CURRICULUM VITAE 2026

Boris A. Khesin

1. Education:

1986 M.Sc. (University Diploma) with honors in mathematics, Moscow State Univ., Russia

1989 Ph.D. (Candidate of Science) in mathematics, Moscow State Univ., Russia
Thesis title: "Normal Forms and Versal Deformations of Evolution Differential Equations."
Thesis adviser: Prof. V.I.Arnold, Steklov Math. Inst., Moscow

2. Employment:

2002 - present	Professor of Mathematics, University of Toronto
1996 - 2002	Associate Professor, University of Toronto
1997 - 1998, 2012	Member, The Institute for Advanced Study, Princeton
1992 - 1996	Assistant Professor, Yale University
1990 - 1992	Morrey Assistant Professor, University of California at Berkeley

Visiting Positions (1–5 months)

2025	Gran Sasso Science Institute, L'Aquila, Italy
1992-2024, 7 times	IHES, Bures-Sur-Yvette, France
2023	Institut Mittag-Leffler, Stockholm, Sweden
2008, 2022	CRM, Barcelona, Spain
2017	MIT, Cambridge, USA
2009-2017, 3 times	Weizmann Institute, Israel
2014	Simons Center SCGP, Stony Brook, USA
2014	Max-Planck Institut, Leipzig, Germany
2004, 2013	Bernoulli Center, Lausanne, Switzerland
2002-2012, 4 times	Ecole Polytechnique, Paris, France
1994-2011, 8 times	Max-Planck Institut, Bonn, Germany
1999-2013, 3 times	MSRI, Berkeley, USA
2009	Observatoire de la Côte d'Azur, Nice, France
2007	Universities of Tokyo and Fukuoka, Japan
2005	Ecole Normale Superieure, Lyon, France
2004	Universite de Geneve, Switzerland
2003	Universite de Nice, France
2002	Universite d'Angers, France
2002	ESI, Vienna, Austria
2000	LAPP, Annecy, France
1997-2000, 3 times	Yale University, New Haven, USA
1996	ETH, Zurich, Switzerland
1995	RIMS, Kyoto, Japan
1993	Universite Paris VII, France
1992, 2012	Isaac Newton Institute, Cambridge, UK

3. Research Areas:

Geometric hydrodynamics and Infinite-dimensional Lie groups;
Mathematical physics: integrable systems, fluid dynamics;
Global analysis: Poisson geometry, gauge theory

5. Awards/Honors:

2024	The 60th birthday conference, Sophus Lie Center, Nordfjordeid, Norway
2021	Oversea Distinguished Scholar, Henan University, China
2020 - 2021	Simons Fellow, Simons Foundation, NY, USA
2018	Chaire Pierre Bonelli, IHES, France
2017	Simons Fellow, Simons Foundation, NY, USA
2012	Member, The Institute for Advanced Study, Princeton
2011	William Spencer Lecturer, Kansas State University
2009	NSERC Grant Accelerator Supplement Award
2006 - 2007	Clay Mathematics Institute Book Fellow
2007	Research fellow of JSPS, Japan
2000	Invited speaker at the Royal Society, London
1999	Premier's Research Excellence Award, Ontario, Canada
1999	The McLean Award, University of Toronto
1997 - 1998	Andre-Aisenstadt Mathematics Prize, Montreal, Canada
1997 - 2001	Alfred P. Sloan Research Fellowship
1997 - 1998	Member, The Institute for Advanced Study, Princeton
1995 - 1996	Yale Junior Faculty Fellowship
1986	Winner in Undergraduate Student Research Competition, Moscow State University, Moscow, Russia

5. Graduate students (thesis topic):

Eugene Ha	2003 M.S.	Classification of the Virasoro coadjoint orbits
Dmitry Donin	2008 Ph.D.	Algebras of pseudo-differential operators
Paul Lee	2009 Ph.D.	Sub-Riemannian geometry and optimal mass transport
Victor Goulart	2016 Ph.D.	Poisson geometry of space curves and mechanics
Cheng Yang	2017 Ph.D.	Averaging, symplectic structures and generalized flows
Daniel Fusca	2018 Ph.D.	A groupoid approach to geometric mechanics
Danny Nackan	2019 M.S.	Continuous limits of the pentagram maps
Vasiliki Liontou	2023 Ph.D.	Gabor frames and contact geometry
Ilia Kirillov	2024 Ph.D	Coadjoint orbits of symplectomorphism groups of surfaces
Luke Volk	2026 Ph.D	Spaces of smooth and singular volume forms
Rene Langøen	2026 Ph.D	On curvature in Lie-theoretic geometry
Daniil Glukhovskiy	2023 - present, PhD student (Stony Brook University, USA)	
Daniele Giannetto	2024 - present, PhD student	
Valeriya Khanikaeva	2026 - present, PhD student	
Kevin Manogue	2026 - present, PhD student (Chalmers University, Sweden)	

