Curriculum Vitae

Vladimir V. Chernov (Tchernov)

Department of Mathematics
6188 Kemeny Hall
Dartmouth College
Hanover, NH 03755-3551
USA

Phone: (+1)-(603) 646 24 21
Fax: (+1)-(603) 646 13 12
e-mail: Vladimir.Chernov@dartmouth.edu

Personal information

Other spelling of the last name: Tchernov

Date of birth: January 9, 1972

Research interests

Geometric and Low-Dimensional Topology, specifically:
knots and links in manifolds (57M27); Vassiliev invariants of knots; invariants of immersed curves and surfaces; higher dimensional link theory (57Q45); generalized linking numbers.

Contact Topology and Geometry, specifically:
Legendrian and transverse knots (57R17) and their relations to wave front propagation (78A05); Legendrian and Lagrangian immersions and embeddings (53D10); Global theory of contact manifolds (53D35); Geodesic Flows (53D25);

Interactions between link theory, Lorentz manifolds (53C50), contact geometry (53D10) and topology (57R17), mathematical physics, specifically:
smooth structures on spacetimes and cosmic censorshiop, relations between causality and linking in causally simple and globally hyperbolic spacetimes; nonrefocussing spacetimes; Legendrian and Lagrangian submanifolds in manifolds of geodesics for semi-Riemannian manifolds.

Degrees

Ph.D. in Mathematics. Uppsala University, Sweden, May 1998.
Advisor: Professor Oleg. Ya. Viro.
Thesis: *Arnold-type invariants of curves and wave fronts on surfaces.*

Ph.D. in Mathematics. University of California at Riverside (UCR), June 1997. [1]
Advisor: Professor Oleg Ya. Viro.
Thesis: *Vassiliev invariants of degree one of knots and links in* R^1*- and in* S^1*-fibrations.*

Diplom Department of Mathematics and Mechanics, St Petersburg State University, Russia (1996) June 1996.

Licentiate in Mathematics. Uppsala University, Swededn, June 1996.

M.Sci University of California at Riverside (UCR), June 1994.

High School 239, St Petersburg, Russia, 1987-1989

Academic Positions

[1] Since my scientific advisor held positions at both Universities, I had to enroll into Graduate Programs at both Universities and to defend a Ph.D. at both places. The theses for the two Ph.D.s are based on different material.

Dartmouth College, Mathematics Department, Hanover NH, USA.

Summer 2013– Now Full Professor;

April - June 2014 Scientific Visitor Max-Planck-Institut für Mathematik, Bonn, Germany;

Summer 2007 – Summer 2013 Associate Professor;

Summer 2001 – Summer 2007, Assistant Professor.

Zürich University, Mathematics Department, Zürich, Switzerland. Fall 2000 – Summer 2001. Postdoc.

Max-Planck-Institut für Mathematik, Bonn, Germany. Fall 1999 – Fall 2000. Scientific Visitor.

ETH Zürich, Zürich, Switzerland. Fall 1998 – Summer 1999. Postdoc.

Teaching the following Dartmouth courses

Math 8 Calculus of Functions of One and Several Variables: Spring 2002, Fall 2016 Winter 2018;

Math 9 Calculus of Functions of One and Several Variables, Honors Section: Fall 2001, Fall 2002, Fall 2003;

Math 11 Multivariable Calculus for Two-Term Advanced Placement First-Year Students: Fall 2004, Fall 2022;

Math 12 Calculus Plus: Fall 2007, Fall 2009, Fall 2012, Fall 2014;

Math 13 Calculus of Vector-Valued Functions: Winter 2004, Winter 2008, Fall 2011, Winter 2020, Spring 2024;

Math 14 Calculus of Vector-Valued Functions, Honors Section: Winter 2002, Winter 2003, Winter 2011;

Math 23 Differential Equations: Spring 2002, Winter 2006, Spring 2009, Fall 2010, Fall 2011, Fall 2012, Winter 2015; Fall 2015 (two sections), Spring 2021;

Math 31 Topics in Algebra: Winter 2004;

Math 35 Real Analysis Winter: 2007, Winter 2019;

Math 42 Differential Geometry I: Winter 2021;

Math 43 Functions of a Complex Variable: Spring 2007;

Math 46 Introduction to Applied Mathematics: Spring 2010;

Math 54 Topology I reading Math 87 class to 3 students in Fall 2021;

Math 63 Real Analysis Winter: 2009, Winter 2020;

Math 72 Topics in Geometry: Spring 2022;

Math 73 Multi-Variable Analysis: Winter 2003;

Math 74–114 Algebraic Topology: Spring 2020, Spring 2021 Spring 2023, Spring 2024;

Math 103 Topics in Analysis: Fall 2004, Fall 2005, Fall 2007, Fall 2009;

Math 104 Differential Topology (previously known as Math 124 Differential Topology): Fall 2002, Fall 2003, Fall 2005, Fall 2009, Winter 2010, Winter 2012, Winter 2013, Winter 2015, Winter 2016, Winter 2017, Winter 2018;

Math 117: one week lectures relating Legendrian linking, Causality and Focussing in Spacetimes in Summer 2017, Summer 2018, Summer 2020;

Math 124 Current Problems in Topology: Spring 2022, Spring 2023;

Math 127: gave a Reading class to a graduate student in Fall 2019 and Winter 2020.

Current and Former Ph.D Students:

Allison Henrich, Ph. D. (2008) Ph. D. Thesis Title: "A sequence of degree one Vassiliev invariants for virtual knots." Currently a tenured Associate Professor at Seattle University.

Paul Kinlaw, Ph. D. (2010) Ph. D. Thesis Title: "Refocusing of null geodesics in Lorentz manifolds." Currently an Associate Professor at Husson University.

Patricia Cahn, Ph. D. (2012) Ph. D. Thesis Title: "Algebras counting self-intersections of curves." Currently a tenure track Assistant Professor at Smith College.

Asa Levi, Ph. D. (2014) Ph. D. Thesis Title: "Refocussing and Virtual Legendrian Knots". Currently an Advanced Data Analyst at Pearson.

Nicolas Petit, Ph. D. (2016) Ph. D. Thesis title: "Finite-type invariants of order one for framed and long virtual knots". Currently a visiting Assistant Professor and Teaching Fellow at Oxford College of Emory University.

David Freund, Ph. D. (2018) Ph. D. Thesis title: "Intersections of virtual multistrings". Currently a Lecturer at Harvard University.

Elizabeth (Lizzie) Buchanan, Ph. D. (2023) Thesis title: "Constructions of Jones polynomial positivity obstructions." University of Iowa RTG Postdoc

Ryan McGuire, Ph. D. Expected in June 2024

Grants
A five year "Collaboration Grants for Mathematicians" from the Simons Foundation awarded in 2017, award number 513272. Grant amount $42000. Project title: "Causality, linking and smooth structures on spacetimes".
A five year "Collaboration Grants for Mathematicians" from the Simons Foundation awarded in 2012, award number 235674. Grant amount $35000. Project title: "Causality and Legendrian Linking".

