

# 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

## Visiting positions:

Institute for Advanced Study,	Member,	9/18-6/19
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-1811293, 2018-2021
- UC Regent's Junior Faculty Award, 2018
- US Junior Oberwolfach Fellow, 2017
- NSF Grant DMS-1704393, DMS-1406337, 2014-2017

## Preprints:

1. *On the Multiplicity One Conjecture in min-max theory*, preprint, arXiv:1901.01173
2. *Min-max theory for networks of constant geodesic curvature* (with J. Zhu), preprint, arXiv:1811.04070
3. *Existence of hypersurfaces with prescribed mean curvature I - Generic min-max* (with J. Zhu), submitted, arXiv:1808.03527
4. *Min-max minimal disks with free boundary in Riemannian manifolds* (with L. Lin and A. Sun), submitted, arXiv:1806.04664
5. *Compactness and generic finiteness for free boundary minimal hypersurfaces* (with Q. Guang), preprint, arXiv:1803.01509
6. *Free boundary minimal hypersurfaces with least area* (with Q. Guang and Z. Wang), submitted, arXiv:1801.07036
7. *Min-max theory for constant mean curvature hypersurfaces* (with J. Zhu), submitted, arXiv:1707.08012

8. *Min-max theory for free boundary minimal hypersurfaces I: regularity* (with M. Li), submitted, arXiv:1611.02612

### **Publications:**

1. *A maximum principle for free boundary minimal hypersurfaces* (with M. Li), accepted by Comm. in Analysis and Geometry arXiv:1708.05001
2. *Curvature estimates for stable minimal hypersurfaces with free boundary* (with Q. Guang and M. Li), accepted by J. Reine Angew. Math (Crelle's Journal), arXiv:1611.02605
3. *Sweeping out 3-manifold of positive Ricci curvature by short 1-cycles via estimates of min-max surfaces* (with Y. Liokumovich), Int. Math. Res. Not. IMRN 2018, no. 4, 1129-1152
4. *Entropy of closed surfaces and min-max theory* (with D. Ketover), J. Differential Geom. 110 (2018), no. 1, 31-71
5. *Existence of minimal surfaces of arbitrary large Morse index* (with H. Li), Calc. Var. Partial Differential Equations 55 (2016), no. 3, Art. 64, 12 pp
6. *Min-max hypersurface in manifold of positive Ricci curvature*, J. Differential Geom. 105 (2017), no. 2, 291-343
7. *On the free boundary min-max geodesics*, Int. Math. Res. Not. IMRN 2016, no. 5, 1447-1466
8. *Min-max minimal hypersurface in  $(M^{n+1}, g)$  with  $Ric_g > 0$  and  $2 \leq n \leq 6$* , J. Differential Geom. 100 (2015), no. 1, 129-160
9. *Mass angular momentum inequality for axisymmetric vacuum data with small trace*, Comm. Anal. Geom. 22 (2014), no. 3, 519-571
10. *Convexity of reduced energy and mass angular momentum inequalities* (with R. Schoen), Ann. Henri Poincaré 14 (2013), no. 7, 1747-1773
11. *On the existence of min-max minimal surfaces of genus  $g \geq 2$* , Commun. Contemp. Math. 19 (2017), no. 4, 1750041, 36 pp
12. *On the existence of min-max minimal torus*, J. Geom. Anal. 20 (2010), no. 4, 1026-1055

### **Survey articles and research reports:**

1. *Min-max theory for constant mean curvature (CMC) hypersurfaces* (with J. Zhu), Partial Differential Equations, Oberwolfach, 35, 2017
2. *On minimal surfaces with free boundary* (with M. Li), special issues of ICCM Notices, to appear
3. *Recent progress on compactness of minimal surfaces with free boundary* (with Q. Guang), Surveys in Geometric Analysis 2017, 63-78, Science Press Beijing, Beijing, 2018. ISBN: 9787030573223

### **Research Talks:**

- New Trends in Geometric Measure Theory, AMS meeting, Hawaii, 3/2019
- Princeton and IAS joint Differential Geometry and Geometric Analysis Seminar, 2/2019
- Geometric Analysis Seminar, CUNY, 2/2019
- Differential Geometry Seminar, Harvard, 2/2019
- Geometric Analysis Seminar, University of Chicago, 1/2019
- Differential Geometry Seminar, UC San Diego, 1/2019

