

Curriculum Vitae

Serge Tabachnikov

Department of Mathematics
Pennsylvania State University,
University Park, PA, 16802, USA;
tabachni@math.psu.edu

Education

Ph.D.: Moscow State University, 1987. Advisors: D. Fuchs and A. Fomenko.
Dissertation: Geometrical applications of the cohomology of infinite-dimensional Lie algebras
M.S.: Moscow State Pedagogical University, 1978, with Honors

Positions held

Permanent positions

Mathematics Teacher, Special High School for Mathematics No 2, Moscow, 1978–80
Professor and Program Coordinator, School of Mathematics by Correspondence (“Gelfand’s School”), Moscow State University, 1979–88
Head of Mathematics Department, “Kvant” magazine, USSR Academy of Sciences, Moscow, 1988–90
Assistant Professor, Associate Professor, and Full Professor of Mathematics, University of Arkansas, 1990–2000
Associate Professor, Full Professor of Mathematics and MASS Director, Penn State, 2000–

Visiting positions

Centre de Physique Theorique, Luminy: May, September 1992; April 1995; June 2000; May–June 2002
Ecole Normale Supérieure de Lyon: June–July 1992
Université Louis Pasteur, Strasbourg: October 1992
IHES, Bur-sur-Yvette: November 1992
ETH, Zurich: December 1992–January 1993, May–July 2003
University of Cambridge and I. Newton Institute: 1994–95
MSRI, Berkeley: May–June 1995; May–July 1997
Max-Planck-Institut, Bonn: 1995–96, full year; July–September 1998; May–August 1999; June–July 2001; January–June 2006; May–June 2009
Tel Aviv University: December 1996–January 1997; May 2000; December 2001; January 2004
Université de Rennes: January, 1998
Université Catholique de Louvain: June 1998
Mathematical Institute at Oberwolfach, RiP program: August 1999; July–August 2003; May 2004; June–July 2005; July 2006, June–July 2007, July 2010
Fields Institute, Toronto: May 2001
Haifa Institute of Technology (Technion), January 2004
Université Claude Bernard, Lyon, June–July 2006
Banff International Research Station, RiT program, May 2008, June 2010
Brown University, January–June 2010
Hausdorff Institute for Mathematics, RiG program, Bonn, June–August 2011
Institut H. Poincaré, Paris, RiP program, March 2012
ICERM, Brown University, June–August 2012

Grants and awards

Research grants

UARK Research Incentive Grants, 1992–93, 1993–94, 1997–98, 1998–99
Arkansas Science and Technology Authority Research Grant, 1993–94
Wolfson College, University of Cambridge fellowship, 1994–95
NSF Research Grants, 1994–97, 1998–01, 2003–05, 2006–09, 2011–14 (sole investigator)
Binational Science Foundation Research Grant, 2001–2004 (with M. Farber and S. Weinberger)
Simons Foundation Grant, 2011–12

Collaboration and travel grants

Volkswagen-Stiftung, Research in Pairs at Oberwolfach: 1999, 2003 (with V. Ovsienko); 2004 (with E. Gutkin); 2005, 2006, 2007, 2010 (with D. Fuchs)
Banff International Research Station, Research in Teams, 2008 (with V. Ovsienko); 2010 (with V. Ovsienko and S. Morier-Genoud)
Hausdorff Research Institute, Research in Groups, 2011 (with M. Gekhtman, M. Shapiro and A. Vainstein)
Institute H. Poincaré, Research in Paris, 2012 (with V. Ovsienko)

Workforce, mentoring and outreach grants

SILO Grant (undergraduate research), 1998–99
MASS Program at PSU, NSF MCTP Grants, 2004–05, 2005–10, 2010–13 (co-PI)
MAA Dolciani Mathematics Enrichment Grant, 2010–12 (with M. Levi)
MSRI Math Circle Mini-grant, 2010–11, 2011–12 (with M. Levi)

Conference and workshop grants

Spring Lecture Series at UARK, 1992, 97, 98, 99; NSF (co-PI)
Algebra and Topology in Interaction, UC Davis, 2009; NSF (co-PI)
Penn State – Göttingen International Summer Schools in Mathematics, 2010–12; NSF (co-PI)

