

Curriculum Vitae

David Borthwick

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Education

1988 A.B. in Physics, Princeton University

1993 Ph.D. in Physics, Harvard University, advised by Arthur Jaffe

Academic Career

1993–96 Assistant Professor of Mathematics, University of Michigan

1996–97 NSF Postdoctoral Research Fellow, University of California, Berkeley

1997–2002 Assistant Professor of Mathematics, Emory University

2002–09 Associate Professor of Mathematics, Emory University

2009– Professor of Mathematics, Emory University

Grants and Fellowships

1994 Rackham Faculty Fellowship, University of Michigan

1994–99 NSF Research Grant, Modern Analysis

1996–2000 NSF Postdoctoral Fellowship

2002–2006 NSF Research Grant, Geometric Analysis

2009–2012 NSF Research Grant, Analysis

Students

2001–02 Jeremy Hall, Masters student

2002–03 Joey Friesenhahn, Senior Honors Thesis

2006–07 Tristan Dennen, Senior Honors Thesis

2006–07 Sam Ballas, Senior Honors Thesis

2008–09 Jacob Geerlings, Senior Honors Thesis

- 2008– Catherine Crompton, Ph.D. student
- 2008– Pascal Philip, Masters student (planning to join Ph.D. program in 2009)

Service

- 1997– Departmental Undergraduate Committee
- 1997–98 Departmental Calculus Committee
- 1997–98 Calculus reform pilot project
- 1997–2008 Mentored 9 graduate teaching assistants
- 1997–2008 Journal articles refereed: *J. Math. Phys.* (8), *Lett. Math. Phys.* (1), *Comm. Anal. Geom.* (1), *Comm. Partial Diff. Eq.* (1), *Math. Phys. Anal. Geom.* (1), *J. Funct. Anal.* (1), *J. Sympl. Geom.* (1), *Math. Res. Lett.* (1), *J. Geom. Anal.* (2), *Comm. Math. Phys.* (1), *Diff. Geom. Appl.* (1), *Pure Appl. Math. Quat.* (1), *Ann. Global Anal. Geom.* (1), *J. Modern Dynamics* (1), *Proc. Amer. Math. Soc.* (1)
- 1997–2008 Thesis committee member, 2 Ph.D., 4 masters, 5 senior honors
- 1997–2008 Graduate preliminary exam in Analysis administered for 8 academic years
- 1997– Undergraduate major advising, approximately 16 students each semester
- 1997– Grant proposals reviewed for National Science Foundation (9), Natural Sciences and Engineering Resource Council of Canada (1), Israel Science Foundation (1)
- 1998–2001 College Academic Standards Committee
- 1998–2008 Graduate level directed study Differential geometry, Fall 1998 (1 student) Differential topology, Fall 1999 (4 students, joint with Prof. Hamilton) PMACS, Summer 1999 (1 Student) Spectral geometry, Fall 2001 (2 students) Spectral theory, Fall 2008 (1 student)
- 1999 Goldwater Scholarship Committee
- 2001–08 Reviewed 21 articles for *Mathematical Reviews*
- 2001– University Library Policy Committee
- 2002–03 Developed Probability and Statistics sequence (Math 361–2) to coordinate with new BA/MSPH at Emory School of Public Health
- 2002–05 College Curriculum Committee
- 2003–04 Undergraduate Math Club co-organizer
- 2002– Departmental Library Liaison
- 2004 Honor Council Panel member
- 2008 College Curriculum Committee (substitute for Spring semester)
- 2009 Family Science Night presentation, Morningside Elementary School

Selected Invited Talks

- 1995 Differential Geometry Seminar, Indiana University
- 1996 AMS National Meeting: Special Session, Orlando
- 1996 AMS-SIAM Summer Conference on Quantization, Mt. Holyoke College
- 1997 AMS National Meeting Special Session, San Diego
- 1997 Analysis Seminar, Stanford University
- 1997 Seminar on Microlocal Methods in Geometric Analysis, Fields Institute, Toronto
- 1998 AMS Regional Meeting: Special Session, Louisville
- 1998 Analysis Seminar, University of Georgia
- 1998 Workshop on Mathematical Physics, UNAM Institute, Cuernavaca, Mexico
- 1998 Workshop on Spectral Geometry, Schrödinger Institute, Vienna
- 1998 Mathematical Physics Seminar, Georgia Tech
- 1999 Workshop on Generalized Dirac Operators, Banach Center, Warsaw
- 2000 Seminar on Spectral Geometry, University of Kentucky
- 2001 Differential Geometry Seminar, Indiana University
- 2002 Workshop on Inverse Spectral Geometry, University of Kentucky
- 2003 Conference on Spectral Analysis in Geometry and Physics, University of California, San Diego
- 2003 PDE and Numerical Methods Seminar, Penn State University
- 2003 Workshop on Spectral Geometry, Dartmouth College
- 2004 Analysis and Geometry Seminar, Ohio State University
- 2004 Workshop on Semi-classical Theory of Eigenfunctions and PDEs, CRM, Montreal and Fields Institute, Toronto
- 2005 AMS National Meeting Special Session, Atlanta
- 2006 AMS Regional Meeting: Special Session, Fayetteville
- 2006 AMS Regional Meeting: Special Session, Miami
- 2007 Workshop on Toeplitz Operators and Deformation Quantization, CTQM, Aarhus, Denmark
- 2008 AMS National Meeting Special Session, San Diego
- 2008 Analysis and PDE Seminar, University of Kentucky
- 2008 Program in Analysis on Singular Spaces, Mathematical Sciences Research Institute, Berkeley
- 2008 Workshop on Mathematical Theory of Resonances, Banff International Research Station

