Xiangwen Zhang — Curriculum Vitae

CONTACT INFORMATION

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EDUCATION

McGill University, Montreal, Canada

- Ph.D., Mathematics, June 2012
- M.S., Mathematics, February 2009
  Advisor: Professor Pengfei Guan

University of Science and Technology of China, Hefei, China

- B.S., Mathematics, July 2007

EMPLOYMENT

Associate Professor, University of California, Irvine	2019 - now
Assistant Professor, University of California, Irvine	2015 - 2019
Ritt Assistant Professor, Columbia University, New York	2012 - 2015

HONORS AND AWARDS

Research Grants

- NSF Grant DMS: 1809582 - Fully Nonlinear Geometric PDE	2018 - 2021
- Simons Collaboration Grants for Mathematicians: 523313	2017 - 2022
- CORCL Faculty Research Grant, UC Irvine	2017 - 2018
- NSF Grant DMS: 1308136 - Fully Nonlinear Geometric PDE	2013 - 2016

Prizes and Awards

- Distinguished paper award for paper [11] by International Consortium of Chinese Mathematicians	2018
- CMS Doctoral Prize by Canadian Mathematics Society	2014
- Alexis D. And W. Charles Pelletier Prize by McGill University	2012
- Carl Herz Prize by Institut des Sciences Mathématiques (ISM)	2011

PUBLICATIONS

25. *Parabolic complex Monge-Ampère equations on compact Kähler manifolds* (with S. Picard), submitted.

24. *On a class of curvature equations* (with P. Guan), submitted.

23. *Regularity of degenerate Hessian equations* (with S. Dinew, S. Plić), **Calculus of Variations and PDE**, accepted (2019).

22. *A flow of conformally balanced metrics with Kähler fixed points* (with D. Phong, S. Picard), **Math. Ann.**, accepted (2019).

21. *A rigidity theorem for surfaces in Schwarzschild manifold* (with P.-N. Chen), **International Mathematics Research Notices**, accepted (2018).

20. *Fu-Yau Hessian Equation* (with D. Phong, S. Picard), **Journal of Differential Geometry**, accepted (2018).

19. *The Anomaly flow on unimodular Lie groups* (with D. Phong, S. Picard), **Contemporary Mathematics**, accepted (2018).

18. *The anomaly flow and the Fu-Yau equation* (with D. Phong, S. Picard), **Annals of PDE**, accepted (2018).

17. *On estimates for the Fu-Yau generalization of a Strominger system* (with D. Phong, S. Picard), **J. Reine Angew. Math. (Crelle's Journal)**, accepted (2016).

16. *Anomaly flows* (with D. Phong, S. Picard), **Comm. Anal. Geom.**, Vol. 26, No. 4, 955-1008, (2018).

15. *Geometric flows and Strominger systems* (with D. Phong, S. Picard), **Mathematische Zeitschrift**, Volume 288, Issue 1-2, 101-113, (2018).

14. *New curvature flows in complex geometry* (with D. Phong, S. Picard), **Surveys in Differential Geometry**, Vol. 22, No. 1 (2017), 331-364.

13. *Supersymmetric String vacua with torsion and geometric flows* (with D. Phong, S. Picard), **PoS (Proceeding of Science)**, CORFU2016, (2017).

12. *ABP estimate and Geometric ineqaulities* (with C. Xia), **Comm. Anal. Geom.**, Vol. 25, No. 3, 685-708, (2017).

11. *The Fu-Yau equation with negative slope parameter* (with D. Phong, S. Picard), **Inventiones Mathematicae**, Vol. 209, No. 2, 541-576, (2017).

10. *Minkowski formulae and Alexandrov theorems in spacetimes* (with M.-T. Wang, Y.-K. Wang), **J. Differential Geometry**, Vol. 105, No. 2, 249-290, (2017).

9. *A second order estimate for general complex Hessian equations* (with D. Phong, S. Picard), **Analysis and PDE**, Vol. 9, No. 7, 1693-1709, (2016).

8. *A proof of the Alexandrov's uniqueness theorem for convex surfaces in* $\mathbb{R}^3$ (with P. Guan, Z. Wang), **Ann. Inst. H. Poincaré Anal. Non Linéaire**, Issue 33, 329-336 (2016).