6. Postdocs (supervised and co-supervised):

Friedrich Wagemann	2000-2001	Ely Kerman	2000-2002
Petr Pushkar	2000-2002	Liviu Mare	2002-2003
Boris Begun	2001-2004	Hamed Maroofi	2002-2004
Martin Pinsonnault	2002-2005	Gregoire Loeper	2003-2004
Robert Wendt	2003-2005	Young-Heon Kim	2004-2008
Pavel Bachurin	2006-2008	Jeremy Wong	2006-2008
Alfonso Grasia-Saz	2007-2010	Alex Castro	2010-2011
Feride Tiglay	2010-2012	Fedor Soloviev	2010-2015
Jaimal Thind	2011-2012	Roberto Santos-Silva	2011-2012
Klas Modin	2012-2014	Mehdi Mousavi	2012-2014
Izosimov Anton	2014-2017	Alexander Shapiro	2016-2019
Cheng Yang	2017-2022	Francisco Torres de Lizaur	2020-2022
Maxence Mayrand	2020-2022	Jose Palacios	2022-2025
Semen Artamonov	2022-2024	Ilia Gaiur	2022-2024
Krzysztof Ciosmak	2022-2025	Ood Shabtai	2024-2027
Maarten Mol	2024-2027		

7. Teaching experience:

1990 - present	Graduate and undergraduate courses;
2026 - present	How to Talk Mathematics Seminar (with G. Taroian and T. Stojimirovic)
2010 - present	Hamiltonian Systems Seminar (currently online, with A. Izosimov)
1998 - present	Symplectic Geometry Seminar (with M. Gualtieri, L. Jeffrey, Y. Karshon, and E. Meinrenken)
1996 - 1997	Differential Systems Seminar (with V. Jurdjevic)
1993 - 1996	Seminar "Geometry, symmetry, and physics" (with I. Frenkel, G. Moore, and G. Zuckerman)
1991 - 1992	Symplectic Geometry Seminar (with A. Givental and A. Weinstein)

8. Lecture Series:

2022	Series of 3 lectures, Wisla Winter School (virtual)
2021	Series of 8 lectures, Henan University, China (virtual)
2019	Series of 3 lectures, ICMAT, Madrid, Spain
2019	Series of 2 lectures, Gökova, Turkey
2013	Series of 3 lectures, NZMRI, New Zealand
2010	Series of 4 lectures, Weizmann Institute, Israel
2003	Series of 3 lectures, Ecole Polytechnique, France
2002	Series of 4 lectures, CIRM, Marseille, France
2001	Series of 4 lectures, CIME, Cetraro, Italy
2000	Series of 2 lectures, Cambridge, UK
1997	Poincare Lecture Series, Fields Institute, Toronto

9. Editorial boards:

2004 - present	Springer series "Encyclopaedia of Mathematical Sciences," subseries "Mathematical Physics";
2004 - present	Journal "Dynamics of Partial Differential Equations"

2007 - present	Journal "Symmetry, Integrability and Geometry: Methods and Applications" (SIGMA)
2007 - 2026	Springer project "Collected Works of V.Arnold," Editor-in-Chief
2022 - present	Journal "Regular and Chaotic Dynamics"
2025 - present	"Arnold Mathematical Journal"

10. Membership:
Canadian Applied and Industrial Mathematics Society (CAIMS)

11. Organizing Scientific Programs and Conferences:

Programs:

Spring 2014	"Quantum anomalies, topology, and hydrodynamics," Simons Center, NY
2004 - 2005	"Geometry of string theory," Fields Institute (FI), Toronto
2001 - 2002	"Groups and geometry," CRM, Montreal
Spring 2001	"Symplectic topology, geometry, and gauge theory," FI, Toronto
Fall 2000	"Infinite-dimensional Lie theory and its applications," FI, Toronto;

Workshops and Conferences:

August 2026	"Billiards and Stars: geometry and dynamics," CIMAT, Guanajuato, Mexico
November 2023	"Infinite-dimensional geometry and fluids," BIRS, Banff, Alberta
April 2021	"Infinite-dimensional Riemannian geometry and stochastic geometric mechanics," ICMS, Edinburgh, UK (postponed)
February 2021	"From quantum chaos to hydrodynamics," CRM, Montreal, Canada (virtual)
January 2018	"Dynamics and integrability of nonholonomic and non-Hamiltonian systems," Padova, Italy
June 2016	"Integrability and near-integrability in geometry," CMO, Oaxaca, Mexico
June 2015	"Integrability in mechanics and geometry," ICERM, Providence, RI
November 2014	"Legacy of Vladimir Arnold," FI, Toronto
May 2014	"Geometrical aspects of hydrodynamics," Simons Center, NY
October 2011	"Dynamical systems and classical mechanics," ICMS, Edinburgh, UK
October 2009	"Geometry of integrable and nonintegrable dynamics," AMS meeting, PennState, USA
August 2008	"30 years of bihamiltonian systems," Banach Center, Poland
January 2007	"Nonholonomic mechanics and integrability," Banff, Alberta
June 2005	"Integrable systems and string theory," CMS meeting, Waterloo
November 2001	"Infinite-dimensional Lie groups," CRM, Montreal
March 2001	"Symplectic and contact topology, quantum cohomology, and symplectic field theory," FI/CRM, Toronto–Montreal
January 2001	"Quasi-classical and Quantum structures," FI, Toronto
September 2000	"Hamiltonian systems," AMS meeting, Toronto
June 1997	"Symplectic geometry," FI, Toronto