- Differential Geometry Seminar, UC Irvine, 1/2019
- Geometric Analysis, AMS meeting, San Francisco, 10/2018
- Stanford Geometry Seminar, 10/2018
- Columbia Geometry & Analysis Seminar, 10/2018
- Nonlinear Analysis Seminar, Rutgers University, 10/2018
- Mass in General Relativity Workshop, Simons Center for Geometry and Physics, 3/2018
- PDE and Differential Geometry Seminar, University of Connecticut, 2/2018
- Geometry/Topology seminar, Boston College, 2/2018
- Geometric partial differential equations and their applications, AMS meeting, UC Riverside, 11/2017
- Member Seminar, CMSA, Harvard, 10/2017
- ITS-CUNY symposium on Nonlinear Problems in Geometry, CUNY, 10/2017
- Nonlinear Analysis Seminar, Rutgers University, 9/2017
- Analysis and Partial Differential Equations Seminar, John Hopkins University, 9/2017
- Partial Differential Equations, Oberwolfach conference, Germany, 8/2017
- Mathematical Congress of the Americas, Montreal, Canada, 7/2017
- Geometric Analysis Seminar, University of Chicago, 6/2017
- 2017 Workshop on Geometric Analysis, Beijing, China, 5/2017
- Geometric Analysis Seminar, MIT, 4/2017
- Perspectives of Mathematics, Tsinghua University, Beijing, China, 4/2017
- Differential Geometry & Geometric Analysis Seminar, Princeton University, 4/2017
- Diff. Geom, Math. Phys., PDE Seminar, University of British Columbia, Canada, 4/2017
- Geometry and Analysis Seminar, UC Santa Cruz, 12/2016
- Joint UCI-UCR-UCSD Southern California Differential Geometry Seminar, Irvine, 11/2016
- Geometric Analysis and General Relativity workshop in BIRS, Banff, 7/2016
- Differential Geometry & Geometric Analysis Seminar, Princeton, 5/2016
- Geometry Seminar, Michigan State University, 4/2016
- Lafayette-Lehigh Geometry & Topology Seminar, 3/2016
- Colloquium, University of Colorado Boulder, 1/2016
- Colloquium, University of Connecticut, 1/2016
- Colloquium, UC Santa Barbara, 12/2015
- Colloquium, Rice University, 12/2015
- Differential Geometry Seminar, UC Irvine, 11/2015
- Differential Geometry Seminar, Harvard, 11/2015
- PDE and Differential Geometry Seminar, University of Connecticut, 9/2015
- Differential Geometry & Geometric Analysis Seminar, Princeton, 4/2015
- Vth Workshop on Differential Geometry, Maceió, Brazil, 3/2015
- Differential Geometry Seminar, Harvard, 12/2014
- Geometric Analysis Seminar, MIT, 9/2014
- Geometric Analysis Conference, Lisbon, Portugal, 7/2014

- Brown Geometric Analysis Seminar, 3/2014
- Berkeley Differential Geometry Seminar, 12/2013
- Columbia Geometry & Analysis Seminar, 11/2013
- UCSB Geometry Seminar, 10/2013
- MSRI Postdoc Seminar, 9/2013
- Bay Area Differential Geometry Seminar, Stanford, 5/2013
- Stanford Geometry Seminar, 10/2012
- MSRI Mathematical General Relativity Workshop, 7/2012
- Annual Geometric Analysis Meeting, China, 6/2012
- Columbia General Relativity Seminar, 12/2011
- Beijing Summer Program in Mathematical Relativity 2011, 6/2011

### Services:

- Referee for *Advances in Mathematics*, *Annali della Scuola Normale Superiore di Pisa*, *Calculus of Variations and Partial Differential Equations*, *Cambridge Journal of Mathematics*, *Communication in Analysis and Geometry*, *Duke Math Journal*, *Indiana University Mathematics Journal*, *Journal of American Math Society*, *Journal of Differential Geometry*, *Journal of Topology and Analysis*, *Proceedings of American Math Society*, etc.
- Co-organizer for *Geometry and Analysis on Manifolds Conference*, 2017, 2018
- Co-organizer for *Special session on Geometric Analysis* at the Joint AMS Mathematics Meetings in San Diego, 2018.
- Organizer for *UCSB Differential Geometry Seminar*, 2016-now
- PhD Thesis defense committees: Qiang Guang (MIT, 2016), Jui-En Chang (MIT, 2016)

### Student and Post-doc:

- Qiang Guang (post-doc at UCSB, current)
- Masoud Geevechi (master student at UCSB, graduated in 2018)