Awards
Senior Faculty Grant for the Fall 2013
Gordon W. Russel 1955 Fellowship for the year 2013-2014
Robert A. Jeffe Fellowship for the year 2007-2008

Research Works to be Submitted for Publications

1. V. Chernov and R. Maguire: *Conjectures on the Khovanov Homology of Legendrian and Transversely Simple Knots,* preprint arXiv:2205.11430 31 pages (2022)

Published or accepted works
Note for non mathematicians: in Mathematics the order of the names of the authors on papers is alphabetical. It does not reflect the degree of contribution of each author. For each paper I have listed the alternative spelling of the authors' names in parentheses.

1. V. Chernov and R. Sadykov: *Conjectures about virtual Legendrian knots and links,* Geometry and Physics DOI 10.1016 8 pages (2023)

2. V. Chernov (Tchernov): *Graded Poisson algebras on bordism groups of garlands,* Topology Appl., **305** 107919, 36 pp., (2022)

3. V. Chernov (Tchernov), G. Martin, I. Petkova: *Khovanov homology and causality in spacetimes,* J. Math. Phys., **61**, no. 2, 022503, 3 pp. (2020)

4. V. Chernov (Tchernov), D. Freund, R. Sadykov: *Minimizing intersection points of curves under virtual homotopy,* J. Knot Theory Ramifications, **29**, no. 3, 2050007, 9 pp (2020)

5. P. Cahn and V. Chernov (Tchernov), *Loose Legendrian and Pseudo-Legendrian Knots in 3-Manifolds,* J. Symplectic Geometry, **18**, no 3, pp. 651–689, (2020)

6. V. Chernov (Tchernov) and S. Nemirovski: *Interval topology in contact geometry,* Communications in Contemporary Mathematics, **22**, no. 5, Mathematics, 1950042, 19 pp., (2020)

7. V. Chernov (Tchernov): *Causality and Legendrian linking for higher dimensional spacetimes.* J. Geom. Phys. **133** (2018), 26–29

8. V. Chernov (Tchernov): *Conjectures on the Relations of Linking and Causality in Causally Simple Spacetimes,* Classical Quantum Gravity **35** (2018), no. 10, 105010, 8 pp.

9. V. Chernov (Tchernov) and S. Nemirovski: *Redshift and contact forms,* J. Geom. Phys. 123 (2018), 379–384

10. V. Chernov (Tchernov) and S. Nemirovski: *Universal Orderability of Legendrian Isotopy Classes,* J. Symplectic Geom. **14** (2016), no. 1, 149–170

11. V. Chernov and R. Sadykov, *Virtual Legendrian Isotopy,* Fundamenta Mathematicae **234** (2016), no. 2, 127–137

12. P. Cahn, V. Chernov and R. Sadykov *The number of framings of a knot in a 3-manifold,* J. Knot Theory Ramifications **23** (2014) no. 13 1450072, 9 pp.

13. V. Chernov (Tchernov): *Some Corollaries of Manturov's Projection Theorem,* Journal of Knot Theory and Its Ramifications **22** (2013) no. 1 1250139-1 - 1250139-6

14. V. Chernov (Tchernov), S. Nemirovski: *Cosmic censorship of smooth structures,* Communications in Mathematical Physics **320** (2013) no. 2, pp. 469-473

15. P. Cahn, V. Chernov (Tchernov): *Intersections of Loops and the Andersen-Mattes-Reshetikhin Algebra,* Journal of the London Mathematical Society (2) **87** (2013) no. 3. pp. 785-801

16. V. Chernov (Tchernov); P. Kinlaw; R. Sadykov, *Topological properties of manifolds admitting a Y^x-Riemannian metric.* J. Geom. Phys. **60** (2010), no. 10, pages 1530–1538

17. V. Chernov (Tchernov) and S. Nemirovski: *Non-negative Legendrian isotopy in ST*M,* Geometry and Topology **14**, no. 1, (2010), pp. 611-626

18. V. Chernov (Tchernov) and S. Nemirovski: *Legendrian links, causality and the Low conjecture,* Geom. Funct. Anal. **19**, no. 5, (2010), pp. 1320-1333

19. E. Byberi and V. Chernov (Tchernov): *Virtual bridge number one knots.* Commun. Contemp. Math. **10** (2008), suppl. 1, pp. 1013-1021

20. V. Chernov (Tchernov): *Mapped Null Hypersurfaces and Legendrian Maps,* Journal of Geometry and Physics, **57**, no 10, (2007), pp. 2114-2123

21. V. Chernov (Tchernov) and Yu. Rudyak: *On generalized Winding Numbers.* Algebra i Analysis, **20**, no 5, (2008), pp. 217-233; reprinted in St. Petersburg Math. J. **20** (2009), no. 5, pp. 837–849

22. V. Chernov (Tchernov) and Yu. Rudyak: *Linking and Causality in Globally Hyperbolic Space-times,* Communications in Mathematical Physics, **279**, no 2, (2008), pp. 309-354

23. V. Chernov (Tchernov) and Yu. Rudyak: *Toward a General Theory of Linking Invariants,* Geometry and Topology, Vol. 9 (2005) Paper no. 42, pp. 1881–1913

24. V. Chernov (Tchernov): *Framed knots in 3-manifolds and Affine Self-linking numbers.* J. Knot Theory Ramifications, **14** (2005), no. 6, pp. 791-819

25. V. Chernov (Tchernov): *Relative framing of transverse knots,* Int. Math. Res. Not., 2004:52 (2004), pp. 2773-2795

26. V. Tchernov (Chernov): *Vassiliev invariants of Legendrian, transverse, and framed knots in contact three-manifolds,* Topology, **42** (2003), no. 1, pp. 1–33

27. V. Tchernov (Chernov): *Isomorphism of the groups of Vassiliev invariants of Legendrian and of Pseudo-Legendrian knots,* Compositio Mathematica, **135** (1) (2003), pp. 103-122

28. V. Chernov (Tchernov): *The Universal order one Vassiliev invariant of framed knots in most S^1-bundles over orientable surfaces,* Algebraic and Geometric Topology, **3** (2003), pp. 89-101

29. V. Tchernov (Chernov) *Arnold-type invariants of wave fronts on surfaces,* Topology, **41**, no. 1, (2002), pp. 1–45

30. A. Stoimenow, V. Tchernov (Chernov), A. Vdovina: *The Canonical Genus of a Classical and Virtual Knot,* Proceedings of the Conference on Geometric and Combinatorial Group Theory, Part II (Haifa, 2000). Geometriae Dedicata, **95** (1) (2002), pp. 215-225

31. V. Tchernov (Chernov): *Homotopy Groups of the Space of Curves on a Surface,* Math. Scand., Vol. 86 (2000), No. 1, pp. 36–44

32. V. Tchernov (Chernov): *Arnold-type Invariants of Curves on Surfaces,* J. Knot Theory Ramifications, 8 (1999), no. 1, pp. 71–97

33. V. Tchernov (Chernov): *Shadows of Wave Fronts and Arnold-Bennequin Type Invariants of Fronts on Surfaces and Orbifolds*, in the refereed Volume of Amer. Math. Soc. Transl. (2), Vol. 190 (1999), pp. 153–184

34. V. Tchernov (Chernov): *The Most Refined Invariant of Degree One of Knots and Links in R^1-Fibrations Over a Surface,* J. Knot Theory Ramifications, 7 (1998), No. 2, pp. 257–266

Minicourses

A three lecture minicourse "Causality and Legendrian Linking" at the VI International Meeting on Lorentzian Geometry, Granada Spain, September 6-9, 2011

Talks at Conferences and Seminars Given and Scheduled

Note: the exact talk titles and dates are given when this information is available.

