Christopher Kottke

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Education and Appointments

2016–	Assistant Professor, New College of Florida
2013–2016	Research Instructor, Northeastern University
2010–2013	Tamarkin Assistant Professor, Brown University
2010	Ph.D. Mathematics, Massachusetts Institute of Technology Thesis: *Index theorems and magnetic monopoles on asymptotically conic manifolds* (supervised by Richard Melrose)
2004	B.A. Mathematics, B.A. Physics, Tufts University.

Publications and Preprints

1. Functorial compactification of linear spaces.
   Proceedings of the AMS, to appear.
   arXiv:1712.03902, (2017), 13 pages.
2. Partial compactification of monopoles and metric asymptotics. (With M. Singer).
   arXiv:1512.02979, (2015), 113 pages.
3. Blow-up in manifolds with generalized corners.
   International Mathematical Research Notices, vol. 2018, no. 8, (2018), pp. 2375–2415.
   arXiv:1509.03874.
4. Equivalence of string and fusion loop-spin structures. (With R. Melrose).
   arXiv:1309.0210, (2013), 48 pages.
5. Dimension of monopoles on asymptotically conic 3-manifolds.
   Bulletin of the LMS, vol. 45, no. 5, (2015), pp. 818–834.
   arXiv:1310.2974.
6. Loop-fusion cohomology and transgression. (With R. Melrose).
   Mathematical Research Letters, vol. 22, no. 4, (2015), pp. 1177–1192.
   arXiv:1309.7674.
7. A Callias-type index theorem with degenerate potentials.
   Communications in PDE, vol. 40, no. 2, (2015), pp. 219–264.
   arXiv:1210.3275.
8. 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.

9. An index theorem of Callias type for pseudodifferential operators.
   Journal of K-Theory, vol. 8, no. 3, (2011), pp. 387–417.
   `arXiv:0909.5661`.

10. 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.

11. 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.

12. 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 Honors and Awards

2017–	Simons Foundation, Collaboration Grant for Mathematicians: Monopole Moduli Spaces and Sen's Conjecture ($42,000).
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

Invited Talks: Conferences and Workshops

2018	Oct	Index Theory: Interactions and Applications, Toulouse.
	Sep	Geometric Analysis and Mathematical Physics, Oldenburg.
	Apr	Workshop on Geometric Quantization, BIRS.
2017	Jun	Analysis and topology in interaction, Cortona, Italy.
2016	Dec	Geometric and spectral methods in PDE, BIRS Oaxaca.
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.

Invited Talks: Seminars

2018	Oct	Purdue University.
2017	Jan	University of Waterloo.
2016	Oct	MIT.
	Mar	Duke University.
2015	Oct	Stanford University.
	Sep	MIT.
	Jan	Boston University.
2014	Dec	Purdue 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	Mar	Purdue University.
2011	Oct	University of Illinois at Urbana-Champaign.
	Mar	Temple University.
	Mar	Northeastern University.
2009	Dec	Brown University.

Other Conferences Attended

2016	Jun	Geometry and topology of stratified spaces, CIRM.
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 Experience

New College of Florida

Partial Differential Equations: Spring 2018.
Real Analysis II: Spring 2018.
Real Analysis I: Fall 2017.
Complex Analysis: Fall 2018, Spring 2017.
Advanced Linear Algebra: Spring 2017.
Functional Analysis: Fall 2016.
Multivariable Calculus: Fall 2018, Fall 2017, Fall 2016.
Tutorial: Writing in Mathematics: Spring 2018.
Tutorial: Mathematical cryptography: Spring 2018.
Tutorial: Topology/Algebraic Topology: Fall 2018, Spring 2018, Fall 2017, Spring 2016.
Tutorial: Differential Topology and Geometry: Fall 2017, Fall 2016.
Tutorial: Putnam exam preparation: Fall 2018, Fall 2017, Fall 2016.

Northeastern University

Graduate Topics in Differential Geometry: Spring 2016.
Multivariable Calculus: Fall 2015, Spring 2015, Spring 2014.
Real Analysis: Fall 2015, Fall 2014, Fall 2013.
Undergraduate Directed Study: Differential Topology: Spring 2014.

Brown University

Abstract Algebra: Spring 2013.
Differential Equations and Nonlinear Dynamics: Fall 2012.
Graduate Algebraic Topology II: Spring 2012.
Introduction to Mathematical Cryptography: Fall 2011.
Intermediate Calculus: Fall 2011.
Honors Linear Algebra: Spring 2013, Spring 2011.
Honors Vector Calculus: Fall 2010.

Massachusetts Institute of Technology

Differential Equations (TA): Spring 2010, Spring 2009, Spring 2007.
Multivariable Calculus (TA): January 2010, January 2009, January 2008.

Professional and Academic Service

Reviewer: Compositio Mathematica, Geometry and Topology, Annals of Global Analysis and Geometry, Advances in Mathematics, Communications in PDE, Springer Graduate Texts, American Mathematical Monthly.

Conference Organizer: The Sen Conjecture and Beyond, University College London, June 2017.

Putnam exam supervisor: Northeastern University, Fall 2015.

Seminar Organizer: Brown University Geometry and Topology Seminar, 2011–2013.

Freshman Advisor: Brown University, 2010–2013.