

**CURRICULUM VITAE:  
WILLIAM MARK GOLDMAN**

**Professional Preparation:**

Princeton Univ.	A. B.	1977
Univ. Cal. Berkeley	Ph.D.	1980
Univ. Colorado	NSF Postdoc.	1980–1981
M.I.T.	C.L.E. Moore Inst.	1981–1983

**Appointments:**

Institute for Advanced Study	Member	Spring 2008
Princeton University	Visitor	Spring 2008
M.S.R.I.	Member	Nov.–Dec. 2007
Univ. Maryland	Assoc. Chair for Grad. Studies	1995–1998
Univ. Maryland	Professor	1990–present
Oxford Univ.	Visiting Professor	Spring 1989
Univ. Maryland	Assoc. Professor	1986–1990
M.I.T.	Assoc. Professor	1986
M.S.R.I.	Member	1983–1984
Univ. Maryland	Visiting Asst. Professor	Fall 1983
M.I.T.	Asst. Professor	1983–1986

**Publications**

- (1) (with D. Fried and M. Hirsch) *Affine manifolds and solvable groups*, Bull. Amer. Math. Soc. **3** (1980), 1045–1047.
- (2) (with M. Hirsch) *Flat bundles with solvable holonomy*, Proc. Amer. Math. Soc. **82** (1981), 491–494.
- (3) (with M. Hirsch) *Flat bundles with solvable holonomy II: Obstruction theory*, Proc. Amer. Math. Soc. **83** (1981), 175–178.
- (4) *Two examples of affine manifolds*, Pac. J. Math. **94** (1981), 327–330.
- (5) (with M. Hirsch) *A generalization of Bieberbach’s theorem*, Inv. Math. , **65** (1981), 1–11.
- (6) (with D. Fried and M. Hirsch) *Affine manifolds with nilpotent holonomy*, Comm. Math. Helv. **56** (1981), 487–523.
- (7) *Characteristic classes and representations of discrete subgroups of Lie groups*, Bull. Amer. Math. Soc. **6** (1982), 91–94.

- (8) *On the polynomial cohomology of affine manifolds*, *Inv. Math.* **65** (1982), 453–457.
- (9) (with M. Hirsch) *Polynomial forms on affine manifolds*, *Pac. J. Math.* **101** (1982), 115–121.
- (10) (with M. Hirsch and G. Levitt) *Invariant measures for affine foliations*, *Proc. Amer. Math. Soc.* **86** (1982), 511–518.
- (11) (with D. Fried) *Three-dimensional affine crystallographic groups*, *Adv. Math.* **47** (1983), 1–49.
- (12) *Conformally flat manifolds with nilpotent holonomy and the uniformization problem for 3-manifolds*, *Trans. Amer. Math. Soc.* **278** (1983), 573–583.
- (13) (with Y. Kamishima) *The fundamental group of a compact flat Lorentz space form is virtually polycyclic*, *J. Diff. Geo.* **19** (1984), 233–240.
- (14) *The symplectic nature of fundamental groups of surfaces*, *Adv. Math.* **54** (1984), 200–225.
- (15) (with R. Brooks) *The Godbillon-Vey invariant of transversely homogeneous codimension-one foliations*, *Trans. Amer. Math. Soc.* **286** (1984), 651–664.
- (16) (with M. Hirsch) *The radiance obstruction and parallel forms on affine manifolds*, *Trans. Amer. Math. Soc.* **286** (1984), 639–649.
- (17) (with R. Brooks) *Volume in Seifert space*, *Duke Math. J.* **51** (1984), 529–545.
- (18) *Representations of fundamental groups of surfaces*, in “Geometry and Topology, Proceedings, University of Maryland 1983-1984,” J. Alexander and J. Harer (eds.), *Lecture Notes in Mathematics* Vol.1167 (1985), 95–117, Springer-Verlag New York.
- (19) *Nonstandard Lorentz space forms*, *J. Diff. Geo.* **21** (1985), 301–308.
- (20) (with M. Hirsch) *Affine manifolds and orbits of algebraic groups*, *Trans. Amer. Math. Soc.* **295** (1986), 175–198.
- (21) *Invariant functions on Lie groups and Hamiltonian flows of surface group representations*, *Inv. Math.* **85** (1986), 1–40.
- (22) (with J. Millson) *Eichler-Shimura homology and the finite generation of cusp forms by hyperbolic Poincare series*, *Duke Math. J.* **53** (1986), 1081–1091.
- (23) (with J. Millson) *Deformations of flat bundles over Kähler manifolds*, in “Geometry and Topology, Manifolds, Varieties, and Knots,” C. McCrory and T. Shifrin (eds.), *Lecture Notes in Pure and Applied Mathematics* **105** (1987), 129-145 Marcel Dekker Inc., New York.

