

Zhiwei Wang

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Personal

Born on January 5, 1986.

Citizen of P. R. China.

Research Interests

Several complex variables and complex geometry

Education

B.S. Pure and Applied Mathematics, Anhui University, September 2003–July 2007.

Ph.D. Mathematics, University of Chinese Academy of Sciences, September 2007–July 2014.
Dissertation Advisor: Xiangyu Zhou

Joint Ph.D. Program, University of California at Los Angeles, September 2012–March 2014.
Advisor: Kefeng Liu

Employment

September 2022– present, Professor, School of Mathematical Sciences, Beijing Normal University

September 2020–September 2022, Associate Professor, School of Mathematical Sciences, Beijing Normal University

July 2016–September 2020, Assistant Professor, School of Mathematical Sciences, Beijing Normal University

July 2014–June 2016, Postdoc, School of Mathematical Sciences, Peking University
Host: Huijun Fan

Publications and Preprints

Publications

Joint with Yinji Li and Xiangyu Zhou, Degenerate complex Monge-Ampère type equations on compact Hermitian manifolds and applications, arXiv:2305.17955. (Accepted for publication by the **Transactions of the American Mathematical Society**)

Joint with Fusheng Deng, Jiafu Ning and Xiangyu Zhou, Linear isometric invariants of bounded domains, arXiv:2209.03510. (Accepted for publication by **Izvestiya: Mathematics**)

Joint with Xiangyu Zhou, CR eigenvalue estimate and Kohn-Rossi cohomology II, **Math. Z.** **306** (2024), no. 2, Paper No. 24, 21 pp.

Joint with Fusheng Deng, Liyou Zhang and Xiangyu Zhou, New characterizations of plurisubharmonic functions and positivity of direct image sheaves, arXiv:1809.10371, **Amer. J. Math.**, **146** (2024), No. 3, 751-768.

Joint with Jiafu Ning and Xiangyu Zhou, On the extension of Kähler currents on compact Kähler manifolds: holomorphic retraction case, arXiv:2105.08224 (Accepted for publication by **Ann. Fac. Sci. Toulouse Math.**)

Joint with Fusheng Deng, Jiafu Ning, and Xiangyu Zhou, Positivity of holomorphic vector bundles in terms of L^p -conditions of $\bar{\partial}$, **Math. Ann.** **385** (2023), no. 1-2, 575-607.

Joint with Xiankui Meng, A Kählerness criterion for real $(1,1)$ -classes on projective manifolds through extendibility of singular potentials, **Sci. China Math.****65** (2022), no.9, 1795-1802.

Joint with Jiafu Ning, and Xiangyu Zhou, Extension of quasi-plurisubharmonic functions, **Mathematical Theory and applications**, **41** (2021), no. 3, 1-12. [Survey paper]

Joint with Fusheng Deng and Jiafu Ning, Characterizations of plurisubharmonic functions, **Sci China Math.** **64** (2021), 1959-1970.

Joint with Fusheng Deng, Liyou Zhang and Xiangyu Zhou, Linear invariants of complex manifolds and their plurisubharmonic variations, arXiv:1901.08920. **J. Funct. Anal.**, **279** (2020), 108514.

Joint with Xiangyu Zhou, CR eigenvalue estimate and Kohn-Rossi cohomology, arXiv:1905.03474., **J. Differential Geom.**, 126 (2024), 1207-1244.

Joint with Fusheng Deng, Liyou Zhang and Xiangyu Zhou, Holomorphic invariants of bounded domains, **J. Geom Anal**, **30**(2019), 1204-1217.

Joint with Fusheng Deng, Liyou Zhang and Xiangyu Zhou, A new proof of Kiselman's minimum principle for plurisubharmonic functions. **C. R. Math. Acad. Sci. Paris**, **357** (2019), no.4., 345-348.

On Grauert-Riemenschneider type criteria. **Acta Math. Sin. (Engl. Ser.)** **35** (2019), no.5.,609-618.

Joint with Jinling Li, Positivities and vanishing theorems on complex Finsler manifolds. **Differential Geom. Appl.** **62** (2019), 83-100.

Local Demailly-Bouche's holomorphic Morse inequalities. **Bull. Inst. Math. Acad. Sin. (NS.)** **12** (2017), no. 4., 339-360.

On the volume of a pseudo-effective class and semi-positive properties of the Harder-Narasimhan filtration on a compact Hermitian manifold. **Ann. Polon. Math.****11** (2016), no.1., 41-58.

Asymptotics of orbifold Bergman kernels: mixed curvature case. **Arch. Math.(Basel)** **101** (2013), no.5., 485-494.

Preprints

Joint with Yinji Li and Xiangyu Zhou, On the range of a class of complex Monge-Ampère operators on compact Hermitian manifolds, Preprint 2023.

Joint with Zhi Li, Jiafu Ning, Xiankui Meng and Xiangyu Zhou, On a Bogomolov type vanishing theorem, arXiv: 2207.12641. Submitted.

Joint with Zhan Li, Invariance of plurigenera for generalized polarized pairs with abundant nef parts, arXiv:2208.08073. Submitted.

Joint with Xiangyu Zhou, Asymptotic estimate of cohomology groups valued in pseudo-effective line bundles, arXiv:1905.03473.

Selected Invited Talks

Taipei conference on geometry and several complex variables, Taipei, July 3-6, 2017.

Young Mathematicians Workshop on Several Complex Variables and Complex Geometry, Beijing, December 8-11, 2017.

