

Jingjun Han

Curriculum Vitae

Department of Mathematics
Johns Hopkins University
3400 N. Charles Street, Baltimore, MD 21218
✉ hanjingjunfdz@gmail.com
🌐 <https://sites.google.com/site/jingjunhan>

Employment

2018–Present **J.J. Sylvester Assistant Professor**, *Johns Hopkins University*.

Education

- 2013–2018 **Ph.D. in Mathematics**, *Peking University*, Advisor: Gang Tian and Chenyang Xu.
Dissertation: Singularities in birational geometry and the minimal model program.
- 2015–2016 **Visiting Student Research Collaborator**, *Princeton University*, Advisor: János Kollár.
- 2009–2013 **B.S. in Mathematics**, *Peking University*, Thesis advisor: Bican Xia.
Thesis: Some notes on positive semi-definite polynomials.

Research Interests

- Birational geometry, e.g. MMP (Minimal Model Program) and boundedness of varieties.
- Symbolic computation, e.g. CAD (Cylindrical Algebraic Decomposition) and automated inequality proving.

Honors and Awards

- 2018 *Valedictorian* (speaker at the graduation ceremony), Peking University
- 2018 *Outstanding Doctoral Dissertation*, Peking University
- 2018 *Outstanding Graduate*, Peking University
- 2018 *May 4th Medal* (the highest honor for students in Peking University, awarded to no more than 10 students every two years), Peking University
- 2016,2017 *Presidential Fellowship*, Peking University
- 2015 *Scholarship of China Telecom, E Surfing Prize* (one of the 50 outstanding college students in China), The Central Committee of the Communist Young League
- 2014 *National Scholarship*, The Ministry of Education of the People's Republic of China
- 2013 *Outstanding Winner of Challenge Cup* (May 4th Young Scientist Award), Peking University
- 2013 *Excellence Research Award of the President's Fund for Undergraduate Students*, Peking University (one of the five recipients)

Publications and Preprints

1. **On nonvanishing and abundance for generalized polarized surfaces**, with Wenfei Liu, arXiv:1808.06361.
2. **Weak Zariski decompositions and log terminal models for generalized polarized pairs**, with Zhan Li, arXiv:1806.01234, submitted.
3. **Birational boundedness of rationally connected Calabi–Yau 3-folds**, with Weichung Chen, Gabriele Di Cerbo, Chen Jiang, and Roberto Svaldi, arXiv:1804.09127, submitted.
4. **On a connectedness principle of Shokurov–Kollàr type**, with Christopher D. Hacon, to appear in *Science China Mathematics*, arXiv:1801.01801.
5. **ACC for log canonical threshold polytopes**, with Zhan Li, and Lu Qi, arXiv:1706.07628, submitted.
6. **On Fujita’s conjecture for pseudo-effective thresholds**, with Zhan Li, arXiv:1705.08862, submitted.
7. **Open weak CAD and its applications**, with Liyun Dai, Hoon Hong, and Bican Xia, *Journal of Symbolic Computation*, 80, 785–816, 2017.
8. **Multivariate discriminant and iterated resultant**, *Acta Mathematica Sinica, English Series*, 32: 659–667, 2016.
9. **Proving inequalities and solving global optimization problems via simplified CAD projection**, with Zhi Jin and Bican Xia, *Journal of Symbolic Computation*, 72: 209–230, 2016.
10. **Constructing fewer open cells by GCD computation in CAD projection**, with Liyun Dai and Bican Xia, *Proceedings of the International Symposium on Symbolic and Algebraic Computation*, 240–247, ACM Press, 2014.
11. **Simple quantifier-free formula of positive semidefinite cyclic ternary quartic forms**, in: Feng R., Lee W., Sato Y. (eds) *Computer Mathematics*, 261–274, Springer, 2014.
12. **A complete method based on successive difference substitution method for deciding positive semi-definiteness of polynomials** (in Chinese), *Acta Scientiarum Naturalium Universitatis Pekinensis*, 2013, 49(4), 545–551.

Books and Chapters

1. **Effective birationality and special BAB**, with Chen Jiang, submitted to the volume of *Singularities, Linear Systems and Fano Varieties* (on the BAB conjecture), edited by Caucher Birkar and Jungkai Chen.
2. **An introduction to the proving of elementary inequalities** (in Chinese), Harbin Institute of Technology Press, China, 2011 (2nd, 2014, 343 pp.).

Conference and Seminar Talks

1. *Complements and minimal discrepancies (2)*, Algebraic Geometry Seminar, Johns Hopkins University, USA, Feb. 12, 2019.
2. *Complements and minimal discrepancies (1)*, Algebraic Geometry Seminar, Johns Hopkins University, USA, Jan. 29, 2019.
3. *Boundedness of singularities admitting an epsilon-PLT blow-up*, Connection to Algebraic Geometers, Shanghai Center for Mathematical Sciences (Fudan University), China, Nov. 20, 2018.
4. *Birational boundedness of rationally connected Calabi–Yau 3-folds*, Algebraic Geometry Seminar, Yale University, USA, Oct. 25, 2018.
5. *Birational boundedness of rationally connected Calabi–Yau 3-folds*, Algebraic Geometry Seminar, Johns Hopkins University, USA, Sep. 11, 2018.
6. *An introduction to the Minimal Model Program*, Postdoc Seminar, Peking University, Beijing,

June 27, 2018.