- (24) *Projective structures with Fuchsian holonomy*, J. Diff. Geo. **25** (1987), 297–326.
- (25) (with J. Millson) *Local rigidity of discrete groups acting on complex hyperbolic space*, Inv. Math. **88** (1987), 495–520.
- (26) *Geometric structures and varieties of representations*, in “The Geometry of Group Representations,” Contemp. Math., Amer. Math. Soc. **74**, (1988), 169–198.
- (27) (with Y. Kamishima) *Topological rigidity of developing maps with applications to conformally flat manifolds*, in “The Geometry of Group Representations,” Contemp. Math., Amer. Math. Soc. **74** (1988), 199–203.
- (28) (with J. Millson) *The deformation theory of representations of fundamental groups of compact Kähler manifolds*, Bull. Amer. Math. Soc. **18** (1988), 153–158.
- (29) *Topological components of spaces of representations*, Inv. Math. **93** (3) (1988), 557–607.
- (30) (with J. Millson) *The deformation theory of representations of fundamental groups of Kähler manifolds*, Publications Mathématiques d’Institut des Hautes Études Scientifiques, **67** (1988), 43–96.
- (31) *Convex real projective structures on compact surfaces*, J. Diff. Geo. **31** (1990), 791–845.
- (32) (with J. Millson) *The homotopy invariance of the Kuranishi space*, Illinois J. Math. (memorial issue dedicated to K. T. Chen), **34** (1990), 337–367.
- (33) *The symplectic geometry of affine connections on surfaces*, Journal für die reine und angewandte Mathematik **407** (1990), 126–159.
- (34) (with J. Millson) *Differential graded Lie algebras and singularities of level sets of momentum mappings*, Comm. Math. Phys. **131** (1990), 495–515.
- (35) (with T. Drumm) *Complete flat Lorentz 3-manifolds with free fundamental group*, Int. J. Math. **1** (1990), 149–161.
- (36) Review of “Conformal Geometry,” by R. Kulkarni and U. Pinkall, Bull. Amer. Math. Soc. **23** (1990), 566–575.
- (37) (with Y. Kamishima) *Conformal automorphisms and closed conformally flat manifolds*, Trans. Amer. Math. Soc. **323** (1991), 797–810.
- (38) *Complex hyperbolic Kleinian Groups*, in “Complex Geometry,” Proceedings of the Osaka International Conference, Marcel Dekker, New York, G. Komatsu and Y. Sakane (eds.), 31–52 (1992).

- (39) (with J. Parker) *Complex hyperbolic ideal triangle groups*, Journal für die reine und angewandte Mathematik **425** (1992), 71–86.
- (40) (with J. Parker) *Dirichlet Polyhedra for Dihedral Groups Acting on Complex Hyperbolic Space*, J. Geom. Anal. **2** (6) (1992), 517–554.
- (41) (with S. Choi) *Convex real projective structures on closed surfaces are closed*, Proc. Amer. Math. Soc. **118** (2) (1993), 657–661.
- (42) *Complex Hyperbolic Geometry*, Proceedings of the Topology Geometry Research Center Workshop, Kyungpook National University, Taegu, Korea, July 1994.
- (43) *Moduli spaces*, Proceedings of the Korean Science and Engineering Foundation Workshop, Korea National University of Education, Ch'onju, Korea, July 1994.
- (44) Review of “An extension of Casson’s invariant,” by K. Walker, Bull. Amer. Math. Soc. **30** (1) (1994), 100–104.
- (45) (with T. Drumm) *Crooked planes*, Electronic Research Announcements of the Amer. Math. Soc. **1** (1), (1995), 10–17.
- (46) (with M. Darvishzadeh) *Deformations of real projective structures and hyperbolic affine structures*, J. Korean Math. Soc. **33** (1996), 625–638.
- (47) (with S. Choi) *The Classification of Real Projective Structures on compact surfaces*, Bull. Amer. Math. Soc. **34** (2) (1997), 161–170.
- (48) *Ergodic Theory on Moduli Spaces*, Ann. Math. **146** (1997), 1–33.
- (49) Review of “Geometry and Topology,” by G. Bredon, American Mathematical Monthly **05** (2) (1998), 192–194.
- (50) (with T. Drumm) *The Geometry of Crooked Planes*, Topology **38** (2) (1999), 323–351.
- (51) (with R. Benedetto) *The topology of the relative character variety of the quadruply-punctured sphere*, Experimental Mathematics (1999) **8:1**, 85–104.
- (52) “Complex Hyperbolic Geometry,” Oxford Mathematical Monographs, Oxford University Press xvii + 316 pp. + 58 illus. (1999).
- (53) Review of “Algorithmic and Computer Methods for Three-Manifolds” by A.T. Fomenko and S.V. Matveev. Society for Industrial and Applied Mathematics Review, **41-2** (1999), 15–17.
- (54) (with V. Charette) *Affine Schottky groups and crooked tilings*, Contemp. Math., Amer. Math. Soc. **262**, (2000), 69–98.

- (55) (with G. Margulis) *Flat Lorentz 3-manifolds and cocompact Fuchsian groups*, Contemp. Math., Amer. Math. Soc. **262**, (2000), 135–146. math.DG/0005292.
- (56) (with M. Kapovich and B. Leeb) *Complex hyperbolic manifolds homotopy-equivalent to a Riemann surface*, Comm. Geom. Anal. **9:1**, (2001), 61–96.
- (57) (with T. Drumm) *Isospectrality of flat Lorentz 3-manifolds*, J. Diff. Geo. **58:3** (2001), 457–466.
- (58) *The Margulis Invariant of Isometric Actions on Minkowski (2+1)-Space*, in “Ergodic Theory, Geometric Rigidity and Number Theory,” Springer-Verlag (2002), 149–164.
- (59) (with V. Charette, T. Drumm and M. Morrill) *Complete flat affine and Lorentzian manifolds*, Geom. Ded. **.97** (2003), 187–198.
- (60) *Action of the modular group on real  $SL(2)$ -characters of a one-holed torus*, Geometry and Topology **7** (2003), 443–486. mathDG/0305096.
- (61) *The complex symplectic geometry of  $SL(2, C)$ -characters over surfaces*, in “Proceedings of the International Conference on Algebraic Groups and Arithmetic: Mumbai 2001,” (S. Dani and G. Prasad, eds.) Tata Institute of Fundamental Research, Narosa Publishing House (distributed by American Mathematical Society) (2004), 375–407. math.DG/0304307.
- (62) (with V. Charette and C. Jones) *Recurrence of geodesics in flat Lorentz 3-manifolds*, Canadian Math. Bull. **47** (2004) no.3, 332–342
- (63) (with W. Neumann) *Homological action of the modular group on some cubic moduli spaces*,. Math. Res. Letters, **12**, Issue 4, (2005), 575–591. math.GT/0401257
- (64) (with S. Choi) *Real projective structures on 2-dimensional orbifolds*, American J. Math. **127** no. 5 (October 2005), 1019–1102. math.GT/0107193
- (65) (with O. Baues) *Is the deformation space of complete affine structures on the 2-torus smooth?*, ”Geometry and Dynamics”, J. Eels, E. Ghys, M. Lyubich, J. Palis and J. Seade (eds.), Proceedings of the Conference ”Geometria complejo et sistemas dinamicos,” commemorating the sixtieth birthday of Alberto Verjovsky, Cuernavaca, Mexico. Contemp. Math., Amer. Math. Soc. **389** (2006) 69–89 math.DG/0401257.