7. *Generalized Kähler-Einstein metrics and Energy functionals* (with Xi Zhang), **Canadian Journal of Math.**, No.6, 1413-1435 (2014).

6. *Alexandroff-Bakelman-Pucci estimate on Riemannian manifolds* (with Yu Wang), **Advances in Mathematics**, Vol. 232, Issue 1, 499-512, (2013).

5. *On the boundary of Kähler cone*, **Proc. Amer. Math. Soc.**, Vol.140, Number 2, 701-705, (2012).

4. *Measure estimates, Harnack inequalities and Ricci lower bound* (with Yu Wang), **Universitatis Iagellonicae Acta Mathematics**, accepted (2018).

3. *Some regularity estimates for the complex Monge-Ampère equations on Hermitian manifolds* (with Xi Zhang), **Journal of Functional Analysis**, Vol. 260, Issue 7, 2004-2026, (2011).

2. *The $\mathcal{C}^{2,\alpha}$ estimate of complex Monge-Ampère equation* (with S. Dinew, Xi Zhang), **Indiana Univ. Math. J.**, **60** No.5, 1713-1722, (2011).

1. *A priori estimates for Monge-Ampère equations on Hermitian manifolds*, **International Mathematics Research Notices**, Vol. 2010, 3814-3836, (2010).

* *Complex Monge-Ampère equation and its applications in geometry*, **PhD Thesis**, McGill University, 2012.

* *Mean Curvature flow for Lagrangian submanifolds with convex potentials*, **Master Thesis**, McGill University, 2008.

Academic Activity

Conference and Colloquium Talks

- Bridging the Gap between Kähler and non-Kähler Geometry, Banff — Oct. 2019
- The 8th ICCM of 2019, Beijing — Jun. 2019
- The AMS Sectional Meeting at San Francisco State University — Oct. 2018
- Workshop on Nonlinear PDEs in real and complex geometry, AIM — Aug. 2018
- International conference on complex geometry and several complex variables, Morningside Center of Mathematics, Beijing — Jul. 2018
- Joint International Meeting of CMS-AMS, Shanghai — Jun. 2018
- Second Symposium in geometry and differential equations, Shanghai — Jun. 2018
- Workshop on *Geometric Analysis*, CRM, Montreal — Mar. 2018
- GAP: Geometry and Physics 2017 (three lectures), Fields Institute — Dec. 2017
- Colloquium, UC Santa Cruz — Nov. 2017
- AMS 2017 Western sectional meeting, UC Riverside — Nov. 2017
- International conference in Current Developments and new directions in Kähler Geometry, University of Notre Dame — Jun. 2017
- Workshop on Complex Monge-Ampère equations, AIM, San Jose — Aug. 2016
- AMS 2016 Spring Eastern Sectional Meeting, Stony Brook University — Mar. 2016
- Geometric Analysis Colloquium, Fields Institute, Toronto — May 2015
- Colloquium, University of Syracuse — Apr. 2015
- RU-CUNY Symposium on Geometric Analysis, Rutgers University — Mar. 2015
- Special Colloquium, UC Irvine — Jan. 2015
- 2014 CMS Winter meeting: *Doctoral Prize Lecture*, Hamilton — Dec. 2014
- 2014 CMS Winter meeting: Differential Geometry Session, Hamilton — Dec. 2014
- Southeast Geometry Seminar, Georgia Tech. University — Mar. 2014
- Colloquium, Wright State University — Mar. 2014
- AMS sectional meeting, John Hopkins University — Jan. 2014
- AMS sectional meeting, Temple University — Oct. 2013
- Conference on elliptic PDEs and geometric applications, Huangshan — Dec. 2012

- Recent Trends in Geometric and Nonlinear Analysis, Banff — Aug. 2012
- Colloquium, Simon Fraser University, Vancouver — Mar. 2012
- Conference in Harmonic Analysis and PDE, Fields Institute, Toronto — Jul. 2011
- AMS Eastern Sectional Meeting, Syracuse — Oct. 2010
- AMS Western sectional meeting, Albuquerque — Apr. 2010

