

**DANIEL S. FREED  
CURRICULUM VITA**

**PERSONAL DATA**

Born:	April 17, 1959	Address:	Department of Mathematics
Citizenship:	U.S. Citizen		University of Texas at Austin
			Austin, TX 78712-1082
			(512) 471-7136
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**EDUCATION**

Ph.D.	University of California, Berkeley (Advisor: I. M. Singer)	1985
M.A.	Harvard University	1981
B.A.	Harvard University (summa cum laude)	1981

**PROFESSIONAL EXPERIENCE**

2013–	Mildred Caldwell and Baine Perkins Kerr Centennial Professor, UT Austin
Fall 2017	Poincaré Distinguished Visiting Professor of Mathematics, Stanford University
2016–2018	Distinguished Visiting Research Chair, Perimeter Institute
Spring 2015	IBM Einstein Fellow, Institute for Advanced Study, Princeton
Fall 2014	Visiting Professor of Mathematics, Harvard University
Spring 2014	Member, Mathematical Sciences Research Institute
1994–2013	Professor, University of Texas at Austin
Spring 2012	Visitor, Simons Center for Geometry and Physics
1996–1998	Member, Institute for Advanced Study, Princeton
Été '95, '99	Visitor, Institut des Hautes Etudes Scientifiques
Fall '92, '93	Visitor, Geometry Center, Minneapolis
1989–1994	Associate Professor, University of Texas at Austin
1987–1989	NSF Postdoctoral Fellow and Assistant Professor, University of Chicago
1985–1987	NSF Postdoctoral Fellow and Moore Instructor, MIT

**HONORS AND PRIZES**

2014	Senior Berwick Prize, London Mathematical Society
2014–2015	Simons Fellow in Mathematics
2012	Inaugural Fellow of the American Mathematical Society
2005–2007	Cook Professorship in Mathematics
2002–2003	Guggenheim Fellow
2002	Invited speaker, International Congress of Mathematicians
2002	College of Natural Sciences Outreach Award
1990–1996	NSF Presidential Young Investigator Award
1988–1992	Alfred P. Sloan Research Fellowship

**GRANTS**

2007–2017	PI, NSF Research Training Grant
2012–2016	PI, NSF Focused Research Group
1988–2019	NSF Individual Research Grant

1990–1996	O'Donnell Foundation Grant
1985–1988	NSF Postdoctoral Fellowship in Mathematics
1981–1984	NSF Graduate Fellowship

## PROFESSIONAL SERVICE

### Institutes

2015–20	General Member, Aspen Center for Physics, Aspen, Colorado
2006–19	Board of Trustees, Mathematical Sciences Research Institute, Berkeley, California
2010–20	Scientific Advisory Committee, Simons Center for Geometry and Physics, Stony Brook, New York
2005–08	Scientific Advisory Board, Banff International Research Station, Banff, Alberta
2002–06	Scientific Advisory Committee, Mathematical Sciences Research Institute, Berkeley, California
1990–99	Cofounder and Steering Committee, IAS/Park City Mathematics Institute

### International Committees

2010–	Steering Committee, Strings-Math biennial conferences
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### National Committees

2015–2017	American Mathematical Society Committee on Science Policy
2014–2016	American Mathematical Society Central Section Program Committee
2012–2014	American Mathematical Society Special Program Committee
2012	Simons Foundation Review Advisory Panel
2004–2006	American Mathematical Society Committee on Steele Prizes
1998–2001	American Mathematical Society National Program Committee (chair in third year)
1995	American Mathematical Society Task Force on Electronic Journals