1. A Zoom talk "Virtual Legendrian knots and possible relations to causality in Borde Sorkin spacetimes." at the Geometric Topology Seminar at the Steklov Institute of Mathematics of the Russian Academy of Science, Moscow, Russia September 27, 2023
2. A Zoom talk "Cosmic Censorship of Smooth Structures on Spacetimes" Physics 2023 Conference July 17–19, 2023 Los Angeles California
3. A Zoom talk "Affine linking numbers and causality in spacetimes", at the special meeting of the Geometric Topology Seminar dedicated to P. Akhmetyev 60 birthday at the Steklov Institute of Mathematics of the Russian Academy of Science, February 3, 2023
4. A Zoom talk "Lie and Poisson Brackets on Loops, their generalizations and applications", Kyiv Mathematical Colloquium, Kyiv, Ukraine, December 22, 2022

5. A talk "Some questions about virtual Legendrian knots" at the Special Session on Lagrangian and Legendrian Submanifolds of the Eastern Sectional Meeting of the AMS (American Mathematical Society) University of Massachusetts-Amherst, Amherst, MA, October 1–2, 2022
6. A Zoom talk "Causality and linking and the additional steps needed to make these results applicable" on July 20, 2022 at the "International Conference Physics 2022: Physics and its Applications" held in San Francisco, California July 18–21, 2022
7. A Zoom Talk "Null Congruences and Legendrian submanifolds" on May 31, 2022 at the "Pseudo-Riemannian Geometry and invariants in General Relativity" conference held May 30–June 3 at the University of Stavenger, Norway
8. A Zoom talk "Some questions about virtual Legendrian knots" on May 24, 2022 at the "Algebraic and Geometric methocs in Analysis" conference held in Odessa, Ukraine May 24–25, 2022
9. A Zoom talk "Some questions about virtual Legendrian knots" on April 23, 2022 at the "Knots in Washington 49.75" Conference held in George Washington University on April 22–24, 2022
10. A Zoom talk "Cosmic Censorship and Smooth Structures, Legendrian linking and black holes" at the Cohomology in algebra, geometry, physics and statistics Seminar of Institute of Mathematics, Czech Academy of Science, Prague on December 15, 2021
11. A Zoom talk "Causality in spacetimes, Legendrian linking and Compact Rank One Symmetric Spaces" at the Prague Mathematical Physics Seminar, Charles University, Prague on December 9, 2021
12. A contributed Zoom talk "Linking: causality and black holes; and cosmic censorship of smooth structures" at the Spanish-Portugese Relativity Meeting EREP 2021 on September 16, 2021, the conference was September 13–17, 2021
13. A Zoom Talk "Linking: causality and black holes; and cosmic censorship of smooth structures" at the Kyiv Mathematical Society, Kyiv, Ukraine on June 24, 2021
14. A Zoom Talk "Linking: causality and black holes; and cosmic censorship of smooth structures" at the "Singularity theorems, causality, and all that. A tribute to Roger Penrose" conference on June 16, 2021, the conference is June 14–18, 2021
15. A Zoom Talk "Applications of linking to the study of causality" at the "International Online Conference Algebraic and Geometric Methods of Analysis dedicated to the memory of Yuriy Trokhymchuk" on May 28, 2021, the conference is May 25–28, 2021
16. A Zoom Social Talk " Khovanov homology and causality in spacetimes" at the Rokhlin Topology Seminar of the St Petersburg department of the Steklov Mathematical Institute, St Petersburg, Russia, March 1, 2021
17. A Zoom Social Talk " Khovanov homology and causality in spacetimes" at the"Invariants of Knots and Links" session of the Joint Mathematics Meeting, January 8, 2021
18. A Zoom talk " Khovanov homology and causality in spacetimes" at the Mathematical Colloquium of the Bauman Moscow State Technical University, Russia. November 5, 2020
19. A Zoom talk " Khovanov homology and causality in spacetimes" at the Topology and Dynamics Seminar, University of Florida, Gainesville, September 15, 2020
20. A Zoom talk " Khovanov homology and causality in spacetimes" at the Geometry, Topology & Physics Seminar" of Kansas State University on September 4, 2020
21. A talk "Causality and Legendrian linking in globally hyperbolic and causally simple spacetimes" at the Geometry and Topology Seminar of UMass Amherst on November 15, 2019
22. A talk "Causality and Linking" at the Geometry Seminar of the University of Virginia on September 17, 2019
23. A talk "Causality and Legendrian linking in higher dimensional and causally simple spacetimes" on August 22 at the Topology, Geometry, and Dynamics: Rokhlin – 100 held at the The Euler International Mathematical Institute, Saint Petersburg, Russia during August 19–23, 2019
24. A talk "Causality and Legendrian linking in higher dimensional and causally simple spacetimes" at the Geometric Topology Seminar Math Department of the Higher School of Economics, Moscow, Russia on June 28, 2019