Books

Books and parts of books authored

1. Polynomials. Phasis, Moscow, 1996 (second edition 2000, third edition 2004) (in Russian)
2. Billiards. Société Mathématique de France, “Panoramas et Synthèses”, No 1, 1995
3. Rational billiards and flat structures (with H. Masur). Handbook of Dynamical Systems, v. 1A, North-Holland, 2002, 1015–1089
4. Projective differential geometry, old and new: from Schwarzian derivative to cohomology of diffeomorphism groups (with V. Ovsienko). Cambridge Univ. Press, 2005.
Russian translation, MCCME, Moscow, 2008
5. Geometry and billiards. Amer. Math. Soc., 2005.
Russian translation, Moscow-Izhevsk, 2011; German translation, in preparation
6. Mathematical omnibus (with D. Fuchs), Amer. Math. Soc., 2007.
Russian translation, MCCME, Moscow, 2011; German translation, Springer, 2011;
translation into Japanese, in preparation
7. Billiards and Poncelet theorem, in L. Flatto. Poncelet’s theorem. Amer. Math. Soc., 2008, 191–211

Books edited

1. Mathematical Olympiads by Correspondence, Nauka, Moscow, 1987 (in Russian)
2. Differential and symplectic topology of knots and curves, AMS, 1999
3. Differential topology, infinite-dimensional Lie algebras and their applications (with A. Ashtashkevich), AMS, 1999

4. Kvant Selecta: Algebra and Analysis I, AMS Math. World, v. 14, 1999
5. Kvant Selecta: Algebra and Analysis II, AMS Math. World, v. 15, 1999
6. Kvant Selecta: Discrete mathematics I, AMS Math. World, v. 17, 2002
7. MASS Selecta: teaching and learning advanced undergraduate mathematics (with S. Katok, A. Sossinsky), AMS, 2003

Research papers

1. On invariant differential operators in general position. *Func. Anal. Appl.*, 16, No 3 (1982), 86–87
2. On characteristic classes of homogeneous foliations. *Russ. Math. Surv.*, 39, No 2 (1984), 189–190
3. On homology in general position of the Lie algebra of vector fields on the line. *Soviet Math. Dokl.*, 275, No 2 (1984), 310–314
4. Characteristic classes of Grassman foliations. *Func. Anal. Appl.*, 19, No 1 (1985), 83–84
5. Characteristic classes of parabolic foliations and symmetric functions. *Serdica*, 11 (1985), 86–95
6. Characteristic classes of parabolic foliations of series B, C, D and degrees of isotropic Grassman manifolds. *Func. Anal. Appl.*, 20, No 2 (1986), 84–85
7. Geometrical applications of cohomology of infinite-dimensional Lie algebras. Dissertation, Moscow, 1987 (translation into French: University of Lyon, 1994)
8. An invariant of submanifolds transversal to a distribution. *Russ. Math. Surv.*, 43, No 3 (1988), 193–194
9. Calculation of the Bennequin invariant of a Legendrian curve by the geometry of its front. *Func. Anal. Appl.*, 22, No 3 (1988), 89–90
10. Characteristic classes of Lagrangian foliations. *Func. Anal. Appl.*, 23, No 2 (1989), 90–91
11. Two remarks on the asymptotic Hopf invariant. *Func. Anal. Appl.*, 24, No 1 (1990), 84–85
12. Around four vertices. *Russ. Math. Surv.*, 45, No 1 (1990), 191–192
13. Numerical study of dual billiards: the case of a semicircle (with I. Monroe). UARK Technical Report, 1992
14. Geometry of Lagrangian and Legendrian 2-webs. *Diff. Geom. Appl.*, 3 (1993) 265–284
15. Poncelet’s theorem and dual billiards. *L’Enseign. Math.*, 39 (1993), 189–194
16. Outer billiards. *Russ. Math. Surv.*, 48, No 6 (1993), 75–102
17. Commuting dual billiard maps. *Geom. Dedicata*, 53 (1994), 57–68
18. A cone eversion. *Amer. Math. Monthly*, 102 (1995), 52–56
19. On the dual billiard problem. *Advances in Math.*, 115 (1995), 221–249
20. The four vertex theorem revisited – two variations on the old theme. *Amer. Math. Monthly*, 102 (1995), 912–916
21. Asymptotic dynamics of the dual billiard transformation. *J. Stat. Phys.*, 83 (1996), 27–38
22. Invariants of smooth triple point free plane curves. *Knot Theory and Ramifications*, 5 (1996), 531–552
23. Sturm theory, Ghys theorem on zeroes of the Schwarzian derivative and flattening of Legendrian curves (with V. Ovsienko). *Selecta Math. (NS)*, 2 (1996), 297–307
24. Projective connections, group Vey cocycle and deformation quantization. *Int. Math. Res. Notes*. 1996, No 14, 705–722
25. Introducing projective billiards. *Ergod. Theory and Dynam. Syst.*, 17 (1997), 957–976
26. Invariants of Legendrian and transverse knots in the standard contact space (with D. Fuchs). *Topology*, 36 (1997), 1025–1053
27. On zeroes of the Schwarzian derivative. *Topics in singularity theory*, 229–239, AMS Transl., ser. 2, v. 180, 1997
28. Parameterized curves, Minkowski caustics, Minkowski vertices and conservative line fields. *L’Enseign. Math.*, 43 (1997), 3–26