- (66) *Mapping Class Group Dynamics on Surface Group Representations*, “Problems on Mapping Class Groups and Related Topics”, B. Farb, ed., Proc. Symp. in Pure Math. **74**, American Mathematical Society (2006), 189 – 214 [math.GT/0509114](#).
- (67) *The Mapping Class Group acts reducibly on  $SU(n)$ -character varieties*, “Knots and Primes: Proceedings of the 2004 Japan-American Mathematics Institute, Johns Hopkins University,” *Contemp. Math.*, Amer. Math. Soc. **416** (2006), 115–119 [math.GT/0509115](#)
- (68) *What is a ... projective structure?* *Notices of the Amer. Math. Soc.* **54** (no. 1) (January 2007), 30–33.
- (69) (with R. Wentworth) *Energy of Twisted Harmonic Maps of Riemann Surfaces*, “In the Tradition of Ahlfors-Bers IV,” (May 19-22, 2005 , University of Michigan, Ann Arbor, Michigan) (Dick Canary, Jane Gilman, Juha Heinonen, Howard Masur, eds.) *Contemp. Math.*, Amer. Math. Soc. **432**, (2007) American Mathematical Society, 45-63 [math.DG/0506212](#),
- (70) *An ergodic action of the outer automorphism group of a free group*, *Geom. Func. Anal.* Vol. 17-3 (2007), 793-805 [math.DG/0506401](#)
- (71) (with K. Scannell, L. Andersson, T. Barbot, R. Benedetti, F. Bonsante, F. Labourie, J.-M. Schlenker) *Remarks on a paper of Mess*, *Geom. Ded.* .Vol. 126, No. 1 (2007), 47–70. [math.DG.0706.0640](#)
- (72) (with E. Xia) *Rank one Higgs bundles and fundamental groups of Riemann surfaces*, *Memoirs of the American Mathematical Society.* **193** (2008), no. 904. [math.DG/0402429](#)
- (73) (with T. Barbot, V. Charette, T. Drumm, and K. Melnick) *A Primer on the (2+1)-Einstein Universe*, in *Recent Developments in Pseudo-Riemannian Geometry*, (D. Alekseevsky, H. Baum, eds.) *Erwin Schrödinger Lectures in Mathematics and Physics*, European Mathematical Society (2008), 179–230 [math.DG.0706.3055](#).
- (74) *Higgs bundles and geometric structures on surfaces*, in *The Many Facets of Geometry: a Tribute to Nigel Hitchin*, O. García-Prada, J.P. Bourguignon, and S. Salamon (eds.), Oxford University Press, 129 – 163, [math.DG.0805.1793](#)
- (75) *Trace coordinates on Fricke spaces of some simple hyperbolic surfaces*, Chapter 15, pp. 611–684, of *Handbook of Teichmüller theory, vol. II* (A. Papadopoulos, ed.), IRMA Lectures in Mathematics and Theoretical Physics volume 13, European Mathematical Society (2008), [math.GM.0402103](#)).

- (76) (with F. Labourie and G. Margulis) *Proper affine actions and geodesic flows on hyperbolic surfaces*, *Annals of Mathematics* **170** (2009), 1051–1083. [math.DG/0406247](#).
- (77) (with E. Xia) *Ergodicity of mapping class group action on  $SU(2)$ -character varieties*, in “Geometry, Rigidity, and Group Actions”, University of Chicago Press (to appear) [GT:0901.1402](#)
- (78) (with V. Charette and T. Drumm) *Stretching three-holed spheres and the Margulis invariant*, ( in ”In the Tradition of Ahlfors-Bers, V. The Triennial Ahlfors-Bers Colloquium, May 8-11, 2008, Rutgers University, Newark New Jersey, M. Bonk, J. Gilman, H. Masur, Y. Minsky, and M. Wolf (eds.)) *Contemporary Mathematics* **510** (2009), 61–70.
- (79) *Locally homogeneous geometric manifolds*, Proceedings of the 2010 International Congress of Mathematicians, Hyderabad, India (2010), 717–744, Hindustan Book Agency, New Delhi, India
- (80) (with V. Charette and T. Drumm) *Affine deformations of the three-holed sphere*, *Geometry & Topology* **14** (2010), 1355-1382.
- (81) (with E. Xia) *Action of the Johnson-Torelli group on representation varieties*, *Proc. A. M. S.* (to appear)
- (82) (with G. McShane, G. Stantchev and S. Tan) *The modular group action on isometric actions on the hyperbolic plane*, (in preparation).
- (83) (with D. Toledo) *Affine cubic surfaces and the four-holed sphere* (in preparation).
- (84) (with G. Margulis and Y. Minsky) *Geodesic laminations on surfaces and proper affine actions on Minkowski  $(2+1)$ -space*, (in preparation).
- (85) *Projective Geometry on Manifolds*, book based on course notes from a course at the University of Maryland in 1988 (in preparation).
- (86) (with D. Cooper) *A 3-manifold with no real projective structure*, (in preparation).