### Conferences Organized

- Co-organizer, “QFT and Invariants of Manifolds, IAS/Park City Mathematics Institute, June–July, 2019.
- Co-organizer, “Mathematics of Topological Phases of Matter”, Simons Center for Geometry and Physics, May–June, 2017.
- Co-organizer, “Boundaries and Defects in Quantum Field Theories”, Aspen Center for Physics, July, 2016.
- Co-organizer, “Symmetry and Topology in Quantum Matter”, Institute for Pure and Applied Mathematics, Los Angeles, Winter, 2015.
- Main scientific organizer, “West Coast Algebraic Topology Summer School”, Pacific Institute for the Mathematical Sciences, Vancouver, July, 2014.
- Co-organizer, “Mathematics of Superconformal Field Theory”, Aspen Center for Physics, July, 2013.
- Co-organizer, “Algebraic Topology, Field Theory and Strings”, Simons Center for Geometry and Physics, Stony Brook, May, 2012.
- Co-organizer, “Supersymmetric Field Theories and their Implications”, graduate student winter school, Simons Center for Geometry and Physics, Stony Brook, March, 2012.
- Co-organizer, “Workshop on Differential Cohomology”, Simons Center for Geometry and Physics, Stony Brook, January, 2011.
- Co-organizer, “New Mathematical Methods in Quantum Gauge Theories”, Aspen Center for Physics, July, 2010.

- Co-organizer, “Hodge Theoretic Reflections on the String Landscape”, International Centre for Mathematical Sciences, Edinburgh, Scotland, June, 2010.
- Co-organizer, “Geometry, Quantum Fields and Strings: Categorical Aspects”, Oberwolfach, Germany, June, 2010.
- Co-organizer, “String Theory and Quantum Geometry”, Aspen Center for Physics, July, 2007.
- Co-organizer, “Twisted  $K$ -Theory”, Arbeitsgemeinschaft, Oberwolfach, Germany, October, 2006.
- Co-organizer, Texas Geometry and Topology Conference, Austin, Texas, October, 2005.
- Co-organizer, “Strings, Branes and Superpotentials”, Aspen Center for Physics, July–August, 2004.
- Co-organizer, “Workshop on Symplectic Geometry and Mathematical Physics”, Mathematical Sciences Research Institute, March, 2004.
- Co-organizer, “Workshop on Geometry and String Theory”, Institute for Theoretical Physics, Santa Barbara, July, 2003.
- Co-organizer, “Karenfest”, Texas Geometry and Topology Conference in honor of Karen Uhlenbeck’s 60th birthday, University of Texas at Austin, October, 2002.
- Co-organizer, “Workshop on Infinite-dimensional Algebras, Conformal Field Theory and Supersymmetry”, Mathematical Sciences Research Institute, April, 2002.
- Co-organizer, Graduate Summer School and Research Program on “Quantum Field Theory, Supersymmetry, and Enumerative Geometry”, IAS/Park City Mathematics Institute, July, 2001.
- Co-organizer, Special Session on “Recent Developments in Index Theory”, Central Sectional Meeting of AMS, Austin, October, 1999.
- Organizing Committee for Summer School on Geometry and Theoretical Physics, Institute for Theoretical Physics, Santa Barbara, July, 1999.
- Co-organizer, Texas Geometry and Topology Conference, Austin, Texas, October, 1998.
- Organizing Committee for Workshop on Duality in Mathematics and Physics, Aspen Center for Physics, July, 1996.
- Co-organizer, Special Session on “Geometry, Topology, and Quantum Field Theory”, Eastern sectional meeting of AMS, Boston, October, 1995.
- Co-organizer, Texas Geometry and Topology Conference, Austin, Texas, April, 1994.
- Co-organizer, Texas Geometry and Topology Conference, Austin, Texas, October, 1991.
- Chairman, Organizing Committee for Workshop on Mathematical Ideas Arising from Conformal Field Theory, held at the Aspen Center for Physics, 1989.
- Member, Organizing Committee for AMS Joint Summer Research Conference on Elliptic Cohomology, Brunswick, Maine, 1988.
- Chairman, Organizing Committee for Workshop on Differential Geometry, held at the Aspen Center for Physics, 1987.

### Editor

- Editor of *Graduate Studies in Mathematics* (American Mathematical Society).
- Associate Editor for *AMS Bulletin* articles.
- Editor of *Gokova Geometry/Topology Journal*.
- Editor of *Advances in Mathematics*, 2000–2016.
- Editor of *Communications in Contemporary Mathematics*, 1998–2013.
- Editor of *Park City Mathematics Series*, publications of the IAS/Park City Mathematics Institute, 1993–1999.
- Associate Editor for Research Announcements in *Bulletin of American Mathematical Society*, 1992–1994.

### CONFERENCE LECTURES AND LECTURE SERIES

- Invited speaker at “CMI-LMS Research School: Algebraic Topology of Manifolds”, Oxford, September, 2017.

