

CURRICULUM VITAE for KARIN MELNICK

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Citizenship: USA

Education

University of Chicago	Mathematics	Ph.D. 2006	Advisor Benson Farb
University of Chicago	Mathematics	M.S. 2000	
Reed College	Mathematics	B.A. 1999	

Papers

- Compact Lorentz manifolds with local symmetry (dissertation), *Journal of Differential Geometry* **81** no. 2 (2009) 355-390.
- (with Mohamed Deffaf and Abdelghani Zeghib) Nonproper isometric actions of semisimple groups on Lorentz manifolds, *Geometric and Functional Analysis* **18** no. 2 (2008) 463-488.
- (with Thierry Barbot, Virginie Charette, Todd Drumm, and William Goldman) A primer on the (2+1)-Einstein universe, in *Recent developments in pseudo-Riemannian Geometry: Proceedings of the special semester, "Geometry of pseudo-Riemannian manifolds with applications to physics," Erwin Schrödinger Institute, Vienna, September - December 2005* (eds. D. Alekseevsky and H. Baum) Vienna: European Mathematical Society (2008) 179-229.
- Isometric actions of Heisenberg groups on compact Lorentz manifolds, *Geometriae Dedicata* **126** no. 1 (2007) 131-154.
- (with Uri Bader and Charles Frances) An embedding theorem for automorphism groups of Cartan geometries, www.arXiv.org/abs/0709.3844, to appear in *Geometric and Functional Analysis*.
- Dynamics on Lorentz manifolds (lecture notes), to appear in *Algèbre, dynamique, et analyse pour la géométrie: Actes des Écoles de Géométrie et Dynamique au Maghreb 2004-2007* (eds. T. Barbot, H. Belbachir, S. Mehdi, D. Smai, and R. Souam).
- (with Charles Frances) Nilpotent groups of conformal flows on compact pseudo-Riemannian manifolds, www.arXiv.org/abs/0807.4735, *submitted*.
- A Frobenius theorem for Cartan geometries, with applications, www.arXiv.org/abs/0812.0624, *submitted*.

Selected Seminar Talks

- University of Maryland: Geometry-Topology Seminar, February 2008
- Centre de Recherches Mathématiques: Geometry-Topology Seminar, December 2007
- University of Chicago: Dynamics Seminar, March 2007
- Brown University: Geometry and Topology Seminar, October 2006
- Reed College: Mathematics Colloquium, April 2006
- Indiana University: Dynamics Seminar, March 2006
- University of Michigan: Topology Seminar, February 2006
- Université Paris-Sud XI: Séminaire Topologie - Géométrie - Dynamique, December 2005

Selected Conference Talks

- Groupement pour la Géométrie et la Topologie au Maghreb, École CIMPA-UNESCO, Marrakech, Morocco, May 2008
- In Honor of Bob Zimmer's 60th Birthday, Chicago, IL, September 2007
- Workshop on Geometric and Topological Rigidity, Banff International Research Station, Banff, Canada, July-August 2007
- Bloomington Geometry Workshop, Bloomington, IN, April 2006
- Workshop on New Techniques in Lorentz manifolds, Banff International Research Station, Banff, Canada, November 2004

Professional Experience

- Department of Mathematics, Yale University, New Haven, CT: Gibbs Assistant Professor, 2006-2009
- Département de Mathématiques, Université Paris-Sud XI, France: Visitor, December 2006
- Department of Mathematics, University of Maryland, College Park, MD: Visitor, Summer 2006
- Unité de Mathématiques Pures et Appliquées, École Normale Supérieure de Lyon, France: Visitor, May 2005, December 2005, November 2006
- Stafford Trading, Inc, Chicago, IL: Quantitative Analyst, December 2000-August 2001
- Bell Labs, Murray Hill, NJ: Senior Technical Associate, Summer 1999, Summer 2000
Cryptanalyst developing an attack on a proposed public-key cryptosystem

Teaching

- Yale University, New Haven, CT: Instructor
Automorphisms of Geometric Structures (graduate), Spring 2009
Undergraduate Independent Study, Spring 2009
Introduction to Differential Geometry (graduate), Fall 2008
Ordinary Differential Equations, Fall 2007
Multivariable Calculus, Fall 2007
- University of Chicago, Chicago, IL: Instructor
Precalculus, Fall 2004-Winter 2005
Calculus, Fall 2003-Winter 2004, 2002-2003
- University of Chicago, Chicago, IL: College Fellow
Set Theory, Point-Set Topology, and Algebraic Topology, 2001-2002

Service

- Co-organizer, Special Session on Conformally Flat Lorentz Manifolds, AMS-MAA Joint Meetings, January 2008
- Colloquium Chair, Yale University, 2007-2008
- Referee for *Geometriae Dedicata* and *Transactions of the AMS*

Outreach and Mentoring

- École de Géométrie Différentielle et Systèmes Dynamiques, Oran, Algeria: Lecturer on “Dynamics on Lorentz manifolds” in French and English, November 2006
- Seminars for Elementary Specialists and Mathematics Educators, Chicago, IL: Instructor in *Geometry* for Chicago Public Schools teachers, Fall 2004
- Directed Reading Program, University of Chicago, Chicago, IL: Member of steering committee, 2002-2003
Mentor for undergraduate independent study in mathematics, Winter 2003, Summer 2003, Spring 2004, Winter 2006
- Advocates for Women in Science, Engineering, and Mathematics, Portland, OR: Volunteer, October 1998-March 1999
Group leader in science and math activities for middle-school girls

Honors and Awards

- Erwin Schrödinger Institute Junior Research Fellowship: April-June 2009
- National Science Foundation Postdoctoral Research Fellowship: 2006-2009
- National Science Foundation International Research Fellowship: *declined*, 2006
- National Science Foundation Graduate Research Fellowship Program: honorable mention, 1999, 2000
- Phi Beta Kappa: Beta of Oregon, May 1999