12. Administrative/outreach work:

1998-1999, 2012-2015, 2022, 2026	Colloquium Chair, University of Toronto
1996 - present	Committees: Tenure-track Appointments, CRC Appointments, PDF Appointments, Tenure/promotion, Awards, Outreach, Library, etc.
2004 - present	Chair of PhD Exams, Arts and Sciences, Engineering Faculty

2006 - present	Lectures/lessons at Palmerston, Forest Hill, and Brown PS, ICS, Sigma and CapeCod Summer Camps

13. Contact/personal information:

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LIST OF PUBLICATIONS

Boris A. Khesin

Refereed Publications

A) BOOKS

Written:

19B. *Topological methods in hydrodynamics.* (with V.I.Arnold) *Applied Math. Series, vol. 125, Springer-Verlag NY*, 1998, xv+374pp.; Second printing 1999, xv+376pp.; Third printing: *World Publishing Corporation, Beijing*, 2009; Russian edition: *MCCME*, 2007, 392pp.; Russian extended second edition: *MCCME*, 2020, 456pp.; English extended second edition: *Springer Nature Switzerland AG*, 2021, xx+455pp.

18B. *Geometry of infinite-dimensional groups.* (with R.Wendt) *Ergebnisse der Mathematik und Grenzgebiete 3.Folge, vol. 51, Springer-Verlag*, 2009, xviii+304pp.; Russian translation: *MCCME*, 2014, 368pp.

17B. *Lectures on topological fluid mechanics.* (with M.Berger, L.Kauffman, K.Moffatt, R.Ricca, and De W.Sumners) *Lecture Notes in Math., vol. 1973, Springer-Verlag*, 2009, 221pp.

Translated:

16B. *Fundamentals of geophysical hydrodynamics* by F. Dolzhansky (English translation) *Encyclopaedia of Math. Sci.: Mathematical Physics*, v.103, Springer-Verlag (2013), xiv+272pp.

Edited:

15B. *Vladimir I. Arnold. Collected Works.* Editors: B.Khesin, M.Sevryuk, and V.Vassiliev, *Volume VII: Spaces and Singularities of Curves, Mathematical Trinities, and Mathematical Education, 1996-1999;* Springer–Nature (2025), 502pp.

14B. *Vladimir I. Arnold. Collected Works.* Editors: B.Khesin, M.Sevryuk, and V.Vassiliev, *Volume V: Symplectic topology, Dynamics of intersections, and Catastrophe theory, 1986-1991;* Springer–Nature (2025), 540pp.

13B. *Vladimir I. Arnold. Collected Works.* Editors: A.Givental, B.Khesin, M.Sevryuk et al. *Volume VI: Dynamics, combinatorics, and invariants of knots, curves, and wave fronts, 1992-1995;* Springer (2023), 492pp.

12B. *Special Volume of Celebratio Mathematica on Dmitry Fuchs.* Editors: B.Khesin, F.Malikov, V.Ovsienko, and S.Tabachnikov, *celebratio.org* (2022), 150pp.

11B. *Special Issue in honour of Alexander Shnirelman's 75th birthday.* Editors: D.Jakobson, B.Khesin, and I.Polterovich, *Annales mathématiques du Québec*, **46:1** (2022), 225pp.

10B. *Special Issue on "Algebra, Topology, and Dynamics in Interaction" in honor of Dmitry Fuchs' 80th anniversary.* Editors: B.Khesin, F.Malikov, V.Ovsienko, and S.Tabachnikov *Symmetry, Integrability and Geometry: Methods and Applications (SIGMA)* (2020), 300pp.

9B. *Vladimir I. Arnold. Collected Works.* Editors: A.Givental, B.Khesin, M.Sevryuk et al. *Volume IV: Singularities in symplectic and contact geometry, 1980-1985;* Springer (2018), 525pp.

8B. *Vladimir I. Arnold. Collected Works.* Editors: A.Givental, B.Khesin, M.Sevryuk et al. *Volume III: Singularity theory, 1972-1979;* Springer (2016), 509pp.

