CURRICULUM VITAE

Xin Zhou

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

Employment:

Cornell University,	Associate Professor,	from 7/20
University of California Santa Barbara,	Associate Professor,	from 7/20
University of California Santa Barbara,	Assistant Professor,	7/16-6/20
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

Grants and awards:

- NSF Career Award, DMS-1945178, 2020-2024
- Alfred P. Sloan Research Fellow, 2019-2021
- NSF Grant DMS-1811293, 2018-2021
- UC Regent's Junior Faculty Award, 2018
- NSF Grant DMS-1704393, DMS-1406337, 2014-2017

Preprints:

1. Generic scarring for minimal hypersurfaces along stable hypersurfaces (with A. Song), submitted, arXiv:2006.03038.
2. Min-max theory for free boundary minimal hypersurfaces II – General Morse index bounds and applications (with Q. Guang, M. Li, and Z. Wang), submitted, arXiv:1907.12064.
3. Compactness and generic finiteness for free boundary minimal hypersurfaces (I) (with Q. Guang and Z. Wang), submitted, arXiv:1803.01509.
4. Free boundary minimal hypersurfaces with least area (with Q. Guang and Z. Wang), submitted, arXiv:1801.07036.

Publications:

1. On the Multiplicity One Conjecture in min-max theory, accepted by *Annals of Math.*, arXiv:1901.01173.
2. Min-max theory for networks of constant geodesic curvature (with J. Zhu), *Adv. Math. 361 (2020), 106941, 16 pp*.
3. Existence of hypersurfaces with prescribed mean curvature I - Generic min-max (with J. Zhu), Cambridge Journal of Mathematics, Volume 8, Number 2, 311-362, 2020.
4. Min-max minimal disks with free boundary in Riemannian manifolds, (with L. Lin and A. Sun), *Geometry & Topology 24 (2020) 471-532*.
5. Min-max theory for constant mean curvature hypersurfaces, (with J. Zhu), *Invent. math. (2019) 218:441–490*.
6. Min-max theory for free boundary minimal hypersurfaces I: regularity, (with M. Li), accepted by *J. of Differential Geom.*, arXiv:1611.02612.
7. A maximum principle for free boundary minimal varieties of arbitrary codimension, (with M. Li), accepted by *Comm. Anal. Geom.*, arXiv:1708.05001.
8. Curvature estimates for stable minimal hypersurfaces with free boundary, (with Q. Guang and M. Li), *J. reine angew. Math.* 759 (2020), 245-264.
9. 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.
10. Entropy of closed surfaces and min-max theory, (with D. Ketover), *J. Differential Geom.* 110 (2018), no. 1, 31-71.
11. 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.
12. Min-max hypersurface in manifold of positive Ricci curvature, *J. Differential Geom.* 105 (2017), no. 2, 291-343.
13. On the free boundary min-max geodesics, *Int. Math. Res. Not.* IMRN 2016, no. 5, 1447-1466.
14. 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.
15. Mass angular momentum inequality for axisymmetric vacuum data with small trace, *Comm. Anal. Geom.* 22 (2014), no. 3, 519-571.
16. Convexity of reduced energy and mass angular momentum inequalities, (with R. Schoen), *Ann. Henri Poincaré* 14 (2013), no. 7, 1747-1773.
17. On the existence of min-max minimal surfaces of genus $g \geq 2$, *Commun. Contemp. Math.* 19 (2017), no. 4, 1750041, 36 pp.
18. On the existence of min-max minimal torus, *J. Geom. Anal.* 20 (2010), no. 4, 1026-1055.

Survey articles and research reports:

1. Multiplicity One Conjecture in min-max theory, *Partial Differential Equations, Oberwolfach Report 2019*, to appear.
2. Free boundary minimal hypersurfaces with least area, (with Q. Guang and Z. Wang), *Surveys in Geometric Analysis 2018*, 45-50, Science Press Beijing, Beijing, 2019. ISBN: 9787030611123.
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.

