CURRICULUM VITAE

ZHENBO QIN

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CITIZENSHIP AND IMMIGRATION
Born: P.R. of China
Citizenship: U.S.A. (3/2001-Present)

EDUCATION

Ph.D. in Mathematics	Columbia University	10/1990
M.Phil. in Mathematics	Columbia University	10/1989
M.S. in Mathematics	Columbia University	05/1987
Diploma in English	Beijing Foreign Languages Institute	07/1986
B.S. in Mathematics	Wuhan University (Wuhan, China)	07/1985

PH.D. THESIS ADVISOR
Professor Robert Friedman, Columbia University.

RESEARCH INTEREST
Algebraic Geometry

GRANTS, AWARDS, AND HONORS
1. External
Alfred P. Sloan Research Fellow, Alfred P. Sloan Foundation (9/1997-8/2001)
Collaboration Grant for Mathematicians, Simons Foundation (9/2013-8/2018)
National Science Foundation DMS-0755520 (9/2008-8/2013)
National Science Foundation DMS-0853354 (1/2009-12/2012)
   (joint with Adrian Clingher, Dan Edidin, Neithalath Kumar and Qi Zhang).
National Science Foundation DMS-0455304 (7/2005-12/2008)
National Science Foundation DMS-0138398 (7/2002-6/2005)
National Science Foundation DMS-9996346 (7/1999-6/2002)
National Science Foundation DMS-9622564 (7/1996-6/1999)
National Science Foundation DMS-9400729 (7/1994-6/1996)
National Science Foundation DMS-0118343 (1/2002-12/2002),

(joint with Dale Cutkosky, Dan Edidin and Qi Zhang).
National Security Agency MSPF-02IC-002 (1/2002-12/2002),
   (joint with Dale Cutkosky, Dan Edidin and Qi Zhang).
American Institute of Mathematics (1998-1999),
   (joint with Carl Faber and Sheldon Katz).
Junior Faculty Enhancement Award, Oak Ridge Associated Universities
   (4/1994-4/1995)
S.S. Chern Sino-U.S. Mathematics Exchange Program (1985)

2. Internal

Chancellor's Award for Outstanding Research and Creative Activity
   (Physical and Mathematical Sciences, 2004)
Research Council Grant (2017)
Summer Research Fellowship (2013)
Research Leave (9/2009-8/2010)
Summer Research Fellowship (2008)
Research Leave (Spring 2004)
Research Board Grant (5/2002-4/2003)
Summer Research Fellowship (2002)
Research Board Grant (1/2000-12/2000)
Junior Faculty Award, College of Arts and Science, OSU (Fall 1997)
OSU A&S Summer Research Program (1997; 1996; 1994)
Oklahoma State Regents Cost Share Program (4/1994-4/1995)
OSU A&S Dean's Incentive Grant (7/1993-6/1996)

EMPLOYMENT HISTORY

Professor, University of Missouri at Columbia (7/1/2002-Present)
   Leonard M. Blumenthal Distinguished Professor (9/2007-8/2012)
Associate Professor, University of Missouri at Columbia (7/1/1999-6/30/2002)
Associate Professor, Oklahoma State University (7/1/1996-7/31/2000)
Assistant Professor, Oklahoma State University (7/1/1992-6/30/1996)
Member, Institute for Advanced Study, Princeton (8/1992-7/1993)
Post-doctoral Fellow, McMaster University, Canada (7/1/1990-6/30/1992)

VISITING POSITIONS

Sun Yat-Sen University, Guangzhou, China (6/2014, 6/2013)
General Member, Mathematical Sciences Research Institute (5/2006, 10/1992)
Hong Kong University of Science and Technology (5/1998)
Institue Henri Poincaré, Centre International de Recherche Emile Borel,
   Université Pierre et Marie Curie, France (6/1995)

PUBLICATIONS
Books authored/edited

(1) *Hilbert schemes of points and infinite dimensional Lie algebras.* Mathematical Surveys and Monographs **228**, American Mathematical Society, Providence, RI, 2018.