7B. *ARNOLD: Swimming Against the Tide.* Editors: B.Khesin and S.Tabachnikov, Amer. Math. Soc. (2014), 224pp.

6B. *Vladimir I. Arnold. Collected Works.* Editors: A.Givental, B.Khesin, A.Varchenko et al. *Volume II: Hydrodynamics, bifurcation theory, and algebraic geometry, 1965-1972;* Springer (2014), 466pp.

4-5B. *Tribute to Vladimir Arnold* and *Memories of Vladimir Arnold.* Editors: B.Khesin and S.Tabachnikov, *Notices of the AMS*, **59** (2012), 378–399 and 482–502.

3B. *Vladimir I. Arnold. Collected Works.* Editors: A.Givental, B.Khesin, J.Marsden, A.Varchenko et al. *Volume I: Representation of functions, Celestial mechanics, and KAM theory, 1957-1965;* Springer (2009), 487pp.

2B. *Symplectic and contact topology: Interactions and perspectives.* Editors: Ya.Eliashberg, B.Khesin, and F.Lalonde, *Fields Institute Communications*, v.35, AMS, Providence (2003), 201pp.

1B. *The Arnoldfest:* Proceedings of a conference in honour of V.I. Arnold for his sixtieth birthday, Toronto (1997), Editors: E.Bierstone, B.Khesin, A.Khovansky, and J.Marsden, *Fields Institute Communications*, v.24, AMS, Providence (1999), 556pp.

B) PAPERS:

Refereed Publications:

99. *Infinite-dimensional nonholonomic and vakonomic systems.* (with Alexander Abanov), *J. of Nonlinear Science*, **36:3** (2026), #67, 26pp.; arXiv:2511.00629

98. *Open problems in billiards and quantitative symplectic geometry.* (with B.Albach, J-F.Barraud, M.Bialy, et al), accepted to *Arnold Mathematical Journal*, (2026), 26pp.; preprint arXiv:2602.12896.

97. *Pensive billiards, point vortices, and the silver ratio.* (with Theodore Drivas and Daniil Glukhovskiy), *Forum of Mathematics, Sigma*, **13:e171** (2025), 1-32; arXiv:2408.03279.

96. *Morse-Bott volume forms.* (with Luke Volk), *Arnold Mathematical Journal*, **12:1** (2026), 142-160; arXiv:2503.00541.

95. *Curvatures of measure-preserving diffeomorphism groups of non-orientable surfaces.* (with Rene Langoen and Irina Markina), *Nonlinearity*, **38** (2025), # 055017, 38pp.; arXiv:2501.06599.

94. *Relative helicity and tiling twist.* (with Nicolau Saldanha), *Trans. of the Amer. Math. Soc.*, **378:12**, (2025), 8759-8782; arXiv:2408.00522.

93. *Coadjoint orbits of area-preserving diffeomorphisms of non-orientable surfaces.* (with Anton Izosimov and Ilia Kirillov), *J. of Symplectic Geometry*, **23:1** (2025), 1-35; arXiv:2304.09354.

92. *Topological foundations of ferroelectricity.* (with Igor Lukyanchuk, Anna Razumnaya, Svitlana Kondovych, Yuri Tikhonov, and Valerii Vinokur), *Physics Reports*, **1110** (2025), 1-56.

91. *The Euler non-mixing made easy.* *Nonlinearity*, **37** (2024), 095025, 6pp.; arXiv:2402.08836.

90. *Singular vortex pairs follow magnetic geodesics.* (with Theodore Drivas and Daniil Glukhovskiy), *Int. Math. Res. Notices (IMRN)*, **2024:14** (2024), 10880-10894; arXiv:2401.08512.

89. *On Arnold's and Pushkin's puzzles.* in *V.Arnold: Collected Works, vol.VII, 1996-1999*, Springer-Nature (2025), 497-500; arXiv:2601.10766.

88. *Simple unbalanced optimal transport.* (with Klas Modin and Luke Volk), *Int. Math. Res. Notices (IMRN)*, **2024:10** (2024), 8839-8855; arXiv:2307.05703.

87. *Geometry of generalized fluid flows.* (with Anton Izosimov), *Calc. Var. Partial Diff. Equations*, **63:3** (2023), 30pp..; arXiv:2206.01434.

86. *The Toda flow as a porous medium equation.* (with Klas Modin), *Comm. Math. Physics (CMP)*, **401** (2023), 1879-1898; arXiv:2207.10214.

85. *Geometric hydrodynamics in open problems.* (with Gerard Misiolek and Alexander Shnirelman), *Arch. Rational Mech. Anal. (ARMA)*, **247:15** (2023), 43pp.; arXiv:2205.01143.

84. *Long-diagonal pentagram maps.* (with Anton Izosimov), *Bulletin of the London Math. Soc.*, **55:3** (2023), 1314-1329; arXiv:2203.07578.