### Doctoral Theses Advised

- Ser-Peow Tan, “Geometric structures and representations of surface groups into  $PSL(2, \mathbb{R})$ ” (UCLA, 1988, co-advised with J. Millson).
- Todd Drumm, “Fundamental polyhedra for Margulis spacetimes” (1990).
- Mark Phillips, “Dirichlet polyhedra in complex hyperbolic space” (1990).
- Robert Miner, “Affine manifolds with dilations” (1991).

- Bernhard Leeb, “3-manifolds with(out) metrics of nonpositive curvature” (1992).
- Shigeru Takamura, “Deformations of complex surfaces” (1994).
- Richard Brown, “Mapping class actions on the  $SU(2)$ -representation varieties of compact surfaces” (1996).
- Po-Hsun Hsieh, “Submanifolds of Kähler manifolds and their normal bundles” (1997).
- Eugene Z. Xia, “Moduli of flat  $PGL(2, \mathbb{R})$ -bundles on Riemann surfaces” (1997).
- Igor Belegradek, “Counting negatively curved manifolds” (1998).
- Hong Chan Kim, “The symplectic structure on the moduli space of real projective structures” (1999).
- Virginie Charette, “Proper actions of discrete groups on  $(2+1)$ -spacetime” (2000).
- Justin Wyss-Gallifent, “Complex hyperbolic triangle groups” (2000) (co-advised with R. Schwartz).
- Adam Sikora, “3-Manifolds, group actions, and character varieties” (2000).
- Ilya Kofman, “Vassilliev invariants of knots and links in  $S^3$  and other 3-manifolds” (2000).
- Lawrence Triplett, “Cyclic groups and complex hyperbolic space” (2001).
- George Stantchev, “Action of the modular group on  $PGL(2, \mathbb{R})$ -characters on a once-punctured torus” (2003).
- Cathy Jones, “Pyramids of properness: towards the properness conjecture” (2003).
- Sean Lawton, “ $SL(3, \mathbb{C})$ -Character Varieties and  $\mathbb{RP}^2$ -Structures on a Trinion” (2006).
- Elisha Peterson, “Trace Diagrams, Representations, and Low-Dimensional Topology” (2006).
- Taejung Kim, “An Investigation on Holomorphic Vector Bundles and Krichever-Lax Matrices Over An Algebraic Curve” (2007)
- Anton Lukyanenko, “Projective triangle groups,” (M.A. 2008)
- Robert Delgado “Density propoerties of Euler characteristic  $-2$  surface group  $PSL(2, \mathbb{R})$ -character varieties” (Ph.D. 2009)
- Ryan Hoban, “Local rigidity of triangle groups in  $Sp(4, \mathbb{R})$ ” (Ph.D. 2009)
- Jeffrey Frazier, advanced to candidacy March 13, 2009
- Andy Sanders, advanced to candidacy March 17, 2009
- Weiqiang Wu, advanced to candidacy May 13, 2009

- Domingo Ruiz, advanced to candidacy May 13, 2009
- Son Lam Ho, candidacy exam planned Fall 2010

**Other thesis committees:**

- Lisa Goldberg, Brandeis
- Bruno Klingler, Paris
- Ron Karidi, Tel-Aviv University
- Aristide Tsemo, Montpellier
- Oliver Baues (Habilitation), ETH Zürich
- François Salein, ENS Lyon
- Charles Frances, ENS Lyon
- Bruno Klingler (Habilitation), Paris.
- Olivier Guichard, Paris 2004
- Ying Zhang, National University, Singapore 2004
- Greg McShane (Habilitation), Toulouse 2005
- Daniel Virgil Mathews (M.Sc.), Melbourne 2005
- Julien Paupert, Paris 2005
- Panagiotis Konstantinou, Arizona 2006
- Peter Gothen, (Agregado), Porto 2007
- David Klein, Toronto 2008
- Krishnendu Gongopadhyay, Indian Institute of Technology, Mumbai 2008
- Reza Seyyadali, Johns Hopkins, 2009
- Ludovic Marquis, University of Paris Sud, 2009
- Frederic Palesi, Insitut Joseph Fourier, Grenoble, 2009
- Martin Deraux (Habilitation), Insitut Joseph Fourier, Grenoble, 2010.
- Tobias Hartnick, ETH Zürich 2010.

**Postdoctoral Sponsorship**

- Kevin Corlette (Fall 1988) (co-sponsor with John Millson)
- John Parker (1989–1992)
- Michael Kapovich (Fall 1991)
- Bruno Klingler (Winter 1995)
- Richard Schwartz (1995 - Summer 1996)
- Doug Bullock (1997-1998) (co-sponsor with John Millson)
- Hanna Sandler (NSF POWRE grant 1999)
- Kyeonghee Jo, 2004–2006.
- Karin Melnick, Summer 2006
- Kelly Delp (AWM fellowship, Summer 2009)
- Aaron Magid, (NSF 2009-2011)

**Selected invited lectures (since 1989)**

## 1989

- January, Geometry seminar, Oxford University
- February, Topology seminar, University of Warwick
- Colloquium, University of London
- March, Colloquium, University of Manchester
- Geometry seminar, Oxford University
- Colloquium, University of Southampton
- May, Geometry seminar, Institut Fourier, University of Grenoble
- Seminar, Institut des Hautes Études Scientifiques
- June, Séminaire A.Besse, École Polytechnique, Paris
- August, Special Session, “Dynamics and Moduli Space,” AMS Summer Meeting, Boulder, Colorado
- International Conference on Algebra, Novosibirsk, USSR
- Algebraic Geometry Seminar, Institute of Mathematics, Siberian branch of USSR Academy of Sciences, Novosibirsk, USSR
- September, Seminar Talk, Reinhart Memorial conference, Geometry Special Year, University of Maryland
- Colloquium, University of Toronto, Toronto, Canada
- October, Special Session, “Low-dimensional topology,” AMS Regional Meeting, Hoboken, NJ
- December, Miniconference, Ohio State University, Columbus, OH
- Colloquium and Geometry Seminar, Rice University

