

# Zheng Hua

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Nationality : Chinese

## Professional Experience

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08/2013- **Assistant Professor.** DEPARTMENT OF MATHEMATICS, UNIVERSITY OF HONG KONG, HONG KONG.  
10/2012-12/2012 **Visitor.** OXFORD UNIVERSITY, U.K.  
06/2012-08/2012 **Visitor.** MAX PLANCK INSTITUTE FOR MATHEMATICS, GERMANY.  
08/2011-05/2012 **Postdoctoral Fellow.** KANSAS STATE UNIVERSITY, U.S.A.  
07/2009-07/2011 **Postdoctoral Fellow.** UNIVERSITY OF BRITISH COLUMBIA, CANADA.

## Education

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2004-2009 **PhD in Mathematics.** UNIVERSITY OF WISCONSIN-MADISON, U.S.A.  
2000-2004 **Bachelor of Science.** ZHEJIANG UNIVERSITY, CHINA.

## Research Interests

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**Algebraic geometry** : derived category, moduli space of sheaves, Calabi-Yau manifolds, Donaldson-Thomas theory.

**Algebra** : Artin-Schelter regular algebras, Calabi-Yau algebras, cluster algebras.

**Mathematical physics** : mirror symmetry, quantization of Poisson moduli spaces.

## Publications & Preprints

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### *Preprints*

1. **Zheng Hua**, Bernhard Keller. Cluster categories and rational curves, *arXiv :1810.00749*, 2018. submitted
2. **Zheng Hua**, Gui-song Zhou. Quasi-homogeneity of superpotentials, *arXiv :1808.03754*, 2018. submitted
3. **Zheng Hua**, Gui-song Zhou. Noncommutative Mather-Yau theorem and its applications to Calabi-Yau algebras and birational geometry, *arXiv :1803.06128*, 2018. submitted
4. **Zheng Hua**, Alexander Polishchuk. Shifted Poisson geometry and meromorphic matrix algebras over an elliptic curve, *arXiv :1712.01659*, 2017. submitted

### *Journal Publications*

5. **Zheng Hua**, Alexander Polishchuk. Shifted Poisson structures and moduli spaces of complexes, *Advances in Mathematics*, Volume 338 (2018), 991-1037.

6. **Zheng Hua**. Contraction algebra and singularity of three-dimensional flopping contraction, *Mathematische Zeitschrift*, (2018) : 431-443.
7. **Zheng Hua**, Yukinobu Toda. Contraction algebra and invariants of singularities, *International Mathematics Research Notices*, no. 10 (2018), 3173-3198.
8. **Zheng Hua**. Chern-Simons functions on toric Calabi-Yau threefolds and Donaldson-Thomas theory, *Pacific Journal of Mathematics*, 277-1 (2015), 119-147.
9. Duiliu-Emanuel Diaconescu, **Zheng Hua**, Yan Soibelman. HOMFLY polynomials, stable pairs and motivic Donaldson-Thomas invariants, *Communications in Number Theory and Physics*, Volume 6, Number 3, 517-600, 2012.
10. **Zheng Hua**. Classification of free actions on complete intersections of four quadrics, *Advances in Theoretical and Mathematical Physics*, 15, no. 4 (2011) 973-990.
11. Lev Borisov, **Zheng Hua**. On the conjecture of King for smooth toric Deligne-Mumford stacks, *Advances in Mathematics*, Volume 221, Issue 1, 1 May 2009, 277-301.
12. Lev Borisov, **Zheng Hua**. On calabi-yau threefolds with large nonabelian fundamental groups, *Proceedings of American Mathematical Society*, 136 (2008), 1549-1551.

### Refereed Conference Publications

13. **Zheng Hua**. On the Grothendieck groups of toric stack, *Proceedings in East Asia Algebraic Geometry conference*, 2016.

## Teaching Experience

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2013-2018	The University of Hong Kong Multivariable calculus, Linear algebra, Basic topology, Algebraic topology, Commutative algebra, Algebraic geometry.
2011-2012	Kansas state university Calculus, Ordinary differential equation.
2009-2011	University of British Columbia Calculus.

## Talks

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### Conference lectures since 2012

10/2018	• Algebraic geometry in East Asia, Vietnam Academy of Sciences and Technology.
10/2018	• The 4-th Sino-Russian Conference in Mathematics, The University of Hong Kong, Hong Kong.
07/2017	• National conference on Algebraic geometry, Chinese Academy of Sciences, China.
03/2017	• Workshop on Mathematics and Superstring Theory -Unlocking the Mysteries of the Accelerating Universe through Superstring Theory and Astrophysical Observations, IPMU, University of Tokyo, Japan.
01/2017	• International Conference on Higher Dimensional Algebraic Geometry, Holomorphic Dynamics and Their Interactions, National University of Singapore, Singapore.
01/2016	• Algebraic geometry in East Asia, University of Tokyo, Japan.
12/2015	• Mathematics inspired by String theory, Mathematical Sciences Centre, Tsinghua University, Sanya, China.
01/2014	• International conference on Calabi-Yau Geometry and Mirror Symmetry, National Taiwan University.
06/2013	• International workshop on Refined invariants in geometry, topology and string theory, Banff International Research Station, Canada.

## Grants and Awards

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2019-2021	Research Grants Council of Hong Kong, General Research Fund no. 17308818 "Shifted Poisson geometry of moduli space and Quantization", PI, HK\$456,452.
2018-2020	Research Grants Council of Hong Kong, General Research Fund no. 17308017 "Contraction algebras, singularities and enumerative geometry", PI, HK\$708,430.
2017-2019	Research Grants Council of Hong Kong, General Research Fund no. 17330316 "Moduli space of non-commutative instantons and Sklyanin algebras", PI, HK\$488,501.
2014-2017	National Natural Science Foundation of China - Science Fund for Young Scholars no. 11401501 "Hilbert scheme of points on quantum projective planes", PI, CNY\$220,000.
2014	HKU Oversea Fellowship, PI, HK\$50,000.
2014-2017	Research Grants Council of Hong Kong, Early Career Scheme no. 27300214 "Donaldson-Thomas theory and stability conditions", PI, HK\$553,870.
2012-2014	AMS-Simons Travel Grant, American Mathematical Society and Simons foundation, PI, USD\$4,000.

## Other Scientific Activities

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Referee for :

Duke Mathematical Journal  
Advances in Mathematics  
Journal of Differential Geometry  
Glasgow Mathematical Journal  
Compositio Mathematica

Organizer and Co-organizer of

05/2020 Workshop on shifted symplectic and Poisson geometry, Institut Henri Poincare, France.  
2013-2018 Geometry seminar, University of Hong Kong.  
05/2012 Special session of Mirror Symmetry in the American Mathematical Society spring central section meeting, University of Kansas.  
2011-2012 Mirror symmetry seminar, Kansas state university.  
2009-2011 Algebraic geometry seminar, University of British Columbia.