83. *Quartic Oscillators.* *SCGP News*, **XVII-XVIII** (2022), 28-29.

82. *The helicity uniqueness conjecture in 3D hydrodynamics.* (with Daniel Peralta-Salas and Cheng Yang), *Trans. of the Amer. Math. Soc. (TAMS)*, **375:2** (2022), 909–924; arXiv:2003.06008

81. *The golden ratio and hydrodynamics.* (with Hanchun Wang), *The Mathematical Intelligencer (TMIN)*, **44:1** (2022), 22–27; arXiv:2104.02225

80. *Geometric hydrodynamics and infinite-dimensional Newton's equations.* (with Gerard Misiolek and Klas Modin), *Bulletin of the Amer. Math. Soc.*, **58:3** (2021), 377–442; arXiv:2001.01143

79. *Higher-dimensional Euler fluids and Hasimoto transform: counterexamples and generalizations.* (with Cheng Yang), *Nonlinearity*, **34:3** (2021), 1525–1542; arXiv:1902.08834

78. *Polar bear or penguin? Musings on Earth cartography and Chebyshev nets.* (with Sergei Tabachnikov), *The Mathematical Intelligencer (TMIN)*, **43:1** (2021), 20–24.

77. *¿Entiendes realmente la cartografía de la Tierra? (Do you really understand the Earth cartography?) EL PAÍS*, Aug.12 (2020), 4pp.

76. *Global, local and dense non-mixing of the 3D Euler equation.* (with Sergei Kuksin and Daniel Peralta-Salas), *Archive Rat. Mech. and Anal. (ARMA)*, **238** (2020), 1087–1112; arXiv:1911.04363

75. *Lectures on pentagram maps and KdV hierarchies.* *Proceedings of the Gokova Geometry-Topology Conferences 2018/2019* (Ed: S.Akbulut et al), International Press, **23** (2021), 164–175.

74. *A basis of Casimirs in 3D magnetohydrodynamics.* (with Daniel Peralta-Salas and Cheng Yang), *Int. Math. Research Notices (IMRN)*, **2021:18** (2021), 13645–13660; arXiv:1901.04404

73. *Averaging, symplectic reduction, and central extensions.* (with Cheng Yang), *Nonlinearity*, **33** (2020), 1342–1365; arXiv:1806.01755

72. *Fun problems in geometry and beyond.* (with Sergei Tabachnikov), *SIGMA*, **15** (2019), 097, 21pp.

71. *¿Es posible ser 1/3 español? (Is it possible to be 1/3 Spanish?) EL PAÍS*, Nov.22 (2019), 3pp.

70. *Geometry of the Madelung transform.* (with Gerard Misiolek and Klas Modin), *Archive Rat. Mech. and Anal. (ARMA)*, **234** (2019), 549-573; arXiv:1807.07172

69. *Vortex sheets and diffeomorphism groupoids.* (with Anton Izosimov), *Advances in Math.*, **338** (2018), 447–501; arXiv:1705.01603

68. *Geometric hydrodynamics via Madelung transform.* (with Gerard Misiolek and Klas Modin), *Proc. Nat. Acad. Sci. (PNAS)*, **115:24** (2018), 6165–6170; arXiv:1711.00321

67. *Vladimir Igorevich Arnold.* (with Sergei Tabachnikov), *Biographical Memoirs Fell. R. Soc.*, **64** (2018), 7–26, DOI: 10.1098/rsbm.2017.0016.

66. *Classification of Casimirs in 2D hydrodynamics.* (with Anton Izosimov), *Moscow Math Journal*, **17:4** (2017), 699–716; arXiv:1702.01843.

65. *Characterization of steady solutions to the 2D Euler equation.* (with Anton Izosimov), *Int. Math. Res. Notices (IMRN)*, **24** (2017), 7459–7503; arXiv:1511.05623.

64. *Coadjoint orbits of symplectic diffeomorphisms of surfaces and ideal hydrodynamics.* (with Anton Izosimov and Mehdi Mousavi), *Annales de l'Institut Fourier*, **66:6** (2016), 2385–2433; arXiv:1504.05629.

63. *The geometry of dented pentagram maps.* (with Fedor Soloviev), *J. Europ. Math. Soc. (JEMS)*, **18** (2016), 147–179; arXiv:1308.5363.

62. *Non-integrability vs. integrability in pentagram maps.* (with Fedor Soloviev), *J. of Geometry and Physics*, **87** (2015), 275–285; arXiv:1404.6221.

61. *KAM theory and the 3D Euler equation.* (with Sergei Kuksin and Daniel Peralta-Salas), *Advances in Math.*, **267** (2014), 498–522; arXiv:1401.5516.