- Invited speaker at “International Conference on Applied Algebraic Topology”, Hokkaido University, Sapporo, Japan, August, 2017.
- Principal speaker (10 lectures) at “Topological and Geometric Methods in QFT”, NSF-CBMS Conference, Montana State University, August, 2017.
- Invited speaker at “Arbeitstagung” in honor of Yuri Manin, Max Planck Institute, Bonn, Germany, June, 2017.
- Invited speaker at “Topology Festival”, Cornell University, Ithica, New York, May, 2017.
- Invited speaker at “Quantum Entanglement”, Simons Symposium, Schloss Elmau, Germany, May, 2017.
- Invited speaker at “JDG 2017” Conference on Geometry and Topology, Harvard University, Cambridge, April, 2017.
- Alexander Zabrodsky Memorial Lectures (3 lectures), Hebrew University, Jerusalem, November, 2016.
- Invited speaker at “Topological quantum matter”, Kavli Institute for Theoretical Physics, Santa Barbara, October, 2016.
- Invited speaker at “Simons Summer Workshop in Mathematics and Physics”, Simons Center for Geometry and Physics, Stony Brook, July, 2016.
- Invited speaker at “Condensed Matter Physics and Topological Field Theory”, Perimeter Institute, Waterloo, October, 2015.
- Invited speaker at “Algebraic Topology: Manifolds Unlocking Higher Structures”, Clay Mathematical Institute, Oxford, September, 2015.
- Plenary speaker at “Topology and Geometry Conference in Bonn”, Hausdorff Research Institute for Mathematics, Bonn, August, 2015.
- Invited speaker at “Geometric Unification from Six-Dimensional Physics”, Banff International Research Station, Banff, May, 2015.
- Invited speaker at “Berkeley Math-Physics Meeting”, Berkeley, April, 2015.
- Invited speaker at “Stratified Spaces in Geometric and Computational Topology and Physics”, Madison, March, 2015.
- Invited speaker at “Topology and Mathematics in Condensed Matter Physics”, Harvard University, Cambridge, September, 2014.
- Invited speaker at “Analysis and Topology in Interaction”, Cortona, June, 2014.
- Invited speaker at “Noncommutative Geometry Festival (in honor of Henri Moscovici)”, Texas A&M University, April, 2014.
- Invited speaker at “Topological Materials”, Tsinghua Sanya International Mathematics Forum, December, 2013.
- Speaker at “Strings-Math 2013”, Simons Center for Geometry and Physics, Stony Brook, June, 2013.
- Keynote speaker at “Graduate Student Geometry and Topology Conference”, Notre Dame, April, 2013.
- Invited speaker at “Aspects of Topology in Geometry and Physics (in honor of Graeme Segal)”, Oxford, December, 2012.
- Plenary speaker at “Algebraic Topology: Applications and New Directions”, Stanford Symposium, July, 2012.
- Invited speaker at “Conference on Geometry and Quantization of Moduli Spaces”, CRM, Barcelona, June, 2012.
- Invited speaker (short course + research lecture) at “Workshop on  $K$ -Theory and Quantum Field Theory”, Erwin Schrodinger Institute, Vienna, June, 2012.
- Invited speaker at “Current Events Bulletin”, Special Session at Joint Mathematics Meeting, Boston, January, 2012.

