

# Peter Smillie

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## Education

Ph.D. Mathematics, Harvard University. Expected June 2018.

Advisor: Shing-Tung Yau

B.S. Mathematics, with honors and distinction, Stanford University, 2011.

## Research Interests

Differential geometry

Moduli spaces

General Relativity

## Grants and Fellowships

NSF Graduate Research Fellowship, 2011- 2014

Stanford undergraduate summer research grant, 2010

## Papers

Bonsante, F.; Seppi, A.; Smillie, P. *The Minkowski problem in regular domains*. In preparation.

Bux, K.-U.; Smillie, P; Vogtmann, K. *On the bordification of outer space*. Preprint 2017, arXiv:1709.01296. Submitted.

Engel, P.; Smillie, P. *The number of non-negative curvature triangulations of  $S^2$* . Preprint 2017, arXiv:1702.02614. Submitted.

## Talks

### *Invited Talks*

*Foliations of Lorentzian manifolds by Weingarten surfaces*, AMS sectional meeting, Riverside, 2017

*Weingarten foliations of 3 dimensional Lorentzian spaceforms*, Harvard, 2017

*Convex triangulations*, Brown, 2017

*Triangulations of  $S^2$* , Luxembourg, 2017

*Triangulations of  $S^2$* , Pavia, 2017

*Degeneration of CMC foliations*, CUNY Graduate Center, 2016

*Constant mean curvature foliations of Minkowski 3-space*, GEAR workshop on Analytic aspects of higher Teichmüller theory, Rutgers, 2016

*Constant mean curvature hypersurfaces in general relativity*, AMS Grad Student Conference, Brown, 2015

*Student Seminar Talks (many topics represent several talks)*

- Positive scalar curvature and minimal hypersurface singularities*, 2017
- Ramification conjectures and Hirzebruch's property of line arrangements*, 2017
- Earthquakes in two-dimensional hyperbolic geometry*, 2017
- Siegel theta functions for indefinite lattices*, 2017
- Constant Gauss curvature hypersurfaces in Minkowski space*, 2016
- Reduction of the Einstein equations in 2+1 with fluid*, 2016
- Relativistic Teichmüller theory*, 2016
- Initial singularity of flat globally hyperbolic spacetimes*, 2015
- Lorentz spacetimes of constant curvature*, 2015
- Characteristic classes of foliations*, 2015
- Ray structures in Teichmüller space*, 2015
- Null mean curvature flow and MOTS*, 2015
- The Riemannian Penrose inequality*, 2015
- CMC spacelike hypersurfaces*, 2015
- Minimal hypersurfaces asymptotic to quadratic cones*, 2015
- Gromov-Hausdorff limits of Kähler manifolds*, 2015
- Spectral curves and CMC surfaces*, 2014
- On the proof of the positive mass theorem*, 2014
- Constant mean curvature hypersurfaces and harmonic maps*, 2014
- Infinitely many minimal surfaces in positive Ricci curvature*, 2013
- Foliations of positive scalar curvature*, 2013
- Boundary connect sum of Poincaré-Einstein manifolds*, 2013
- Minimal surfaces in hyperbolic three-space*, 2013
- The moment map and  $\lambda_1$  for Hermitian symmetric spaces*, 2013
- Eigenvalue estimates and arithmetic curves*, 2013
- Volumes of arithmetic locally symmetric spaces*, 2013
- Higgs bundles and variations of Hodge structure*, 2012
- Hamiltonian mean curvature flow*, 2012
- On "The Self-Duality equations on a Riemann surface"*, 2012
- Symplectic conifold transitions*, 2012
- On "The Yang-Mills equations over Riemann surfaces"*, 2012
- Geometry of diffeomorphism groups*, Trivial Notions Seminar, 2012
- The ADHM construction*, Harvard Baby Gauge Theory Seminar, 2012
- Cohomology of loop groups*, Harvard Baby Gauge Theory Seminar, 2012

## Teaching experience

Lecturer, *21a: Multivariable Calculus*, Harvard, Fa. 2014, Fa. 2015, Spr. 2016, Fa. 2017

Course Assistant, *Differential Geometry*, National Taiwan University, Fa. 2013 - Spr. 2014

Course Assistant, *213br: Advanced Complex Analysis*, Harvard, Spr. 2013

## Professional activities

Referee for Journal of Differential Geometry

Yau students seminar, organizer 2013-14

Harvard 'Trivial Notions' graduate seminar, organizer 2012-13

Stanford Math Tournament, co-organizer, 2010

Stanford University Mathematical Organization, president, 2009-10

Established undergraduate symposium at Stanford, 2009

PROMYS, councilor 2008

Last updated: October 8, 2017