29. On functions with zero mean over a finite group. *Func. Anal. Appl.*, 31, No 1 (1997), 93–94
30. Estimates for the Bennequin number of Legendrian links from state models for knot polynomials. *Math. Research Lett.*, 4 (1997), 143–156
31. Exact transverse line fields and projective billiards in a ball. *Geom. and Funct. Anal.*, 7 (1997), 594–608
32. More on paperfolding (with D. Fuchs). *Amer. Math. Monthly*, 106 (1999), 27–35
33. Geometry of exact transverse line fields and projective billiards. *Differential and symplectic topology of knots and curves*, 131–152, AMS Transl., ser. 2, v. 190, 1999
34. Projectively equivalent metrics, exact transverse line fields and the geodesic flow on the ellipsoid. *Comm. Math. Helv.*, 74 (1999), 306–321
35. Fagnano orbits of polygonal dual billiards. *Geom. Dedicata*, 77 (1999), 279–286
36. Remarks on the geometry of exact transverse line fields. *Differential topology, infinite-dimensional Lie algebras and applications*, 247–260, AMS, 1999
37. Going in circles: variations on the Money-Coutts theorem. *Geom. Dedicata*, 80 (2000), 201–209
38. A four vertex theorem for polygons. *Amer. Math. Monthly*, 107 (2000), 830–833
39. Projective geometry of polygons and discrete 4-vertex and 6-vertex theorems (with V. Ovsienko). *L'Enseign. Math.*, 47 (2001), 3–19
40. Billiards in Finsler and Minkowski geometries (with E. Gutkin). *J. Geom. and Phys.*, 40 (2002), 277–301
41. Ellipsoids, complete integrability and hyperbolic geometry. *Moscow Math. J.*, 2 (2002), 185–198
42. Topology of cyclic configuration spaces and periodic orbits of multi-dimensional billiards (with M. Farber). *Topology*, 41 (2002), 553–589
43. Periodic trajectories in 3-dimensional convex billiards (with M. Farber). *Manuscripta Mat.*, 108 (2002), 431–437
44. Dual billiards in the hyperbolic plane. *Nonlinearity*, 15 (2002), 1051–1072
45. On polygonal dual billiard in the hyperbolic plane (with F. Dogru). *Reg. Chaotic Dynamics*, 8 (2003), 67–82
46. Topological robotics: motion planning in projective spaces (with M. Farber and S. Yuzvinsky). *Int. Math. Res. Notes*, 2003, No 34, 1853–1870
47. On skew loops, skew branes and quadratic hypersurfaces. *Moscow Math. J.*, 3 (2003), 681–690
48. On three-periodic trajectories of multi-dimensional dual billiards. *Alg. Geom. Topology*, 3 (2003), 993–1004
49. Remarks on magnetic flows and magnetic billiards, Finsler metrics and a magnetic analog of Hilbert's fourth problem. *Dynamical systems and related topics*, Cambridge Univ. Press, 2004, 233–252
50. Tire track geometry: variations on a theme. *Israel J. Math.*, 151 (2006), 1–28
51. Non-existence of n -dimensional T -embedded discs in \mathbf{R}^{2n} (with G. Stojanovic). *Comm. Math. Helv.*, 81 (2006), 877–882
52. Complexity of piecewise convex transformations in two dimensions, with applications to polygonal billiards (with E. Gutkin). *Moscow Math. J.*, 6 (2006), 673–701
53. On configuration space of plane polygons, sub-Riemannian geometry and periodic orbits of outer billiards (with D. Genin). *J. Modern Dynamics*, 1 (2007), 155–173
54. The Poncelet grid and the billiard in an ellipse (with M. Levi). *Amer. Math. Monthly*, 114 (2007), 895–908
55. Hyperbolic Carathéodory conjecture (with V. Ovsienko). *Proc. of Steklov Inst.*, 258 (2007), 178–193
56. A proof of Culter's theorem on the existence of periodic orbits in polygonal outer billiards. *Geom. Dedicata*, 129 (2007), 83–87

