

# Qizheng Yin

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First name / last name: Qizheng / Yin  
Date of birth: 18 July 1986  
Place of birth: Hebei, China  
Citizenship: China  
Marital status: married, with two children

## Research area

*Algebraic geometry* — algebraic cycles, moduli spaces, enumerative geometry, algebraic curves, abelian varieties,  $K3$  surfaces, hyper-Kähler varieties

## Employment

Since Jan 2017: BICMR, Peking University

- Assistant professor (tenure track)

Jan 2014 – Dec 2016: ETH Zürich

- Postdoc in the group of Rahul Pandharipande

## Education

Sep 2013 – Dec 2013: Radboud Universiteit Nijmegen & Université Pierre et Marie Curie – Paris VI

- PhD, mention *très honorable*.
- Thesis: *Tautological cycles on curves and Jacobians*, supervised by Ben Moonen and Claire Voisin.

Sep 2010 – Aug 2013: Université Pierre et Marie Curie – Paris VI & Universiteit van Amsterdam

Sep 2008 – Aug 2010: École normale supérieure & Université Pierre et Marie Curie – Paris VI

- Master of Science, mention *très bien*.
- Thesis: *Motifs de dimension finie et applications aux conjectures de Bloch-Beilinson* (in French), supervised by Claire Voisin.

Sep 2007 – Aug 2008: École normale supérieure & Université Paris Diderot – Paris VII

- Bachelor of Science, mention *très bien*.
- Thesis: *Géométrisation des surfaces : construction de l'espace de Teichmüller* (in French), joint with Jérémy Guéré and supervised by Mathieu Cossutta.

Sep 2004 – Aug 2007: Peking University

## Grants and honors

- NSFC major (sub)program 11890661, *Mirror symmetry conjectures and related topics*, co-principal investigator, 2019 – 2023.

- NSFC key program 11831013, *Theory of moduli spaces and applications*, co-principal investigator, 2019 – 2023.
- Thousand talents plan: Recruitment program for young professionals, 2018 – 2020.
- NSFC young scientists fund 11701014, *Gromov-Witten theory and algebraic cycles on hyper-Kähler varieties*, principal investigator, 2018 – 2020.
- Algebraic Geometry (journal name) prize, Foundation Compositio Mathematica, 2017.

### (Pre)publications

- (1) *Perverse-Hodge complexes for Lagrangian fibrations*, joint with Junliang Shen, arXiv:2201.11283.
- (2) *On intersection cohomology and Lagrangian fibrations of irreducible symplectic varieties*, joint with Camilla Felisetti and Junliang Shen, Transactions of the American Mathematical Society 375 (2022), no. 4, 2987 – 3001.
- (3) *Motivic decompositions for the Hilbert scheme of points of a K3 surface*, joint with Andrei Neguț and Georg Oberdieck, Journal für die Reine und Angewandte Mathematik 778 (2021), 65 – 95.
- (4)  *$P = W$  for Lagrangian fibrations and degenerations of hyper-Kähler manifolds*, joint with Andrew Harder, Zhiyuan Li, and Junliang Shen, Forum of Mathematics. Sigma 9 (2021), Paper No. e50, 6 pp.
- (5) *Topology of Lagrangian fibrations and Hodge theory of hyper-Kähler manifolds*, joint with Junliang Shen, appendix by Claire Voisin, Duke Mathematical Journal 171 (2022), no. 1, 209 – 241.
- (6) *Rational curves in holomorphic symplectic varieties and Gromov-Witten invariants*, joint with Georg Oberdieck and Junliang Shen, Advances in Mathematics 357 (2019), 106829, 28 pp.
- (7) *K3 categories, one-cycles on cubic fourfolds, and the Beauville-Voisin filtration*, joint with Junliang Shen, Journal of the Institute of Mathematics of Jussieu 19 (2020), no. 5, 1601 – 1627.
- (8) *Tautological classes with twisted coefficients*, joint with Dan Petersen and Mehdi Tavakol, Annales Scientifiques de l'École Normale Supérieure (4) 54 (2021), no. 5, 1179 – 1236.
- (9) *Derived categories of K3 surfaces, O'Grady's filtration, and zero-cycles on holomorphic symplectic varieties*, joint with Junliang Shen and Xiaolei Zhao, Compositio Mathematica 156 (2020), no. 1, 179 – 197.
- (10) *Relations in the tautological ring of the moduli space of K3 surfaces*, joint with Rahul Pandharipande, Journal of the European Mathematical Society (JEMS) 22 (2020), no. 1, 213 – 252.
- (11) *On O'Grady's generalized Franchetta conjecture*, joint with Nebojsa Pavic and Junliang Shen, International Mathematics Research Notices IMRN (2017), no. 16, 4971 – 4983.
- (12) *On the Chow ring of certain rational cohomology tori*, joint with Zhi Jiang, Comptes Rendus Mathématique de l'Académie des Sciences, Paris 355 (2017), no. 5, 571 – 576.
- (13)  *$\mathbb{A}^1$ -equivalence of zero cycles on surfaces, II*, joint with Yi Zhu, Annals of K-theory 3 (2018), no. 3, 379 – 393.
- (14) *Curve counting on abelian surfaces and threefolds*, joint with Jim Bryan, Georg Oberdieck, and Rahul Pandharipande, Algebraic Geometry 5 (2018), no. 4, 398 – 463.
- (15) *Cycles on curves and Jacobians: a tale of two tautological rings*, Algebraic Geometry 3 (2016), no. 2, 179 – 210.
- (16) *Some remarks on modified diagonals*, joint with Ben Moonen, Communications in Contemporary Mathematics 18 (2016), no. 1, 1550009, 16 pp.
- (17) *Finite-dimensionality and cycles on powers of K3 surfaces*, Commentarii Mathematici Helvetici 90 (2015), no. 2, 503 – 511.
- (18) *The generic nontriviality of the Faber-Pandharipande cycle*, International Mathematics Research Notices IMRN (2015), no. 5, 1263 – 1277.

