Curriculum Vitae

Personal information:

Name: Ivan Limonchenko
Year of birth: February 09, 1989
Place of work: Mathematical Institute SASA (Belgrade, Serbia)
E-mail: ivan.limoncenko@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, 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)

Scientific organizations membership and awards:

☐ **Since 2016:** member of the Moscow Mathematical Society

☐ **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. 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

2. I.Yu.Limonchenko, L.V.Monin, and A.G.Khovanskii, "*Cohomology rings of quasitoric bundles*", Filomat, 36:19 (2022), 6513-6537.

3. I.Yu.Limonchenko, T.E.Panov, "*Minimally non-Golod complexes and Massey products*", Russian Mathematical Surveys, 77:4(466) (2022), 203-204.

4. 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.

5. 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.

6. I.Yu.Limonchenko, D.V.Millionshchikov, *"Higher order Massey products and applications"*, Contemporary Mathematics, 772 (2021), 209–240.

7. Dj.Baralic, J.Grbic, I.Yu.Limonchenko, and A.Vucic, *"Toric objects associated with the dodecahedron"*, Filomat, 34:7 (2020), 2329—2356.

8. V.M.Buchstaber, I.Yu.Limonchenko, *"Massey products, toric topology and combinatorics of polytopes"*, Izvestiya: Mathematics, 83:6 (2019), 3–62.

9. 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.

10. 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.

11. 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.

12. I.Yu.Limonchenko, *"Topology of moment-angle-manifolds arising from flag nestohedra"*, Chinese Annals of Mathematics, 38B(6) (2017), 1287–1302.

13. I.Yu.Limonchenko, *"Massey products in cohomology of moment-angle manifolds for 2-truncated cubes"*, Russian Mathematical Surveys, 71:2 (2016), 376–378.

14. I.Yu.Limonchenko, *"Families of minimally non-Golod complexes and polyhedral products"*, Far Eastern Mathematical Journal, 15:2 (2015), 222–237.

15. 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.

16. I.Yu.Limonchenko, *"Bigraded Betti numbers of certain simple polytopes"*, Mathematical Notes, 94:3 (2013), 351–363.

Preprints:

1. A.Bahri, I.Yu.Limonchenko, T.E.Panov, J.Song, and D.Stanley, "*A stability theorem for bigraded persistence barcodes*" (2023); arXiv:2303.14694.

2. V.M.Buchstaber and I.Yu.Limonchenko, "*Direct families of polytopes with nontrivial Massey products*" (2018); arXiv:1811.02221.

3. V.M.Buchstaber and I.Yu.Limonchenko, "*Embeddings of moment-angle manifolds and sequences of Massey products*" (2018); arXiv:1808.08851.

Organizer of scientific events:

☐ **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** (Saint 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 Cognitome 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:

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:

• *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): talk at the "XX Geometrical Seminar" international conference, May 20 – 23, 2018.

• *University of Kragujevac* (Kragujevac, Serbia): invited 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, Lawrenceville; 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.