

Jeffrey Danciger

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Current Position

Assistant Professor, UT Austin. Fall 2014 -

Past Positions

Research member, MSRI, Spring 2015.

R.H. Bing Instructor and NSF postdoctoral fellow, UT Austin, Fall 2011 - Spring 2014.

Research Interests

Geometry and topology in low dimensions.

Non-Riemannian geometric structures, including constant curvature semi-Riemannian geometry, projective geometry, and affine geometry.

Education

June 2011 Ph.D. Mathematics, Stanford University.
Adviser: Steven Kerckhoff
Thesis: *Geometric transitions: from hyperbolic to anti de Sitter geometry.*

June 2006 B.S. Mathematics and Physics, UCSB, College of Creative Studies.

Honors, Awards & Fellowships

Sloan Research Fellowship, 2016.

NSF Grant - Topology, *Spaces of geometric structures via geometric transitions*, 2015–2018.

NSF Mathematical Sciences Postdoctoral Research Fellowship, 2011–2014.

Publications

1. J. Danciger, F. Guéritaud, F. Kassel, *Convex cocompact actions in real projective geometry*, arXiv:1704.08711, 2017.
2. J. Danciger, F. Guéritaud, F. Kassel, *Convex cocompactness in pseudo-Riemannian hyperbolic spaces*, *Geometriae Dedicata*, special issue *Geometries: A celebration of Bill Goldman's 60th birthday*. (to appear), arXiv:1701.09136.

3. J. Danciger, S. Maloni, J.-M. Schlenker, *Higher signature Delaunay decompositions*, arXiv:1602.03865, 2016 (submitted).
4. S. Ballas, J. Danciger, G.-S. Lee, *Convex projective structures on non-hyperbolic three-manifolds*, arXiv:1508.04794, 2015 (submitted).
5. J. Danciger, F. Guéritaud, F. Kassel, *Fundamental domains for free groups acting on anti-de Sitter 3-space*, *Mathematical Research Letters*, **23** (2016), no. 3, pp. 735–770.
6. J. Danciger, S. Maloni, J.-M. Schlenker, *Polyhedra inscribed in a quadric*, arXiv:1410.3774, 2014 (submitted).
7. D. Cooper, J. Danciger, A. Wienhard, *Limits of geometries*, *Transactions of the American Mathematical Society*, DOI: <https://doi.org/10.1090/tran/7174>, 2017.
8. J. Danciger, F. Guéritaud, F. Kassel, *Margulis spacetimes via the arc complex*, *Inventiones Mathematicae*, **204** (2016), no. 1, pp. 133–193.
9. J. Danciger, F. Guéritaud, F. Kassel, *Geometry and topology of complete Lorentz spacetimes of constant curvature*, *Annales scientifiques de l'École normale supérieure*, **49** (2016), no. 1, pp/ 1–56.
10. J. Danciger, *Ideal triangulations and geometric transitions*, *Journal of Topology*, **7** (2014), no. 4, pp. 1118–1154.
11. J. Danciger, *A geometric transition from hyperbolic to anti de Sitter geometry*, *Geometry and Topology* **17** (2013), no. 5, pp. 3077–3134.
12. T. Barbot, F. Bonsante, J. Danciger, W. M. Goldman, F. Guéritaud, F. Kassel, K. Krasnov, J. Schlenker, A. Zeghib, *Some open questions on anti de Sitter geometry*, arXiv:1205.6103, (2012).
13. J. Danciger, S. Devadoss, J. Mugno, D. Sheehy, R. Ward, *Shape deformation in continuous map generalization*, *GeoInformatica* **13** (2009), no. 2, pp. 203–221.
14. J. Danciger, S.R. Garcia, M. Putinar, *Variational principles for symmetric bilinear forms*, *Math. Nachr.* **281** (2008), Issue 6, pp. 761–911.
15. J. Danciger, S. Rubinstein-Salzedo, *A Hilbert Space Approach to Bounded Analytic Interpolation Theory*, *Complex Analysis and Operator theory*, **1** (2007), no. 4, 523–532.
16. J. Danciger, *A Min Max Theorem for Complex Symmetric Matrices*, *Linear Algebra and Its Applications* **412** (2006), no. 1, 22–29.
17. J. Danciger, S. Devadoss, D. Sheehy, *Compatible Triangulations and Point Partitions by Series Triangular Graphs*, *Computational Geometry: Theory and Applications* **34** (2006), no. 3, 195–202.

Works in preparation

1. *Margulis spacetimes with parabolic elements*, with F. Guéritaud, and F. Kassel.
2. *Proper affine actions of right-angled Coxeter groups*, with F. Guéritaud, and F. Kassel.
3. *Convex cocompactness for right angled reflection groups*, with F. Guéritaud, and F. Kassel.
4. *Examples and counter-examples of convex cocompact groups*, with F. Guéritaud, and F. Kassel.
5. *Induced metrics on convex hulls of quasi-circles*, with F. Bonsante, S. Maloni, and J.-M. Schlenker.

