Anton Izosimov – Curriculum Vitae

Tenure Track Assistant Professor
Department of Mathematics
University of Arizona

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EDUCATION

- Loughborough University, PhD in Mathematics, 2012
  Thesis title: Singularities of bi-Hamiltonian systems and the multidimensional rigid body
  Advisor: Alexey Bolsinov
- Moscow State University, Candidate of Sciences in Mathematics, 2011
  Thesis title: Focus-focus singularities of integrable Hamiltonian systems
  Advisors: Alexey Bolsinov, Andrej Oshemkov
- Moscow State University, MS with honors in Mathematics, 2008

EMPLOYMENT

- University of Arizona, Tenure Track Assistant Professor, January 2018 - present
- University of Toronto, Postdoctoral Fellow, 2014 - 2017
- Higher School of Economics (Moscow), Docent, 2013 - 2014
- Moscow State University, Assistant Professor, 2012 - 2014

VISITING POSITIONS

- Max Planck Institute for Mathematics, June - December 2017
- Hausdorff Research Institute For Mathematics, January - April 2012

TEACHING EXPERIENCE

- University of Arizona
  - Undergraduate: Calculus I and II, Formal Mathematical Reasoning and Writing, ODEs and Stability Theory, Real Analysis, Theory of Complex Variables, Theory of Probability, Theory of Statistics
  - Graduate: Algebra, Complex Analysis, Geometry and Topology, Symplectic Geometry and Integrable Systems
- University of Toronto: Calculus, Differential Equations, Groups and Symmetry, Linear Algebra, Real Analysis
- Higher School of Economics: Calculus, Linear Algebra
- Moscow State University: Geometry and Topology

SELECTED AWARDS, GRANTS, AND SCHOLARSHIPS

- NSF Research Grant, 2020 - 2024
- F.V. Atkinson Teaching Award, University of Toronto, 2016
- Best Instructor Award, Higher School of Economics, 2014
- Dynasty Foundation Scholarship, Russia, 2013 - 2014
- Russian Foundation of Basic Research Grant, 2012 - 2013
- Overseas Research Scholarship, United Kingdom, 2008 - 2011
- Leonhard Euler Foundation Scholarship, Russia, 2008

SERVICE

To the profession and broader community:

- Co-organizer of "Lie groups, geometry, integrability, hydrodynamics" conference, Nordfjordeid, Norway, 2024
- Advisory committee member, "Poisson 2024" conference, Napoli, Italy, 2024
- Arnold Mathematical Journal, guest editor of the special issue on finite dimensional integrable systems, 2024
- NSF panelist, 2022
- Co-organizer of the virtual Hamiltonian Systems Seminar
- Referee for several book series and multiple journals, including Inventiones, Duke, etc.
- Co-organizer of the Tucson Math Circle

To the University of Arizona:
- Member of the Postdoctoral Committee, 2020 and 2022 - present
- Member of the Graduate Committee, 2020 - 2022
- Coordinator of the Undergraduate Research Assistantship Program, 2020 - 2021
- Co-chair of the Mathematics Colloquium, 2018 - 2019

To the University of Toronto:
- Organizer of the Symplectic Geometry Seminar, 2015 - 2016

GRADUATE STUDENTS

Current:
- Quinton Aboud, University of Arizona, PhD
- Abigayle Dirdak, University of Arizona, PhD
- Ilia Kirillov, University of Toronto, PhD (co-advised with B. Khesin)

Past:
- Leaha Hand, University of Arizona, PhD, 2024
- Abigayle Dirdak, University of Arizona, MS, 2021
- Ilia Kirillov, Moscow State University, MS, 2019
- Daniel Fusca, University of Toronto, PhD, 2018 (co-advised with B. Khesin)
- Konstantin Aleshkin, Moscow State University, MS, 2015

POSTDOCS
- Darlayne Addabbo, University of Arizona, 2020 - present
- Melinda Lanius, University of Arizona, 2018 - 2021 (now a TTAP at Auburn)