60. *Integrability of higher pentagram maps.* (with Fedor Soloviev), *Mathem. Annalen*, **357** (2013), 1005–1047; arXiv:1204.0756.

59. *The vortex filament equation in any dimension.* *Procedia IUTAM*, **7** (2013), 135-140.

58. *Geometry of diffeomorphism groups, complete integrability and geometric statistics.* (with Jonatan Lenells, Gerard Misiolek, and Stephen C. Preston), *Geom. and Funct. Anal.*, **23:1** (2013), 334–366; arXiv:1105.0643.

57. *Curvatures of Sobolev metrics on diffeomorphism groups.* (with Jonatan Lenells, Gerard Misiolek, and Stephen C. Preston), *Pure and Appl. Math. Quaterly*, **9:2** (2013), 291–332; arXiv:1109.1816.

56. *The pentagram map in higher dimensions and KdV flows.* (with Fedor Soloviev), *Electron. Res. Announc. Math. Sci. (ERA-MS)*, **19** (2012), 86–96; arXiv:1205.3744.

55. *Symplectic structures and dynamics on vortex membranes.* *Moscow Math. Journal*, **12:2** (2012), 413–434; arXiv:1201.5914.

54. *The Euler and Navier-Stokes equations on the hyperbolic plane.* (with Gerard Misiolek), *Proc. Nat. Acad. Sci. (PNAS)*, **109**, no.45 (2012), 18324–18326; arXiv:1205.5322.

53. *Dynamics of symplectic fluids and point vortices.* *Geom. and Funct. Anal.*, **22:5** (2012), 1444–1459; arXiv:1106.1609.

52. *Discrete spherical means of directional derivatives and Veronese maps.* (with Alexander Belyaev and Serge Tabachnikov), *J. of Geometry and Physics*, **62** (2012), 124–136; arXiv:1106.3691.

51. *Contact complete integrability.* (with Serge Tabachnikov), *Regular and Chaotic Dynamics*, **15:4-5** (2010), 504–520; arXiv:0910.0375.

50. *A nonholonomic Moser theorem and optimal mass transport.* (with Paul Lee), *J. of Sympl. Geometry*, **7:4** (2009), 381–414; arXiv:0802.1551.

49. *Pseudo-Riemannian geodesics and billiards.* (with Serge Tabachnikov), *Advances in Math.*, **221** (2009), 1364–1396; math.DG/0608620.

48. *Generalized Hunter-Saxton equation and geometry of the circle diffeomorphism group.* (with Jonatan Lenells and Gerard Misiolek), *Mathem. Annalen*, **342** (2008), 617–656; arXiv:0803.3078.

47. *Groups and topology in Euler hydrodynamics and KdV.* in *Hamiltonian dynamical systems and applications*, editor W.Craig, *NATO Science Series B,* **XVI**, Springer-Verlag (2008), 93–102.

46. *Poisson geometry and first integrals of geostrophic equations.* (with Paul Lee), *Physica D*, **237** (2008), 2072–2077; arXiv:0802.4439.

45. *Geodesics on an ellipsoid in Minkowski space.* (with Daniel Genin and Serge Tabachnikov) *L'Enseignement Mathématique*, **53** (2007), 307–331; arXiv:0705.0188.

44. *Shock waves for the Burgers equation and curvatures of diffeomorphism groups.* (with Gerard Misiolek) *Proc. Steklov Math. Inst.*, **259** (2007), 73–81; math.DG/0702196.

43. *Pseudodifferential symbols on Riemann surfaces and Krichever-Novikov algebras.* (with Dmitry Donin), *Comm. Math. Phys.*, **272:2** (2007), 507–527.

42. *Topological fluid dynamics.* *Notices AMS*, **52:1** (2005), 9–19,

41. *Polar linkings, intersections, and Weil pairing.* (with Alexei Rosly), *Proc. Royal Soc. London A* **461** (2005), 3505–3524.

40. *Asymptotic directions, Monge-Ampere equations and the geometry of diffeomorphism groups.* (with G. Misiolek), *J. of Math. Fluid Mechanics* **7** (2005), S365–S375, math.DG/0504556.

39. *A polar de Rham theorem.* (with A. Rosly and R. Thomas), *Topology* **43** (2004), 1231–1246, math.AG/0305081.

38. *Bihamiltonian structures and quadratic algebras in hydrodynamics and on non-commutative torus.* (with A. Levin and M. Olshanetsky), *Comm. Math. Phys.* **250** (2004), 581–612, nlin.SI/0309017.

37. *The flow completion of the Burgers equation.* (with P. Michor), in *Infinite-dimensional groups and manifolds:* IRMA Lectures in Math. and Theor. Physics (Ed.: T.Wurzbacher), Walter de Gruyter & Co., Berlin, 2004, 17–27.

36. *Geometry of fluid motion. Séminaire Équat. Dér. Part.,* Ecole Polyt. **X** (2003), 1–10.