Teaching

University of Texas–Austin.

Fall 2017	Math 382C, Algebraic topology (graduate prelim course).
Fall 2017	Math 408D, Calculus for engineers (second semester).
Fall 2016	Math 382C, Algebraic topology (graduate prelim course).
Fall 2015	Math 341, Linear Algebra.
Fall 2015	Math 408D, Calculus for engineers (second semester).
Fall 2014	Math 373K, Algebraic structures I.
Spring 2014	Math 392C, Geometry of surface group representations (graduate topics course).
Spring 2014	Math 408K, Differential calculus.
Fall 2011	Math 408C, Differential calculus for engineers.

Service

1. Co-organzier, The 58th Texas Geometry and Topology Conference, University of Texas, Austin, November 17-19, 2017.
2. Graduate Awards Committee, AY 2016–2017, College of Natural Sciences, UT Austin.
3. Instructor hiring committee, AY 2015–2017, UT Austin.
4. Organizer, UT Austin Groups and dynamics seminar, AY 2017- (with Lewis Bowen).
5. Organizer, UT Austin Topology Seminar, Spring 2017 (with John Luecke, and Alan Reid).
6. Organizer, Special session of the JMM on Group actions and geometric structures, January 7, 2017. (with Anna Wienhard)
7. Organizer, Department Colloquium, AY 2015–, UT Austin. (with Arie Israel)
8. Organizer, Lorentzian geometric structures seminar, Spring 2015, MSRI.
9. Co-organzier, The 52nd Texas Geometry and Topology Conference, University of Texas, Austin, November 14-16, 2014.
10. Co-organizer, RTG workshop on Geometric Structures and Discrete Groups, University of Texas, Austin, May 2-4, 2014.
11. Co-organizer, GEAR Junior Retreat, University of Illinois, Champaign-Urbana, July 23 - August 3, 2012.
12. Co-organizer, AMS special session on the geometry of real projective structures (Mathematical Research Communities), JMM Boston, January 5, 2012.
13. Referee for many journals, including *Annales de la Faculté des sciences de Toulouse*, *Bulletin of the London Mathematical Society*, *Duke Mathematical Journal*, *Geometriae Dedicata*, *Geometry and Topology*, etc.

Graduate Students

1. Current students: Martin Bobb (in candidacy)

Invited talks

- August 2017 GEAR Junior Retreat, Stanford.
Geometric structures on manifolds, mini-course (4 lectures).
- June 2017 Geometric Topology in Cortona, Cortona Italy.
Convex real projective structures and Anosov representations
- May 2017 IHES, Geometry and Discrete Groups seminar.
Convex real projective structures and Anosov representations
- May 2017 Université Lille 1, Geometry seminar.
Convex real projective structures and Anosov representations
- October 2016 UT Austin Topology seminar
Proper affine actions of right-angled Coxeter groups
- October 2016 UT Austin Groups actions and dynamics seminar
Convex cocompact actions and generalizations
- June 2016 Conference in honor of Bill Goldman, Maryland
Proper affine actions of right-angled Coxeter groups
- May 2016 Advanced school on low-dimensional topology and geometric group theory, Trieste
Proper affine actions of right-angled Coxeter groups
- March 2016 Geometric structures on three-manifolds seminar, Institute for advanced study
Proper affine actions of right-angled Coxeter groups
- March 2016 Geometry and Topology Seminar, Columbia University
Proper affine actions of right-angled Coxeter groups
- October 2015 LA Joint Topology Seminar, USC
Convex projective structures on non-hyperbolic manifolds
- July 2015 Workshop on three-dimensional geometric structures, representations of surface groups and related topics, Luxembourg
Convex projective structures on non-hyperbolic manifolds
- May 2015 Daryl Cooper birthday conference, UC Berkeley
Convex projective structures on non-hyperbolic manifolds
- May 2015 Geometry and topology seminar UChicago
Convex projective structures on non-hyperbolic manifolds
- April 2015 MSRI Research seminar - Dynamics on moduli spaces of geometric structures.
Convex projective structures on non-hyperbolic manifolds
- March 2015 MSRI Lorentzian Geometric Structures Seminar.
Margulis spacetimes and contracting deformations of hyperbolic surfaces I + II.
- October 2014 UT Austin Back porch seminar.
Degenerations of anti de Sitter 2+1 space-times.
- October 2014 UT Austin Group Actions and Dynamics seminar.
Limits of geometries.
- July 2014 Borel Seminar, Les Diablerets
Complete spacetimes of constant curvature in dimension 3.
- May 2014 Conference on Geometry, Topology, and Physics, Pitt
Moduli spaces of constant curvature spacetimes.
- April 2014 Rice Geometry and Analysis seminar
Moduli spaces of constant curvature spacetimes.
- February 2014 UIUC Differential geometry seminar
Moduli spaces of constant curvature spacetimes.
- January 2014 UIC Colloquium
Moduli spaces of constant curvature spacetimes.
- December 2013 Berkeley Topology seminar
Moduli spaces of constant curvature spacetimes.
- December 2013 Stanford Topology seminar