INVITED CONFERENCE TALKS AND LECTURE SERIES

Upcoming conferences:
- Discrete Integrable Systems: Difference Equations, Cluster Algebras and Probabilistic Models, ICTS, Bangalore, India, 2024

Past conferences:
- Statistical Mechanics and Discrete Geometry, IPAM, Los Angeles, 2024
- Infinite Dimensional Geometry and PDEs, Banff, 2023
- Math in the Mine: a workshop on shape spaces, Minière de Vallauria, France, 2023
- Finite Dimensional Integrability in Mathematical Physics, Les Diablerets, 2023
- JMM, Special Session on Integrable Systems and Symplectic Group Actions, Boston, 2023
- FDIS 2022: Finite Dimensional Integrable Systems, Tel Aviv University, 2022
- AMS Fall Eastern Sectional Meeting, Session on Geometric Dynamics, Online, 2020
- FDIS 2019: Finite Dimensional Integrable Systems, Shanghai Jiao Tong University, 2019
- Cluster Algebra and Mathematical Physics, Michigan State University, 2018
- Geometric Aspects of Momentum Maps and Integrability, CSF Ascona, 2018

- Gone Fishing 2018: a meeting on Poisson geometry, UC San Diego, 2018
- Analytic and Algebraic Methods in Differential Equations, Moscow, 2017
- Painleve Equations and Discrete Dynamics, Banff, 2016
- Integrable Systems, CSF Ascona, Switzerland, 2016
- Integrability and Near-Integrability in Mechanics and Geometry, BIRS-Oaxaca, 2016
- Analysis of PDEs of Fluid Mechanics, Rice University, 2016
- Integrability in Mechanics and Geometry, ICERM, 2015
- Beyond Toric Integrability, EPFL, 2013

Lecture series:

- Poisson Geometry and Hydrodynamics, four lectures at Poisson 2018 summer school, Fields Institute, 2018

PAPERS

Preprints:

1. Pentagram maps over rings, Grassmannians, and skewers, with L. Hand, arXiv:2405.06122
2. Planar networks and simple Lie groups beyond type A, arXiv:2308.13975

Published/accepted:

1. Coadjoint orbits of area-preserving diffeomorphisms of non-orientable surfaces, with B. Khesin and I. Kirillov,
   Journal of Symplectic Geometry, to appear
2. Integrable systems and cluster algebras, with M. Gekhtman
   Encyclopedia of Mathematical Physics 2nd edition, 2024
3. Geometry of generalized fluid flows, with B. Khesin
   Calculus of Variations and Partial Differential Equations, vol. 63, no. 3, 2024
4. Change of polytope volumes under Möbius transformations and the circumcenter of mass
   Discrete & Computational Geometry, doi:10.1007/s00454-022-00481-x, 2023
5. Long-diagonal pentagram maps, with B. Khesin
   Bulletin of the London Mathematical Society, vol .55, no. 3, pp. 1314-1329, 2023
6. Polygon recutting as a cluster integrable system
   Selecta Mathematica, vol. 29, no. 21, 2023
7. Jordan-Kronecker invariants of Lie algebra representations and degrees of invariant polynomials, with A. Bolsinov and I. Kozlov
   Transformation Groups, vol. 28, pp. 541-560, 2023
8. What is a lattice W-algebra, with G. Marí Beffa
   International Mathematics Research Notices, no. 19, pp. 17021-17059, 2023
9. Dimers, networks, and cluster integrable systems
   Geometric and Functional Analysis, vol. 32, pp. 861-880, 2022
10. The pentagram map, Poncelet polygons, and commuting difference operators
    Compositio Mathematica, vol. 158, no. 5, pp. 1084-1124, 2022
11. Pentagram maps and refactorization in Poisson-Lie groups
    Advances in Mathematics, vol. 404, p. 108476, 2022
12. Intersecting the sides of a polygon
    Proceedings of the American Mathematical Society, vol. 150, pp. 639-649, 2022
13. The limit point of the pentagram map and infinitesimal monodromy, with Q. Aboud
    International Mathematics Research Notices, no. 7, pp. 5383-5397, 2022
14. Smooth invariants of focus-focus singularities and obstructions to product decomposition, with A. Bolsinov
    Journal of Symplectic Geometry, vol. 17, no. 6, pp. 1613-1648, 2019
15. Vortex sheets and diffeomorphism groupoids, with B. Khesin
    Advances in Mathematics, vol. 338, pp. 447-501, 2018