Invited Seminar Talks

- Differential Geometry seminar, UC Berkeley — Apr. 2019
- Geometric Analysis seminar, University of Oregon, Eugene — Oct. 2018
- Informal Complex Geometry and PDE seminar, Columbia University — Sep. 2018
- Analysis and PDE Seminar, Johns Hopkins University, Baltimore — Sep. 2018
- Differential Geometry seminar, USTC, Hefei — Jul. 2018
- Geometric Analysis seminar, Zhejiang University, Hangzhou — Jul. 2018
- Geometry seminar, Indiana University, Bloomington — Apr. 2018
- Differential Geometry seminar, UC Riverside — May 2017
- Geometry and Topology seminar, University of Wisconsin, Madison — Mar. 2017
- Differential Geometry seminar, Ohio State University, Columbus — Mar. 2017
- Differential Geometry seminar, UC Santa Barbara — Feb. 2017
- Geometric Analysis seminar, UC San Diego — Apr. 2016
- Informal Complex Geometry and PDE seminar, Columbia University — Mar. 2016
- Differential Geometry seminar, UC Riverside — Feb. 2016
- Differential Geometry seminar, UC Irvine — Jan. 2016
- Nonlinear Analysis and PDEs seminar, CUNY, New York — May 2015
- Analysis seminar, McGill University — Jan. 2015
- Geometry and Topology seminar, University of Waterloo, Waterloo — Nov. 2014
- PDE Geometric Analysis seminar, University of Wisconsin, Madison — Oct. 2014
- Symposia of Math Department, Wuhan University, Wuhan, China — Jun. 2014
- Geometric Analysis Seminar, USTC, Hefei, China — Jun. 2014
- CIRGET Junior Seminar, McGill University, Montreal — May 2014
- PDE seminar, Ohio State University — Mar. 2014
- Nonlinear Analysis Seminar, Rutgers University — Mar. 2014
- Geometric Analysis Seminar, Princeton University — Feb. 2014
- Differential Geometry Seminar, CUNY, New York — Apr. 2013
- Analysis Seminar, Binghamton University, Binghamton — Apr. 2013
- Analysis and PDE Seminar, Johns Hopkins University, Baltimore — Feb. 2013
- Geometry and Topology Seminar, UQAM, Montreal — Mar. 2012
- Geometry and Analysis seminar, Columbia University, New York — Jan. 2012
- Special seminar of math department, ETH, Zürich — Jan. 2012
- Colloquium, Wuhan Institute of Physics and Mathematics, Wuhan — Aug. 2010
- ISM Graduate Student seminar, Montreal — Apr. 2010

Mini-courses

- Mini-course on *Anomaly flows*, USTC, Hefei — July 2018
- GAP: Geometry and Physics 2017 (three lectures), Fields Institute — Dec. 2017

Teaching Experience

Instructor at University of California, Irvine — 2015 - now

- Math 205C: Introduction to Graduate Analysis, Spring 2020

- Math 205B: Introduction to Graduate Analysis, Winter 2020
- Math 205A: Introduction to Graduate Analysis, Fall 2019
- Math 218C: Differential Geometry (Graduate course), Spring 2019
- Math 3A: Linear Algebra, Winter 2019
- Math 2D: Multi-variable Calculus, Winter 2019
- Math 140A: Elementary Analysis, Fall 2018
- Math 295C: Partial Differential Equations (Graduate course), Spring 2018
- Math 295B: Partial Differential Equations (Graduate course), Winter 2018
- Math 3A: Linear Algebra (two sections), Fall 2017
- Math 2D: Multi-variable Calculus (two sections), Summer 2017, Summer 2018
- Math 218C: Differential Geometry (Graduate course), Spring 2017
- Math 218B: Differential Geometry (Graduate course), Winter 2017
- Math 2D: Multi-variable Calculus, Winter 2017
- Math 218A: Differential Geometry (Graduate course), Fall 2016
- Math 218C: Differential Geometry (Graduate course), Spring 2016
- Math 2D: Multi-variable Calculus, Winter 2016

Instructor at Columbia University, New York 2012 - 2015

- Math W4062: Intro-Modern Analysis II, Spring 2015
- Math V1201: Calculus III, Spring 2015
- Math W4061: Intro-Modern Analysis I, Fall 2014
- Math W4062: Intro-Modern Analysis II, Spring 2014
- Math V3952: Undergraduate Seminars II, Spring 2014
- Math W4061: Intro-Modern Analysis I, Fall 2013
- Math S2010: Linear Algebra, Summer 2013
- Math V1201: Calculus III (Two sections), Spring 2013
- Math V1101: Calculus I, Fall 2012.