- November 2013 *Moduli spaces of constant curvature spacetimes.*
UCSB Topology seminar.
- October 2013 *Moduli spaces of constant curvature spacetimes*
UT Austin Group Actions and Dynamics seminar.
- September 2013 *Moduli spaces of constant curvature spacetimes.*
Temple Geometry seminar.
- September 2013 *Margulis spacetimes via the arc complex.*
Exotic geometric structures workshop, ICERM, Brown University.
- August 2013 *Margulis spacetimes, the arc complex, and the Crooked Plane Conjecture.*
William Rowan Hamilton geometry and topology workshop, Dublin.
- August 2013 *Margulis spacetimes via the arc complex.*
Rolf Nevanlinna Colloquium, Helsinki, Finland.
- June 2013 *Complete flat Lorentz three-manifolds.*
Geometric topology in Cortona (in honor of Riccardo Benedetti), Cortona Italy.
- May 2013 *Complete flat Lorentz three-manifolds.*
Université Lille 1 Geometry and Dynamics seminar.
- April 2013 *Ideal triangulations of anti de Sitter manifolds.*
Heidelberg Geometry seminar.
- April 2013 *Geometric transitions in Lorentzian geometry.*
Michigan GEAR/RTG lecture series (2 lectures).
- April 2013 *Geometric transitions in Lorentzian geometry.*
Maryland Geometry and Dynamics seminar.
- February 2013 *Complete flat Lorentz three-manifolds.*
UT Austin Topology seminar.
- October 2012 *Complete affine three-manifolds.*
Workshop on Higher Teichmüller-Thurston Theory, Montreal.
- September 2012 *Volumes and rigidity in anti de Sitter geometry.*
UT Austin Group Actions and Dynamics seminar.
- August 2012 *Geometry and topology of complete Lorentz spacetimes of constant curvature.*
GEAR retreat, University of Illinois, Urbana-Champaign.
- May 2012 *Geometry and topology of complete Lorentz spacetimes of constant curvature.*
Rigidity and flexibility in dimensions 2,3, and 4 (KerckhoffFest), Luminy.
- April 2012 *Degenerations and transitions of sub-geometries of projective geometry.*
TCU Department Colloquium.
- April 2012 *Hyperbolic and AdS geometry in dimension three.*
Brown topology seminar.
- April 2012 *Geometric transitions: from hyperbolic to AdS geometry.*
Boston college topology seminar.
- February 2012 *Geometric transitions: from hyperbolic to AdS geometry.*
Université Lille 1, Geometry seminar.
- February 2012 *Geometric transitions: from hyperbolic to AdS geometry.*
Geometry Seminar, Université Paul Sabatier, Toulouse.
- February 2012 *Geometric transitions: from hyperbolic to AdS geometry.*
Workshop on moduli spaces of representations, Institut Henri Poincaré, Paris.
- December 2011 *Degenerations and transitions of sub-geometries of projective geometry.*
Wasatch Topology Conference, Kimball Junction, Utah.
- September 2011 *Geometric transitions: from hyperbolic to AdS geometry.*
UT Austin Topology seminar.
- Geometric transitions: from hyperbolic to AdS geometry.*

- April 2011 RTG Conference on higher Teichmüller theory, Michigan.
Geometric transitions: from hyperbolic to AdS geometry.
- April 2011 UC Berkeley Topology seminar.
Geometric transitions: from hyperbolic to AdS geometry.
- March 2011 Yale Geometry and Topology seminar.
Geometric transitions: from hyperbolic to AdS geometry.
- March 2011 Ahlfors Bers Colloquium, Rice University.
Geometric transitions: from hyperbolic to AdS geometry.

Expository talks and outreach

- February 2016 Texas Undergraduate Geometry and Topology Conference
Polyhedra inscribed in quadrics
- January 2016 Workshop on $\mathrm{Sp}(4, \mathbb{R})$ -Anosov representations, Granby Colorado.
Morse actions of discrete groups on symmetric spaces a la Kapovich–Leeb–Porti
- March 2015 Graduate student topology and geometry conference, UIUC
Introduction to complete 2 + 1 spacetimes of constant curvature
- March 2015 Graduate student topology and geometry conference, UIUC
Introduction to complete 2 + 1 spacetimes of constant curvature
- June 2013 Workshop on higher Teichmüller–Thurston theory, Maine.
Anosov representations in AdS geometry

References

Ph.D. adviser: Steven Kerckhoff – spk@math.stanford.edu

NSF postdoc mentor: Alan Reid – areid@math.utexas.edu

Other references:

William Goldman – wmg@math.umd.edu

François Labourie – francois.labourie@math.unice.fr

Miscellaneous

U.S. citizen.

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