

Jonathan J. Zhu

INFORMATION	University of Washington 4110 E Stevens Way NE Seattle, WA, USA	<i>Phone:</i> +1 (908) 487 8999 <i>E-mail:</i> jonozhu@uw.edu <i>Web:</i> < math.washington.edu/~jonozhu >	<i>Citizenship:</i> Dual citizen Australia, USA
INTERESTS	Differential Geometry, Geometric Analysis; Minimal surfaces, Mean curvature flow.		
APPOINTMENTS	Assistant Professor Postdoctoral Research Fellow Research Fellow Visiting Scholar	Department of Mathematics, University of Washington Department of Mathematics, Princeton University National Science Foundation Postdoctoral Research Fellowship Mathematical Sciences Institute, Australian National University School of Mathematics, Institute for Advanced Study	2022 - 2018 - 2022 2020 - 2021 2018 - 2019
EDUCATION	Harvard University , Cambridge, MA, USA	Ph.D in Mathematics Advisor 1: Prof. William P. Minicozzi II (MIT) Advisor 2: Prof. Shing-Tung Yau (Harvard)	2013 - 2018
	Massachusetts Institute of Technology , Cambridge, MA, USA	SB in Mathematics, Physics	2009 - 2013 GPA: 5.0/5.0
PUBLICATIONS AND PREPRINTS	<ol style="list-style-type: none">23. <i>Uniqueness of blowups for forced mean curvature flow</i> (with S. Hirsch), preprint, 2310.08005.22. <i>Sharp distance comparison for curve shortening flow on the round sphere</i> (with P. Bryan and M. Langford), preprint, arXiv:2310.02649.21. <i>A distance comparison principle for curve shortening flow with free boundary</i> (with M. Langford), preprint, arXiv:2302.14258.20. <i>Moving monotonicity formulae for minimal submanifolds in constant curvature</i> (with K. Naff), preprint, arXiv:2210.03263.19. <i>The prescribed point area estimate for minimal submanifolds in constant curvature</i> (with K. Naff), preprint, arXiv:2206.08302.18. <i>Widths of balls and free boundary minimal submanifolds</i>, Adv. Nonlinear Stud. 23 (2023). doi:10.1515/ans-2022-0044, arXiv:2203.10031.17. <i>Min-max theory for capillary surfaces</i> (with C. Li and X. Zhou), preprint, arXiv:2111.09924.16. <i>Rigidity of spherical product Ricci solitons</i> (with A. Sun), preprint, arXiv:2108.02326.15. <i>On certain quantifications of Gromov's non-squeezing theorem</i> (with K. Sackel, A. Song and U. Varolgunes), to appear in Geom. Topol. arXiv:2105.00586.14. <i>Lojasiewicz inequalities for mean convex self-shrinkers</i>, Int. Math. Res. Not. IMRN (2021). doi:10.1093/imrn/rnab287, arXiv:2101.09025.13. <i>Lojasiewicz inequalities, uniqueness and rigidity for cylindrical self-shrinkers</i>, preprint, arXiv:2011.01633.12. <i>Rigidity and Lojasiewicz inequalities for Clifford self-shrinkers</i> (with A. Sun), preprint, arXiv:2011.01636.		