- Invited speaker at “Shanks Workshop: Subfactors, Fusion Categories, Planar Algebras and Random Matrices”, Vanderbilt University, Nashville, October, 2011.
- Invited speaker at “Strings-Math 2011”, University of Pennsylvania, June, 2011.
- Invited speaker at 60th birthday conference for Michael Freedman, Station Q, Santa Barbara, April, 2011.
- Invited speaker at “Workshop on Differential Cohomology” (3 lectures), Simons Center for Geometry and Physics, Stony Brook, January, 2011.
- IGA lecturer (10 lectures), University of Adelaide, Australia, October, 2010.
- Eisenbud lecture series (3 lectures), Brandeis University, Boston, April, 2010.
- Kempf lecture series (2 lectures), Johns Hopkins University, Baltimore, March, 2010.
- Invited speaker at “Midwest conference on topology and physics”, Ann Arbor, February, 2010.
- Invited speaker at “Mathematical Methods in General Relativity and Quantum Field Theories”, Paris, November, 2009.
- Invited speaker at “Strings, Fields and Topology”, Oberwolfach, Germany, June, 2009.
- Invited speaker at “Topological Field Theory”, Northwestern University, Evanston, May, 2009.
- Invited speaker at “Topology,  $C^*$ -algebras, and String Duality”, Texas Christian University, Fort Worth, May, 2009.
- Invited speaker at “Gauge theory and Langlands duality”, Kavli Institute for Theoretical Physics, Santa Barbara, July, 2008.
- Invited speaker at “Geometry and Physics: Special Metrics and Supersymmetry”, Bilbao, Spain, May, 2008.
- Invited speaker at “Geometry and Physics”, Hausdorff Research Institute for Mathematics, Bonn, Germany, May, 2008.
- Invited speaker at “The Mathematical Sciences from the 20th to the 21st Century”, a celebration of the 25th anniversary of the Mathematical Sciences Research Institute, Berkeley, California, January, 2008.
- Invited speaker at “Texas Geometry and Topology Conference”, College Station, Texas, October, 2007.
- Invited plenary speaker at “Abel Symposium in Algebraic Topology”, Oslo, Norway, August, 2007.
- Invited speaker at “Maxwell Institute Colloquium on Conformal Field Theory and Topology”, Edinburgh, Scotland, May, 2007.
- Invited speaker at “Geometry Festival”, Maryland, April, 2007.
- Niven lecturer (2 lectures), University of Oregon, Eugene, Oregon, April, 2007.
- Invited speaker at Nigel Hitchin’s 60th birthday celebration, Madrid, Spain, September, 2006.
- Invited speaker (3 lectures) at “XVth Oporto Meeting on Geometry, Topology and Physics”, Oporto, Portugal, July, 2006.
- “Andrejewski Lecture series” (3 lectures), Max Planck Institute for Mathematics, Leipzig, Germany, April, 2006.
- Invited speaker at “Pacific Northwest Geometry Seminar”, Palo Alto, California, February, 2006.
- Invited speaker (lecture in memory of Raoul Bott) at “Black holes, topological strings, and invariants of holomorphic submanifolds”, Harvard University, Boston, Massachusetts, January, 2006.
- Invited speaker at “Stringy Topology in Morelia”, Morelia, Mexico, January, 2006.
- Invited speaker at “Simons Workshop in Mathematics and Physics”, Stony Brook, New York, August, 2005.
- Invited speaker at “Geometric Topology and Connections with Quantum Field Theory”, Oberwolfach, Germany, June, 2005.
- Plenary speaker at Canadian Mathematical Society summer meeting, Waterloo, Canada, June, 2005.

