

CURRICULUM VITAE

Xin Zhou

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Research Interest: Geometric Analysis; Calculus of Variations; General Relativity

Employment:

University of California Santa Barbara,	Assistant Professor,	7/16-now
Massachusetts Institute of Technology,	CLE Moore Instructor,	9/13-6/16
Mathematical Sciences Research Institute,	Postdoc Fellow,	8/13-12/13

Education:

Stanford University,	Ph.D. in mathematics,	June 2013
Peking University,	M.S. in mathematics,	June 2008
Tsinghua University,	B.S. in physics and mathematics,	June 2006

Awards:

- NSF Grant DMS-1406337, 2014-2016
- NSF Grant DMS-1704393, 2016-2017

Preprints:

1. (joint with Shing-Tung Yau) Min-max theory via minimal filling, preprint
2. (joint with Jonathan Zhu) Min-max theory for CMC hypersurfaces, preprint, arXiv:1707.08012
3. (joint with Martin Li) A maximum principle for free boundary minimal hypersurfaces, arXiv:1708.05001
4. (joint with Martin Li) Min-max theory for free boundary minimal hypersurfaces I: regularity, preprint, arXiv:1611.02612
5. (joint with Qiang Guang and Martin Li) Curvature estimates for stable minimal hypersurfaces with free boundary, preprint, arXiv:1611.02605

Publications:

1. (joint with Y. Liokumovich) *Sweeping out 3-manifold of positive Ricci curvature by short 1-cycles via estimates of min-max surfaces*, International Mathematics Research Notices 2016, doi:10.1093/imrn/rnw264
2. (joint with D. Ketover) *Entropy of closed surfaces and min-max theory*, accepted by J. of Differential Geometry, arXiv:1509.06238
3. (joint with Haozhao Li) *Existence of minimal surfaces of arbitrary large Morse index*, Calculus of Variations and Partial Differential Equations, 2016, 55(3), 1-12

4. *Min-max hypersurface in manifold of positive Ricci curvature*, J. Differential Geometry, 105 (2017), 291-343
5. *On the free boundary min-max geodesics*, International Mathematics Research Notices, Vol. 2016, No. 5, pp. 1447-1466
6. *Min-max minimal hypersurface in (M^{n+1}, g) with $Ric_g > 0$ and $2 \leq n \leq 6$* , J. Differential Geometry, 100 (2015) 129-160
7. *Mass angular momentum inequality for axisymmetric vacuum data with small trace*, Communication in Analysis and Geometry, 22, (2014) 519-571
8. (joint with R. Schoen) *Convexity of reduced energy and mass angular momentum inequalities*, Ann. Henri Poincaré, 14 (2013), 1747-1773
9. *On the existence of min-max minimal surfaces of genus $g \geq 2$* , Communications in Contemporary Mathematics, 19, 1750041 (2017)
10. *On the existence of min-max minimal torus*, J. Geom. Anal. 20 (2010),1026-1055

Survey articles and research reports:

1. (joint with J. Zhu) *Min-max theory for constant mean curvature (CMC) hypersurfaces*, Partial Differential Equations, Oberwolfach, 35, 2017, to appear
2. (joint with M. Li) *On minimal surfaces with free boundary*, special issues of ICCM Notices, to appear
3. (joint with Q. Guang) *Recent progress on compactness of minimal surfaces with free boundary*, Proceeding of the Workshop on Geometric Analysis 2017, to appear

Other Writings:

1. *Introduction to the min-max theory for minimal surfaces*, hand-written lecture notes for a topic class on the min-max theory of minimal surfaces in 2013
2. *Lecture notes on minimal surfaces*, this series of lecture notes were taken for the topic class on minimal surfaces given by Professor Rick Schoen in the Winter quarter of 2012 at Stanford
3. *Introduction to Mathematical General Relativity*, this series of lecture notes were taken for the topic class on mathematical General Relativity given by Professor Rick Schoen in the spring quarter of 2012 at Tsinghua University

Research Talks:

- “Min-max theory for CMC hypersurfaces”, Geometric partial differential equations and their applications, AMS meeting, UC Riverside, 11/2017
- “Min-max theory for CMC hypersurfaces”, Member Seminar, CMSA, Harvard, 10/2017
- “Min-max theory for CMC hypersurfaces”, ITS-CUNY symposium on Nonlinear Problems in Geometry, CUNY, 10/2017
- “Min-max theory for CMC hypersurfaces”, Nonlinear Analysis Seminar, Rutgers University, 9/2017
- “Min-max theory for CMC hypersurfaces”, Analysis and Partial Differential Equations Seminar, John Hopkins University, 9/2017