7. *Birational boundedness of rationally connected Calabi–Yau 3-folds*, Algebraic Geometry Seminar, Xiamen University, Xiamen, June 3, 2018.
8. *Birational boundedness of rationally connected Calabi–Yau 3-folds*, Algebraic Geometry Seminar, University of Cambridge, UK, May 16, 2018.
9. *Birational boundedness of rationally connected Calabi–Yau 3-folds*, Sino-French Conference in Algebraic and Complex Geometry, Université Claude Bernard Lyon 1, Lyon, France, Apr. 24, 2018.
10. *The ACC for log canonical threshold polytopes*, International Conference on Differential Geometry—An Event in Honor of Professor Gang Tian’s 59/60th Birthday, The University of Sydney, Australia, Feb. 2, 2018.
11. *The ACC for log canonical threshold polytopes*, Algebraic Geometry Seminar, University of Utah, USA, Nov. 14, 2017.
12. *The ACC for log canonical threshold polytopes*, Algebraic Geometry Seminar, Princeton University, USA, Nov. 10, 2017.
13. *Birkar’s proof of the BAB conjecture*, One-day Workshop on Kähler Geometry, Peking University, China, Sep. 23, 2017.
14. *The ACC for log canonical threshold polytopes*, The First National Algebraic Geometry Conference, Chinese Academy of Sciences, China, Jul. 3–7, 2017.
15. *Special BAB*, Workshop on Singularities, Linear System, and Fano Varieties. NCTS, Taiwan, China, Apr. 13–16, 2017.
16. *Open Weak CAD and Its Applications*, Symbolic Computation Seminar, NC State University, USA, March 22, 2016. (cancelled)
17. *A Simple Quantifier-free Formula of Positive Semidefinite Cyclic Ternary Quartic Forms*, The 10th Asian Symposium on Computer Mathematics (ASCM 2012), Chinese Academy of Sciences, China, Oct. 26–28, 2012.

Visiting Experiences

- Jan. 2019, The University of Utah, U.S.A (2 Weeks)
May. 2018, University of Cambridge, U.K. (3 weeks)
Jan. 2018, The University of Sydney, Australia. (2 Weeks)
Nov. 2017, University of Utah, U.S.A (3 weeks)

Teaching

- 2018–Present **Instructor**, *Johns Hopkins University*.
- Math 401, Introduction to Abstract Algebra.
 - Math 202, Vector Calculus ×2.
- 2013–2018 **Senior teaching assistant**, *Peking University*.
- Honorable class of Mathematical Analysis (2)
 - Honorable class of Mathematical Analysis (3)
 - Complex Variables Functions ×2
 - Topology

Selected Service

Mathematical Reviews (since 2016),

Referee for *International Mathematics Research Notices* (since 2019), *Algebra & Number Theory*

(since 2019), *American Journal of Mathematics* (since 2018), *Mathematische Zeitschrift* (since 2018), *Journal of Systems Science and Complexity* (since 2018), *Journal of Mathematical Inequalities* (since 2015), *Journal of Symbolic Computation* (since 2014).

Other Activities

- 2018 Committee Member of “Northern Star of Outlook Math Talent Competition”
- 2017 Coach of Beijing Mathematical Olympiad Team
- 2017 Coach of Chinese National Team for IMO
- 2015–Present Editor Board of *Learning Mathematics*, Press of University of Science and Technology of China (in Chinese)

Software

Psdgcd, a Maple Package, A package using Maple language, which provides several functions for proving inequalities and solving global optimization problems efficiently.

<https://sites.google.com/site/jingjunhan/home/software>

References List

- Caucher Birkar
Professor
DPMMS, Centre for Mathematical Sciences
University of Cambridge
Cambridge, CB3 0WB, UK
Email: c.birkar@dpmms.cam.ac.uk
- Vyacheslav Shokurov
Professor
Department of Mathematics
Johns Hopkins University
Baltimore, MD 21218, USA
Email: shokurov@math.jhu.edu
- Gang Tian
Professor
Beijing International Center for Mathematical Research
Peking University
Beijing 100871, China
Email: gtian@math.pku.edu.cn
- Chenyang Xu
Professor
Department of Mathematics
Massachusetts Institute of Technology
Cambridge, MA 02139-4307, USA
Email: cyxu@math.mit.edu

- Christopher Hacon
Professor
Department of Mathematics
University of Utah
Salt Lake City, Utah 84112-0090, USA
Email: hacon@math.utah.edu

Last updated: Feb 15th, 2019