25. A talk "Refocusing and smooth structures on spacetimes" at the Interactions between Contact and Lorentzian Geometry Conference to be held at the Ruhr-Universitaet Bochum, Germany May 20–24 on May 23, 2019
26. A talk "Causality and Linking" at the Interactions between Contact and Lorentzian Geometry Conference to be held at the Ruhr-Universitaet Bochum, Germany May 20–24 (2019) on May 21, 2019
27. A talk "Conjectures on the Relations of Linking and Causality in Causally Simple Spacetimes" on January 20, 2019 at the Knots in Washington XLVII Conference held January 20–21, 2019 at the George Washington University
28. A talk "Minimizing intersection and self intersection points of loops on a surface, brackets and cobrackets" at the Topology and Dynamics Seminar, University of Florida, Gainesville November 20 (2018)
29. A talk "Causality and Legendrian linking" at the QMAP seminar of UC Davis on November 30, (2018)
30. "Causality and Linking" a seminar talk at the Economic-Mathematical Methods department of the St Petersburg Economics University on October 2, (2018)
31. A talk " Causality and Legendrian linking in higher dimensional and causally simple spacetimes" at the Rokhlin Topology Seminar of the St Petersburg department of the Steklov Mathematical Institute, St Petersburg, Russia October 1, 2018
32. A talk "Some corollaries of Manturov's projection Theorem" on December 10, 2017 at the Knots in Washington XLV Conference held December 8–10, 2017 at the George Washington University
33. A Floer Colloquium talk "Intersection and self-intersection points of loops on a surface, brackets and co-brackets" at Ruhr-Universitaet Bochum, Germany, April 26 (2017)
34. A Topology Seminar talk "Minimizing intersection points of loops" at the the Department of Mathematics Kansas State University, Manhattan, KS, December 9 (2016)
35. A Colloquium talk "Linking, casualty and smooth structures on spacetimes" at the Department of Mathematics Kansas State University, Manhattan, KS, December 8 (2016)
36. A Colloquium talk ""Linking, causality and smooth structures on spacetimes" at the Department of Mathematics George Washington University, Washington DC, December 2 (2016)
37. A talk "Minimizing intersection points of loops on a surface and the Andersen-Mattes-Reshetikhin Poisson bracket" at the Gauge Theory, Topology and Symplectic geometry seminar, Harvard University, Boston, MA on September 30 (2016)
38. A talk "Minimizing intersection points of loops on a surface and the Andersen-Mattes-Reshetikhin Poisson bracket" at the Geometric Topology Seminar at the Moscow Steklov Mathematical Institute, Moscow, Russia on September 2 (2016)
39. A talk "Minimizing intersection points of loops on a surface and the Andersen-Mattes-Reshetikhin Poisson bracket" at the Rokhlin Topology Seminar of the St Petersburg department of the Steklov Mathematical Institute, St Petersburg, Russia on June 6 (2016)
40. A talk "Cosmic censorship of smooth structures" on March 20 at the Special Session on Mathematical General Relativity of the Spring Eastern Sectional Meeting #1118 of the American Mathematical Society held March 19-20, 2016 at the State University of New York, Stony Brook
41. A Principal talk "Universal orderability of Legendrian isotopy classes" on December 4 at the "XLI Knots in Washington" conference held in George Washington University December 4-6, 2015
42. A Colloquium talk "Linking, causality and smooth structures on spacetimes" at the university of Florida, Gainesville, November 30, 2015
43. A talk "Linking, causality and smooth structures on spacetimes" on August 17 at the conference "General Relativity:100 years after Hilbert" held at LEPAGERI Institute, Slovakia August 17-21, 2015

44. A Colloquium talk "Low conjecture, Linking and causality in spacetimes" at the Mathematical Science Institute of the Australian National University, Canberra on April 23, 2015
45. A departmental seminar talk "Low conjecture, Linking and causality in globally hyperbolic Lorentz spacetimes" at the Department of Theoretical Physics of the Australian National University, Canberra on April 22, 2015
46. A talk "On knots transverse to a vector field" at the Algebra and Topology seminar at the Mathematical Science Institute of the Australian National University, Canberra on April 21, 2015
47. A talk "Low conjecture, Linking and causality in globally hyperbolic Lorentz spacetimes" on April 16, 2015 at the IGA/AMSI Workshop "Symmetries and Spinors interactions between geometry and physics" held at the University of Adelaide Australia on April 13-17, 2015
48. A talk "On knots transverse to a vector field" at the Rokhlin Topology Seminar at the St. Petersburg Department of the Steklov Institute of Mathematics, St Petersburg, Russia, December 15, 2014
49. A talk "On knots transverse to a vector field" at the Geometric Topology Seminar at the Moscow State University, Russia, September 30, 2014
50. A talk "Knots and vector fields" at the "Economical cybernetics and economico-mathematical methods" department of the St Petersburg State University of Economics and Finance on September 4, 2014
51. A talk "Low conjecture, Linking and causality in globally hyperbolic Lorentz spacetimes" at the Seminar Algebra & Geometrie sowie Oberseminar Geometrie/Topologie at the Georg-August-Universitaet, Goettingen, May 20, 2014
52. A talk "Low conjecture, Linking and causality in globally hyperbolic Lorentz spacetimes" at the obersemianr "Analysis, Geometrie and Statistics" of the Friedrich-Schiller-Universitaet, Jena, May 14, 2014
53. A talk "Cosmic censorship of smooth structures" on December 20 at the "Analysis and singularities" conference dedidcated to the 75th anniversary of Vladimir Igorevich Arnold held at the Steklov Mathematical Institute, Moscow,Russia December 17-21, 2012
54. A talk "Linking and causality" at the "Economical cybernetics and economico-mathematical methods" department of the St Petersburg State University of Economics and Finance on December 6, 2012
55. A talk "Linking and causality" at the Rokhlin Topology Seminar, St. Petersburg Department of the Steklov Institute of Mathematics, St Petersburg, Russia on December 3, 2012
56. A Colloquium talk "Link theory and general relativity" at Sienna College, October 5, 2012
57. A talk "Smooth Cosmic Censorship and determining causality from linking" on August 20 at the" Fourth Geometry Meeting dedicated to the centenary of A.D.Alexandrov" held at the Euler International Mathematical Institute held August 20-25, 2012
58. A talk "Cosmic censorship of smooth structures and integer valued metrics on spacetimes" on August 8, 2012 at the "Geometric Topology" Seminar of the Steklov Mathematical Institute, Moscow Russia
59. A talk "Legendrian linking and causal structure in a spacetime" on March 24 at the "46th Annual Spring Topology and Dynamics Conference" held at Universidad Nacional Autonoma de Mexico (UNAM) Mexico City, Mexico, March 22-24, 2012
60. A Colloquium talk "Smooth Cosmic Censorship and determining causality from linking" on March 21, 2012 at the Depto. de Matematicas, CINVESTAV, Mexico City, Mexico
61. A talk "Computing causal relation between events from the set of points where the events are visible at a given time moment" on March 17 at the "Special Session on Mathematics Applied in the Sciences: From Statistics to Topology" session of the 2012 Spring Eastern Sectional Meeting #1080 held at the George Washington University, Washington, DC March 17-18, 2012
62. A talk "Smooth Cosmic Censorship" on March 15 at the XXXIV Knots in Washington Conference held at George Washington University, Washington DC, March 14-16, 2012