57. Geodesics on an ellipsoid in Minkowski space (with D. Genin and B. Khesin). *L'Enseign. Math.*, 53 (2007), 307–331
58. Totally skew embeddings of manifolds (with M. Ghomi). *Math. Zeitschrift*, 258 (2008), 499–512
59. On algebraically integrable outer billiards. *Pacific J. Math.*, 235 (2008), 89–92
60. Converse Sturm-Hurwitz-Kellogg theorem and related results. *J. Fixed Point Theory Appl.*, 3 (2008), 121–130
61. Birkhoff billiards are insecure. *Discr. Cont. Dyn. Syst.*, 23 (2009), 1035–1040
62. Quasiperiodic motion for the Pentagon map (with V. Ovsienko and R. Schwartz). *Electron. Res. Announc. Math. Sci.*, 16 (2009), 1–8
63. Self-dual polygons and self-dual curves (with D. Fuchs). *Funct. Anal. and Other Math.*, 2 (2009), 203–220
64. Pseudo-Riemannian geodesics and billiards (with B. Khesin). *Advances in Math.*, 221 (2009), 1364–1396
65. On bicycle tire tracks geometry, hatchet planimeter, Menzin’s conjecture and oscillation of unicycle tracks (with M. Levi). *Experimental Math.*, 18 (2009), 173–186
66. Geometry and dynamics of the pentagram map. *Geometric methods in physics, Proceedings of the XXVIII Workshop GMP*, Amer. Inst. Physics, 2009, 172–181
67. Existence and non-existence of skew branes. *J. Fixed Point Theory Appl.*, 7 (2010), 419–431
68. Contact complete integrability (with B. Khesin). *Reg. Chaotic Dynamics*, 15 (2010), 504–520
69. The Pentagon map: a discrete integrable system (with V. Ovsienko and R. Schwartz). *Commun. Math. Phys.*, 299 (2010), 409–446
70. Elementary surprises in projective geometry (with R. Schwartz). *Math. Intelligencer*, 32 (2010) No 3, 31–34
71. Variations on the Tait-Kneser theorem (with V. Timorin). Preprint
72. Topological aspects of the Dvoretzky Theorem (with D. Burago and S. Ivanov). *J. Topology and Analysis*, 2 (2010), 453–467
73. Periodic trajectories in the regular pentagon (with D. Davis and D. Fuchs). *Moscow Math. J.*, 11 (2011), 1–23
74. Variations on R. Schwartz’s inequality for the Schwarzian derivative. *Discr. Comp. Geom.*, 46 (2011), 724–742
75. The Pentagon integrals on inscribed polygons (with R. Schwartz). *Electronic J. of Combinatorics*, 18 (2011), P171
76. Discrete spherical means of directional derivatives and their applications (with A. Belyaev and B. Khesin). *J. Geom. Physics*, 62 (2012), 124–136
77. 2-frieze patterns and the cluster structure of the space of polygons (with S. Morier-Genoud and V. Ovsienko). *Ann. Inst. Fourier*, in print
78. The (un)equal tangents problem. *Amer. Math. Monthly*, 110 (2012), 398–405
79. Liouville-Arnold integrability of the pentagram map on closed polygons (with V. Ovsienko and R. Schwartz). Preprint arXiv:1107.3633
80. Higher pentagram maps, weighted directed networks, and cluster dynamics (with M. Gekhtman, M. Shapiro and A. Vainshtein). *Electron. Res. Announc. Math. Sci.*, 19 (2012), 1–17
81. Periodic trajectories in the regular pentagon, II (with D. Fuchs). Preprint
82. On fibrations with flat fibers (with V. Ovsienko). Preprint
83. The equal tangents property (with J. Jerónimo-Castro and G. Ruiz-Hernández). Preprint

Expository articles

Articles in “Kvant” magazine (in Russian)