### Invited talks

- (1) *On the perverse = Hodge phenomenon*, Algebraic geometry seminar, Jussieu, Dec 2021.
- (2) *Two applications of the LLV algebra*, Algebraic geometry seminar, Stony Brook, Apr 2021.
- (3) *The Chow ring of Hilb(K3) revisited*, Seminar ‘Algebraic geometry in East Asia’, online, Oct 2020.
- (4) *A compact analogue of  $P = W$* , Workshop ‘Moduli of Higgs bundles and holomorphic symplectic geometry’, ETH Zürich, Jan 2020.
- (5) *On the topology of Lagrangian fibrations*, Lecture series in algebraic geometry, Chinese Academy of Sciences, Sep 2019.
- (6) *Topology of Lagrangian fibrations and Gopakumar-Vafa invariants of K3 surfaces*, Beijing-Zurich moduli workshop, Peking University, Sep 2019.
- (7) *A compact analogue of the  $P = W$  conjecture*, Workshop on algebraic geometry, Fudan University, Jul 2019.
- (8) *A compact analogue of the  $P = W$  conjecture*, Workshop ‘Discrete groups and moduli’, Nagoya University, Jun 2019.
- (9) *On the tautological ring of the moduli space of K3 surfaces*, Hong Kong geometry colloquium, HKUST, Mar 2019.
- (10) *Perverse sheaves, holomorphic Lagrangian fibrations, and hyper-Kähler geometry*, MIST 2019 workshop, Chinese University of Hong Kong, Jan 2019.
- (11) *Special cycles on holomorphic symplectic varieties*, Conference ‘Algebraic geometry in East Asia’, Hanoi, Oct 2018.
- (12) *Special subvarieties in holomorphic symplectic varieties*, Workshop ‘Cohomology of algebraic varieties’, CIRM, Oct 2018.
- (13) *Generalizations of the Bogomolov-Mumford theorem*, Workshop ‘Algebraic surfaces and related topics’, Xiamen University, Sep 2018.
- (14) *Special subvarieties in holomorphic symplectic varieties*, Workshop ‘Classical algebraic geometry’, Oberwolfach, Jul 2018.
- (15) *Rational curves and special subvarieties in holomorphic symplectic varieties*, Workshop on algebraic geometry, Chinese Academy of Sciences, Jun 2018.
- (16) *Motivic aspects of the tautological ring of  $\mathcal{M}_g$* , Winter young algebraic geometer workshop, SUSTC, Dec 2017.
- (17) *Curves, sheaves, and cycles on K3 surfaces*, Seminar at IBS-CGP, POSTECH, Dec 2017.
- (18) *K3 categories and algebraic cycles on holomorphic symplectic varieties*, Pearl symposium in geometry, Chinese University of Hong Kong, Nov 2017.
- (19) *K3 categories and zero cycles on holomorphic symplectic varieties*, Algebraic geometry conference in honor of Arnaud Beauville’s 70th birthday, Chinese Academy of Sciences, Oct 2017.
- (20) *Chow groups and derived categories of K3 surfaces*, Second BICMR & IBS-CGP joint symplectic geometry workshop, Peking University, Sep 2017.
- (21) *Derived categories of K3 surfaces and zero cycles on holomorphic symplectic varieties*, First national algebraic geometry conference, Chinese Academy of Sciences, Jul 2017.
- (22) *Cycles on K3 surfaces and hyper-Kähler varieties via Gromov-Witten theory*, BICMR-Tokyo algebraic geometry workshop, Peking University, May 2017.
- (23) *Gromov-Witten theory, cycles on moduli of K3’s, and cycles on hyper-Kähler’s*, Workshop ‘Cycles and moduli’, ETH Zürich, Mar 2017.
- (24) *Curves and cycles on K3 surfaces*, Mathematics and string theory seminar, Kavli IPMU, Feb 2017.
- (25) *Cycles on the universal K3 surface*, Workshop on algebraic geometry, Xiamen University, Jan 2017.
- (26) *Zero cycles on log K3 surfaces*, Master lectures and workshop ‘Hyper-Kähler manifolds, Hodge theory and Chow groups’, TSIMF, Dec 2016.
- (27) *Curve counting on abelian threefolds*, BICMR & IBS-CGP joint symplectic geometry workshop, Jeju, Oct – Nov 2016.