- Invited speaker at “Symposium on the First Superstring Revolution”, Aspen Center for Physics, Aspen, Colorado, August, 2004.
- Invited speaker at “AMS-SIAM Conference on String Geometry”, Snowbird, Colorado, June, 2004.
- Invited speaker at Midwest Topology Seminar, Northwestern University, Evanston, Illinois, February, 2004.
- Invited speaker at “Elliptic Cohomology and Chromatic Phenomena”, Isaac Newton Institute, Cambridge, England, December, 2002.
- Invited speaker in Mathematical Physics section, International Congress of Mathematicians, Beijing, China, August, 2002.
- Invited speaker at “Stringy Orbifolds”, Chengdu, China, August, 2002.
- Invited speaker (2 lectures) at “Current Developments in Mathematics”, Harvard University, November, 2001.
- Invited speaker (7 lectures) at Graduate Summer School “Quantum Field Theory, Supersymmetry, and Enumerative Geometry”, IAS/Park City Mathematics Institute, July, 2001.
- Invited speaker (4 lectures) at “Duality Workshop: A Math/Physics Collaboration”, Institute for Theoretical Physics, Santa Barbara, June, 2001.
- Invited speaker at “New interfaces in geometry and physics”, Miraflores de la Sierra, Spain, June, 2001.
- Invited speaker at Clifford Lectures Conference, Tulane University, November, 2000.
- Invited speaker at “International Congress of Mathematical Physics”, London, England, July, 2000.
- Invited speaker at Gokova Topology/Geometry Conference, Gokova, Turkey, May, 2000.
- Invited speaker at “Special Program on Geometry and Topology”, Feza Gursey Institute of Istanbul, Turkey, May, 2000.
- Plenary speaker at “Strings, Duality, and Geometry”, Montreal, Canada, March, 2000.
- Invited speaker at “Geometry, Duality and Hodge theory”, Irvine, March, 2000
- Invited speaker at “Texas Geometry and Topology Conference”, Texas A&M, College Station, November, 1999.
- Invited speaker at “A Fiftieth Anniversary Celebration of the Postdoctoral Instructorship in Mathematics at MIT”, Boston, October, 1999.
- Invited speaker (3 lectures) at “Mathematics from Physics”, University of Illinois, Urbana-Champaign, May, 1999.
- Invited speaker at “Southern California Geometric Analysis Seminar”, University of California at Irvine, February, 1999.
- Invited speaker at Pacific Northwest Geometry Symposium, Eugene, Oregon, November, 1998.
- Invited speaker (5 lectures) at “Geometry and Duality”, Institute for Theoretical Physics, Santa Barbara, January, 1998.
- Invited speaker at “Trimestre de Physique/Mathematique: Integrales Fonctionnelles”, Centre Emile Borel, Paris, December, 1997.
- Invited speaker at “Workshop on Higher Category Theory and Physics”, Northwestern University, March, 1997.
- Invited speaker at “Moduli Spaces in Geometry and Physics”, University of Florida, February, 1997.
- Invited speaker at Special Session on “Moduli Spaces of Vector Bundles over Riemann Surfaces”, Rider College, October, 1996.
- Invited hour address at Eastern sectional meeting of AMS, Boston, October, 1995.
- Invited speaker at “Geometry and Physics”, Aarhus, Denmark, July, 1995.
- Invited speaker at Gokova Topology/Geometry Conference, Gokova, Turkey, June, 1995.
- Invited speaker at Special Session on Topology and Geometry (AMS-IMU Conference), Jerusalem, Israel, May, 1995.

Invited speaker at “Topological and Geometrical Problems Related to Quantum Field Theory”, Trieste, Italy, March, 1995.

Invited speaker at “Particles and Fields, 1994”, Banff, Alberta, August, 1994.

Invited speaker at Namboodiri Conference, University of Chicago, May, 1994.

Invited speaker at “Mathematical Physics and Geometry”, Mathematical Sciences Research Institute, Berkeley, January, 1994.

Invited speaker at “Spectral Geometry”, Mathematical Sciences Research Institute, Berkeley, November, 1993.

Invited speaker at “Conformal Field Theory, Operator Algebras and Low-Dimensional Topology”, Warwick, England, August, 1993.

Invited speaker at Geometry and Topology Conference in honor of Raoul Bott’s 70th birthday, Harvard University, April, 1993.

Invited speaker at Special Session “Knots and Topological Quantum Field Theory” (AMS Conference), Dayton, Ohio, October, 1992.

Invited speaker at “Symposium on Gauge Theory, Geometry, and Topology”, Warwick, England, July 1992.

Invited speaker at “New Index Theories and Applications”, Oxford, England, July 1992.

Plenary speaker at “XIX International Colloquium on Group Theoretical Methods in Mathematical Physics”, Salamanca, Spain, June 1992.

Invited speaker (5 lectures) at the summer school “Recent Problems in Mathematical Physics”, Salamanca, Spain, June 1992.

Invited speaker at Clifford Lectures Conference, Tulane University, February 1992.

Invited speaker and participant in US/USSR Meeting “Mathematics and String Theory”, Mathematical Sciences Research Institute, Berkeley, June 1991.

Invited speaker at “Applications of Algebraic Topology to Geometry and Analysis”, Mathematical Sciences Research Institute, Berkeley, January 1990.

Invited speaker (5 lectures) at “College on Global Geometric and Topological Methods in Analysis”, International Centre for Theoretical Physics, Trieste, Italy, December 1988.

Invited speaker at the AMS Joint Summer Research Conference “Geometric and Topological Invariants of Elliptic Operators”, Brunswick, Maine, July 1988.

Invited speaker at the CBMS Conference “Gauge Theory”, St. Louis, June 1987.

