

Yau Mathematical Sciences Center
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Employment

- Professor, Yau Mathematics Science center, Tsinghua University, 2014 -present
- Visiting Scientist, Kavli IPMU at University of Tokyo, 2014 -present
- Visiting Associate Scientist, Kavli IPMU at University of Tokyo, 2013 -2014
- Assistant Professor, Boston University, 2012 - 2014.
- Boas Assistant Professor, Northwestern University, 2011- 2012.

Education

- Harvard University, Cambridge, U.S.
Ph.D. in Mathematics, 2006-2011 (Thesis supervisor: Shing-Tung Yau)
- University of Science and Technology of China, Hefei, P. R. China
M.Phil. in Mathematics, 2003-2005. (Thesis supervisor: Sen Hu)
- University of Science and Technology of China, Hefei, P. R. China
B.Sc. in Mathematics, School of the Special Class for Gifted Young, 1999–2003.

Academic Interest

- Algebraic geometry and complex geometry: Calabi-Yau geometry, Singularity/Landau-Ginzburg theory, moduli problem, mirror symmetry.
- Quantum field theory and string theory: Renormalization theory, Topological string, Supersymmetric gauge theory, supergravity.

Awards

- Morningside Medal of Mathematics: Gold Medal Award, 2016.
- New World Mathematics Awards: Golden Prize for Doctor Thesis Awards, 2012
- Harvard Merit Fellowship 2010-2011
- Harvard Salam Fellowship, 2008-2009
- USTC Outstanding Graduate Scholarship, 2003

Publications and Preprints

1. *Effective Batalin-Vilkovisky quantization and geometric applications*, arXiv:1709.00669[math.QA]
2. *Vertex algebras and quantum master equation*, arXiv:1612.01292 [math.QA]
3. *Twisted supergravity and its quantization* (with K. Costello), arXiv: arXiv:1606.00365 [hep-th]
4. *Batalin-Vilkovisky quantization and the algebraic index*(with Q.Li, R. Grady), **Adv. Math.** 317 (2017), 575-639.. Preprint at arXiv:1507.01812[math-QA]
5. *Quantization of open-closed BCOV theory, I* (with K. Costello), arXiv:1505.06703 [hep-th]
6. *A mirror theorem between Landau-Ginzburg models.* **Nuclear Phys. B.**, **898** (2015).
7. *Landau-Ginzburg mirror symmetry conjecture* (with W. He, Y. Shen, R. Webb), arXiv:1503.0175[math.AG].
8. *On the B-twisted topological sigma model and Calabi-Yau geometry* (with Q. Li), **J.Diff.Geom.** **102 (2016) no.3, 409-484**. Preprint at arXiv:1402.7000 [math.QA].
9. *Mirror symmetry for unimodular exceptional singularities* (with C. Li, K. Saito and Y. Shen), **J. Eur. Math. Soc.** 19 (2017), no.4, 1189-1229. Preprint at arXiv:1405.4530[math.AG].
10. *Primitive forms via polyvector fields* (with C. Li and K. Saito), arXiv:1311.1659 [math.AG]
11. *On the B-twisted quantum geometry of Calabi-Yau manifolds* (with Q. Li), Proceedings of the Sixth International Congress of Chinese Mathematicians 2013
12. *Variation of Hodge structures, Frobenius manifolds, and gauge theory*, arXiv:1303.2782 [math.QA]
13. *Renormalization and mirror symmetry*, **SIGMA** **8** (2012), 101
14. *BCOV theory on the elliptic curve and higher genus mirror symmetry*, arXiv:1112.4063 [math.QA]
15. *Feynman graph integrals and almost modular forms*, **Commun. Number theory Phys**, **6**, (2012)
16. *Quantum BCOV theory on Calabi-Yau manifolds and the higher genus B-model* (with K. Costello), arXiv:1201.4501 [math.QA]
17. *Calabi-Yau geometry and higher genus mirror symmetry*, PhD Thesis (2011), Harvard University.
18. *Picard-Fuchs Equations of Relative Periods and Abel-Jacobi Map for Calabi-Yau Hypersurfaces* (with B.H. Lian and S.T. Yau), **Amer. J. Math**, **134** (2012), no.5, 1345-1384
19. *Morphisms from Azumaya prestable curves with a fundamental module to a projective variety: Topological D-strings as a master object for curves* (with C.H. Liu, R. Song and S.T. Yau), arXiv:0809.2121 [math.AG]
20. *On the spectrum of unitary finite-Euclidean graphs* (with L.A. Vinh), **Ars Combin.** **110** (2013), 275-287.
21. *Hamiltonian Formalism of the de-Sitter Invariant Special Relativity* (with M.L. Yan, N.C. Xiao and W. Huang), **Commun. Theor. Phys.** **48** :27-36, (2007)
22. *Baryonium with a phenomenological skyrmion-type potential* (with M.L. Yan, B. Wu and B.Q. Ma), **Phys. Rev. D**, **72** (2005) 0 34027