(2) Proceedings of *the Conference on Hilbert Schemes, Vector Bundles and their Interplay with Representation Theory*, Columbia, Missouri (2002). Contemporary Math. **322** (2003), American Mathematical Society. Co-edited with Dale Cutkosky, Dan Edidin and Qi Zhang.

Papers authored

(3) *On Okounkov's conjecture connecting Hilbert schemes of points and multiple q-zeta values.* Intern. Math. Res. Notices **2018**, 321-361. (with Fei Yu)

(4) *The Cohomological Crepant Resolution Conjecture for the Hilbert-Chow morphisms.* J. Differ. Geom. **104** (2016), 499-557. (with Wei-ping Li)

(5) *The nef cones of and minimal-degree curves in the Hilbert schemes of points on certain surfaces.* Pacific J. Math. **284** (2016), 439-453. (with Yuping Tu)

(6) *The Gromov-Witten invariants of the Hilbert schemes of points on surfaces with $p_g > 0$.* Internat. J. Math. **26** (2015), 1550009, 26 pp. (with Jianxun Hu and Wei-ping Li)

(7) *Mini-walls for Bridgeland stability conditions on the derived category of sheaves over surfaces.* Asian J. Math. **18** (2014), 321-344. (with Jason Lo)

(8) *Donaldson-Thomas invariants of certain Calabi-Yau 3-folds.* Communications in Analysis and Geometry **21** (2013), 541-578. (with Wei-ping Li)

(9) *Polynomial Bridgeland stability for the derived category of sheaves on surfaces.* Communications in Analysis and Geometry **19** (2011), 31-52. (with Wei-ping Li)

(10) *1-point Gromov-Witten invariants of the moduli spaces of sheaves over the projective plane.* Trans. Amer. Math. Soc. **363** (2011), 2551-2569. (with Wei-ping Li)

(11) *Equivariant cohomology of incidence Hilbert schemes and infinite dimensional Lie algebras.* Manuscripta Math. **133** (2010), 519-544. (with Wei-ping Li)

(12) *Integral cohomology of Hilbert schemes of points on surfaces.* Communications in Analysis and Geometry **16** (2008), 969-988. (with Wei-ping Li)

(13) *On the crepancy of the Gieseker-Uhlenbeck morphism.* Asian J. Math. **12** (2008), 213-224. (with Qi Zhang)

(14) *On certain moduli spaces of ideal sheaves and Donaldson-Thomas invariants.* Math. Res. Letters **14** (2007), 403-411. (with Sheldon Katz and Wei-ping Li)

(15) *The Gromov-Witten and Donaldson-Thomas correspondence for trivial elliptic fibrations.* Internat. J. Math. **18** (2007), 821-838. (with Dan Edidin)

(16) *Hilbert schemes of points on the minimal resolution and soliton equations.* Contemp. Math. **442** (2007), 435-462. (with Weiqiang Wang)

(17) *Incidence Hilbert schemes and infinite dimensional Lie algebras.* Proceedings of Fourth International Congress of Chinese Mathematicians (Hangzhou, 2007), 408-441, Vol II. (with Wei-ping Li)

(18) *On the Euler numbers of certain moduli spaces of curves and points.* Communications in Analysis and Geometry **14**, 387-410 (2006). (with Wei-ping Li)

(19) *Integral operators and integral cohomology classes of Hilbert schemes.* Math. Ann. **331**, 669-692 (2005). (with Weiqiang Wang)

(20) *Hilbert scheme intersection numbers, Hurwitz numbers, and Gromov-Witten invariants.* Contemp. Math. **392** (2005), 67-81. (with Wei-ping Li and Weiqiang Wang)

(21) *Hilbert schemes, integrable hierarchies, and Gromov-Witten theory.* Intern. Math. Res. Notices **40** (2004), 2085-2104. (with Wei-ping Li and Weiqiang Wang)

(22) *Ideals of the cohomology rings of Hilbert schemes and their applications.* Trans. Amer. Math. Soc. **356** (2004), 245-265. (with Wei-ping Li and Weiqiang Wang)

(23) *The cohomology rings of Hilbert schemes via Jack polynomials.* CRM Proceedings and Lecture Notes **38** (2004), 249-258. (with Wei-ping Li and Weiqiang Wang)