35. *Euler equations on homogeneous spaces and Virasoro orbits.* (with G.Misiolek), *Advances in Math.*, **176** (2003), 116–144, math.SG/0210397

34. *Geometry of higher helicities. Moscow Math. J.*, **3:3** (2003), 989–1011,

33. *Polar homology.* (with A.Rosly), *Canad. J. Math.*, **55** (2003), 1100–1120, math.AG/0009015,

32. *A Poisson–Lie framework for rational reductions of the KP hierarchy. Letters in Math. Physics*, **58** (2001), 101–107.

31. *Polar homology and holomorphic bundles.* (joint with A.Rosly), *Phil. Trans. Royal Soc. London A*, **359** (2001), 1413–1427.

30. *Topology bounds the energy. An Introduction to the Geometry and Topology of Fluid Flows* (Ed.: R.L. Ricca), Kluwer, Dordrecht, The Netherlands (2001), 229–238.

29. *Symplectic geometry on moduli spaces of holomorphic bundles over complex surfaces.* (with A.Rosly) *The Arnoldfest* (Eds: E.Bierstone et al.), Fields Institute Comm., **24** (1999), 311–323.

28. *Homotopy classification of nondegenerate quasiperiodic curves on the 2-sphere.* (with B.Shapiro), *Publ. Inst. Math. (Beograd) (N.S.)*, **66(80)** (1999), 127–156.

27. *Extensions and contractions of the Lie algebra of q-pseudodifferential symbols.* (with V.Lyubashenko and C.Roger) *J. Func. Anal.*, **143** (1997), 55–97

26. *Informal complexification and Poisson structures on moduli spaces. AMS Transl., Ser. 2*, **180** (1997), 147–155

25. *Four-dimensional realization of two-dimensional current groups.* (with I.Frenkel) *Comm. Math. Phys.*, **178** (1996), 541–562.

24. *Universal Drinfeld-Sokolov reduction and matrices of complex size.* (with F.Malikov) *Comm. Math. Phys.*, **175** (1996), 113–134.

23. *On cohomology of the Lie algebra of pseudodifferential symbols on a circle.* (with C.Roger) *J. Math. Sci.*, **82:6** (1996), 3800–3806.

22. *The Lie-Poisson group of pseudodifferential symbols.* (with I.Zakharevich) *Comm. Math. Phys.*, **171** (1995), 475–530.

21. *Affine Gelfand-Dickey brackets and holomorphic vector bundles.* (with P.Etingof) *Geom. and Funct. Anal.*, **4** (1994), 399–423.

20. *Steady fluid flows and symplectic geometry.* (with V.Ginzburg) *J. of Geometry and Physics*, **14** (1994), 195–210.

19. *The Lie-Poisson group of pseudodifferential symbols and fractional KP-KdV-hierarchies.* (with I.Zakharevich) *C.R. Acad. Sci. Paris*, **316** (1993) Serie I, 621–626.

18. *The logarithm of the derivative operator and higher spin algebras of W_∞-type.* (with I.Bakas and E.Kiritsis) *Comm. Math. Phys.*, **151** (1993), 233–243.

17. *Topological methods in hydrodynamics.* (with V.Arnold) *Annual Reviews in Fluid Mechanics*, **24** (1992), 145–166.

16. *Ergodic interpretation of integral hydrodynamic invariants. J. of Geometry and Physics*, **9** (1992), 101–110.

15. *A hierarchy of centrally extended algebras and the logarithm of the derivative operator. Int. Math. Research Notices (Duke Math. J.)* , **1:1** (1992), 1–5.

14. *Topology of steady fluid flows.* (joint with V.Ginzburg) *Topological Aspects of the Dynamics of Fluid and Plasmas, eds. H.K.Moffatt, G.M.Zaslavsky, P.Comte, M.Tabor (Kluwer Acad. Publ.)*, (1992), 265–272.

13. *Swallowtails and Whitney umbrellas are homeomorphic.* (with B. Shapiro) *J. of Alg. Geometry*, **1** (1992), 549–560.

12. *Non-degenerate curves on S^2 and orbit classification of the Zamolodchikov algebra.* (with B. Shapiro) *Comm. Math. Phys.*, **145:2** (1992), 357–362

11. *Central extension of the algebra of pseudodifferential symbols.* (with O. Kravchenko) *Funct. Anal. Appl.*, **25:2** (1991), 152–154.

10. *Singularities of light hypersurfaces and the structure of hyperbolicity sets for systems of partial differential equations. Advances in Soviet Mathematics, AMS, ed. V.I.Arnold*, **1** (1990), 105–118.

9. *Symplectic leaves of the Gelfand-Dikii brackets and homotopy classes of non-degenerate curves.* (with V. Ovsienko) *Funct. Anal. Appl.*, **24:1** (1990), 33–40.