- (28) *Curves and cycles on K3 surfaces*, Beijing geometry and physics colloquium, Peking University, Oct 2016.
- (29) *Decomposition of the small diagonal for families of K3 surfaces*, Workshop ‘Derived categories and Chow groups of hyperkaehler and Calabi-Yau varieties’, SCGP, Sep 2016.
- (30) *Cycles on K3 surfaces via stable maps*, Workshop ‘Curves on surfaces and 3-folds’, EPFL, Jun 2016.
- (31) *Comptage de courbes sur les surfaces abéliennes* (in French), Arithmetic et algebraic geometry seminar, University of Strasbourg, Nov 2015.
- (32) *Curve counting on abelian varieties: old and new*, Seminar ‘Geometry and algebra, geometry and analysis’, Utrecht University, Oct 2015.
- (33) *Curve counting on abelian surfaces and threefolds*, Workshop ‘Algebraic geometry’, Oberwolfach, Mar 2015.
- (34) *Curve counting on abelian surfaces and threefolds*, Algebra and number theory seminar, University of Copenhagen, Feb 2015.
- (35) *Curve counting on abelian surfaces and threefolds*, Workshop ‘Motivic invariants related to K3 and abelian geometries’, HU Berlin, Feb 2015.
- (36) *Tautological cycles on curves, surfaces, abelian and hyper-Kähler varieties*, Seminar of geometry, University Roma Tre, Nov 2014.
- (37) *Tautological cycles on powers of varieties*, Workshop ‘Classical algebraic geometry’, Oberwolfach, Jun – Jul 2014.
- (38) *Cycles on powers of varieties*, Algebra and number theory seminar, University of Augsburg, Apr 2014.
- (39) *Tautological cycles on curves and Jacobians*, Workshop ‘Algebraic cycles and tautological classes’, Radboud University Nijmegen, Dec 2013.
- (40) *A tale of two tautological rings*, Geometry and mathematical physics seminar, University of Amsterdam, Oct 2013.
- (41) *A tale of two tautological rings*, Workshop ‘Cohomology of the moduli space of curves’, ETH Zürich, Oct 2013.
- (42) *Cycles on Jacobians*, Algebraic geometry seminar (SAG), Bonn, May 2013.
- (43) *Cycles algébriques sur les variétés abéliennes et les jacobiennes* (in French), Seminar ‘Réseau d’étudiants en géométrie algébrique (RéGA)’, IHP, Apr 2013.
- (44) *Interesting cycles on symmetric powers of curves*, Algebraic geometry and moduli seminar, ETH Zürich, Mar 2013.
- (45) *On the tautological ring of the universal curve*, Algebraic geometry and moduli seminar, ETH Zürich, Nov 2012.
- (46) *On the tautological ring of the universal curve*, Algebra and geometry seminar, University of Amsterdam, Sep 2012.

## Teaching

### Peking University

- Spring 2022: Hodge theory and complex algebraic geometry
- Fall 2021: Linear algebra A
- Spring 2021: Undergraduate geometry seminar
- Fall 2020: Topics in algebraic geometry
- Spring 2020: Geometry II (honors)
- Fall 2019: Linear algebra B
- Spring 2019: Geometry II (honors)
- Fall 2018: Algebraic geometry II

- Spring 2018: Undergraduate seminar on elliptic curves
- Spring 2017: Topics in algebraic geometry

ETH Zürich

- Spring 2014: Algebraic cycles and motives (mini-course)

Radboud Universiteit Nijmegen

- Fall 2013: Smooth manifolds (reading course)

Université Paris VI

- Spring 2011: TD algèbre et géométrie (in French)

## **Languages**

- Chinese: native
- English & French: fluent
- Dutch & German: beginner