1. Mathematical radio club. 1983, No 3
2. Mistakes in geometrical proofs. 1984, No 3 (in English: Quantum, 1998, No 6)
3. Considerations of continuity. 1987, No 9. (in English : Quantum, 1990, No 2)
4. Geometry of equations. 1988, No 10
5. On plane curves. 1988, No 11-12
6. On curvature. 1989, No 5
7. On self-referential sentences. 1989, No 6
8. Archimedes' law from the viewpoint of a mathematician. 1989, No 10 (in English: in "Geometry, Analysis and Mechanics", World Sci. Publ., 1995, 215–218)
9. Differential geometry around us. 1989, No 11
10. How many roots does a polynomial have? 1989, No 12
11. Polynomials least different from zero. 1990, No 6 (in English: Quantum, 1994, No 1 and Kvant Selecta: algebra and analysis, II, 161–165)
12. Web geometry. 1990, No 7
13. Chebyshev's nets (with Yu. Kotov). 1990, No 7
14. Segments of constant areas (with D. Fuchs). 1990, No 8 (in English: Quantum, 1992, No 2)
15. Which is larger? 1990, No 10
16. Nazism and mathematics. 1990, No 11. (in Japanese: Basic Sugaku, 1991)
17. Variations on Escher's theme. 1990, No 12
18. The Sylvester problem (with V. Timorin). 2009, No 5-6
19. Impossible tilings (with D. Fuchs), 2011, No 2

Other

1. Monthly mathematical radio show. All-Union Radio Station, Moscow, 1981-83 (10 scripts)
2. Instructive games (with A. To'om). Moscow State Univ. Math. School by Correspondence, 1987
3. Encyclopedia of mathematical physics, Moscow, 1998. 17 articles on contact geometry
4. Solution to a problem by Coxeter. Summer Geometry Institute Problem Book, Smith College, 1993
5. A problem. Math. Intelligencer, 13 (1991), No 2
6. Problem No 10724, Amer. Math. Monthly, 106 (1999); solution: 108 (2001), 472–473
7. Preface to Kvant Selecta, AMS Math. World, v. 14 (1999)
8. Personal reflections on D. Fuchs, Differential topology, infinite-dimensional Lie algebras and applications, 309–311, AMS Transl., ser. 2, v. 194, 1999
9. Outer billiards (in Russian). Mat. Prosv., ser. 3, No 5 (2001), 125–135
10. MASS Program at Penn State (with A. Katok and S. Katok). Math. Intelligencer, 24 (2002), No 4, 50–56
11. A tale of a geometric inequality. MASS Selecta, AMS, 2003, 257–262
12. Bringing Eastern European traditions to North American students (with P. Humke and Yu. Ilyashenko). Notices of AMS, 50 (2003), 1250–1254
13. Dual billiards (with F. Dogru). Math. Intelligencer, 27, No 4 (2005), 18–25. Translation into Russian: "Letnyaya konferenciya turnira gorodov: izbrannye materialy", v. 1. Moscow, MCNMO, 2009, pp. 28-47.
14. Comments to problems 1976-4, 1976-5, 1976-12, 1979-19, 1981-10, 1983-4, 1987-3, 1994-2, 1994-8, 1994-17. Arnold's Problems, Springer-Verlag, & Phasis, 2005
15. Billiards in bounded convex domains. Encyclopedia of mathematical physics, Elsevier, 2006, v. 1, p. 296–299
16. Polygonal billiards. Encyclopedia of mathematical physics, Elsevier, 2006, v. 4, pp. 84–87
17. "Arnold's Problems" book review. Math. Intelligencer, 29, No 1 (2007), 49–51
18. 27 lines (in Russian). Mat. Prosv., ser. 3, No 12 (2008), 145–160
19. What is ... the Schwazian derivative (with V. Ovsienko). Notices of AMS, 56 (2009), 34–36

20. “Chases and escapes” book review. *Math. Intelligencer*, 31, No 2 (2009), 78–79
21. “Outer billiards on kites” book review. *Bull. AMS*, 48 (2011), 285–292
22. International Summer School for Students (with E. Ghys). *Notices of AMS*, 59 (2012), 365

Curriculum development

Transformational geometry, course and lecture notes, UARK, 1993
 Differential topology, course and lecture notes, UARK, 1999
 Mathematical methods of mechanics, course and lecture notes, UARK, 2000
 Introduction to symplectic topology, course and lecture notes, Penn State, 2002
 Intuitive topology, MASS course, Penn State, 2002
 Geometry and billiards, REU and MASS course, Penn State, 2004 and 2005
 Differential topology, course and lecture notes, Penn State, 2008
 Invitation to knot theory, REU course, Penn State, 2009
 Exploration in convexity, MASS course, Penn State, 2009
 Geometry of polynomials, REU course, Penn State, 2010
 Concepts of geometry, PMASS course, Penn State, 2011