- “Min-max theory for CMC hypersurfaces”, Partial Differential Equations, Oberwolfach conference, Germany, 8/2017
- “Min-max minimal hypersurfaces with free boundary”, Mathematical Congress of the Americas, Montreal, Canada, 7/2017
- “Min-max minimal hypersurfaces with free boundary”, Geometric Analysis Seminar, University of Chicago, 6/2017
- “Min-max minimal hypersurfaces with free boundary”, 2017 Workshop on Geometric Analysis, Beijing, China, 5/2017
- “Min-max minimal hypersurfaces with free boundary”, Geometric Analysis Seminar, MIT, 4/2017
- “Min-max minimal hypersurfaces with free boundary”, Perspectives of Mathematics, Tsinghua University, Beijing, China, 4/2017
- “Min-max minimal hypersurfaces with free boundary”, Differential Geometry & Geometric Analysis Seminar, Princeton University, 4/2017
- “Min-max minimal hypersurfaces with free boundary”, Diff. Geom, Math. Phys., PDE Seminar, University of British Columbia, Canada, 4/2017
- “Min-max minimal hypersurfaces with free boundary”, Geometry and Analysis Seminar, UC Santa Cruz, 12/2016
- “Min-max minimal hypersurfaces with free boundary”, Joint UCI-UCR-UCSD Southern California Differential Geometry Seminar, Irvine, 11/2016
- “Min-max minimal hypersurfaces with free boundary”, Geometric Analysis and General Relativity workshop in BIRS, Banff, 7/2016
- “Min-max theory in Gaussian space and Entropy Conjecture”, Differential Geometry & Geometric Analysis Seminar, Princeton, 5/2016
- “Min-max theory in Gaussian space and Entropy Conjecture”, Geometry Seminar, Michigan State University, 4/2016
- “Min-max theory in Gaussian space and Entropy Conjecture”, Lafayette-Lehigh Geometry & Topology Seminar, 3/2016
- “Geometric variational theory and applications”, Colloquium, University of Colorado Boulder, 1/2016
- “Geometric variational theory and applications”, Colloquium, University of Connecticut, 1/2016
- “Geometric variational theory and applications”, Colloquium, UC Santa Barbara, 12/2015
- “Geometric variational theory and applications”, Colloquium, Rice University, 12/2015
- “Geometric variational theory and applications”, Differential Geometry Seminar, UC Irvine, 11/2015
- “Min-max theory in Gaussian space and Entropy conjecture”, Differential Geometry Seminar, Harvard, 11/2015
- “On the Morse index in the min-max theory of minimal surfaces”, PDE and Differential Geometry Seminar, University of Connecticut, 9/2015
- “On the Morse index in the min-max theory of minimal surfaces”, Differential Geometry & Geometric Analysis Seminar, Princeton, 4/2015

- “Min-max hypersurface in manifold with $Ric_g > 0$ ”, V Workshop on Differential Geometry, Maceió, Brazil, 3/2015
- “Min-max hypersurface in manifold with $Ric_g > 0$ ”, Differential Geometry Seminar, Harvard, 12/2014
- “Min-max hypersurface in manifold with $Ric_g > 0$ ”, Geometric Analysis Seminar, MIT, 9/2014
- “Min-max minimal hypersurface in (M^{n+1}, g) with $Ric_g > 0$ ”, Geometric Analysis Conference, Lisbon, Portugal, 7/2014
- “Min-max minimal hypersurface in (M^{n+1}, g) with $Ric_g > 0$ ”, Brown Geometric Analysis Seminar, 3/2014
- “Min-max minimal hypersurface in (M^{n+1}, g) with $Ric_g > 0$ ”, Berkeley Differential Geometry Seminar, 12/2013
- “Min-max minimal hypersurface in (M^{n+1}, g) with $Ric_g > 0$ ”, Columbia Geometry & Analysis Seminar, 11/2013
- “Min-max minimal hypersurface in (M^{n+1}, g) with $Ric_g > 0$ ”, UCSB Geometry Seminar, 10/2013
- “On the mass angular momentum inequalities”, MSRI Postdoc Seminar, 9/2013
- “Min-max minimal surface of high genus”, Bay Area Differential Geometry Seminar, Stanford, 5/2013
- “Min-max minimal hypersurface in (M^{n+1}, g) with $Ric_g > 0$ and $2 \leq n \leq 6$ ”, Stanford Geometry Seminar, 10/2012
- “Introduction to conformal method on vacuum constraint equations”, MSRI Mathematical General Relativity Workshop, 7/2012
- “On the existence of min-max minimal surface of high genus”, Annual Geometric Analysis Meeting, China, 6/2012
- “Some recent progress on mass angular momentum inequality”, Columbia General Relativity Seminar, 12/2011
- “Axial symmetry and mass angular momentum inequality”, Beijing Summer Program in Mathematical Relativity 2011, 6/2011

Services:

- Regular contributor to *Mathematical Reviews/MathSciNet*
- Organizer for *UCSB Differential Geometry Seminar*, 2016-now
- Co-Organizer for *MIT Geometric Analysis Seminar*, 2014-2016