(24) *Stability of the cohomology rings of Hilbert schemes of points on surfaces.* J. reine angew. Math. **554** (2003), 217-234. (with Wei-ping Li and Weiqiang Wang)

(25) *Curves in the Hilbert schemes of points on surfaces.* Contemp. Math. **322** (2003), 89-96. (with Wei-ping Li and Qi Zhang)

(26) *Stable rank-2 bundles on Calabi-Yau manifolds*, Internat. J. Math. **14** (2003), 1097-1120. (with Wei-ping Li)

(27) *Gromov-Witten invariants of the Hilbert scheme of 3-points on* $\mathbb{P}^2$. Asian J. Math. **7** (2003), 551-574. (with Dan Edidin and Wei-ping Li)

(28) *On blowup formulae for the S-duality conjecture of Vafa and Witten III: relation with vertex operator algebras.* J. reine angew. Math. **542** (2002), 173-217. (with Wei-ping Li)

(29) *Hilbert schemes and symmetric products: a dictionary.* Contemp. Math. **310** (2002), 233-257. (with Weiqiang Wang)

(30) *On 1-point Gromov-Witten invariants of the Hilbert schemes of points on surfaces.* Proceedings of 8th Gökova Geometry-Topology Conference (2001). Turkish J. Math. **26** (2002), 53-68. (with Wei-ping Li)

(31) *Vertex algebras and the cohomology ring structure of Hilbert schemes of points on surfaces.* Math. Ann. **324** (2002), 105-133. (with Wei-ping Li and Weiqiang Wang)

(32) *Hilbert schemes and* $\mathcal{W}$ *algebras.* Intern. Math. Res. Notices **27** (2002), 1427–1456. (with Wei-ping Li and Weiqiang Wang)

(33) *Generators for the cohomology ring of Hilbert schemes of points on surfaces.* Intern. Math. Res. Notices **20** (2001), 1057-1074. (with Wei-ping Li and Weiqiang Wang)

(34) *Vector bundles, the S-duality conjecture of Vafa and Witten, and vertex algebras.* Fitst International Congress of Chinese Mathematicians (Beijing,

1998), 235-240. AMS/IP Stud. Adv. Math. **20**. *Amer. Math. Soc., Providence, RI*, 2001. (with Wei-ping Li)

(35) *On blowup formulae for the S-duality conjecture of Vafa and Witten.* Invent. Math. **136** (1999), 451-482. (with Wei-ping Li)

(36) *Enumeration of nodal genus-2 plane curves with fixed complex structure.* J. Alg. Geom. **7** (1998), 569-587. (with Sheldon Katz and Yongbin Ruan)

(37) *Quantum cohomology of projective bundles over $\mathbb{P}^n$.* Trans. Amer. Math. Soc. **350** (1998), 3615-3638. (with Yongbin Ruan)

(38) *On blowup formulae for the S-duality conjecture of Vafa and Witten II: the universal functions.* Math. Res. Lett. **5** (1998), 439-453. (with Wei-ping Li)

(39) *Vertex operator algebras and the blowup formula for the S-duality conjecture of Vafa and Witten.* Math. Res. Lett. **5** (1998), 791-798. (with Wei-ping Li)

(40) *Rank-3 stable bundles on rational ruled surfaces.* Math. Z. **222** (1996), 279-303. (with Wei-ping Li)

(41) *Extensions of vector bundles and rationality of certain moduli spaces of stable bundles.* J. reine angew. Math. **475** (1996), 209-220. (with Wei-ping Li)

(42) *On complex surfaces diffeomorphic to rational surfaces.* Invent. Math. **120** (1995), 81-117. (with Robert Friedman)

(43) *Flips of moduli spaces and transition formulas for Donaldson polynomial invariants of rational surfaces.* Communications in Analysis and Geometry **3** (1995), 11-83. (with Robert Friedman)

(44) *The smooth invariance of the Kodaira dimension of a complex surface.* Math. Res. Lett. **1** (1994), 369-376. (with Robert Friedman)

(45) *Stable vector bundles on algebraic surfaces.* Trans. Amer. Math. Soc. **345** (1994), 833-852. (with Wei-ping Li)

(46) *On smooth structures of potential surfaces of general type homeomorphic to rational surfaces.* Invent. Math. **113** (1993), 163-175.