8. *Invariants of Hamiltonian KdV-structures. Russ. Math. Surveys*, **45:1** (1990), 209–210.

7. *Versal deformations of intersections of invariant submanifolds of dynamical systems. Russ. Math. Surveys*, **44:3** (1989), 181–182.

6. *Invariants of the Euler equations for ideal or barotropic hydrodynamics and superconductivity in D dimensions.* (with Yu. Chekanov) *Physica D*, **40** (1989), 119–131.

5. *Integrals of motion of the Euler equation of multidimensional hydrodynamics and superconductivity.* (with Yu.Chekanov and V.Ovsienko) *Diff.Geom., Lie Groups and Mechanics, Zap. Sem. LOMI*, **172** (1988), 105–113 (in Russian). English transl.: *J. of Sov. Math.*, **59:5** (1992), 1096–1102.

4. *Bifurcations of gradient dynamical systems. Modern Problems in Math., New Achievements, VINITI AN USSR*, **33** (1988), 113–155 (in Russian). English transl.: *J. of Sov. Math.*, **52** (1990), 3279–3305.

3. *Korteweg-de Vries super-equation as an Euler equation.* (with V.Ovsienko) *Funct. Anal. Appl.*, **21:4** (1987), 329–331.

2. *Homogeneous vector fields and Whitney umbrellas. Russ. Math. Surveys*, **42:5** (1987), 171–172.

1. *Bifurcations of singular points of gradient vector fields. Funct. Anal. Appl.*, **20:3** (1986), 250–252.

Non-refereed Publications:

9N. *On the 80th Birthday of Dmitry Borisovich Fuchs.* (with A.Fialowski, A. Sossinsky, A. Kirillov, V. Ovsienko, et al.) *SIGMA Journal*, vol.16 (2020), Art. 023, 17pp.; arXiv:2004:03270

8N. *Vortex filaments and the Hasimoto transform.* in *Proceedings of Shape Analysis Workshop* in Bad Gastein (2014), preprint hal-01076953, 19–22.

7N. *Comments to the Mathematical Trivium.* (with Sergei Tabachnikov), in *Arnold: Swimming against the tide*, Amer. Math. Soc. (2014), 57–66; Russian transl. in *V.I.Arnold: Problems*, MCCME (2018), 16–27.

6N. *On V.I.Arnold and hydrodynamics. Notices of the AMS*, vol. 59 (2012), 492–495; Russian transl. in *V.I.Arnold: Towards the 80th anniversary*, MCCME (2018), 382–389.

5N. *Preface to the "Collected Works of V.I.Arnold"* Springer-Verlag (2009), 9pp.

4N. *Comments to Arnold's Problems* (to 20 problems in the Russian edition, and to 32 problems in the English edition), in *Arnold's Problems*, Phasis, Moscow (2000), 454pp; Springer (2004), 639pp.

3N. *Vladimir Igorevich Arnold (on the occasion of his sixtieth birthday).* (with D.V.Anosov, A.A.Bolibrukh, L.D.Faddeev, A.A.Gonchar, M.L.Gromov, S.M.Gusein-Zade, Yu.S.Ilyashenko, A.G.Khovanskii, M.L.Kontsevich, V.V.Kozlov, Yu.I.Manin, A.I.Neishtadt, S.P.Novikov, Yu.S.Osipov, M.B.Sevryuk, Ya.G.Sinai, A.N.Tyurin, A.N.Varchenko, V.A.Vassiliev, V.M.Vershik, and V.M.Zakalyukin) *Russian Math. Surveys*, **52** (1997), 235–255.

2N. *Adjacency of symplectic leaves of the Gelfand-Dikii structures. Proc. of Intern. Algebr. Conf., Novosibirsk*, (1989), 61 (in Russian).

1N. *Boundary singularities of intermittent functions. Proc. of XXII Conf. on Operator Theory, Kuibyshev*, (1988), 198–199 (in Russian).

Papers submitted for publications

1S. *Information geometry of diffeomorphism groups.* (with Gerard Misiolek and Klas Modin), research monograph arXiv:2411.03265, (2024), 89pp., submitted.

2S. *Universal vector and matrix optimal transport.* (with Klas Modin), preprint arXiv:2510.02039, (2025), 29pp., submitted.

3S. *Madelung hydrodynamics and Poisson geometry of wave functions.* (with Klas Modin), preprint arXiv:2607.01024, (2026), 27pp., submitted.

4S. *Virasoro extensions for diffeomorphisms with breaks.* (with Anton Izosimov and Howard Xiao), preprint arXiv:2605.07682, (2026), 20pp., submitted.

5S. *Generalized Marsden–Weinstein symplectic structures.* (with Klas Modin and Cornelia Vizman), preprint (2026), 19pp., submitted.