Editor

Kvant magazine, 1989–1990
 American Mathematical Monthly, 2001–; Notes Editor, 2011–
 Journal of Fixed Point Theory and Applications, 2007–
 V. Arnold memorial issue (with B. Khesin), *Notices AMS*, 2012, March and April issues
 Student Mathematics Library Editorial Committee, AMS, 2012–2016

Conference and Schools organizing

Symplectic topology, Fayetteville, AR, 1992
 Dehn surgery (with Ch. Goodman-Strauss), Fayetteville, 1997
 Combinatorial methods in algebra (with M. Johnson and V. Retakh), Fayetteville, 1998
 Complex dynamics (with L. Lanzani and V. Retakh), Fayetteville, 1999
 Nonholonomic dynamics and integrability (with B. Khesin), Banff, 2007
 Billiards and related topics (with R. Schwartz), AMS Meeting, Murfreesboro, 2007
 Legendrian knots and related topics (with D. Fuchs and L. Traynor), AIM 2008
 Algebra and topology in interaction (with Ya. Eliashberg, M. Mulase, N. Reshetikhin, A. Schwarz, M. Vazirani), UC Davis 2009
 Geometry of integrable and non-integrable dynamics (with B. Khesin and M. Levi), AMS Meeting, Universty Park, 2009
 Random dynamics (with A. Novikov, Ya. Pesin, W. Wojczynski), Universty Park, 2009
 Billiards Arbeitsgemeinschaft (with S. Troubetzkoy), Oberwolfach, 2010
 Göttingen-Penn State international summer school on dynamical systems (with L. Bartholdi, M. Denker and Ya. Pesin), Göttingen, 2011
 International mathematical summer school for high school and college students (with M. Andler, E. Ghys, V. Kleptsyn, D. Schleicher), Bremen, 2011; Lyon, 2012
 Summer@ICERM undergraduate program (with P. Hooper), ICERM, Brown University, 2012
 Finite-dimensional integrable systems (with C. Duval and G. Valent), Luminy, 2013

Doctoral students

F. Dogru, Ph.D. 2003; D. Genin, Ph.D. 2005; Yu. Tyurina, Ph.D. 2005; G. Stojanovic, Ph.D. 2007; N. Early, current

Service and outreach activities

Department, college, university committees

Member of committees at UARK: Undergraduate, Hiring, Steering, Library, Spring Lecture Series, Graduate, VIGRE; Department of Mathematics, 1990–2000
Honors Director, Department of Mathematics, UARK, 1996–2000
MASS Director, Department of Mathematics, Penn State, 2000–
Honors Director, Department of Mathematics, Penn State, 2000–
Colloquium Chair, Department of Mathematics, Penn State, 2008–11
Marker Lectures Committee, Chair, Penn State, 2010–11
Member of committees at Penn State: Student Awards, Undergraduate Studies, VIGRE, Promotion and Tenure, Graduate Studies, GTA Oversight, PSU-PKU Steering; Department of Mathematics
Outreach Council, Eberly College of Science, Penn State 2000–
Schreyer Scholars Selection Committee, Schreyer Honors College, Penn State 2011–12

National and international committees and boards

American Mathematics Competitions, Advisory Panel, member, 2002–2004
Young Scholars (Epsilon) Awards Committee, AMS, member, 2007–2010 (Chair, 2009–2010)
Frank and Bennie Morgan Prize for Outstanding Research in Mathematics by an Undergraduate Student Committee, AMS-MAA-SIAM, member, 2010–2013
International Mathematical Summer School for Students, Scientific Committee, member, 2010–
Illustrative Mathematics Project Advisory Board, AMS representative, 2011–

Refereeing

Referee for numerous research journals
Referee for grant awarding agencies (NSF, NSA, Sloan Foundation, BSF, various European and Russian agencies and foundations)
Math Reviews reviewer

Outreach

Canada/USA Binational Mathematical Summer Program, invited lecturer, 2001, 2002
Mathematical Club for high school students (with J. Duncan), UARK, 1990–93
Mathematical Club, Park Forest Middle School, State College, 2002
Mathematical Club, Radio Park Elementary School, State College, 2003–05
Mathematical Club, Primrose Hill Elementary School, Barrington, RI, 2010
Mathematical Circles, State College High, Park Forest and Mount Nittany Middle Schools, (with M. Guysinsky and M. Levi), State College, 2010–
International mathematical summer school for high school and college students, invited lecturer, Bremen, 2011

