Curriculum Vitae

Xiaodong Wang
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Education

- B.S. in Mathematics, Tsinghua University, China, 1993.
- M.S. in Mathematics, Peking University, China, 1996.
- Ph.D. in Mathematics, Stanford University, June 2001.
  Adviser: Professor Richard Schoen.

Employment

- Professor of Mathematics, Michigan State University, Aug. 2014–present
- Associate Professor of Mathematics, Michigan State University, Aug. 2008–July 2014
- Assistant Professor of Mathematics, Michigan State University, Aug. 2004–July 2008
- C. L. E. Moore Instructor of Mathematics, MIT Sept. 2001–July, 2004.

Research Interests

Geometric Analysis and PDE

Grants

- Simons Foundation Collaboration Grant for Mathematicians 312820, Sept. 2014–Aug. 2022 (extended twice due to the pandemic)
- NSF Research Grant DMS 0905904, Sept. 2009–Aug. 2013
- NSF Research Grant DMS 0505645, June 2005–May 2009
- NSF Research Grant DMS 0202122, July 2002–June 2004

Publications and Preprints (available on http://www.math.msu.edu/~xwang)

1. *A simpler proof of Frank and Lieb's sharp inequality on the Heisenberg group* (joint with Fengbo Hang), arXiv:2211.10301, submitted.
2. *A Sharp Inequality Relating Yamabe Invariants on Asymptotically Poincare-Einstein Manifolds with a Ricci Curvature Lower Bound* (joint with Zhixin Wang), submitted, arXiv:2201.11244
3. *On a Sharp Inequality Relating Yamabe Invariants on a Poincare-Einstein Manifold* (joint with Zhixin Wang), Proc. AMS.150 (2022), no. 11, 4923–4929.

4. *Uniqueness Results on a geometric PDE in Riemannian and CR Geometry Revisited* , Math. Z.301 (2022), no. 2, 1299–1314.

5. *Remarks on an Inequality for Closed Hypersurfaces in Complete Manifolds with Nonnegative Ricci Curvature* , to appear in Annales de la Faculte des Sciences de Toulouse.

6. *Improved Sobolev inequality with constraints* (joint with Fengbo Hang), Int. Math. Res. Notices 2022, no. 14, 10822–10857.

7. *Liouville type theorems on manifolds with nonnegative curvature and strictly convex boundary* (joint with Qianqiao Guo and Fengbo Hang), Math. Res. Letters.28 (2021), no. 5, 1419–1439.

8. *Uniqueness results for positive harmonic functions on B^n satisfying a nonlinear boundary condition* (joint with Qianqiao Guo), Cal. Variations and PDE 59 (2020), no. 5, Paper No. 146, 8 pp.

9. *On compact Riemannian manifolds with convex boundary and Ricci curvature bounded from below*, J. Geom. Anal. 31 (2021), no. 4, 3988-4003.

10. *Remarks on a mean field equation on S^2* (joint with Changfeng Gui, Fengbo Hang, Amir Moradifam), Journal of Mathematical Study, 54 (2021), no. 1, 81-88 (special issue in honor of Alice Chang and Paul Yang).

11. *Some recent results in CR geometry.* Tsinghua lectures in mathematics, 469–484, Adv. Lect. Math. (ALM), 45, Int. Press, Somerville, MA, 2019.

12. *Brendle's inequality on static manifolds* (joint with Ye-Kai Wang), J. Geometric Anal. 28 (2018), no.1, 152-169.

13. *Uniqueness results on surfaces with boundary*, Cal. Variations and P.D.E. 56 (2017), no. 3, Art. 87, 11pp.

14. *Characterization by symmetry of solutions of a nonlinear subelliptic equation on the Heisenberg group* (joint with Yazhou Han and Meijun Zhu), J. Math. Study. 50 (2017), no.1, 17-27.

15. *An integral formula in Kahler geometry with applications*, Comm. Contemporary Math. 19 (2017), no. 5, 1650063, 12 pp.

16. *Boundary effect of Ricci curvature* (joint with Pengzi Miao), J. Diff. Geom.103 (2016), 59-82.

17. *On a remarkable formula of Jerison and Lee in CR geometry*, Math. Res. Letters 22 (2015), no.1, 279-299.

18. *The isoperimetric constant of symmetric spaces of noncompact type*, Proceedings of American Math Soc. 143 (2015), no.11, 4885-4891.

19. *A new characterization of the CR sphere and the sharp eigenvalue estimate for the Kohn Laplacian* (joint with Song-Ying Li, Duong Ngoc Son), Advances in Math. 281 (2015), 1285-1305.

20. *An Obata type theorem in CR geometry* (joint with Song-Ying Li), J. Diff. Geom. 95 (2013), 483-502.

21. *Pinching theorems for the volume entropy* (joint with François Ledrappier), preprint, 2011.

22. *On the bottom of the spectrum of Kähler-Einstein manifolds with strongly pseudoconvex boundary* (joint with Song-Ying Li), Int. Res. Math. Notices 19 (2012), 4351-4371.

23. *Local gradient estimate for p-harmonic functions on Riemannian manifolds* (joint with Lei Zhang), Comm. Anal. Geom. 19 (2011), no. 4, 759-771.

24. *Compactifications of complete Riemannian manifolds*, Surveys in Geometric Analysis and relativity (ALM 20), pp. 517-529.

25. *Extension of a theorem of Shi and Tam* (joint with Michael Eichmair and Pengzi Miao), Calculus of Variations and PDE. 43 (2012), no. 1-2, 45-56.

26. *An integral formula for the volume entropy with applications to rigidity* (joint with François Ledrappier), J. Diff. Geom. 85 (2010), 461-478.