Workshop on Complex Analysis and Complex Geometry, Wuhan, March 16-19, 2018.

Young Mathematicians Workshop on Several Complex Variables, XuZhou, December 7-9, 2018.

Workshop on Several Complex Variables in memory of Prof. Qikeng Lu, Shantou, December 21-24, 2018.

Holomorphic mappings and complex geometry, Shanya, TSIME, January 14-18, 2019.

Title: New characterizations of plurisubharmonic functions and its applications

Singular metrics in Kählerian complex geometry, Marseille, France, CIRM, February 4-8, 2019.

Title: New characterizations of plurisubharmonic functions and positivity of direct image sheaves

ALKAGE (Algebraic and Kähler Geometry) Workshop, Institut Fourier, France, May 13-17, 2019.

Title: Linear invariants of complex manifolds

Workshop on several complex variables, Shenzhen, June 20-July 20, 2019.

Short Course: some recent developements on several complex variables

TianYuan International Workshop in Several Complex Variables, Changchun, July 28-August 2, 2019.

Title: Linear invariants of complex manifolds

2019 Annual Conference on Several Complex Variables, Xinyang, August 19-21, 2019.

Title: Pluricanonical spaces with canonical (Finsler) norms and the geometry of complex manifolds

Young Mathematicians Workshop on Several Complex Variables 2019, Osaka, Japan, September 7-9, 2019. Title: Pluricanonical spaces with canonical (Finsler) norms and the geometry of complex manifolds

Mini-Workshop on geometry and complex analysis, Beijing, November 23-24, 2019.

Title: New characterization of plurisubharmonic functions and positivities of direct images

The 8th Workshop on the Geometry and Topology of submanifolds, Fuzhou, November 28-December 1, 2019.

Title: New characterization of plurisubharmonic functions and positivities of direct images

Online seminar at USTC (invited by Lei Zhang), August 3, 2020.

Title: An incomplete review of L^2 -methods

Talk at Capital Normal University (invited by Ming Xu), October 29, 2020.

Title: Holomorphic Morse inequalities and related problems

Online workshop on several complex variables, Wuhan, December 5-6, 2020.

Title: On the extension of quasi-psh functions

2020 Workshop on several complex variables and complex geometry, Xiamen, December 11-14, 2020.

Title: Optimal L^2 -estimate and plurisubharmonicity

2020 Young Mathematicians Workshop on differential geometry, Shenzhen, December 15-20, 2020.

Title: Linear invariants of complex manifolds

2021 Young Mathematician Workshop on several complex variables and complex geometry, Tianjin, April 9-13, 2021

Title: CR eigenvalues estimate and Kohn-Rossi cohomology

2021 Annual Conference on Several Complex Variables, Changchun, November 12-15, 2021.

Title: Recent progress on related problems on plurisubharmonic functions

2022 Young Mathematician Workshop on several complex variables and complex geometry, Wuhan, March 19-20, 2022.

Title: Recent progress on the converse L^2 theory and applications

2022 Virtual workshop in complex analysis and geometry, Changchun, July 2, 2022.

Title: Recent progress on the extension of quasi-psh functions

The 9th International Congress of Chinese Mathematicians (ICCM2022), 45min, Nanjing, July 31-August 5, 2022.

Title: Linear invariants of complex manifolds

2022 Young Mathematician Workshop on Several Complex Variables, Wuhan, August 22-24, 2022.

Title: Recent progress on the converse L^2 theory and applications

2022 Young Mathematician Workshop on Complex Geometry, Tianjin, December 3-4, 2022.

Title: Linear isometric invariants of bounded domains

2023 Annual Conference on Several Complex Variables, Wuhan, August 17-21, 2023.

Title: Recent progress on the positivities in several complex variables and complex geometry

2023 South-East Algebraic Geometry Conference, Dongguan, November 17-20, 2023

Title: Recent progress on the positivities in several complex variables and complex geometry

Talk at Academy of Systems Science and Mathematics, CAS, (Invited by Songyan Xie), Beijing, November 22, 2023

Title: On a Bogomolov type vanishing theorem

Teaching Experience

Fall 2015, Mathematical Analysis III, Teaching Assistant, PKU

Fall 2016, Calculus I, Instructor, BNU

Spring 2017, Calculus II, Instructor, BNU

Fall 2017, Calculus I, Instructor, BNU
Spring 2018, Calculus II, Instructor, BNU
Fall 2018, Linear Algebra, Instructor, BNU
Fall 2019, Calculus I, Instructor, BNU
Spring 2020, Calculus II, Instructor, BNU
Fall 2020, Calculus A, Instructor, BNUZ
Spring 2021, Complex Analysis, Instructor, BNU
Fall 2021, Introduction to several complex variables, Instructor, BNU
Fall 2021, Complex geometry, Instructor, BNU
Spring 2022, Complex Analysis, Graduate Course, Instructor, BNU
Fall 2022, Introduction to several complex variables, Instructor, BNU
Fall 2022, Graduate Seminar on several complex variables, Instructor, BNU
Spring 2023, One Complex Variable, Instructor, BNU
Fall 2023, Analytic Geometry, Instructor, BNU
Spring 2024, One Complex Variable, Instructor, BNU

Students

Master Students

(2021) Xiaoye Lin, Yueping Li
(2022) Yandong Zheng
(2023) Xincheng Zhu, Haoyuan Sun, Chenlong Yue

PhD Students

(2023) Kai Pang

Visitings

Institut Fourier, Université Grenoble Alpes, May 1-May 28, 2019.