Conferences co-organized

- Aug 1-5, 2016: Strings 2016, Tsinghua University, China.
- July 24-28, 2016: Summer School on String Theory, Quantum Field Theory and Geometry of Spacetime, Tsinghua University, China.
- Jan 6-14, 2016: Thematic Program: Mathematics of Quantum Field Theory, IBS-CGP, Korea.
- Dec 31 2015- Jan 4 2016: String-Math 2015, Sanya, China.
- Sep 29-Oct 3, 2015: Homological Methods in Quantum Field Theory, SCGP, USA.
- Feb 10-14, 2014: Primitive forms and related subjects, Kavli-IPMU, Japan.

Invited Talks

- July 31-Aug 11, 2017: Geoquant 2017, Aarhus, Denmark.
- July 24-29, 2017: String-Math 2017, Hamburg, Germany.
- July 20-22, 2017: Flat connections in physics and geometry, Heidelberg, Germany.
- July 3-7, 2017: Symposium in Geometry and Differential Equations, Beijing, China.
- June 8, 2017: ICTS seminar, USTC, Hefei, China.
- May 22-26, 2017: Homological mirror symmetry and higher genus invariants, Simons Center for Geometry and Physics, USA.
- May 8-12, 2017: Quantum fields on manifolds with boundary and the BV formalism, Perimeter Institute, Canada.
- Apr 28-May 1, 2017: JDG conference on geometry and topology, Harvard, USA.
- Apr 25-28, 2017: Developments of mathematics at IPMU: in honor of Kyoji Saito, Kavli IPMU, Japan.
- Apr 17-24, 2017: Gauge Equations, Geometry and Strings, ICMAT, Madrid, Spain.
- Mar 13-17, 2017: Workshop on homological mirror symmetry, IAS, Princeton, USA.
- Feb 6, 2017: Geometry and Physics seminar, IBS-CGP, Korea.
- Jan 19, 2017: Ganita seminar, University of Toronto, Canada.
- Jan 18, 2017: Mathematical Physics seminar, Perimeter Institute for theoretical physics, Canada.
- Oct 31-Nov 4, 2016: BICMR/IBS-CGP joint Symplectic Geometry Workshop, Jeju, Korea.
- Aug 6-11, 2016: The 7th International Congress of Chinese Mathematicians, Beijing, China.
- Aug 1-5, 2016: Strings 2016, Beijing, China.
- June 20-26, 2016: Retrospective Workshop for the Thematic Program on Calabi-Yau Varieties: Arithmetic, Geometry and Physics, Herstmonceux Castle, UK
- May 8-14, 2016: Lecture series for “Factorization Algebras and Functorial Field Theories”, MFO, Germany.
- May 6-8, 2016: Simons Workshop on SYZ Mirror Symmetry and related topics, Harvard, USA.
- Apr 24-30, 2016: Mini course on “BV quantization and geometric applications”, IBS-CGP, Korea.
- Apr 5-12, 2016: MIST IV: Mathematics Inspired by String Theory, CUHK, Hong Kong.