4. Min-max theory for constant mean curvature (CMC) hypersurfaces, (with J. Zhu), *Partial Differential Equations, Oberwolfach Report*, 35, 2017.
5. On minimal surfaces with free boundary, (with M. Li), *special issues of ICCM Notices*, to appear.

Research Talks:

- Berkeley Differential Geometry Online Seminar, 9/2020
- 2020 Workshop on Geometric Analysis, China, 9/2020
- BICMR online seminar on Geometric Analysis, 5/2020
- Colloquium, Cornell University, 11/2019
- Differential Geometry Seminar, Harvard University, 9/2019
- Partial Differential Equations, Oberwolfach conference, Germany, 7/2019
- RTG Workshop on Geometric Analysis, Princeton University, 6/2019
- 2019 Workshop on Geometric Analysis, China, 5/2019
- Colloquium, Peking University, China, 5/2019
- Diff. Geom, Math. Phys., PDE Seminar, University of British Columbia, Canada, 4/2019
- Variational Methods in Geometry Seminar, IAS, 3/2019
- Differential Geometry Seminar, Ohio State University, 2/2019
- Colloquium, University of Alabama at Birmingham, 2/2019
- Princeton and IAS joint Differential Geometry and Geometric Analysis Seminar, 2/2019
- Geometric Analysis Seminar, CUNY, 2/2019
- Differential Geometry Seminar, Harvard University, 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, Stanford University, 10/2018
- Columbia Geometry & Analysis Seminar, Columbia University, 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 University, 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 University, 11/2015
- PDE and Differential Geometry Seminar, University of Connecticut, 9/2015
- Differential Geometry & Geometric Analysis Seminar, Princeton Univeristy, 4/2015
- Vth Workshop on Differential Geometry, Maceió, Brazil, 3/2015
- Differential Geometry Seminar, Harvard University, 12/2014
- Geometric Analysis Seminar, MIT, 9/2014
- Geometric Analysis Conference, Lisbon, Portugal, 7/2014
- Brown Geometric Analysis Seminar, Brown University, 3/2014
- Berkeley Differential Geometry Seminar, UC Berkeley, 12/2013
- Columbia Geometry & Analysis Seminar, 11/2013
- UCSB Geometry Seminar, UC Santa Barbara, 10/2013
- MSRI Postdoc Seminar, Berkeley, 9/2013
- Bay Area Differential Geometry Seminar, Stanford University, 5/2013
- Stanford Geometry Seminar, Stanford University, 10/2012
- MSRI Mathematical General Relativity Workshop, Berkeley, 7/2012
- 2012 Geometric Analysis Workshop, China, 6/2012
- Columbia General Relativity Seminar, Columbia University, 12/2011

Services at Cornell:

- Co-organizer for *Cornell Geometric Analysis Seminar*, 2020-now.
- By-Law Committee member, 2020-2021.
- Graduate Committee member, 2020-2021.

Other Professional Activities:

- Referee for *Advances in Mathematics, American Journal of Mathematics, Calculus of Variations and Partial Differential Equations, Cambridge Journal of Mathematics, Communication in Analysis and Geometry, Duke Math Journal, Journal of American Math Society, Journal of Differential Geometry, Mathematische Annalen, Proceedings of American Math Society, etc.*
- Co-organizer for *Special session on Geometric Partial Differential Equations and Variational Methods* at the AMS Sectional Meeting in Riverside, 2019.
- Co-organizer for *Variational Methods in Geometry Seminar*, IAS, 2018.
- Co-organizer for *Special session on Geometric Analysis* at the Joint AMS Mathematics Meetings in San Diego, 2018.
- Co-organizer for *UCSB Geometry and Analysis on Manifolds Conference*, 2017, 2018.
- PhD Thesis defense committees: Qiang Guang (MIT, 2016), Jui-En Chang (MIT, 2016).