Zhiyu Tian

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Employment

Mar. 2018-, Associate professor, BICMR, Peking University, Beijing, China.

Jan. 2015- Feb. 2018, Chargé de Recherche, CNRS, Fourier Institute, Grenoble, France.

Feb. 2015- April 2015, Member of IAS, Princeton, NJ, USA.

Fall, 2014, visiting scientist at Universität Bonn, Bonn, Germany.

Sep. 2011-Aug. 2014, Olga Taussky and John Todd Instructor in Mathematics, Caltech, Pasadena, CA, USA.

Education

2007- 2011
Ph.D in Mathematics. Stony Brook University.
Advisor: Jason Starr,
Dissertation: Symplectic geomety of rationally connected threefolds.

2003-2007
B.S. in Mathematics and Physics, Tsinghua University, Beijing, China.

Research Interests

Algebraic geometry.
Research key words: birational geometry; rationally connected varieties; Gromov-Witten invariants; Chow group; hyperkähler varieties; irregular varieties.

Honors and Grants

Qiushi Outstanding Young Scholar Award, Qiushi Foundation (Hong Kong), 2018.

Invited speaker at AMS Summer Institute of Algebraic Geometry, Salt Lake City, 2015.

NSFC grants: "Moduli space and applications" (joint grant, 2019-2024) No. 11831013; "Geometry of Fano varieties" (joint grant 2019-2022) No. 11871155; "Symplectic geometric invariants and integrable systems " No. 11890662 (sub-program of"Geometric structures and topological invariants" (2019-2024) No.11890660).

Publications and Preprints

Publications

1. (with Lie Fu and Charles Vial) Motivic hyperkähler resolution conjecture for generalized Kummer varieties, *Geometry & Topology* , 23 (2019), no. 1, 427-492.

2. (with Lie Fu) Motivic multiplicative McKay correspondence for surfaces, *Manuscripta Math.* 158 (2019), no. 3-4, 295-316.

3. (with Lie Fu) 2-cycles sur les hypersurfaces cubiques de dimension 5. *Math. Z.*, 293 (2019), no. 1-2, 661-676.

4. Hasse principle for three classes of varieties over global function fields, *Duke Math. Journal*, Volume 166, Number 17 (2017), 3349-3424.

5. (with Zhi Jiang and Jungkai Chen) Irregular varieites with geometric genus one, theta divisors, and fake tori, *Adv. Math.*, 320 (2017), 361390.

6. (with Chenyang Xu) Finiteness of fundamental groups, *Compositio Math.*, Volume 153, Issue 2, February 2017, 257-273.

7. (with Hong R. Zong) Weak approximation for isotrivial families, *J. Reine Angew. Math.* (Crelle's journal), `https://doi.org/10.1515/crelle-2016-0073`.

8. (with Zhiyuan Li) Integral Hodge classes on fourfolds fibered by quadric bundles, *Proc. A.M.S.*, Vol. 144, Number 8, August 2016, Pages 3333-3345.

9. R-equivalence on del Pezzo surfaces of degree 4 and cubic surfaces, *Taiwanese Journal of Math.* Vol. 19, No. 6, 1603-1612, 2015.

10. (with Letao Zhang) Weak Approximation for Cubic Hypersurfaces and Degree 4 del Pezzo Surfaces, *Int. Math. Res. Notices* Volume 2018, Issue 3, 31 January 2018, Pages 762-784.

11. Weak approximation for cubic hypersurfaces, *Duke Math. Journal*. Volume 164, Number 7 (2015), 1401-1435.

12. Symplectic geometry and rationally connected 4-folds, *J. Reine Angew. Math.* (Crelle's journal), Volume 2015, Issue 698, Pages 221–244.

13. (with Francois Greer and Zhiyuan Li) Picard groups on moduli of K3 surfaces with Mukai models, *Int. Math. Res. Notice*, 2015.16 (2015): 7238-7257.

14. Separable rational connectedness and stability, in *Rational points, rational curves, and entire holomorphic curves on projective varieties*, *Contemporary Mathmatics, 654*, 155-160.

15. (with Hong R. Zong) One cycles on rationally connected varieties, *Compositio Mathematica*, Vol. 150 (2014), issue 03, 396-408.

16. Symplectic geometry of rationally connected threefolds. *Duke Math. Journal*. Volume 161, Number 5 (2012), 803-843.

Preprints

1. Hasse principle for zero cycles on rational surfaces over global function fields.
2. Zero cycles on rationally connected varieties over Laurent fields.
3. (with Jason Starr) All smooth low degree complete intersections are rationally simply connected, available upon request.
4. (with Jason Starr) Separable rational connectedness and weak approximation in positive characteristic. `https://arxiv.org/abs/1907.07041`
5. (with Jason Starr and Runhong Zong) Weak approximation for Fano complete intersections in positive characteristic, `https://arxiv.org/abs/1811.02466`.
6. Towards the symplectic Grabber-Harris-Starr theorems, submitted, `http://arxiv.org/abs/1208.4340`
7. (with Zhiyuan Li) Moduli of complete intersection K3 surfaces, `http://arxiv.org/abs/1304.3219`.
8. (with Lie Fu) Motivic hyperhähler conjecture for Hilbert scheme of $K3$ surfaces, `http://math.univ-lyon1.fr/~fu/articles/MotivicCrepantHilbK3.pdf`.

Services

(Co-)Organizer for the following research activities: Workshop on Geometry of Fano varieties, Mar. 2019, BICMR, joint with Zhi Jiang (Fudan); Beijing Algebraic Geometry Colloquium (monthly AG meetings in the Beijing area) together with Baohua Fu (CAS), Lei Fu (Tsinghua), Qizhen Yin (BICMR)); Modern Algebraic Geometry, BICMR, Jul. 2018; Sino-French workshop on algebraic and complex geometry, Lyon, Apr. 22-26, 2018; groupe de travail on:Lawson homology (Jul. 2018), Chow groups (Fall 2016), between Université de Lyon I, ENS Lyon and Université Grenoble-Alpes 2016-2017; workshop on hyperkahler manifolds, cubic hypersurfaces, and decomposition of the diagonal Octorber 2016 at Université de Lyon I; workshop on the decomposition of the diagonal and stable rationality July 2016 at BICMR, Beijing.

Mentor for many undergraduate students for undergraduate research at Peking University.

Served in the thesis defense committees for many PhD students and master students at Peking University and other universities.

Reviewer for Math Review and Zb. Math.

Referee for Math. Z., Geometry & Topology, Journal of Algebraic Geometry, Algebraic Geometry, Math. Ann., Selecta Mathematica, Geom. Dedica., Manuscripta Math..

Teaching in the past 3 years

1. Fall 2020, Algebraic geometry I, Peking University.
2. Spring 2020, Introduction to algebraic geometry, Peking Univ.
3. Fall 2019, Topics in algebraic geometry, Peking Univ.
4. Spring 2019, Algebraic Geometry II, Peking University.
5. Fall 2018, Undergraduate seminar in geometry, Peking University;

Last updated: September 11, 2020