings from the topological viewpoint” at the international conference “Algebraic Groups: the White Nights season II”, July 4 – 8, 2022.
- *University of Belgrade* (Belgrade, Serbia): a talk at the “XXI Geometrical Seminar” international conference, June 26 – July 2, 2022.
- *Sirius Mathematics Center* (Sochi, Russia): a talk at the international conference “Topology of torus actions and related topics”, Oct. 25 – 29, 2021.
- *Osaka City University* (Osaka, Japan): **invited** talk “On the secondary cohomology of moment-angle-complexes” at the international conference “Toric Topology 2021 in Osaka”, March 24 – 26, 2021.
- *University of Montreal* (Montreal, Canada): **invited** talk “On homotopy theory of polyhedral products with Golod face rings” at the 2020 Winter Meeting of the Canadian Mathematical Society, Dec. 3 – 8, 2020.
- *Fields Institute, University of Toronto* (Toronto, Canada): **invited** talk “On families of flag polytopes and their moment-angle manifolds” at the international workshop on Polyhedral Products in Homotopy Theory, Jan. 20 – 24, 2020.

- *Euler International Mathematical Institute* (St.-Petersburg, Russia): a talk at the international conference “Topology, Geometry, and Dynamics: Rokhlin – 100”, Aug. 19 – 23, 2019.
- *Kumamoto City International Center* (Kumamoto, Japan): **invited** talk “On polyhedral products of low LS-category” at the 45th Symposium on Transformation Groups, Dec. 6 – 8, 2018.
- *Fudan University* (Shanghai, China): a talk at the Special Session on Algebraic and Geometric Topology of the “Joint International Meeting of the American Mathematical Society and the Chinese Mathematical Society”, June 11 – 14, 2018.
- *Steklov Mathematical Institute of RAS* (Moscow, Russia): **invited** talk “On the new families of flag nestohedra arising in toric topology” at the International Seminar on Toric Topology for Young Researchers, May 31 – June 2, 2018.
- *University of Nis* (Vrnjacka Banja, Serbia): a talk at the “XX Geometrical Seminar” international conference, May 20 – 23, 2018.
- *University of Kragujevac* (Kragujevac, Serbia): a talk “On Calabi-Yau representatives in the SU-bordism ring” at the 14th Serbian Mathematical Congress, May 16 – 19, 2018.
- *Tsinghua Sanya International Mathematics Forum* (Sanya, China): **invited** talk “SU-bordism ring and Calabi-Yau manifolds” at the International Open Chinese–Russian Conference "Algebraic Topology, Geometry and Combinatorics of Manifolds", Dec. 5 – 9, 2017.
- *Dalian University of Technology* (Dalian, China): a talk at the international workshop on Low-Dimensional Topology and Algebraic Topology, Nov. 9 – 11, 2017.
- *Princeton University, Rider University* (Princeton University, USA): **invited** talk at the international conference “Princeton-Rider Workshop on the Homotopy Theory of Polyhedral Products”, May 29 – June 2, 2017.
- *Okayama University of Science* (Himeji, Japan): a talk at the 43rd Symposium on Transformation Groups, Nov. 17 – 19, 2016.
- *University of Nis* (Zlatibor, Serbia): a talk at the “XIX Geometrical Seminar” international conference, Aug. 28 – Sept. 4, 2016.
- *Technical University* (Berlin, Germany): a contributed talk “Massey operations, toric spaces and simple polytopes” at the 7th European Congress of Mathematics, July 17 – 22, 2016.

- *Kagoshima University* (Kagoshima, Japan): a talk at the international conference “Toric Topology 2016 in Kagoshima”, Apr. 19 – 22, 2016.
- *Sobolev Mathematical Institute of RAS* (Novosibirsk, Russia): a talk at the international conference “Dynamics in Siberia”, Feb. 29 – March 4, 2016.