11. *Mean convex mean curvature flow with free boundary* (with N. Edelen, R. Haslhofer and M. Ivaki), Comm. Pure Appl. Math. **75** (2021), no. 4, 767-817. doi:10.1002/cpa.22009, arXiv:1911.01186.
10. *Reilly's type inequality for the Laplacian associated to a density related with shrinkers for MCF* (with M. Carmen Domingo-Juan and V. Miquel), J. Differential Equations. **272** (2021), 958-978. doi:10.1016/j.jde.2020.10.004, arXiv:1503.01332.
9. *Min-max theory for networks of constant geodesic curvature* (with X. Zhou), Adv. Math. **361** (2020), art.106941. doi:10.1016/j.aim.2019.106941, arXiv:1811.04070
8. *Existence of hypersurfaces with prescribed mean curvature I - Generic min-max* (with X. Zhou), Camb. J. Math. **8** (2020), no. 2, 331-362. doi:10.4310/CJM.2020.v8.n2.a2, arXiv:1808.03527
7. *Min-max theory for constant mean curvature hypersurfaces* (with X. Zhou), Invent. Math. **218** (2019), no. 2, 441-490. doi:10.1007/s00222-019-00886-1, arXiv:1707.08012
6. *Moving-centre monotonicity formulae for minimal submanifolds and related equations*, J. Funct. Anal., **274** (2018), no. 5, 1530-1552. doi:10.1016/j.jfa.2017.07.008, arXiv:1704.08195
5. *First stability eigenvalue of singular minimal hypersurfaces in spheres*, Calc. Var. Partial Differential Equations, **57** (2018), no. 5, art. 130. doi:10.1007/s00526-018-1417-8, arXiv:1610.04816
4. *On the entropy of closed hypersurfaces and singular self-shrinkers*, J. Differential Geom. **114** (2020), no. 3, 551-593. doi:10.4310/jdg/1583377215, arXiv:1607.07760
3. *On the rigidity of mean convex self-shrinkers* (with Q. Guang), Int. Math. Res. Not. IMRN **2018**, no. 20, 6406-6425. doi:10.1093/imrn/rnx078, arXiv:1603.09435
2. *Rigidity and Curvature Estimates for Graphical Self-shrinkers* (with Q. Guang), Calc. Var. Partial Differential Equations, **56** (2017), no. 6, art. 176. doi:10.1007/s00526-017-1277-7, arXiv:1510.06061
1. *Minimal Hypersurfaces with Small First Eigenvalue in Manifolds of Positive Ricci Curvature*, J. Topol. Anal. **9** (2017), no. 3, 505-532. doi:10.1142/S1793525317500200, arXiv:1512.00105

OTHER ARTICLES

- Min-max theory for constant mean curvature hypersurfaces* (with X. Zhou), research report, Partial Differential Equations, Oberwolfach, 35 (2017).
- An inverse phase stability approach to rational materials synthesis* (with W. Sun, W. Huang, D. Kramer and G. Ceder), in preparation.

AWARDS

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| Alfred P. Sloan Research Fellowship | 2023-2025 |
| NSF Mathematical Sciences Postdoctoral Research Fellowship | 2018-2022 |
| ICCM Best Paper Award, Gold Medal | 2020 |

INVITED TALKS

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| • Geometric Analysis Seminar, | University of Oregon, 31 Oct 2023 |
| • Geometric Analysis Seminar, | Rutgers University, 19 Sep 2023 |
| • Non-Linear Critical Point Theory in Analysis and Geometry, | BIRS UBC Okanagan, Aug 2023 |
| • Geometric Analysis Seminar, | University of California - San Diego, 4 May 2023 |
| • Red-Raider Mini Symposium XIX, | Texas Tech University, 21 Apr 2023 |
| • Geometric Analysis Seminar, | Massachusetts Institute of Technology, 19 Apr 2023 |
| • Geometric Analysis and Topology Seminar, | New York University, 14 April 2023 |