- Jan 1-4, 2016: Workshop on Poisson Geometry and Mathematical Physics, Chern Institute of Mathematics, Tianjin.
- Dec 31, 2015: Strings-Math 2015, Sanya, China.
- Dec 27, 2015: Workshop on Mathematics Physics, Dec 27, Sanya, China.
- Nov 24, 2015: 2015 Annual Conference of Chinese Mathematical Society, CNU, Beijing.
- Nov 14, 2015: Geometry and Physics seminar, Shanghai Jiaotong University, Shanghai
- July 13-July 18,, 2015: “Uniformization,Riemann-Hilbert Correspondence, Calabi-Yau manifold, and Picard-Fuchs Equation”, Mittag-Leffler Institute, Sweden
- July 6-10, 2015: GAP XII-Derived Algebraic Geometry, IBS-CGP, Pohang, Korea
- March 28, 2015: Tianyuan workshop in algebraic geometry, AMSS, Beijing.
- Mar 23, 2015: Symplectic geometry and mathematical physics, BICMR, China.
- March 7, 2015: Beijing Geometry and Physics Colloquium, Peking University
- Feb 7-8, 2015: Lecture series-Introduction to perturbative field theory, Morningside Center for Mathematics, CAS, Beijing.
- Jan 20, 2015: String/Math Seminar, Perimeter Institute, Canada
- Aug 26, 2014: China annual complex analysis conference, USTC, Hefei.
- Oct 20, 2014: Geometry seminar, Lehigh University, USA.
- Oct 6, 2014: Informal mathematical physics seminar, Columbia University, USA.
- Sep 29-Aug 3, 2014: Homological methods in quantum field theory, Simons center for geometry and physics, USA.
- Sep 18, 2014: Seminar on mathematical physics, Morningside Center for Mathematics, CAS, Beijing.
- Aug 5, 2014: 60 years of Calabi conjecture-Workshop in Honor of Professor Shing-Tung Yau on the occasion of his 65th birthday, Tsinghua University
- June 8-15, 2014: Lecturer for Research Training Group 1670, University of Hamburg, Germany
- May 19-23, 2014: Representation Theory, Integrable Systems, and Quantum Fields, Northwestern University, USA
- April 1, 2014: Algebraic geometry seminar, Princeton, USA
- Mar 3-7, 2014: Workshop on B-model aspect of Gromov-Witten theory, University of Michigan
- Feb 10-14, 2014: Lecturer: Primitive forms and related subjects, Kavli IPMU, Japan
- Nov 25, 2013: Geometry and Physics seminar, University of Michigan, USA
- July 22, 2013: Invited seminar, Kavli IPMU, Japan
- July 16, 2013: The Sixth International Congress of Chinese Mathematicians, Taipei
- Apr 12-14, 2013: Mini-course for FRG Workshop on Gromov-Witten theory, Columbia University, USA
- Mar 11, 2013: Geometry and Physics seminar, University of Michigan, USA
- Jan 29, 2013: Differential geometry seminar, Harvard University, USA
- Nov 30, 2012: Everytopic Seminar, Brandeis University, USA
- Nov 27, 2012: GAP Seminar, Penn State University, USA
- Sep 14-17, 2012: Boston-Keio Summer Workshop on Geometry, Boston University, USA
- Aug 27, 2012: FRG Workshop: Generalized Geometry, String Theory, and Deformations, Harvard University, USA

- August 20-24, 2012: The Conference of Mirror Symmetry and Related Topics, KMUST, China
- July 27-Aug 20, 2012: Summer course, MSC at Tsinghua University, China
- August 10, 2012: Math Literature Seminar, MSC at Tsinghua University, China
- July 18, 2012: Workshop on the mathematical aspects of quantum field theory, USTC, China
- June 26, 2012: Geometry and Physics of the Landau-Ginzburg Model, IPMU, Japan
- June 18, 2012: Quantization and Mathematics: An Undergraduate Conference, Northwestern University, USA
- Mar 19, 2012: Geometry and Physics Seminar, University of Michigan, USA
- Feb 18, 2012: Hong Kong Geometry Colloquium, Hong Kong
- Feb 17,20, 2012: Geometry and Physics Seminar, HK Chinese Univ, Hong Kong
- Feb 8,11, 2012: Geometry Seminar, HKUST, Hong Kong
- Dec 9, 2011: Geometry Seminar, Boston University, USA
- Nov 3, 2011: Felix Klein Seminar, University of Notre Dame, USA
- Aug 3, 2011: Workshop on Chiral Differential Operators, Northwestern University, USA
- July 19, 2011: Seminar on QFT, MIT, US
- May 5, 2011: Mirror Symmetry Seminar, Simons Center for Geometry And Physics, Stonybrook
- Mar 4, 2011: Algebraic Geometry Seminar, University of Wisconsin, USA
- Feb 22, 2011: Differential Geometry Seminar, Harvard University, USA
- Oct 14, 2010: Geometry/Physics Seminar, Northwestern University, USA
- Sep 28, 2010: Differential Geometry Seminar, Harvard University, USA
- Dec 4 2009: Differential Geometry Seminar, Harvard University, USA
- Mar 12, 2009: Graduate Trivial Notion Seminar, Harvard University, USA
- Apr 24, 2008: Graduate Trivial Notion Seminar, Harvard University, USA