Christopher Kottke

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Education and Employment

2013–	Research Instructor, Northeastern University
2010–2013	Tamarkin Assistant Professor, Brown University
June 2010	Ph.D. Mathematics, Massachusetts Institute of Technology Thesis: *Index theorems and magnetic monopoles on asymptotically conic manifolds* Advisor: Richard B. Melrose
June 2004	B.A. Mathematics & Physics, Tufts University, *Highest Honors, Phi Beta Kappa*

Publications and Preprints

1. Partial compactification of monopoles and metric asymptotics, (with M. Singer),
   `arXiv:1512.02979`, (2015), 113 pages.
2. Blow-up in manifolds with generalized corners,
   `arXiv:1509.03874`, (2015), 33 pages.
3. Equivalence of string and fusion loop-spin structures, (with R. Melrose),
   `arXiv:1309.0210`, (2013), 48 pages.
4. Dimension of monopoles on asymptotically conic 3-manifolds,
   Bulletin of the LMS, vol. 45, no. 5, (2015), pp. 818–834.
   `arXiv:1310.2974`.
5. Loop-fusion cohomology and transgression, (with R. Melrose),
   Mathematical Research Letters, vol. 22, no. 4, (2015), pp. 1177–1192.
   `arXiv:1309.7674`.
6. A Callias-type index theorem with degenerate potentials,
   Communications in PDE, vol. 40, no. 2, (2015), pp. 219–264.
   `arXiv:1210.3275`.
7. Generalized blow-up of corners and fiber products, (with R. Melrose),
   Transactions of the AMS, vol. 367, no. 1, (2015), pp. 651–705.
   `arXiv:1107.3320`.
8. An index theorem of Callias type for pseudodifferential operators,
   Journal of K-Theory, vol. 8, no. 3, (2011), pp. 387–417.
   `arXiv:0909.5661`.
9. Accurate finite-difference and time-domain simulation of anisotropic media by subpixel smoothing, (with A.F. Oskooi and S. Johnson),
   Optics Letters, vol. 34, no. 18, (2009), pp. 2778–2780.
10. Perturbation theory for anisotropic dielectric interfaces, and application to sub-pixel smoothing of discretized numerical methods, (with A.F. Oskooi and S. Johnson),
    Physical Review E, vol. 77, no. 3, (2008), pp. 6611–6621.
11. Vortex core identification in viscous hydrodynamics, (with L. Finn and B. Boghosian).
    Philosophical Transactions of the Royal Society A, vol. 386, no. 1833, (2005), pp. 1937–1948.

Academic Awards

2011–2012	AMS-Simons Postdoctoral Travel Grant.
2009	Charles and Holly Housman Award for Excellence in Undergraduate Teaching, MIT.
2005	Presidential Fellowship, MIT.
2000–2004	National Merit Scholarship, Tufts University.

Academic Talks

Conferences and Workshops

2016	Dec	Geometric and spectral methods in PDE, BIRS Oaxaca.
	Jun	Geometry and topology of stratified spaces, CIRM.
2015	Dec	Analysis on singular manifolds, CMS Winter Meeting, Montreal.
	Jul–Aug	Metric and analytic aspects of moduli spaces, visiting fellow, Newton Institute.
2014	Nov	Geometric scattering theory and applications, BIRS.
	Jul	String geometry and loop spaces, Greifswald University.
	Jun	Analysis and topology in interaction, Cortona, Italy.
2013	Oct	Geometric and spectral analysis, AMS Sectional, Temple University.
	Mar	Geometric and singular analysis, Potsdam University.
2012	Jun	Spectral invariants on singular and non-compact spaces, CRM.
	May	Analysis and geometric singularities, Oberwolfach.
	Apr	Spring lecture series, University of Arkansas.
2011	Jun	Microlocal methods in mathematical physics and global analysis, Universität Tübingen.
2010	Aug	Topics in spectral and scattering theory, Penn State University.
	Jun	Talbot workshop on loop groups and twisted K-theory, Breckenridge, CO.
2009	Oct	Microlocal analysis and spectral theory on singular spaces, AMS Sectional, Penn State.
	Apr	Singularities at MIT.
2008	Aug	Second symposium on spectral and scattering theory, Federal University of Pernambuco.

Seminars

2015	Oct	Stanford University.
	Sep	MIT.
	Jan	Boston University.
2014	Dec	Purdue University.
	Oct	Northeastern University.
	Apr	Boston University.
	Mar	Worldwide Center of Mathematics.
2013	Nov	University of Montreal.
	Sep	Northeastern University.
	May	University College London.
	Mar	Boston University.
2012	Sep	Brown University.
	Mar	Purdue University.
2011	Oct	University of Illinois at Urbana-Champaign.
	Mar	Temple University.
	Mar	Northeastern University.
	Feb	Brown University.
2009	Dec	Brown University.

Other Conferences Attended

2013	May	Control, index, traces and determinants, Conference for Jean-Michel Bismut, Orsay.
2011	Oct	Microlocal methods in spectral and scattering theory, Northwestern University.
	Jan	Geometric analysis, CIRM.
2010	Mar	Geometric scattering theory and applications, BIRS.
2009	Jul	Spectral theory and geometric analysis, Northeastern University.
2008	Jun	Geometric applications of microlocal analysis, CIRM.

Teaching/Advising/Organizing

Northeastern University

2016	Spr	Graduate Topics in Differential Geometry.
2015	Fall	Multivariable calculus.
		Real analysis.
		Putnam exam supervisor.
	Spr	Multivariable calculus.
2014	Fall	Real analysis.
	Spr	Multivariable calculus.
		Undergraduate directed study in differential topology.
2013	Fall	Real Analysis.

Brown University

2013	Spr	Abstract algebra.
2012	Fall	Differential equations and nonlinear dynamics.
	Spr	Graduate algebraic topology II.
2011	Fall	Introduction to mathematical cryptography.
		Intermediate calculus.
	Spr	Honors linear algebra.
2010	Fall	Honors vector calculus.
2010–2013		Freshman/sophomore advisor.
2011–2013		Organizer: Geometry and Topology seminar.

Massachusetts Institute of Technology

2010	Spr	Differential equations (TA)
	Win	Multivariable calculus (TA)
2009	Spr	Differential equations (TA)
	Win	Multivariable calculus (TA)
2008	Win	Multivariable calculus (TA)
2007	Spr	Differential equations (TA)