Selected Colloquia and Seminars 1986–2014: Bar-Ilan University, Boston University, Brandeis, Brown, Cal Tech, City University of New York, Columbia, Concordia, Geometry Center, Harvard, Institute for Advanced Study, Johns Hopkins, Kansas State University, Mathematical Sciences Research Institute, McGill, MIT, New Mexico State, Notre Dame, Northwestern, Orsay, Oxford, Princeton, Rice, Rockefeller, Rutgers, Simons Center for Geometry and Physics, Stanford, Texas A & M, Tel Aviv University, Technion, Texas Christian University, Tulane, University of Barcelona, University of California at Berkeley, University of California at San Diego, University of California at Santa Barbara, University of Chicago, University of Houston, University of Illinois, University of Kansas, University of Maryland, University of Michigan, University of Minnesota, University of North Carolina, University of Pennsylvania, University of Texas, University of Toronto, University of Toulouse, University of Utah, University of Virginia, University of Warwick, University of Wisconsin, Virginia Polytechnic Institute, Yale.

#### **Ph.D. STUDENTS**

Arun Debray, current

Ethan Leeman, current

Valentin Zakharevich, current

Mio Alter, Mathematics, Ph.D., 2013

Braxton Collier, Mathematics, Ph.D., 2012  
 Orit Davidovich, Mathematics, Ph.D., 2011  
 Michael Ortiz, Mathematics, Ph.D., 2009  
 Spencer Stirling, Mathematics, Ph.D., 2008  
 Alexander Kahle, Mathematics, Ph.D., 2008  
 Kevin Klonoff, Mathematics, Ph.D., 2008  
 Matthew Scholl, Mathematics, Ph.D., 2006  
 Jerry Jenquin, Physics, Ph.D., 2004  
 (with Karen Uhlenbeck) Fergus O’Dea, Mathematics, Ph.D., 2000  
 Mihaela Manilou, Physics, Ph.D., 1997  
 Rob Harrington, Physics, Ph.D., 1996

## PUBLICATIONS

### Books

1. (with K. Uhlenbeck), “Instantons and Four-Manifolds”, MSRI Publications, Volume 1, Springer-Verlag, New York, 1984, 1991 (Second Edition).
2. “Five Lectures on Supersymmetry”, American Mathematical Society, Providence, RI, 1999.

### Books Edited

3. (edited with K. Uhlenbeck), “Geometry and Quantum Field Theory”, IAS/Park City Mathematics Series, 1. American Mathematical Society, Providence, RI; Institute for Advanced Study (IAS), Princeton, NJ, 1995.
4. (edited with P. Deligne, P. Etingof, L. Jeffrey, D. Kazhdan, J. Morgan, D. Morrison, E. Witten), “Quantum Fields and Strings: A Course for Mathematicians”, American Mathematical Society, Providence, RI, 1999.
5. (edited with D. Morrison, I. Singer), “Quantum Field Theory, Supersymmetry, and Enumerative Geometry”, IAS/Park City Mathematics Series, 11. American Mathematical Society, Providence, RI; Institute for Advanced Study (IAS), Princeton, NJ, 2006.

### Research Articles

6. (with L. A. Shepp), *A poisson process whose rate is a hidden Markov process*, Advances in Applied Probability, **14** (1982), 21–36.
7. (with Jean-Michel Bismut) *Fibré déterminant et invariant  $\eta$* , C. R. Acad. Sci. Paris. Sér. I Math., **301** (1985), 707–710.
8. *Flag manifolds and Kahler geometry*, Infinite Dimensional Groups (ed. V. G. Kac), MSRI Publications, Volume 4, Springer-Verlag, New York, 1985.
9. (with P. C. Fishburn, P. Frankl, J. C. Lagarias, A. M. Odlyzko), *Probabilities for intersecting systems and random subsets of finite sets*, SIAM J. Alg. Disc. Meth., **7** (1986), 73–79.
10. (with Jean-Michel Bismut), *The analysis of elliptic families. I. Metrics and connections on determinant bundles*, Commun. Math. Phys., **106** (1986), 159–176.
11. (with Jean-Michel Bismut), *The analysis of elliptic families. II. Dirac operators,  $\eta$  invariants, and the holonomy theorem*, Commun. Math. Phys., **107** (1986), 103–163.
12. *Determinants, Torsion, and Strings*, Commun. Math. Phys., **107** (1986), 483–513.
13. (with Cumrun Vafa), *Global anomalies on orbifolds*, Commun. Math. Phys., **110** (1987), 349–389.
14. *On determinant line bundles*, in “Mathematical Aspects of String Theory” (ed. S. T. Yau), World Scientific Publishing, 1987.
15.  *$Z/k$ -Manifolds and families of Dirac operators*, Invent. Math., **92** (1988), 243–254.
16. *The geometry of loop groups*, J. Diff. Geom., **28** (1988), 223–276.