## 1990

- January, Workshop, University of Utah
- February, Geometry Seminar and Complex Analysis Seminars, SUNY at Stony Brook
- May, Séminaire d’invariant de Casson, Universität Bern, Switzerland
- June, Colloquium, Tokyo Institute of Technology, Tokyo, Japan
- Principal Speaker, Workshop in “Geometric structures and representation spaces,” Kyoto, Japan (two lectures)
- Colloquium, Osaka University, Japan
- Colloquium, Kumamoto University, Japan
- Colloquium and Topology seminar (3 lectures), Seoul National University, Korea
- October, Invited One-hour address, AMS meeting, Amherst, Massachusetts
- December, Conference on Complex Geometry, Commemoration of Fiftieth anniversary of Osaka University, Japan

- Conference on CR Structures, Kumamoto University, Japan

1991

- January, Conference on “Representations of fundamental groups,” University of Chicago
- Colloquium, Northern Illinois University, De Kalb, Illinois
- March, Conference on “Bundles in complex differential geometry,” Idaho State University, Pocatello, Idaho
- UMIACS Seminar on Computational Geometry and Computer Graphics
- Summer, Lectured (with computer demonstration) to Undergraduates and High-School Teachers, Regional Geometry Institute, Park City, UT
- September, Colloquium, University of Connecticut
- Valley Geometry Seminar, Amherst, MA
- October, Colloquium, American University, Washington, DC

1992

- Special Session on “Complex analysis and symplectic topology,” AMS Annual Meeting, Baltimore, MD
- Conference on “Flat connections and their applications,” Tulane University
- Seminaire A.Besse, École Polytechnique, Paris
- Colloque de Géométrie et Topologie, Université de Paris, Orsay, France
- Colloque de Géométrie et Topologie, Université Paul Sabatier, Toulouse, France (two lectures)
- Relativity Seminar, Physics Department, University of Maryland
- Invited Speaker, Cornell Topology Festival
- Workshop on “Visualization of Geometric Structures,” MSRI, Berkeley
- Colloquium, University of Washington, Seattle

1993

- Special Session, “Low-dimensional topology,” AMS regional meeting, Howard University, Washington DC
- Topology conference, University of Pennsylvania
- Differentialgeometrie im Großen, Oberwolfach, Germany
- Conference in hyperbolic geometry, University of Warwick, England
- Geometry Seminar, Oxford University, England

- Special session of joint AMS-DMV meeting, Heidelberg, “Visualization in geometry and topology” (invited but declined)
- Geometry Seminar, University of Toronto
- Colloquium, University of Kentucky
- December, “Geometries in Interaction,” Tel-Aviv University

## 1994

- Colloquium, Rutgers University, Newark
- Topology Seminar, Princeton University
- Topology Seminar, Institute for Advanced Study
- TGRC Workshop, Kyungpook National University, Taegu, Korea
- KOSEF Workshop, Korea National University of Education, Ch’onju, Korea
- Seminar, Okayama University, Okayama, Japan
- Special session, “Complex hyperbolic geometry and discrete groups, AMS regional meeting, Stillwater Oklahoma
- Workshop, “Applications of symplectic geometry,” Newton Institute, Cambridge University, England

## 1995

- Geometric analysis seminar, University of Minnesota
- Ontario Topology Seminar, Montreal, Quebec
- 4-week course, “Geometria differenziale,” University of Perugia, Perugia, Italy
- Special sessions, “Locally Symmetric Spaces,” and “Cohomology of groups,” AMS regional meeting, Boston, Massachusetts (invited)

## 1996

- Geometry Seminar, University of Pennsylvania
- “Visualizing geometry,” Rutgers University, Camden, New Jersey
- Valley Geometry Seminar, University of Massachusetts, University of Massachusetts, Amherst, Amherst
- GANG Seminar, University of Massachusetts, University of Massachusetts, Amherst, Massachusetts
- Special Session, “Hyperbolic Geometry,” AMS regional meeting, Courant Institute, New York City
- Midwest Geometry Conference, Norman, Oklahoma
- Conference on “Geometry, Physics and Harmonic maps,” Campinas, Brazil

- Special session, “Holomorphic vector bundles with or without additional structure,” AMS regional meeting, Lawrenceville, New Jersey
- Conference on “Crystallographic groups and their generalizations,” Kortrijk, Belgium
- ‘Knots in Washington’ conference, George Washington University.

## 1997

- “Moduli Spaces in Geometry and Physics”, Institute of Fundamental Theory, Gainesville, Florida.
- Colloquium, Rutgers University (New Brunswick, NJ).
- AMS regional meeting, College Park.
- Special session, “Noneuclidean and spacetime geometries”, AMS regional meeting, Montreal.

## 1998

- Colloquium, University of Arizona (2 lectures).
- Colloquium, University of Mainz.
- Round Table on “Pseudo-Riemannian Geometry”, Nancy, France.
- Conference on “Rigidity, Ergodic Theory, and Geometry,” Paris.
- Topology Conference, Athens, Georgia.
- Special Session on “Complexity of Geometric Structures,” AMS meeting, Chicago (invited but declined).
- Colloquium, McMaster University.
- Plenary Address, Annual Meeting of Canadian Mathematical Society, Kingston, Ontario.
- Special Session, “Differential Geometry,” Annual Meeting of Canadian Mathematical Society.

## 1999

- Analysis Seminar, Columbia University.
- Special session on “Diophantine Problems,” Regional A.M.S. Meeting, Las Vegas, Nevada.
- Special session on “Integrable Systems,” Regional A.M.S. Meeting, Buffalo, New York.
- Special session on “Complex Geometry,” Regional A.M.S. Meeting, Buffalo, New York.
- Lecture, “The Art of Mathematics,” Yellow Barn Art Gallery, Glen Echo, Maryland.
- “Crystallographic Groups and their Generalizations II,” Kortrijk, Belgium.