63. An invited one hour talk "Low conjecture, linking and causality in global hyperbolic Lorentz spacetimes" on June 16 at the The 87th Encounter between Mathematicians and Theoretical Physicists "Lorentz geometry in Mathematics and in Physics" dedicated to Norbert A Campo for his 70th birthday, June 16-18, 2011
64. A plenary talk "Causality in spacetimes and Legendrian linking" on April 30, 2011 at the "XXXII Knots in Washington" Conference held in George Washington University April 29 - May 1, 2011
65. A talk "Causality in spacetimes and Legendrian linking" on March 17, 2011 at the Thursday Seminar on Topology, at SUNY Stony Brook
66. A talk "Causality, Low Conjecture and globally hyperbolic spacetimes" on February 15, 2011 at the Topology Seminar, Brandeis University
67. A talk "Causality, Low conjecture and the partial order on the space of Legendrian spheres" on November 19, 2010 at the Analysis-Geometry Seminar, Northeastern University
68. A talk "Causality, Low conjecture and the partial order on the space of Legendrian spheres" on September 24, 2010 at the Gauge Theory and Topology Seminar, Harvard University
69. A talk "Legendrian linking, refocussing and causality in spacetimes" on September 15, 2010 at the Center for Dynamics and Geometry Seminar, Penn State University, State College, PA
70. A talk "Causality in space-times, Low conjecture and the partial order on Legendrian spheres" on August 18, 2010 at the International Conference "Geometry, Topology, Algebra and Number Theory, Applications" dedicated to the 120th anniversary of Boris Delone, Steklov Mathematical Institute, Moscow, Russia
71. A talk "Refocussing and Y^x-manifolds" on June 18, 2010 at the Moscow - St Petersburg seminar of Low-dimensional Mathematics, POMI, St Petersburg, Russia
72. A talk "Topological Properties of Manifolds admitting a Y^x-Riemannian metric" on January 26, 2010 at the Analysis seminar of the Department of Mathematics, University of Western Ontario, London, Canada
73. A Colloquium talk "Legendrian links, causality, and the Low conjecture" on January 28, 2010 at the Department of Mathematics, University of Western Ontario, London, Canada
74. An invited talk "Legendrian links, causality, and the Low conjecture" on October 30; at the special session on Geometry and Topology of the 2009 Fall Southeastern AMS Sectional #1053 Meeting held in Boca Raton, Florida on October 30 - November 1, 2009
75. A talk "Legendrian links, causality, and the Low conjecture" at the seminar "Mnogoobraziya i ih otobrazheniya" ("Manifolds and their mappings") at the Mechanics and Mathematics Department of the Moscow State University, Moscow, Russia on September 11, 2009
76. A talk "Legendrian links, causality, and the Low conjecture" at the D. Sokolov seminar "Cosmic electrodynamics and dynamo theory" at the "Research Computing Center" of the Moscow State University, Moscow, Russia on September 10; 2009
77. A talk "Legendrian links, causality, and the Low conjecture" at the symplectic geometry seminar of the Department of Mathematics, Columbia University, on April 24, 2009
78. A talk "Linking, Causality and Refocusing" at the Rokhlin Topology Seminar at the St. Petersburg Department of the Steklov Institute of Mathematics, St Petersburg, Russia, on September 8, 2008
79. A talk "Linking, Causality and Refocusing" at E. A. Kudryavtseva and S. A. Bogatyi seminar "Mnogoobraziya i ih otobrazheniya" ("Manifolds and their mappings") at the Mechanics and Mathematics Department of the Moscow State University, Moscow, Russia on September 4, 2008
80. A talk "Selflinking invariant for nonzerohomologous framed knots in 3-manifolds" at the Shepin Topology seminar at the Steklov Mathematical Institute of the Russian Academy of Sciences, Moscow, Russia on September 3, 2008
81. A talk "Vassiliev invariant estimates for unknotting numbers of virtual knots." at the V. Manturov "Knots and Representation Theory" at the Mechanics and Mathematics Department of the Moscow State University, Moscow, Russia on September 2, 2008

82. A talk "Linking of skies and causality in globally hyperbolic spacetimes" on July 3, 2008 at the "Differential Geometry and General Relativity" section of the Fifth World Congress of Nonlinear Analysts held July $2-9$ in Orlando, Florida
83. A talk "Linking of skies and causality in globally hyperbolic spacetimes" at the Topology Seminar of the University of Tennessee, Knoxville on April 4, 2008
84. An invited talk "Causality and linking in space-times" on February 24 at the Texas Geometry and Topology Conference, held February $22-24$, 2008 at the Texas Tech University, Lubbock, Texas
85. A talk "Causality, linking and refocussing space-times" on September 14 at the "Algebra and Geometry Around Knots and Braids" conference, held September $10-14$, 2007 in the Euler Institute, St Petersburg, Russia
86. A talk "Linking and causality in globally hyperbolic spacetimes" on August 21 at the "Analysis and singularities" conference, held August $21-24$, 2007 in the Steklov Mathematical Institute, Moscow, Russia
87. A talk "Garlands, graded Poisson algebras, and applications." at the Topology and Dynamical Systems Seminar, University of Florida, Gainesville, March 20, 2007
88. A talk "Some applications of the Graded Poisson algebras on bordism groups of garlands." at the Topology Seminar, Mathematics Department, Ohio State University, October 31, 2006
89. An invited talk "Poisson and other algebras on bordism groups of garlands." on October 29, 2006 at the "Special Session on Homotopy Theory of Compactified Moduli Spaces" at the AMS 2006 Fall Eastern Section #1021 Meeting, Storrs CT, held October $28-29$, 2006
90. A talk "Graded Poisson algebras, bordism groups, affine linking numbers and applications." at the Gauge Theory and Topology Seminar, Department of Mathematics, Harvard University, October 20, 2006
91. A talk "Graded Poisson algebras on bordism groups of garlands and minimizing intersection of loops on a surface." at the Topology Seminar, Mathematics Department, Brandeis University, October 17, 2006
92. An invited talk "Graded Poisson algebras on bordism groups of odd-dimensional garlands and minimizing the intersection of loops on a surface." on October 8, 2006 at the "Special Session on Floer Methods in Low -dimensional Topology" of the AMS 2006 Fall Western Section Meeting #1019, Salt Lake City, UT, held October $7-8$, 2006
93. A talk "Graded Poisson algebras on bordism groups of garlands." at the "Rokhlin Topology Seminar", the St. Petersburg Department of the Steklov Institute of Mathematics, St Petersburg, Russia, September 11, 2006
94. A talk "Applications of the Ω_*-algebra of the space of garlands." on June 9, 2006 at the Lehigh University Geometry and Topology Conference, held June $8-10$, 2006
95. A talk "Generalized strings algebra." at the Geometry and Topology seminar, Department of Mathematics and Statistics, University of Calgary, Canada, May 10, 2006
96. Colloquium talk "Affine linking numbers and their applications to the study of wave front propagation." Department of Mathematics and Statistics, University of Calgary, Canada, May 5, 2006
97. A talk "Relative framing of transverse knots." at the Symplectic Topology Seminar, Department of Mathematics and Statistics, University of Calgary, Canada, May 1, 2006
98. A talk "New algebraic structures on the generalized string algebra." on December 4, 2005 at the "Algebraic Topology" section of the Union College Mathematics Conference, Union College, Schenectady NY, held December $3-4$, 2005
99. A talk "Framed knots in 3-manifolds and affine self-linking numbers." at the "Rokhlin Topology Seminar", Steklov Institute of Mathematics at St Petersburg, Russia, September 12, 2005
100. A talk "Relative framings of transverse knots." at the "Moscow-Petersburg Seminar on Low-Dimensional Mathematics", Steklov Institute of Mathematics at St Petersburg, Russia, September 9, 2005
101. A talk "Generalizations of Chas-Sullivan string homology and applications to link and coincidence theories." on July 26, 2005 at the 5 International Siegen Topology Symposium "Manifolds and Their mappings" held at Siegen University, Germany, on July $25-29$, 2005