17. *An index theorem for families of Fredholm operators parametrized by a group*, *Topology*, **27** (1988), 279–300.
18. (with David Groisser), *The basic geometry of the manifold of Riemannian metrics and of its quotient by the diffeomorphism group*, *Mich. Math J.*, **36** (1989), 323–344.
19. *Anomalies and determinant line bundles*, XVIIth International Colloquium on Group Theoretical Methods in Physics (Sainte-Adele, PQ, 1988), World Scientific Publishing, Teaneck, NJ, 1989.
20. (with Robert Gompf), *Computer tests of Witten’s Chern-Simons theory against the theory of three-manifolds*, *Phys. Rev. Lett.*, **66** (1991), 1255–1258.
21. (with Robert Gompf), *Computer calculation of Witten’s 3-manifold invariant*, *Commun. Math. Phys.*, **141** (1991), 79–117.
22. (with Richard Melrose), *A mod  $k$  index theorem*, *Invent. Math.*, **107** (1992), 283–299.
23. *Reidemeister torsion, spectral sequences, and Breiskorn spheres*, *J. reine Math.*, **429** (1992), 75–89.
24. (with Frank Quinn), *Chern-Simons theory with finite gauge group*, *Commun. Math. Phys.*, **156** (1993), 435–472, ([arXiv:hep-th/9111004](#)).
25. *Extended structures in topological quantum field theory*, in “Quantum Topology” (eds. L. H. Kauffman and R. A. Baadhio), World Scientific, 1993, 162–173, ([arXiv:hep-th/9306045](#)).
26. *A gluing law for the index of Dirac operators*, in “Global Analysis in Modern Mathematics (ed. K. K. Uhlenbeck), Publish or Perish, 1993, 5–14.
27. *Locality and integration in topological field theory*, in “Group Theoretical Methods in Physics, Volume 2” (eds. M. A. del Olmo, M. Santander and J. M. Guilarte), Ciemat, 1993, 35–54, ([arXiv:hep-th/9209048](#)).
28. *Lectures on topological quantum field theory*, in “Integrable Systems, Quantum Groups, and Quantum Field Theories” (eds. L. A. Ibort and M. A. Rodríguez), Kluwer Academic Publishers, 1993, 95–156.
29. *Higher algebraic structures and quantization*, *Commun. Math. Phys.*, **159** (1994), 343–398, ([arXiv:hep-th/9212115](#)).
30. (with Xianzhe Dai)  *$\eta$ -Invariants and determinant lines*, *J. Math. Phys.*, **35** (1994), 5155–5194, ([arXiv:hep-th/9405012](#)).
31. *Classical Chern-Simons theory, 1*, *Adv. Math.*, **113** (1995), 237–303, ([arXiv:hep-th/9206021](#)).
32. *Characteristic numbers and generalized path integrals*, in “Geometry, Topology, & Physics for Raoul Bott” (ed. S.-T. Yau), International Press, 1995, 126–138, ([arXiv:dg-ga/9406002](#)).
33. (with Xianzhe Dai)  *$\eta$ -invariants and determinant lines*, *C. R. Acad. Sci. Paris Ser. I Math.* **320** (1995), no. 5, 585–591, ([arXiv:hep-th/9405012](#)).
34. *Determinant line bundles revisited*, “Geometry and Physics (Aarhus, 1995),” 187–195, *Lecture Notes in Pure and Appl. Math.*, **184**, Dekker, New York, 1997, ([arXiv:dg-ga/9505002](#)).
35. *Two index theorems in odd dimensions*, *Commun. Anal. Geom.*, **6** (1998), 317–329, ([arXiv:dg-ga/9601005](#)).
36. (with J. Harvey, R. Minasian, G. Moore) *Gravitational anomaly cancelation for M-theory five-branes*, *Adv. Theor. Math. Phys.*, **2** (1998), ([arXiv:hep-th/9803205](#)).
37. *Quantum groups from path integrals*, proceedings of “Particles and Fields (Banff, 1994)”, 63–107, *CRM Ser. Math. Phys.*, Springer, New York, 1999, ([q-alg/9501025](#)).
38. *Special Kähler manifolds*, *Commun. Math. Phys.*, **203** (1999), 31–52, ([arXiv:hep-th/9712042](#)).
39. (with P. Deligne) *Classical field theory*, in “Quantum Fields and Strings: A Course for Mathematicians” (ed. P. Deligne, P. Etingof, D. Freed, L. Jeffrey, D. Kazhdan, J. Morgan, D. Morrison, E. Witten), American Mathematical Society, Providence, RI, 1999, pp. 137–225.
40. (with P. Deligne) *Supersolutions*, in “Quantum Fields and Strings: A Course for Mathematicians” (ed. P. Deligne, P. Etingof, D. Freed, L. Jeffrey, D. Kazhdan, J. Morgan, D. Morrison,