Supervision

Students

Supervision of Graduate Students

- Chao-Ming Lin 2018 -
- Qiqi Zhang: visiting student at UCI 2018 - 2019
- Kathryn Dover: Competitive Edge graduate program at UCI Summer 2017

Supervision of Undergraduate Research

- Yuewen Li: supervise reading on *Intro-modern analysis* Spring 2019
- Yizhi Chen: supervise reading on *Calculus on manifolds* Winter 2019
- Jacob Krantz (a high school student from Corona del Mar HS): supervising reading on geometry of curves and surfaces Fall 2018
- Kevin Smith: Research project on *Alexandrov's uniqueness theorem* Winter and Spring 2017

Ph.D. Committee Service

- Alex Mramor, May 2019
- Christopher Lopez, June 2017
- Zhuhai Wang, Columbia University, May 2015
- Daniel Rubin, Columbia University, April 2015
- Thomas Nyberg, Columbia University, May 2014

- Tristan Collins, Columbia University, May 2014
- Yu Wang, Columbia University, April 2013

Advancement Exam Service

- Helton Leal, August 2019
- Tao Ju, May 2019
- John Treuer, September 2018
- Lisi Jiang (EECS, outside member), May 2018
- Gregory Gordon Huey, September 2017
- Xu Zou (Engineering School, outside member), April 2017
- Matthew Gibson, September 2016
- Jiawei Zhou, September 2016
- Yucheng Ji, September 2016
- Alex Mramor, May 2016
- Zhijie Huang, Columbia University, October 2014
- Sebastien Picard, Columbia University, March 2014

Academic Service

Referee for Journals

- Advance in Mathematics
- Advanced Studies in Pure Mathematics
- American Journal of Mathematics
- Analysis and PDE
- Annals of PDE
- Archiv der Mathematik
- Bulletin of Institute of Mathematic (Academia Sinica)
- Calculus Variation and PDE
- Communication in Analysis and Geometry
- Complex Variables and Elliptic Equations
- Harvard CMSA Proceedings
- International Mathematics Research Notice
- Journal of Differential Equations
- Journal of Differential Geometry
- Journal of the European Mathematical Society
- Journal of Functional Analysis
- Journal of Geometric Analysis
- Mathematical Research Letter
- Pacific Journal of Mathematics
- Proceedings of the AMS
- Pure and Applied Mathematics Quarterly
- Science China Mathematics
- Transactions of the American Mathematical Society

Conference and Seminar service

- Co-Organizer for Special Session, 2019 AMS Fall Western Section Meeting, University of California at Riverside, November 9-10, 2019
- Co-Organizer for 26th Southern California Geometric Analysis Seminar, 2019

- Co-Organizer for 25th Southern California Geometric Analysis Seminar, 2018
- Co-Organizer for Special Session, 2018 AMS Spring Central meeting, Ohio State University at Columbus, March 17-18, 2018
- Co-Organizer for Special Session, 2017 AMS Fall Western Section Meeting, University of California at Riverside, November 3-4, 2017
- Co-Organizer of Differential Geometry seminar at UC Irvine, 2015 -
- Co-Organizer of Analysis seminar at UC Irvine, 2015 -

Committee service

- Internal:
  - Real Analysis Qualify Exam Committee, 2017-2018
  - Comprehensive Analysis Exam Committee, 2016-2017
  - Colloquium and Distinguished Lectures Committee, 2016-2017, 2018-2019
  - Graduate Student Admission Committee, 2015-2016, 2017-2018, 2018-2019
- External:
  - American University of Beirut (AUB) Research Grants Reviewer, 2019
  - Canadian Natural Sciences and Engineering Research Council (NSERC) Grant Reviewer, 2018
  - NSF Review Panel, 2018

Other service

- AMS Mathscinet Reviewer, since 2011 -

Outreach

- Grader/Proctor for OC Regional MATHCOUNTS Competition, February 2017
- Member of UCI Math Circle (leading math circle sessions), Fall 2016, Winter 2018, Spring 2019