102. A talk "Relative framing of transverse knots and Vassiliev invariants of transverse and pseudo-Legendrian knots." on June 5, 2005 at the AMS-IMS-SIAM Summer Research Conference "Quantum Topology-Contemporary Issues and Perspectives" held at Snowbird Utah, June $5-9$, 2005
103. A talk "Relative framing of transverse knots." on November 7, 2004 at the "Special Session on Invariants of knots and 3-manifolds" of the 2004 Fall Eastern Section Meeting of the AMS #1042, Pittsburgh, PA, November $6-7$, 2004
104. A talk "Algebraic structures on generalized strings and applications." at the Differential Geometry and Topology Seminar of the Universite du Quebec a Montreal, Montreal, Canada, September 17, 2004
105. A talk "Relative framings of transverse knots." on August 26, 2004 at the "L.V. Keldysh Centennial Conference in Geometric Topology, Discrete Geometry and Set Theory" held August $24-28$, 2004 at the Steklov Mathematics Institute of the Russian Academy of Science and at the Moscow State University, Moscow, Russia
106. A talk "Affine linking numbers, their applications, and operations on generalized strings." at the Geometry and Topology seminar, Department of Mathematics, University of Pennsylvania, April 8, 2004
107. An invited talk "Algebraic structures on generalized strings." on April 18, 2004 at the Special "Homotopical Physics" Section of the Spring Eastern AMS Section Meeting #997, Lawrenceville NJ, held on April $17-18$, 2004
108. A talk "Affine linking numbers and generalized string homology." on December 5, 2003 at the "Borders in 3-dimensional topology" conference held at the Ohio State University, Columbus, December $5-7$, 2003
109. A talk "Vassiliev invariants of Legendrian, pseudo-Legendrian, transverse, and framed knots in contact 3-manifolds." at the Geometry and Topology seminar, Mathematics Department, SUNY Buffalo, November 14, 2003
110. A talk "Affine linking numbers, their applications and algebraic structures on generalized strings." on November 8, 2003 at the "Algebraic Topology" Section of the Union College Mathematics Conference, Union College, Schenectady, NY, held on November $8-9$, 2003
111. A talk "Affine linking and winding numbers and the study of front propagation." on October 25, 2003 at the "Homological Physics" Section of the Fall AMS Southeastern Section Meeting #991, at the University of North Carolina, Chapel Hill NC, October $24-25$, 2003
112. A talk "Vassiliev invariant of Legendrian, pseudo-Legendrian and framed knots in contact 3-manifolds." at the "Gauge Theory and Topology Seminar", Department of Mathematics, Harvard University, October 10, 2003
113. A talk "Vassiliev invariants of Legendrian, pseudo-Legendrian, transverse and framed knots in contact 3-manifolds." at the Geometric Topology Seminar, Department of Mathematics, Columbia University, September 19, 2003
114. A talk "Affine linking and winding numbers and their applications to the study of causality and of front propagations." at the "Arnolds Seminar on Singularity Theory", Mathematics Department of Moscow State University, Moscow, Russia, September 9, 2003
115. A talk "Affine linking numbers and their application to the study of front propagations." at the "Moscow-Petersburg Seminar on Low-Dimensional Mathematics", Steklov Institute of Mathematics at St Petersburg, Russia, September 5, 2003
116. A talk "Algebraic structures on generalized strings and the general theory of affine linking numbers." at the "Rokhlin Topology Seminar", Steklov Institute of Mathematics at St Petersburg, Russia, September 1, 2003
117. A talk "Affine linking and winding numbers and the study of front propagation." on July 18, 2003 at the "XII Oporto meeting in Geometry Topology and Physics", Universidade do Porto, Portugal, held July $17-20$, 2003
118. A talk "Affine linking and winding numbers and the study of front propagation." at the Mathematical Physics Seminar, Departamento de Matematica Instituto Superior Tecnico Lisboa, Portugal, July 17, 2003

119. A talk "Affine linking and winding numbers and the study of front propagation." on July 12, 2003 at the "Topological Dynamics and Ergodic Theory" session of the "2003 Summer Conference on Topology and its Applications", Howard University, held on July $9-12$, 2003
120. A talk "Affine linking and winding numbers and the study of front propagation." on June 13, 2003 at the Lehigh University Geometry and Topology Conference, held on June $12-14$, 2003
121. A talk "Vassiliev invariants of Legendrian, Pseudo-Legendrian and framed knots in contact 3-manifolds." on June 6, 2003 at the "NSF-NSA Conference on Interactions between Representation Theories, Knot Theory, Topology, Quantum Field Theory, Category Theory and Mathematical Physics", held at SUNY Potsdam on June $2-6$, 2003
122. A talk "Affine linking numbers and their applications to the study of wave front propagation and causality." on June 4 2003 at the "NSF-NSA conference on Interactions between Representation Theories, Knot Theory, Topology, Quantum Field Theory, Category Theory and Mathematical Physics", held at SUNY Potsdam, NY, on June $2-6$, 2003
123. Colloquium talk "Affine Linking Numbers and the Causality Relation for Wave Fronts." at the Department of Mathematics, Boise State University, Boise, ID, May 13, 2003
124. A talk "Vassiliev-Goussarov invariants of Legendrian pseudo-Legendrian and framed knots." at the Topology Seminar, Department of Mathematics, Boise State University, May 12, 2003
125. A talk "Affine linking numbers and causality relations for wave fronts." at the Topology Seminar, Mathematics Department, Yale University, March 27, 2003
126. A talk "Vassiliev invariants of Legendrian, Pseudo-Legendrian and framed knots in contact 3-manifolds." at the Topology Seminar, Mathematics Department, Brandeis University, February 12, 2003
127. A talk "The universal order one invariant of framed knots in the total spaces of S^1-bundles over orientable surfaces $F^2 \neq S^2, S^1 \times S^1$." on November 10, 2002 at the special session on "Invariants of knots and low-dimensional manifolds" of the AMS Southeastern Section meeting #982 at Orlando Florida, held on November $9-10$, 2002
128. An invited talk "Affine linking Numbers and Causality relations for wave fronts." on November 10, 2002 at the special session on "Homotopy Theory and Geometric Topology" at the AMS Southeastern Section meeting #982 at Orlando Florida, held on November $9-10$, 2002
129. A talk "Universal order one Vassiliev invariants of framed knots in the total spaces of S^1-bundles over surfaces." at the "Rokhlin Topology Seminar", Steklov Institute of Mathematics at St. Petersburg, Russia, September 9, 2002
130. A talk "The causality relation and affine linking numbers." at the "Rokhlin Topology Seminar", Steklov Institute of Mathematics at St. Petersburg, Russia, July 8, 2002
131. A talk "Framed knots in 3-manifolds and the natural framings of transverse knots." on March 8, 2002 at the "Workshop in Geometric Topology and Geometric Group Theory", University of Florida, Gainesville held on March $3-10$, 2002
132. A talk "Vassiliev invariants of Framed, Pseudo-Legendrian and Legendrian knots in contact 3-manifolds.", on March 4, 2002 at the "Workshop in Geometric Topology and Geometric Group Theory", University of Florida, Gainesville, held on March $3-10$, 2002
133. A talk "Vassiliev invariants of Framed, Pseudo-Legendrian and Legendrian knots in contact 3-manifolds." at the Geometry-Topology Seminar, Department of Mathematical Sciences, Binghamton University, Binghamton NY, February 14, 2002
134. A talk "Legendrian and Pseudo-Legendrian knots and Vassiliev invariants for them." at the Rokhlin Topology Seminar, St Petersburg Department of Steklov Institute of Mathematics, St Petersburg, Russia, December 17, 2001
135. Two talks "Finite order invariants of Legendrian, Transverse and framed knots in contact 3-manifolds, parts I and II." at the "Rokhlin Topology Seminar", Steklov Institute of Mathematics at St. Petersburg, Russia, September 3 and 10, 2001
136. A talk at the Mathematical Physics seminar at the ETH Zurich, Switzerland, 2001
137. Invited speaker at the Contact Geometry Workshop at Stanford University, December $13-17$, 2000