16. Characterization of steady solutions to the 2D Euler equation, with B. Khesin
International Mathematics Research Notices, no. 24, pp. 7459-7503, 2017
17. Singularities of integrable systems and algebraic curves
International Mathematics Research Notices, no. 18, pp. 5475-5524, 2017
18. Classification of Casimirs in 2D hydrodynamics, with B. Khesin
Moscow Mathematical Journal, vol. 17, pp. 699-716, 2017
19. Finite-dimensional integrable systems: a collection of research problems, with A. Bolsinov and D. Tsonev
Journal of Geometry and Physics, vol. 115, pp. 2-15, 2017
20. Euler equations on the general linear group, cubic curves, and inscribed hexagons, with K. Aleshkin
L'Enseignement Mathématique, vol. 62, pp. 143-170, 2016
21. Coadjoint orbits of symplectic diffeomorphisms of surfaces and ideal hydrodynamics, with B. Khesin and M. Mousavi
Annales de l'Institut Fourier, vol. 66, no. 6, pp. 2385-2433, 2016
22. Pentagrams, inscribed polygons, and Prym varieties
Electronic Research Announcements in Mathematical Sciences, vol. 23, pp. 25-40, 2016
23. Flat bi-Hamiltonian structures and invariant densities
Letters in Mathematical Physics, vol. 106, pp. 1415-1427, 2016
24. Leapfrog map and Toda lattice, appendix to Integrable cluster dynamics of directed networks and pentagram maps by M. Gekhtman, M. Shapiro, S. Tabachnikov, and A. Vainshtein
Advances in Mathematics, vol. 300, pp. 390-450, 2016
25. Algebraic geometry and stability for integrable systems
Physica D, vol. 291, pp. 74-82, 2015
26. Singularities of bi-Hamiltonian systems, with A. Bolsinov
Communications in Mathematical Physics, vol. 331, pp. 507-543, 2014
27. Stability of relative equilibria of multidimensional rigid body
Nonlinearity, vol. 27, pp. 1419-1444, 2014
28. The derived algebra of a stabilizer, families of coadjoint orbits, and sheets
Journal of Lie Theory, vol. 24, pp. 705-714, 2014
29. Curvature of Poisson pencils in dimension three
Differential Geometry and its Applications, vol. 31, pp. 557-567, 2013
30. Stability of stationary rotations of multidimensional rigid body
Moscow University Mathematics Bulletin, vol. 68, pp. 80-82, 2013
31. Stability in bihamiltonian systems and multidimensional rigid body
Journal of Geometry and Physics, vol. 62, pp. 2414-2423, 2012
32. A note on relative equilibria of a free multidimensional rigid body
Journal of Physics A: Mathematical and Theoretical, vol. 45, p. 325203, 2012
33. Algebra and topology of integrable systems: problems for investigation, with A. Bolsinov, A. Konyaev, and A. Oshemkov
Tr. Sem. Vektor Tenzor Anal., vol. 28, pp. 119-191, 2012 (in Russian)
34. Classification of almost toric singularities of Lagrangian foliations
Sbornik: Mathematics, vol. 202, pp. 1021-1042, 2011
35. Smooth invariants of focus-focus singularities
Moscow University Mathematics Bulletin, vol. 66, pp. 178-180, 2011