(47) *On the existence of stable rank-2 sheaves on algebraic surfaces.* J. reine angew. Math. **439** (1993), 213-219.

(48) *Moduli of simple rank-2 sheaves on K3-surfaces.* Manuscripta Math. **79** (1993), 253-265.

(49) *Low-degree Donaldson polynomial invariants of rational surfaces.* J. Alg. Geom. **2** (1993), 413-442. (with Wei-ping Li)

(50) *Homotopy, diffeomorphism and deformation classifications of certain surfaces of class VII.* Proceedings of AMS **118** (1993), 165-170.

(51) *Equivalence classes of polarizations and moduli spaces of sheaves.* J. Differ. Geom. **37** (1993), 397-415.

(52) *Complex structures on certain differentiable 4-manifolds.* Topology **32** (1993), 551-566.

(53) *Simple sheaves versus stable sheaves on algebraic surfaces.* Math. Z. **209** (1992), 559-579.

(54) *Stable rank-2 bundles on simply connected elliptic surfaces.* Duke Math. J. **67** (1992), 557-569.

(55) *Moduli of stable sheaves on ruled surfaces and their Picard groups.* J. reine angew. Math. **433** (1992), 201-219.

(56) *Moduli spaces of stable rank-2 bundles on ruled surfaces.* Invent. Math. **110** (1992), 615-626.

(57) *Chamber structures of algebraic surfaces with Kodaira dimension zero and moduli spaces of rank-2 vector bundles.* Math. Z. **207** (1991), 121-136.

(58) *Birational properties of moduli spaces of stable locally free rank-2 sheaves on algebraic surfaces.* Manuscripta Math. **72** (1991), 163-180.

(59) *Symmetric polynomials constructed from moduli of stable sheaves on ruled surfaces.* Manuscripta Math. **73** (1991), 373-383.

(60) *Equivalence classes of polarizations and moduli spaces of rank two bundles on ruled surfaces.* Ph.D. Thesis, Columbia University (1990).

GRADUATE COURSES TAUGHT

(1) **University of Missouri**

Spring 2018	Readings in Algebraic Geometry (Math 8085), 2 sections
Fall 2017	Topics in Algebra: Hilbert schemes of points (Math 8102)
Fall 2017	Doctoral Dissertation Research (Math 9090)
Summer 2017	Doctoral Dissertation Research (Math 9090)
Spring 2017	Doctoral Dissertation Research (Math 9090)
Fall 2016	Doctoral Dissertation Research (Math 9090)
Spring 2016	Doctoral Dissertation Research (Math 9090)
Fall 2015	Readings in Algebraic Geometry (Math 8085)
Spring 2015	Readings in Algebraic Geometry (Math 8085)
Fall 2014	Readings in Algebraic Geometry (Math 8085)
Spring 2014	Readings in Algebraic Geometry (Math 8085)
Fall 2013	Readings in Commutative Algebra (Math 8085), 2 sections
Fall 2013	Master's Project (Math 8190)
Spring 2013	Algebraic Geometry II: Schemes (Math 8616)
Fall 2012	Algebraic Geometry (Math 8615)
Fall 2010	Basic Algebra (Math 8210)
Fall 2010	Doctoral Dissertation Research (Math 9090), 2 sections
Spring 2010	Doctoral Dissertation Research (Math 9090), 2 sections
Fall 2009	Doctoral Dissertation Research (Math 9090)
Spring 2009	Doctoral Dissertation Research (Math 9090)
Fall 2008	Doctoral Dissertation Research (Math 9090)
Fall 2008	Algebraic Geometry II: Schemes (Math 8616)
Fall 2008	Basic Algebra (Math 8210)
Spring 2008	Algebraic Topology (Math 8618)
Spring 2008	Readings in Algebraic Geometry (Math 8085)
Spring 2008	Readings in Field/Galois Theory (Math 8085)
Fall 2007	Algebraic Geometry (Math 8615)