138. A talk at the Oberseminar in Complex Geometry, University of Zurich, Zurich, Switzerland, 2000
139. A talk at the Topology Seminar at the Max-Planck-Institut fur Mathematik, Bonn, Germany, 2000
140. Colloquium Talk, at the Mathematics Department, University of Siegen, Siegen, Germany, 2000
141. A talk at the Geometry Seminar at the Institute of Mathematics of the University of Basel, Switzerland, 2000
142. A talk at the Geometry seminar at the Ruhr-Universitat, Bochum, Germany, 2000
143. A talk at the Geometry seminar at the Albret-Ludwigs-Universitat, Freiburg, Germany, 2000
144. A talk at the Geometry Seminar at the Bonn University, Bonn, Germany, 2000
145. A talk at the Geometry and Topology Seminar, University Paul Sabatier, Toulouse, France,2000
146. A talk at the Topology seminar, Strasbourg University, Strasbourg, France, 2000
147. A talk at the Oberseminar, at the Max-Planck-Institut fur Mathematik, Bonn, Germany, 1999
148. Invited speaker at the "Geometric and symplectic topology" program, Pisa University, Pisa, Italy, 1999
149. A talk at the "Sur les singularites" seminar at the l'Ecole Normale Superieure in Paris, France, 1999
150. Speaker at the "VIII OPORTO Meeting in Geometry Topology and Physics", Porto, Portugal, 1999
151. Two talks at the Symplectic Geometry Seminar at the ETH Zurich, Switzerland, $1998 - 1999$
152. A talk at the Geometry Seminar at the Institute of Mathematics of the University of Basel, Switzerland, 1999
153. A talk at the "V.I. Arnold's seminar on Singularity Theory", Moscow State University, Russia, 1999
154. Colloquium talk, Department of Mathematics at the University of California Riverside, CA, 1997
155. A talk at the AMS meeting #920 at the University of Maryland, College Park MD, 1997
156. Principal speaker at the MSRI workshop "Combinatorial Problems Arising in Knots and 3-manifolds", Berkeley, CA 1997

Seminar Talks at Dartmouth

1. Two talks "Causality and Linking in globally hyperbolic and causally simple spacetimes", Part 1 and Part 2 at the Topology seminar, Mathematics Department, Dartmouth College on February 22 and March 1, 2018
2. A talk "Some Corollaries of Manturov's projection Theorem" at the Geometry and Topology seminar, Mathematics Department, Dartmouth College, October 2, 2012
3. A talk "Smooth Cosmic Censorship" at the Geometry and Topology seminar, Mathematics Department, Dartmouth College, April 3, 2012
4. A talk "Conformal maps from spacetimes to the space of Legendrian submanifolds and causality on causally simple spacetimes" at the Geometry and Topology seminar, Mathematics Department, Dartmouth College, October 11, 2011
5. A talk "Causal structure on the space of Legendrian spheres isotopic to a sky and some open questions" at the Geometry and Topology seminar, Mathematics Department, Dartmouth College, October 5, 2010
6. A talk "Legendrian links, causality, and the Low conjecture" at the Geometry and Topology seminar, Mathematics Department, Dartmouth College, April 10, 2009
7. A sequence of four talks "Algebra on Bordism groups of garlands" at the Geometry and Topology seminar, Department of Mathematics, Dartmouth College, on April 25, May 3, May 17, May 24 2007.

8. Two talks "Affine linking number and causality in globally hyperbolic Lorentz manifolds and a roundtrip journey from singular null surfaces to Legendrian mappings, part I." and "A roundtrip journey from singular null surfaces to Legendrian mappings, part II." at the Geometry and Topology seminar, Department of Mathematics, Dartmouth College, April 20 and May 18, 2006
9. Two talks "Applications of Vassiliev invariants to distinguishing pseudo-Legendrian knots, parts I and II." at the Geometry and Topology seminar, Department of Mathematics, Dartmouth College, May 26 and June 2, 2005
10. A talk "Generalizations of the complex analysis Cauchy integral formula and related algebraic structures on generalized string homology." at the Geometry and Topology seminar, Department of Mathematics, Dartmouth College, March 9, 2004
11. A talk "Affine linking numbers and their applications to the causality relation." at the Geometry and Topology seminar, Department of Mathematics, Dartmouth College, November 21, 2003
12. A talk "Universal order one Vassiliev invariants of framed knots in the total spaces of S^1-bundles over surfaces." at the Geometry and Topology seminar, Department of Mathematics, Dartmouth College, November 14, 2003
13. Two talks "Affine winding numbers and their applications to wave propagations, part I" and "Towards the general theory of affine linking numbers part II : Relations with winding numbers and front propagation." at the Geometry and Topology seminar, Department of Mathematics, Dartmouth College, On February 20 and March 13, 2003
14. Two talks "Affine linking number and the Causality Relation invariant, parts I and II." at the Geometry and Topology seminar, Department of Mathematics, Dartmouth College on May 14 and 21, 2002
15. Two talks "Framed knots in 3-manifolds and some new invariants of transverse knots, parts I and II." at the Geometry and Topology Seminar, Department of Mathematics, Dartmouth College, October 4 and 11, 2001

Talks for Undergraduates

1. A Zoom talk "Black holes, causality and linking" at the XXVIII Hudson River Undergraduate Mathematics Conference, held at the Keene State College , NH April 10, 2021
2. A talk "Counting intersection points of loops on a surface" at the XXIII Hudson River Undergraduate Mathematics Conference, held at the St Michael's College in Colchester, VT April 2, 2016
3. A talk "Smooth Structures on Spacetimes" at the XIX Hudson River Undergraduate Mathematics Conference, held at the Western New England University in Springfield, MA April 21, 2012
4. A talk "Smooth structures on a spacetime." at the XVIII Hudson River Undergraduate Mathematics Conference, held at the Union College, Schenectady NY, April 16, 2011
5. A talk "Algebras detecting minimal intersection and self intersection numbers of curves on a surface" on September 15, 2010 at the Geometry Luncheon Seminar, Penn State University, State College, PA
6. A talk "Causality and Linking." at the XVI Hudson River Undergraduate Mathematics Conference, held at the Union College, Schenectady NY, April 18, 2009
7. A talk "Knot Theory and the Study of Wave Front Propagation." at the XIII Hudson River Undergraduate Mathematics Conference, Westfield, MA, April 8, 2006

Undergraduate Research Supervised at Dartmouth

Undergraduate and High School Research: Mario Tomba Morillo '25, Shadi Ali Ahmad '22, Ranvir Deshmukh HS, Mitchell Jubeir '23, Kate Kucharczcuk '23, Jacob Swenberg '21, . Various projects relating causality in spacetimes and the computable linking invariants. Spring 2021 – Now. Kate Kucharczuk and Mitchell Jubeir were Presidential Scholars under my supervision in Fall 2021 and Winter 2022, Mario Tomba Morillow was a Presidential Scholar under my supervision in Fall 2023 and Winter 2024.