- E. Witten), American Mathematical Society, Providence, RI, 1999, pp. 227–355, ([arXiv:hep-th/9901094](#)).
41. (with E. Witten) *Anomalies in string theory with D-branes*, Asian J. Math, **3** (1999), 819–851, ([arXiv:hep-th/9907189](#)).
  42. (with M. Hopkins) *On Ramond-Ramond fields and K-theory*, J. High Energy Phys. 2000, no. 5, Paper 44, 14 pp., ([arXiv:hep-th/0002027](#)).
  43. *Dirac charge quantization and generalized differential cohomology*, Surv. Differ. Geom. VII, 2000, 129–194, ([arXiv:hep-th/0011220](#)).
  44. *The Verlinde algebra is twisted equivariant K-theory*, Turkish J. Math., **25** (2001), pp. 159–167, ([arXiv:math.RT/0101038](#)).
  45. *K-theory in quantum field theory*, Current Developments in Mathematics 2001, International Press, Somerville, MA, pp. 41–87, ([arXiv:math-ph/0206031](#)).
  46. *Classical Chern-Simons theory, Part 2*, Houston J. Math., **28** (2002), pp. 293–310.
  47. *Twisted K-theory and loop groups*, Proceedings of the International Congress of Mathematicians, Beijing 2002, Volume III, Higher Education Press, 2002, pp. 419–430, ([arXiv:math.AT/0206237](#)).
  48. (with G. Moore) *Setting the quantum integrand of M-theory*, Commun. Math. Phys., **263** (2006), pp. 89–132, ([arXiv:hep-th/0409135](#)).
  49. *Classical field theory and supersymmetry*, “Quantum Field Theory, Supersymmetry, and Enumerative Geometry”, IAS/Park City Mathematics Series, 11. American Mathematical Society, Providence, RI; Institute for Advanced Study (IAS), Princeton, NJ, 2006.
  50. (with E. Diaconescu, G. Moore) *The M-theory 3-form and  $E_8$  gauge theory*, Elliptic Cohomology (Proceedings of the Workshop on Elliptic Cohomology and Chromatic Phenomena (2002)), London Math. Soc. Lecture Note Ser., 342, Cambridge Univ. Press, Cambridge, 2007, 44–88, ([arXiv:hep-th/0312069](#)).
  51. (with G. Moore and G. Segal) *Heisenberg groups and noncommutative fluxes*, Annals of Physics, **322** (2007), pp. 236–285, ([arXiv:hep-th/0605200](#)).
  52. (with G. Moore and G. Segal) *The uncertainty of fluxes*, Commun. Math. Phys., **241** (2007), pp. 242–274, ([arXiv:hep-th/0605198](#)).
  53. (with M. Hopkins, C. Teleman) *Twisted equivariant K-theory with complex coefficients*, J. Topology, **1** (2008), pp. 16–44, ([arXiv:math.AT/0206257](#)).
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