Invited conference, colloquium and seminar talks (since 1991)

1. Annual AMS/MAA Meeting (Geometry), San Francisco, January 1991
2. Midwest Topology Conference, Lawrence, May 1991
3. Centre de Physique Theorique, Luminy, June 1991
4. University of Texas at Austin, October 1991
5. UC at Davis, December 1991
6. Annual AMS/MAA Meeting (Symplectic topology), Baltimore, January 1992
7. Rencontres Franco-Russe de geometrie, CIRM, Luminy, May 1992
8. Ecole Normale Superieur de Lyon, June 1992
9. Université Louis Pasteur, Strasbourg, October 1992
10. Conference on polygonal billiards, ENS de Lyon, October 1992
11. Université de Rennes, November 1992
12. IHES, Bures-sur-Yvette, November 1992

13. ETH-Zentrum, Zurich, December 1992
14. Penn State University, March 1993
15. UC at Davis, May 1993
16. Stanford University, May 1993
17. Smith College, July 1993
18. Wichita St. University, September 1993
19. UC at Riverside, March 1994
20. SUNY at Stony Brook, March 1994
21. Yale University, March 1994
22. Symposium on classical and quantum billiards, Ascona, July 1994
23. Université Louis Pasteur, Strasbourg, April 1995
24. Ecole Normale Supérieure, Paris, April 1995
25. Centre de Physique Théorique, Luminy, April 1995
26. Stanford University, May 1995
27. University of Southern California, May 1995
28. UC at Santa Cruz, May 1995
29. Geometry conference, Oberwolfach, October 1995
30. MPIM (Oberseminar), Bonn, November 1995
31. Koeln University, February 1996
32. Tel Aviv University, January 1997
33. Combinatorics and knot theory workshop, MSRI, January 1997
34. AMS Meeting (Chaotic dynamics), Memphis, March 1997
35. UC at Santa Cruz, June 1997
36. Université de Rennes, January 1998
37. University of Wisconsin, Madison, February 1998
38. AMS Meeting (Geometry and topology of 3-Manifolds), Davis, April 1998
39. Université Catholique de Louvain, June 1998
40. University of Toronto, November 1998
41. Columbia University, December 1998
42. University of Alabama, Birmingham, February 1999
43. Dynamics conference, Oberwolfach, July 1999
44. University of Arizona, Tucson, September 1999
45. Tulane University, October 1999
46. Penn State University, November 1999
47. New Mexico State University, Las Cruces, December 1999
48. AMS Meeting (Finsler and Minkowski geometry), Lowell, April 2000
49. Tel Aviv University, May 2000
50. Centre de Physique Théorique, Luminy, June 2000
51. Ecole Normale Supérieure, Paris, June 2000
52. Georgia Topology Conference, Athens, July 2000
53. Geometry conference, Oberwolfach, October 2000; mini-course of 2 lectures
54. AMS Meeting (Dynamics), San Francisco, October 2000
55. Indiana University, Bloomington, February 2001
56. University of Pennsylvania, Philadelphia, March 2001
57. Séminaire Sud-Rhodanien de Géométrie, Atelier billiards, Montpellier, June 2001; mini-course of 5 lectures
58. Ruhr University, Bochum, July 2001
59. Dynamical systems conference, Penn State, October 2001
60. Tel Aviv University, December 2001
61. Haifa Institute of Technology (Technion), December 2001
62. Georgia Institute of Technology, Atlanta, April 2002