Jacob Swenberg '21, an undergraduate research project studying whether the link polynomials detect causality in 3-dimensional globally hyperbolic spacetimes. Supervised jointly with Samantha Allen and Ina Petkova from Dartmouth College

Greg Elliot '12, Senior Thesis, Winter-Spring 2012.

Yong Su '09, Dartmouth Presidential Scholar student in Fall 2007, Winter 2008.

Evarist Byberi '08, Dartmouth Presidential Scholar student in Fall 2006 and Spring 2007. In Fall 2007 we wrote a joint paper published in "Communication in Contemporary Mathematics" and in the Winter-Spring 2008 he wrote a senior thesis with me.

Secondary advisor for graduate students and PhD thesis committee member including extrernal PhD committee member

Doug Knowles PhD 2021 (Primary and the Main Advisor is Ina Petkova)

Sam Tripp PhD 2022 (Primary and the Main Advisor is Ina Petkova)

Zach Winkeler PhD 2022 (Primary and the Main Advisor is Ina Petkova)

Yury Belousov PhD 2023 Higher School of Economics, Moscow, Russia

Prize nominating activities

Nominated two people for the Vin Future Special Prize to be awarded by the Vin Future Foundation

College Service

Mathematics Department Vice Chair Summer 2023-Spring 2024

The Faculty Advisor to the "Dartmouth Undergraduate Mathematics Society" (DMS) 2004–2013 and in 2019 – 2021 (Professor Rosa Orellana is my co-advisor for the DMS.) In 2002 – 2004, before DMS was officially registered with the Council on Student Organizations, I jointly with Peter Doyle conducted regular unofficial meetings, where invited faculty, graduate and undergraduate students were giving Mathematics talks for Dartmouth undergraduates. In the Spring 2011–Winter 2014 we had multiple events, including lectures by undergraduate students, graduate students, alumni lectures by Dartmouth Faculty members. I gave two of the faculty lectures. More information about the past events of the Dartmouth mathematics Society can be found at `http://www.math.dartmouth.edu/~mathteam/archive.html`

Dartmouth College Putnam Mathematics Exam coach in 2001 – 2007; one of the two Putnam Coaches in Fall 2010, Fall 2011 (the other coach was Sergi Elizalde) and Mathematics fun problem solving session organizer in 2002–2004, 2006, Winter 2008.

Mathematics Department Graduate Representative in Fall 2008 – Spring 2010 and Fall 2021–Spring 2024;

Member of the Council on Libraries in Fall 2009 – Spring 2012.

Member of the SIAA College Committee Winter 2020

The Advisor to Mathematics Majors in Fall 2005 – Winter 2006. Secondary advisor to Mathematics Majors Fall 2009 – Spring 2021 and Winter 2022.

A Chair of the Thayer Prize Mathematical Competition Committee in 2004 and 2006. A member of the committee in 2002, 2003, 2008, 2009, 2010, 2011, 2012, 2013.

A Chair of the Mathematics Department Prize Committee in 2016, 2017, 2018, 2021–2022. A member of the Mathematics Department Prize Committee Winter 2018, Fall 2019, Winter 2020, Spring 2021, Fall 2022-Spring 2023, Fall 2023, Spring 2024.

Mathematics Department Colloquium Director in the Spring 2002, Fall 2003 and Winter–Spring 2012, in 2019-2020 academic years we cochaired the Colloquium with Ina Petkova, Fall 2021 – Spring 2022

A member of the Graduate Admissions Committee in the 2002–2003, 2004–2005, 2007–2008, 2010–2011 academic years.

A member of the Mathematics Department Recruiting Committee in 2008–2009 and $2012-2013$.

A member of the Teaching Evaluation Committee in the 2002–2024 academic year, the Chair of the Teaching Evaluation Committee in Fall 2020.

A member of the Graduate Program Committee in the 2001–2002 and $2012-2013$ academic years.

A member of the ad-hoc Committee on Curriculum Development for Math 17 "An Introduction to Mathematics Beyond Calculus".

Teaching mentor for a graduate student Ellizabeth Gillaspy, Winter 2011

A course supervisor, course chair or teaching mentor for the following classes: Math 22 "Linear Algebra with Applications" Fall 2021 Math 13 "Calculs of vector-valued functions" Fall 2021 Math 12 "Calculus Plus" in Fall 2009; Math 13 "Calculus of Vector-Valued Functions" Winter 2008, Fall 2023, Spring 2023; Math 14 "Calculus of Vector-Valued Functions, Honors Section" in Winter 2008; Math 23 "Differential equations" in Spring 2009, Spring 2010, Spring 2021; Math 24 "Linear Algebra" in Winter 2009; Math 54 "Topology I" Summer 2022, Summer 2023; Math 104 "Topics in Topology" in Spring 2004; For Math 124 "Current Problems in Topology" in Fall 2007 and in Fall 2008;

In Fall 2019, Winter 2020, Spring 2021 I supervised reading courses for graduate students In Lorentzian Geometry and in Causality, In Winter 2008 I gave Math 87 "Reading course" instead of Math 54 to 3 students that could not take Math 54 when it was offered. I also gave a separate instance of Math 87 to one of these students that counts as his second Presidential Scholar term. I gave Math 74 "Topics in Topology" as a reading course to a student in Spring 2006.

In Summer of 2017 and Summer 2018 I gave two three lectures introductions to Causality in Lorentizan Geometry as the part of the Math 117 Graduate couse.

Main Professional Activities

Member of the "Mathematics in Moscow Committee" of the American Mathematical Society, Fall 2007–2008, Chair of the Committee Fall 2008–Spring 2010 and Fall 2011– Spring 2012

Reviewer for the American Mathematical Society publications database Mathematical Reviews and for the European database Zentralblatt. I have written about 50 reviews for Mathematical Reviews and about 25 for Zentralblatt.

External referee for the Geometriae Dedicata (2022-2023), International Journal of Mathematics (2023). Journal of Differential Geometry and Applicatons (2020), Journal of Symplectic Geometry (2019), Classical and Quantum Gravity (2018), External referee for the Arkiv for matematik (2011), Mathematische Annalen (2010), Contemporary Mathematics. Fundamental Directions (2010), Journal of Knot Theory and its Ramifications in (2008-2009), Pacific Journal of Mathematics (2005), Proceedings of the American Mathematics Society (2009), and book reviewer for A. K. Peters (2007) and Springer (2004), (2009), (2010).

A members of the two person external review committee for the Siena College Mathematics Department Spring 2013.

Nominator for the VinFuture Prize in 2021, 2022, 2023

A research consultant creating, advising and supervising high school and undergraduare research projects for the Torhea-Neoscholar 2020–Now, Ivy Mind Academy Summer 2021, Sunrise International Education (Horizon Academic Research Program) Summer 2021, Summer 2022 and Summer 2023, Polygence 2021