- A.M.S. Summer Institute “From manifolds to singular varieties,” Boulder, Colorado.
- Topology seminar, Microsoft Research.

## 2000

- Colloquium, University of Maryland.
- March, Colloquium, University of Durham.
- Seminar, University of Edinburgh.
- EURO-Workshop, “Rigidity in Dynamics and Geometry,” Programme in Ergodic Theory, Rigidity and Number Theory, Newton Institute, Cambridge.
- April, Seminar, Warwick University.
- Seminar, Johns Hopkins University.
- June, Plenary Address, Lehigh Geometry Conference

## 2001

- February, Lecture Series (Dynamics and group actions Special Colloquium, Lie groups Seminar), Yale University.
- April, Seminar, University of California San Diego.
- Seminar, University of Southern California.
- Seminar, Caltech.
- Colloquium, Rutgers University.
- May, Case Lecturer, Saint Louis University.
- Plenary Speaker, “Knots in Washington” conference, George Washington University.
- July, Special Session “Differential Geometric Methods in Mathematical Physics,” joint meeting of AMS/SMF Lyon, France.
- September, Departmental Colloquium and Differential Geometry Seminar, University of Utah.
- October, Algebraic Geometry Seminar, Duke University.
- November, String Theory seminar, Department of Physics
- Differential Geometry Seminar, Oxford University.
- 3-lecture minicourse in Seminaire Sud-Rhodanien, “Géométrie des Espaces Homogènes”, CIRM, Luminy, France.
- December, International Conference “Discrete groups, Geometry and Arithmetic” in honor of the sixtieth birthday of M.S. Raghunathan, Tata Institute of Fundamental Research, Bombay, India.

## 2002

- Topology Seminar, Columbia University.
- Department Colloquium, University of Virginia.
- Geometry Seminar, University of Illinois at Chicago.

- Topology/Geometry Seminar, University of Chicago.
- Department Colloquium, University of California, Santa Cruz.
- MSRI workshop “Nonabelian Hodge Theory”.
- Department Colloquium, Stanford University.
- Seminar, Johns Hopkins University.
- Geometric Analysis Seminar, Princeton University.
- “Geometry and Dynamics of Groups”, CIRM, Luminy
- 3-lecture minicourse and lecture in conference, European Differential Geometry Endeavor in Edinburgh, Scotland (23 July – 2 August 2002).

## 2003

- Plenary speaker, International Conference on “Complex Geometry and Dynamical Systems,” commemorating the 60th birthday conference of Alberto Verjovsky, (January 6-10) Cuernavaca.
- Japan-Amer. Math. Inst., “Knots and Primes,” Johns Hopkins
- Seminar, University of Chicago (March 13)
- Seminar, University of Illinois at Chicago. (March 14)
- Colloquium, George Mason University. (March 28)
- AMS Special Session, “Rigidity in geometry and group theory,” AMS regional meeting, Courant Institute, New York. (April 13)
- Organizer and Plenary Speaker, Knots in Washington XVI (May 6)
- Seminar, Instituto de Matematicas y Fisica Fundamenta, Madrid. (May 15).
- AMS Special Session, “Moduli spaces in geometry and physics,” joint AMS-RSME meeting, Sevilla. (June 21)
- Geometry/Dynamics seminar, École Normale Supérieure de Lyon. (June 23)
- July, Plenary speaker, “Vector bundles in Algebraic Geometry,” Porto, Portugal.
- Plenary Speaker, Knots in Washington XVII (December 21)

## 2004

- Keynote speaker, “Physics and Mathematics of the large N (Planar) Limit in Gauge Theory,” conference at Centre de Recherches Mathématiques, Montreal. (January 8)
- Colloquium, Rice University, (January 22)
- Colloquium, American University, (January 28)
- Colloquium, Northwestern University, (March 10)
- Geometry Seminar, University of Chicago, (March 11)
- Geometry Seminar, University of Chicago, (May 4)

- Co-organizer with V. Charette and T. Drumm, “New techniques in Lorentz manifolds,” Banff International. Research Station.

2005

- AMS Special Session, “Dynamics of Mapping Class Group Actions on Moduli Spaces” (40-minute survey talk) Atlanta
- “Geometric structures on low-dimensional manifolds and their deformation spaces,” Minicourse, Cuernavaca
- Plenary speaker, “Bounded Cohomology, Harmonic Maps and Higgs Bundles,” Strasbourg and Basel.
- Colloquium, Morgan State University
- Colloquium, Wesleyan University
- Plenary speaker (and co-organizer), “Discrete Groups and Geometric Structures, with Applications” Oostende, Belgium
- Minicourse, “Geometric structures on low-dimensional manifolds and their deformation spaces”, Lisbon Geometry Lectures
- Workshop on “Lorentzian Geometry,” ENS de Lyon
- “Higgs bundles and vector bundles on curves,” Madrid
- Colloquium, University of Illinois, Champaign-Urbana
- Crash course, “Mapping Class Group Dynamics on Character Varieties”, University of Chicago
- “Pseudo-Riemannian Geometry”, Schrödinger Institute, Vienna
- “Mathematical aspects of general relativity”, Newton Institute
- Colloquium, Columbia University

2006

- Topology seminar, University of Texas
- Colloquium, Brown University
- Colloquium, Pennsylvania State University
- “Lie Groups: Dynamics, Rigidity, Arithmetic”, Conference to honor Gregory Margulis’s 60th birthday, Yale University
- Topology Seminar, University of Wisconsin
- Co-organizer and speaker, “Complex Geometry,” Conference to honor Domingo Toledo’s 60th birthday, Utah
- Principal Speaker, “Current Developments in Geometric Topology,” Barrett Lectures, University of Tennessee
- “Teichmüller Spaces: Classical and Quantum,” Oberwolfach
- Invited speaker, Geometry Conference, to honour Nigel Hitchin’s 60th birthday, Madrid
- Pacific Northwest Geometry Seminar, Portland State Univ.