63. Institut de Mathématiques de Luminy, May 2002
64. Université de Provence, Marseille, May 2002
65. Université Claude Bernard, Lyon, May 2002
66. International workshop on piecewise isometries, Luminy, June 2002
67. University of South Carolina, Columbia, March 2003
68. AMS Meeting (Differential geometry), Bloomington, April 2003
69. AMS Meeting (Applications of Teichmüller theory), Bloomington, April 2003
70. AMS Meeting (Algebraic and topological combinatorics), New York, April 2003
71. University of Florida, Gainesville, April 2003
72. Conference on hyperbolic dynamics, Zurich, June 2003
73. Conference on topology and robotics, Zurich, June 2003
74. Novos Talentos em Matemática, Luso, Portugal, September 2003
75. Tel Aviv University, January 2004
76. Haifa Institute of Technology (Technion), January 2004
77. University of Toronto, March 2004
78. SUNY at Stony Brook, March 2004
79. University of Pennsylvania, April 2004
80. Ohio State University, Columbus, May 2004
81. Geometry conference, Oberwolfach, September 2004
82. University of Dortmund, July 2005
83. Dynamics conference, Oberwolfach, July, 2005
84. Independent University of Moscow, October, 2005
85. Max-Planck-Institut, Bonn, January 2006
86. Koeln University, February 2006
87. Brussels-Koeln Symplectic Seminar, March 2006
88. University of Dortmund, April 2006
89. Max-Planck-Institut, Bonn, April 2006
90. Alexander von Humboldt Foundation conference, Bonn, April 2006
91. University of Lille, May 2006
92. Institut de Mathématiques de Luminy, May 2006
93. Université Claude Bernard, Lyon, June, 2006
94. Geometry conference, Oberwolfach, October 2006
95. University of Toronto, October 2006
96. Dartmouth College, October 2006
97. Brown University, April 2007
98. SUNY Stony Brook, April 2007
99. Hebrew University, Jerusalem, June 2007
100. Different approaches to complexity, Technion, Haifa, June 2007
101. Dynamical systems, mathematical billiards and related problems in complex geometry.
Summer school, Cologne, July 2007; mini-course of 3 lectures
102. Novos Talentos em Matemática, Lisbon, Portugal, September 2007; mini-course of 6 lectures
103. Temple University, October 2007
104. AMS Southeast Meeting, Murfreesboro, November 2007; invited address
105. University of Illinois, March 2008
106. University of Southern California, April 2008
107. Low complexity dynamics, BIRS, May 2008
108. University of Chicago, June 2008
109. University of Toronto, November 2008
110. McMaster University, Hamilton, November 2008
111. Discrete differential geometry, Oberwolfach, January 2009
112. University of Arkansas, Fayetteville, March 2009

113. AMS Meeting (The interface between number theory and dynamical systems), Urbana-Champaign, March 2009
114. University of Maryland, April 2009
115. Bloomington Geometry Workshop, Bloomington, April 2009
116. University of Jena, May 2009
117. Jacobs University, Bremen, May 2009
118. Dynamical Numbers, MPIM-Bonn, June 2009
119. University of Dortmund, June 2009
120. University of Dusseldorf, June 2009
121. Max-Planck-Institut, Bonn, June 2009
122. Geometric Methods in Physics, Bialowieza, Poland, June 2009
123. Dynamics conference, Oberwolfach, July 2009
124. Algebra and topology in interaction, Davis, September 2009
125. Temple University, October 2009
126. AMS Meeting (Geometry of integrable and non-integrable dynamics), State College, October 2009
127. Foundations of computational mathematics, Fields Institute, Toronto, November 2009
128. University of Toronto, November 2009
129. Brock University, Ontario, Canada, November 2009
130. Algebres de Lie de dimension infinie: geometrie et cohomologie, Lyon, November 2009
131. Georgia Institute of Technology, Atlanta, February 2010
132. Northeastern University, Boston, February 2010
133. University of North Texas, Denton, March 2010
134. SUMS conference, Brown University, Providence, March 2010
135. Geometry, Dynamics and Topology Day, Charleston, IL, March 2010
136. SIAM conference on nonlinear waves and coherent structures, Philadelphia, August 2010
137. Moduli spaces in Mathematics and in Physics, Strasbourg, September 2010
138. Geometry, Dynamics, Integrable Systems, Belgrade, September 2010
139. UMS, University of Illinois at Chicago, October 2010
140. University of South Florida, Tampa, October 2010
141. University of Wisconsin, Madison, November 2010
142. Cornell University, November 2010
143. AMS/MAA Joint Meeting (Math Circles), New Orleans, January 2011
144. Tel Aviv University, March 2011
145. University of Michigan, April 2011
146. International Mathematical Summer School for Students, Bremen, July 2011, mini-course of 3 lectures
147. Bonn University, July 2011
148. International Summer School on Dynamical Systems, Göttingen, August 2011, mini-course of 4 lectures
149. Geometry, Dynamics, Integrable Systems, Sintra, Portugal, September 2011
150. Symplectic Dynamics, Princeton, October 2011
151. MAA fall meeting, University of Findlay, OH; invited address, October 2011
152. University of Illinois, December 2011
153. Integrability, modern variations, Hausdorff Institute, Bonn, January 2012, mini-course of 2 lectures
154. Michigan State University, February 2012
155. Scattering by obstacles and billiards, University of Aveiro, Portugal, March 2012
156. Carolina Dynamics Symposium, Clemson University, April 2012