- Young Mathematicians in Noncommutative Geometry and Analysis, Texas A&M, 17 Aug 2022
- Mean Curvature Flow and Related Topics, Queen Mary University of London, 8 July 2022
- Workshop on Scalar Curvature, Minimal Surfaces, and Initial Data Sets, Harvard CMSA, 5 May 2022
- Geometric Analysis Seminar, Massachusetts Institute of Technology, 4 May 2022
- Geometry Seminar, University of Minnesota, 14 Apr 2022
- Regularity Theory for Minimal Surfaces and Mean Curvature Flow, MSRI, 22 Mar 2022
- Differential Geometry Seminar, University of California - Riverside, 11 Mar 2022
- Geometry and Topology Seminar, North Carolina State University, 9 Mar 2022
- Differential Geometry and Geometric Analysis Seminar, Princeton University, 23 Feb 2022
- Geometry and Topology Seminar, California Institute of Technology, 11 Feb 2022
- Calculus of Variations in Probability and Geometry, IPAM, 10 Feb 2022
- Geometric Analysis Seminar, Columbia University, 10 Dec 2021
- Geometric Analysis section, AustMS Annual Meeting, University of Newcastle, 9 Dec 2020
- New Directions in Geometric Flows, Banff International Research Station, 9 Nov 2021
- Geometric Analysis Seminar, Rutgers University, 26 Oct 2021
- Analysis and Geometric Analysis Seminar, Cornell University, 4 Oct 2021
- Geometric Analysis Seminar, University of Notre Dame, 29 Apr 2021
- Geometry Seminar, University of Newcastle, 17 Mar 2021
- Geometric Analysis Seminar, University of California - San Diego, 3 Feb 2021
- ICCM Annual Meeting, UST China, 29 Dec 2020
- Geometric Analysis section, AustMS Annual Meeting, University of New England, 10 Dec 2020
- Pure Math Colloquium, University of Waterloo, 30 Nov 2020
- PDE and Analysis Seminar, Australian National University, 24 Nov 2020
- Geometric Analysis Seminar, City University of New York, 12 Nov 2020
- Geometric Analysis Seminar, University of Chicago, 20 Oct 2020
- Differential Geometry and Geometric Analysis Seminar, Princeton University, 10 Jun 2020
- PDE and Differential Geometry Seminar, University of Connecticut, 9 Mar 2020
- Differential Geometry Seminar, University of California - Berkeley, 27 Jan 2020
- Geometric Analysis Colloquium, Fields Institute, 13 Nov 2019
- Congress on Geometric Analysis, University of Cádiz, 29 Oct 2019
- Metro Area Differential Geometry Seminar, Johns Hopkins University, 12 Oct 2019
- 3rd Symposium in Geometry and Differential Equations, UST China, 21 May 2019
- Geometry and Topology Seminar, California Institute of Technology, 26 Apr 2019
- Geometric Analysis Seminar, Rutgers University, 12 Mar 2019
- Variational Methods in Geometry Seminar, Institute for Advanced Study, 9 Oct 2018
- Differential Geometry Seminar, University of Adelaide, 17 Aug 2018
- Geometric Analysis section, Joint Mathematics Meetings, San Diego, 13 Jan 2018
- Geometric Analysis section, AustMS Annual Meeting, Macquarie University, 13 Dec 2017
- Differential Geometry Seminar, University of Sydney, 11 Dec 2017
- Minimal Surface Seminar, University of Pennsylvania, 3 Oct 2017
- Differential Geometry and Geometric Analysis Seminar, Princeton University, 27 Sep 2017
- PDE Mini-School, University of North Carolina - Chapel Hill, 13 Apr 2017
- AMS Graduate Student Conference, Brown University, 7 Apr 2017
- Differential Geometry Seminar, University of California - Santa Barbara, 10 Feb 2017
- Geometric Analysis Seminar, University of Chicago, 8 Nov 2016
- Geometry and Topology Seminar, University of Wisconsin - Madison, 4 Nov 2016
- Differential Geometry Seminar, Harvard University, 25 Oct 2016
- Analysis and PDE Seminar, Johns Hopkins University, 17 Oct 2016
- PDE and Analysis Seminar, Australian National University, 16 Aug 2016

**TEACHING
EXPERIENCE**

University of Washington

Lecturer, Math224 (F, G) Advanced Multivariable Calculus
 Lecturer, Math224 (E, G) Advanced Multivariable Calculus
 Lecturer, Math126 (E) Calculus with Analytic Geometry III

Autumn 2023
Winter 2023
Autumn 2022

Princeton University

Lecturer, MAT175 Multivariable Calculus for Economics and Life Sciences
Lecturer, MAT203 Advanced Vector Calculus
Course coordinator and lecturer, MAT201 Multivariable Calculus
Lecturer, MAT201 Multivariable Calculus

Spring 2022
Fall 2021
Spring 2020
Fall 2019

Harvard University

Instructor, Math21a Multivariable Calculus
Instructor, Math1b Integral Calculus

Spring 2018, Spring 2016, Spring 2015
Fall 2016

Massachusetts Institute of Technology

Grader, 18.102 Functional Analysis

Spring 2012, Spring 2011

REFEREE SERVICE

- *Advanced Nonlinear Studies*
- *Advances in Mathematics*
- *Calculus of Variations and Partial Differential Equations*
- *Cambridge Journal of Mathematics*
- *Communications in Contemporary Mathematics*
- *Duke Mathematical Journal*
- *Geometric and Functional Analysis*
- *Geometry and Topology*
- *International Mathematics Research Notices*
- *Journal für reine und angewandte Mathematik (Crelle's Journal)*
- *Journal of Differential Geometry*
- *Journal of Functional Analysis*
- *Journal of Geometric Analysis*
- *Mathematische Annalen*
- *Pacific Journal of Mathematics*
- *Proceedings of the American Mathematical Society*
- *Pure and Applied Mathematics Quarterly*

CONFERENCES AND SEMINARS ORGANISED

- University of Washington DG/PDE Seminar, 2022 -
- SMRI-MATRIX Symposium: ‘Singularities in Geometric Flows: An Ancient Perspective’, Jan 2022
- Princeton University Differential Geometry and Geometric Analysis Seminar, 2019 - 2020
- MIT geometric analysis student seminar, 2016 - 2018

ADDITIONAL INFORMATION

Languages: English (native), Mandarin Chinese (basic).