2007

- Seminar, Instituto Scientifica Tecnica., Lisbon

- Seminar, University of Porto
- Panelist (representing AMS), “What are the implications of the new curriculum recommendations for post-secondary education and employment?”, conference on “K-12 Mathematics Curriculum Standards: What Should Students Learn and When Should They Learn It?”, Center for the Study of Mathematics Curriculum (CSMC) (<http://cltnet.org/cltnet/misc/csmcmath07/>), Arlington, Virginia
- Dynamics and Geometry Seminars, Yale University
- Geometry Seminar, Colloquium, Univ. of Georgia
- Graduate Topology Seminar, Georgia Tech
- Workshop, “Representations of surface groups”, American Institute of Mathematics, co-organizer with Steven Bradlow, Oscar García-Prada and Anna Wienhard
- 28th William J. Spencer Lecture, Kansas State Univ.
- Geometry Seminar, University of Illinois, Chicago
- Conference to honor Bill Thurston’s 60th birthday, Princeton University
- Plenary speaker (two lectures), 7th KAIST Geometric Topology Fair, Gyeongju, Korea
- Cluster Algebras Seminar, Université de Sherbrooke
- Colloque, Centre de Recherches Mathématiques, Montréal
- Distinguished Scholar-Teacher Public Lecture, “Playing pool on curved surfaces and the wrong way to add fractions”
- Seminar, “Teichmüller theory and Kleinian groups” program, Mathematical Sciences Research Institute

## 2008

- Co-organizer, Special Session, “Conformally flat Lorentzian Manifolds,” Joint Mathematics Meetings, San Diego, January 7
- Department Colloquium and Lunch Seminar, Princeton University, February 6
- Seminar organizer and primary speaker, “Mapping class group dynamics on moduli spaces,” Princeton University Mathematics Department (met weekly all Spring semester)
- After Hours Conversations, “Equilateral Triangles”, Harry’s Bar, Institute for Advanced Study, March 3
- Co-organizer and speaker, “Lie Theory, Geometry and Discrete Groups,” Conference to honor John Millson’s 62nd birthday University of Maryland, March 20–23
- Department Colloquium, Yale University, April 6

- Plenary Speaker (and workshop co-organizer), Fourth Ahlfors-Bers Colloquium, Rutgers University, Newark, May 8-11
- Plenary Speaker, “Group-theoretic Methods in the Study of Algebraic Varieties,” Conference to Celebrate Friedrich Hirzebruch’s 80th Birthday, Bar-Ilan University, Israel May 18 – 25
- Scientific Committee, “Crystallographic Groups and Geometric Structures”, Kortrijk, Belgium, May 26-30
- Lecture series in “Geometry and dynamics of groups” activity, École Polytechnique, Paris, June 2–3.
- Conference on Algebraic and Geometric Topology, Gdansk, Poland, June 9-13
- Symplectic Geometry seminar, University of Toronto, August
- Co-organizer and speaker, “Representations of surface groups,” workshop, CIRM Luminy, September

## 2009

- Special Session, “Geometry, Algebra, and Topology of Character Varieties ,” AMS Annual Meeting, Washington DC
- Colloquium, National University of Singapore January 21.
- Conference on “Dynamics of  $\text{Aut}(\mathbb{F}_n)$ -actions on representation varieties”, Sde-Boker, Israel, January 6-11 (invited but declined)
- Colloquium, Howard University, February 6.
- Complex Analysis and Dynamics Seminar, Graduate Center CUNY, New York City, March 4
- Research Seminar, Northeastern University, March 10
- Department Colloquium, University of Tennessee, March 20
- Invited Address, Mathematical Association of America University of Mary Washington, Fredericksburg, Virginia April 17-18.
- “Group theory, number theory and geometry,” conference in honor of Fritz Grunewald on his sixtieth birthday, Oxford, 30 March - 3 April (invited but declined)
- Geometry Seminar, University of Paris Sud (Orsay) May 28
- “From braid groups to Teichmüller spaces”, Luminy workshop, 1 - 5 June
- Department Colloquium and Seminar, Université de Rennes , 6 - 11 June
- “Encounters between mathematicians and theoretical physics” Strasbourg, 11 -13 June.
- NSF-CBMS Conference, Central Connecticut State University, July 23, 2009, Families of Riemann Surfaces and Weil-Petersson Geometry (Scott Wolpert, principal speaker)
- Seminar, Princeton University, September 20

- Colloquium, Temple University, September 21
- “What is...” seminar, University of Michigan, October 13
- Colloquium, University of Michigan, October 13
- November 16 - 21 “Computational Differential Geometry, Topology, and Dynamics” workshop in thematic program “Foundations of Computational Mathematics” Fields Institute, Toronto. (invited but declined)
- December 16- 20, Special Session “Geometric structures and Geometric group theory” of joint AMS-KMS meeting, Seoul, and possible workshop. (invited but declined)