27. *Rigidity theorems for manifolds with boundary and positive Ricci curvature* (joint with Fengbo Hang), J. Geom. Anal. 19 (2009), 628-642.

28. *Harmonic functions, entropy, and a characterization of the hyperbolic space*, Journal Geom. Anal. 18 (2008), 272-284.

29. *An integral equation in conformal geometry* (joint with Fengbo Hang and Xiaodong Yan), Annales de l'Institut Henri Poincare (C) ANALYSE NON LINEAIRE 26 (2009), 1-21.

30. *Vanishing sectional curvature on the boundary and a conjecture of Schroeder and Strake.* (joint with Fengbo Hang), Pacific J. Math 232 (2007), 283-287.

31. *A remark on Zhong-Yang's eigenvalue estimate* (joint with Fengbo Hang), IMRN 18 (2007).

32. *Sharp integral inequalities for harmonic functions* (joint with Fengbo Hang and Xiaodong Yan), Comm. Pure Appl. Math. 61 (2008), 54–95.

33. *On the stability of Kähler-Einstein manifolds* (joint with Xianzhe Dai and Guofang Wei), Comm. Anal. Geom. 15 (2007), 669–693.

34. *On asymptotically complex hyperbolic Kähler manifolds*, Proc. AMS 135 (2007), no. 9, 2949-2960.

35. *Some rigidity and nonrigidity results on the sphere* (joint with Fengbo Hang), Comm. Analysis and Geometry 14 (2006) 91-106.

36. *A new approach to some nonlinear geometric equations in dimension two* (joint with Fengbo Hang), Cal. of Var. and PDE 26 (2006), no. 1, 119-135.

37. *On the stability of Riemannian manifolds with a parallel spinor* (joint with Xianzhe Dai and Guofang Wei), Invent. Math. 161 (2005), 151-176.

38. *Notes on Perelman's paper on the entropy formula for Ricci flow and its geometric applications,* (joint with Natasa Sesum and Gang Tian), 2003.

39. *Uniqueness of the AdS spacetime in any dimensions,* Acta Mathematica Sinica 21 (2005), no. 4, 917-922.

40. *On the L^2 cohomology of a convex cocompact hyperbolic manifold,* Duke Math. J. 115 (2002) no.2, 311-327.

41. *On the geometry of conformally compact Einstein manifolds,* Mathematical Research Letters 8 (2001) no. 5&6 (2001) 671–688.

42. *A new proof of Lee's theorem on the spectrum of conformally compact Einstein manifolds,* Communication in Analysis and Geometry 10 (2002), no.3, 647-651.

43. *The mass of asymptotically hyperbolic manifolds,* Journal of Differential Geometry 57 (2001), no.2, 273–299.

Services in Recent Years

1. Hiring committee, Fall 2022-Spring 2023
2. Chair of the hiring committee, Fall 2021-Spring 2022
3. Personnel committee, Spring 2019-2021
4. Graduate Study Committee, 2018-2019
5. Guest Professor at Freiburg University, Germany, April and May, 2018
6. Personnel committe, 2016-2017
7. Hiring committee, 2015
8. Personnel committe, 2014-2015
9. Advisory committee, 2011-2013.

10. Referee for various journals:

    Journal of AMS, J. EMS, Advances in Math., Inventiones Mathematicae, American J. of Mathematics, J. für die Reine und Angewandte Math., Journal of Differential Geometry, Communications in Analysis and Geometry, Communications in Mathematical Physics, Communications in Partial differential Equations, Proc. of AMS, Transactions of AMS, etc.

Postdocs mentored:

- Xi Guo, Oct 2016-June 2018 (She is back to Wuhan University as an assistant professor)
- Gangyi Chen (He is back to Guangzhou University)
- Ye-Kai Wang, Aug. 2014-May 2016 (currently assistant professor at National Cheng Kung University, Taiwan)

Ph. D. Students

- Ambar Rao (graduated in Spring, 2013)
- Wenchuan Tian (graduated in Spring 2021; currently visiting assist. prof. at UC Santa Barbara)
- Zhixin Wang (Fall 19-present)

Recent Invited Talks

- March 23, 2023, Geometric PDE seminar, Chinese Academy of Mathematics and Systems Science (over zoom)
- Dec. 18, 2022, Geometry seminar, Xiamen University (over zoom)
- Oct. 21, 2022, Colloquium, Howard University (over zoom)
- Workshop on Partial differential equations and conformal geometry, Aug. 29-Sept. 3, 2022, American Institute of Mathematics
- Dec. 3, 2021, Geometric Analysis seminar, Nanjing University, China (over zoom)
- Oct. 20, 2021, Geometry and Analysis seminar, UC Santa Cruz (over zoom)
- Aug, 2021, Shaanxi Normal Univ. (over zoom)
- July 9, 2021, International Conf. on Geom. Anal. and PDE, Shanghai Jiaotong Univ (over zoom)
- May 16-21, 2021 BIRS-IASM Workshop, "Geometric PDE and Applications to Problems in Conformal and CR Geometry (Online)

- March 18, 2021, Geometry Seminar, Univ. of Pennsylvania (over zoom)
- March 3, 2021, Colloquium, Rutgers Univ. at Newark (over zoom)
- July 14-20, 2019 Miniconference on nonlinear PDE, Changsha, China
- Nov, 2019 Geometry Seminar, Univ. of Chicago
- Mar. 7, 2019 Differential Gometry Seminar, Ohio State Univ.
- Mar. 4, 2019 Analysis and Differential Geometry Seminar, Univ. of Connecticut