Spring 2007	Master's Project (Math 8190)
Fall 2006	Independent Readings (Theory of Partitions)
Fall 2005	Basic Algebra (Math 8210)
Fall 2005	Independent Readings (Math 8085)
Spring 2005	Algebraic Topology (Math 8618)
Spring 2005	Master's Project (Math 8190)
Fall 2004	Basic Algebra (Math 8210)
Fall 2004	Master's Project (Math 8190)
Fall 2003	Algebraic Geometry (Math 435)
Spring 2003	Algebraic Topology (Math 403)
Fall 2000	Schemes (Math 435)
Fall 1999	Algebraic Geometry (Math 435)

(2) **Oklahoma State University**

Spring 1999	Algebraic Geometry
Spring 1997	Algebraic Geometry (Readings)
Spring 1996	Schemes
Spring 1996	Commutative Algebra (Readings)
Fall 1995	Algebraic Geometry
Fall 1995	Commutative Algebra (Readings)
Spring 1994	Algebraic Surfaces
Fall 1993	Algebraic Geometry

UNDERGRADUATE COURSES TAUGHT
(1) **University of Missouri**

Fall 2017	Differential Equations (Math 4100)
Spring 2017	Differential Equations (Math 4100), 2 sections
Fall 2016	Differential Equations (Math 4100), 2 sections
Spring 2016	Calculus III (Math 2300), 2 sections
Fall 2015	Calculus III (Math 2300), 2 sections
Spring 2015	Calculus III (Math 2300), 2 sections
Fall 2014	Differential Equations (Math 4100), 2 sections
Spring 2014	Calculus III (Math 2300), 2 sections
Fall 2013	Calculus III (Math 2300), 2 sections
Spring 2013	Differential Equations (Math 4100)
Fall 2012	Differential Equations (Math 4100)
Spring 2012	Differential Equations (Math 4100), 2 sections
Fall 2011	Differential Equations (Math 4100)
Fall 2011	Introduction to Abstract Algebra I (Math 4720)
Spring 2011	Differential Equations (Math 4100), 2 sections
Fall 2010	Differential Equations (Math 4100)
Spring 2009	Differential Equations (Math 4100), 2 sections
Spring 2008	Differential Equations (Math 4100)
Fall 2007	Differential Equations (Math 4100)
Spring 2007	Differential Equations (Math 4100)

Spring 2007	Introduction to Abstract Algebra I (Math 4720)
Fall 2006	Calculus III (Math 2300), 2 sections
Spring 2006	Differential Equations (Math 4100)
Spring 2006	Introduction to Abstract Algebra I (Math 4720)
Fall 2005	Differential Equations (Math 4100)
Spring 2005	Differential Equations (Math 4100)
Fall 2004	Differential Equations (Math 4100)
Fall 2003	Differential Equations (Math 304)
Spring 2003	Differential Equations (Math 304)
Fall 2002	Differential Equations (Math 304)
Fall 2002	Introduction to Abstract Algebra I (Math 340)
Spring 2002	Differential Equations (Math 304), 2 sections
Fall 2001	Calculus III (Math 201), 2 sections
Spring 2001	Calculus II (Math 175)
Spring 2001	Calculus III (Math 201)
Fall 2000	Calculus III (Math 201)
Spring 2000	Calculus III (Math 201), 2 sections
Fall 1999	Calculus III (Math 201)

(2) **Oklahoma State University**

Spring 1999	Differential Equations
Fall 1998	Linear Algebra
Spring 1998	Complex Variables
Spring 1998	Modern Algebra II
Fall 1997	Differential Equations
Fall 1997	Modern Algebra I
Spring 1997	Complex Variables
Spring 1997	Linear Algebra
Fall 1996	Differential Equations
Fall 1996	Introduction to Modern Algebra
Spring 1996	Calculus of Several Variables
Fall 1995	Differential Equations
Spring 1995	Calculus of Several Variables
Spring 1995	Complex Variables
Fall 1994	Differential Equations
Fall 1994	Linear Algebra
Spring 1994	Linear Algebra
Fall 1993	Calculus of Several Variables

(3) **McMaster University**

Spring 1992	Advanced Engineering Mathematics
Fall 1991	Advanced Engineering Mathematics
Spring 1991	Calculus
Fall 1990	Calculus