## 2010

- Miniconference, “Geometric structures in 2 and 3 dimensions,” Autrans, France, January 17-22
- Miniconference, “Conformally flat Lorentz manifolds,” Princeton University, February 17–19 (co-organizer and speaker)
- Colloquium, University of Maryland, February 26
- Geometry Seminar, University of München, March 22
- Invited Speaker, Second Killing-Weierstrass Colloquium, Braniewo, Poland, March 24-26.
- Colloquium, University of Illinois, Chicago, April 23
- Co-organizer (with A. Reid, R. Canary and S. Boyer), Character Varieties in the Geometry and Topology of Low-dimensional Manifolds, BIRS, Banff April 25-30.
- Teichmüller theory and its interactions with Mathematics and Physics, Barcelona, June 28- July 3.
- Co-organizer (with J. Seade, S. Cantat and N. Gusevskii) and lecturer, Advanced School and Workshop on Discrete Groups in Complex Geometry, ICTP, Trieste, Italy, 28 June - 16 July
- Co-organizer (with Ser-Peow Tan and Caroline Series), Geometry, Topology and Dynamics of Character Varieties, Institute of Mathematical Sciences, National University of Singapore July 17– August 17, speaker in Conference
- Invited Speaker, Geometry Section, International Congress of Mathematicians, Hyderabad, August 19-27
- Chair, Organizing committee, “Geometry and analysis on moduli of Riemann surfaces,” symposium in honor of Scott Wolpert, University of Maryland, September 22-24
- Colloque sur Représentations et les Surfaces, Université de Sherbrooke, October 2010.
- Workshop, Oberwolfach, December 2010 (invited but declined)

## 2011

- Colloquium, Rice University, January 2011.
- BIRS Workshop, “Frontiers in Complex Dynamics” (Celebrating John Milnor’s 80th birthday), Sunday, February 20 to Friday, February 25, 2011.
- Scientific Committee, 14 - 18 March 2011 Representations of Surface Groups and Higgs Bundles (A Satellite Meeting at the University of Oxford), part of Newton Institute semester-long activity on “Moduli Spaces”
- Workshop, Oberwolfach
- London Mathematical Society Durham Symposium (July 4-14). GEOMETRY AND ARITHMETIC OF LATTICES
- Plenary Speaker, Symposium in honor of Caroline Series, University of Warwick

### **Grants and Awards**

- University of Maryland Distinguished Scholar-Teacher
- Faculty Mentor (for Rachel Kirsch), Philip Merrill Presidential Scholars Program 2009-2010
- NSF Research Grants 1981–present  
Most recent award: DMS070781 (5-year award)
- NSF Travel grant for US participants at CIRM conference, “Representations of surface groups,” September 1-5 2008.
- NSF Travel grant for US participants at 2010 ICTP conference on “Complex geometry...”, Trieste, Italy.
- NSF Travel grant for US participants for 2010 IMS conference on “Geometry, topology and dynamics of character varieties,” Singapore.
- NSF Postdoctoral Fellowship 1980–81
- NSF Graduate Fellowship 1977–80
- MSRI Postdoctoral Fellowship, 1984–1985
- Alfred P.Sloan Foundation Fellow 1987–89
- SERC Visiting Fellowship, Oxford University (sponsored by Professor S. K. Donaldson)
- Supplemental NSF grant to bring Michael Kapovich to Mathematics Department, 1991–1992
- Supplemental NSF grant to bring Simon Donaldson to Mathematics Department, 1992–1993
- University of Maryland Semester Research Awards, Fall 1998, Fall 2005.
- Principal Investigator, departmental NSF grant for computer equipment (SCREMS), 1986

- Co-Principal Investigator (with H.Glaz), NSF (SCREMS) grant for computer equipment for Mathematics Department, 1990
- Co-Principal Investigator (with H.Glaz), NSF (SCREMS) grant for computer equipment for Mathematics Department, 1992
- Co-Principal Investigator (with H.Glaz), GRB grant for computer equipment for Mathematics Department, 1994

### Service

- Director/co-founder, Experimental Geometry Lab (2000–).
- Editor-in-chief, *Geometriae Dedicata* (2003–). (editorial board since 1999)
- Advisory Board, Mathematics Research Communities, American Mathematical Society, February 2010–January 2013
- Selection Committee, 2009 Distinguished Scholar-Teachers
- Selection Committee, Kirwan Award for Undergraduate Teaching, University of Maryland 2009
- Member-At-Large, AMS Council (2006–2009).
- AMS Committee on Education (2006–2009).
- Principal Investigator, Maryland VIGRE program (2004–2010).
- Chair, External Review Committee, Department of Mathematics and Institute of Mathematical Sciences, Stony Brook University, March 2006.
- Review Committee for VIGRE program, University of Wisconsin, March 2006.
- Scientific Committee, Ahlfors-Bers Colloquium 2011
- Scientific Committee, Summer School/Workshops/Conference, Institute of Mathematics, National University of Singapore, Summer 2010
- Co-director, School and Conference on Discrete Groups in Complex Geometry and Dynamics, ICTP, Trieste, June 28– July 14, 2010 (also presented a course of 5 75-minute lectures in the Summer School)
- Co-organizer, BIRS workshop Geometry of Character Varieties, Banff, May 2011
- Co-organizer, Workshop on Surface Group Representations, Isaac Newton Institute, Spring 2012
- Advisory Board, Ramanujan Math. Soc. Lecture Notes Series
- Managing Editor, *Transformation Groups* (2000-2002), Editorial Board (2002–present).
- Panelist, Project NeXT panel discussion on Graduate Education, Joint Mathematics Meetings, January 2007.
- Search Committee, Mathematics Department Chair (2006-2007)

- Board of Governors, Geometry Center, University of Minnesota, 1994–1996.
- NSF panels for research grants, 2003, 2005, 2006, 2008, 2009
- Selection Panel for NSF Graduate Fellowships, 2005
- Selection Panel for NSF Postdoctoral Fellowships, 2009, 2010
- Selection Panel for NSF Special Meetings, 2009
- Organizer, Reception at JMM for “University of Maryland Mathematics Department Alumni and Friends”, 2007, 2008, 2009.
- US Observer for European Science Foundation Research Networking Program, “Interactions of Low-Dimensional Topology and Geometry with Mathematical Physics”