2009 Workshop on Resonances in Mathematical Physics, Centre International
des Rencontres Mathematiques, Luminy

Publications

1. D. Borthwick, The Pfaffian line bundle, *Comm. Math. Phys.* **149** (1992), 463–494.
2. —, Euclidean Majorana fermions, fermionic integrals, and relative Pfaffians, *J. Math. Phys.* **34** (1993), 2691–2712.
3. —, A. Lesniewski, and H. Upmeyer, Non-perturbative deformation quantization of Cartan domains, *J. Funct. Anal.* **113** (1993), 153–176.
4. —, S. Klimek, A. Lesniewski, and M. Rinaldi, Super Toeplitz operators and non-perturbative deformation quantization of supermanifolds, *Comm. Math. Phys.* **153** (1993), 49–76.
5. —, A. Lesniewski, and M. Rinaldi, Hermitian symmetric superspaces of type IV, *J. Math. Phys.* **34** (1993), 4817–4833.
6. —, S. Klimek, A. Lesniewski, and M. Rinaldi, Supersymmetry and Fredholm modules over quantized spaces, *Comm. Math. Phys.* **166** (1994), 397–415.
7. —, S. Klimek, A. Lesniewski, and M. Rinaldi, Matrix Cartan superdomains, super Toeplitz operators, and quantization, *J. Funct. Anal.* **127** (1995), 456–510.
8. —, M. Rinaldi, and A. Lesniewski, Notes on the structure of quantized hermitian symmetric spaces, *Rev. Math. Phys.* **7** (1995) 871–891.
9. —, T. Paul, and A. Uribe, Legendrian distributions with applications to relative Poincaré series, *Inventiones Math.* **122** (1995) 359–402.
10. — and A. Uribe, Almost complex structures and geometric quantization, *Math. Res. Lett.* **3** (1996), 845–861.
11. —, A. McRae, and E. C. Taylor, Quasirigidity of hyperbolic 3-manifolds and scattering theory, *Duke Math. J.* **89** (1997), 225–236.
12. —, Microlocal techniques for semiclassical problems in geometric quantization, in *Perspectives on Quantization*, ed. by M.A. Rieffel and L.A. Coburn, *Contemp. Math.* **214** (1998).
13. —, T. Paul, and A. Uribe, Semiclassical spectral estimates for Toeplitz operators, *Ann. Inst. Fourier* **48** (1998), 1189–1229.
14. — and A. Uribe, Nearly Kählerian embeddings of symplectic manifolds, *Asian J. Math.* **4** (2000), 599–620.

15. —, Introduction to Kähler quantization, *Contemp. Math.* **260** (2000), 91–132.
16. —, Scattering theory for conformally compact metrics with variable curvature at infinity, *J. Funct. Anal.* **184** (2001), 313–376.
17. — and P. Perry, Scattering poles for asymptotically hyperbolic manifolds, *Trans. Amer. Math. Soc.* **354** (2002), 1215–1231.
18. — and A. Uribe, The spectral density function for the Laplacian on high tensor powers of a line bundle, *Ann. Global Anal. Geom.* **21** (2002), 269–286.
19. —, C. Judge, and P. Perry, Determinants of Laplacians and isopolar metrics on surfaces of infinite area, *Duke Math. J.* **118** (2003), 61–102.
20. — and A. Uribe, On the pseudospectra of Berezin-Toeplitz operators, *Methods Appl. Anal.* **10** (2003), 31–65.
21. —, C. Judge, and P. Perry, Selberg’s zeta function and the spectral geometry of geometrically finite hyperbolic surfaces, *Comm. Math. Helv.* **80** (2005), 483–515.
22. — and S. Graffi, A local quantum version of the Kolmogorov theorem, *Comm. Math. Phys.* **257** (2005), 499–514.
23. — and A. Uribe, The semi-classical structure of low-energy states in the presence of a magnetic field, *Trans. Amer. Math. Soc.* **359** (2007), 1875–1888.
24. —, *Spectral Theory of Infinite-Area Hyperbolic Surfaces*, Progress in Mathematics **256**, Birkhäuser, Boston, 2007.
25. —, Upper and lower bounds on resonances for manifolds hyperbolic near infinity, *Comm. Partial Diff. Eq.* **33** (2008), 1507–1539.
26. — and P. Perry, Inverse scattering results for metrics hyperbolic near infinity, preprint, 2009.