

Curriculum Vitae

Han-Bom Moon

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Contact

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Personal

- Born April 1982, Busan, Korea. South Korean citizen.
- Visa category: H1B

Education

- Ph.D. in Mathematics, Seoul National University, 2011.
Thesis advisor: Young-Hoon Kiem.
Thesis title: *Birational geometry of moduli spaces of curves of genus zero.*
- B.S. in Mathematics Education, Seoul National University, graduation with honors (Summa cum laude), 2005.

Employment

Sep 2017 ~	Member	Institute for Advanced Study
Aug 2013 ~ Aug 2017	P. M. Curran Visiting Assistant Professor	Fordham University
Aug 2011 ~ Aug 2013	Postdoctoral Associate	University of Georgia

Research Interests

Algebraic Geometry and related areas

- Geometry, topology and combinatorics of moduli spaces.
- Birational geometry of moduli spaces.
- Geometric invariant theory.

- Geometric and numerical properties of conormal blocks.

Publications

1. (with K. Chung) Mori's program for the moduli space of conics in Grassmannian. *Taiwanese J. Math., a special issue for Algebraic Geometry in East Asia 2016*, to appear, arXiv:1608.00181.
2. (With C. Summers, J. von Albade, and R. Xie) Birational contractions of $\overline{M}_{0,n}$ and combinatorics of extremal assignments. *J. Algebraic Comb.*, to appear, arXiv:1508.03915.
3. (With K. Chung) Chow ring of the moduli space of stable sheaves supported on quartic curves. *Q. J. Math.*, to appear, arXiv:1506.00298.
4. (With K. Chung) Moduli of sheaves, Fourier-Mukai transform, and partial desingularization. *Math. Z.*, 283 (2016), no. 1-2, 275-299.
5. (With S.-B. Yoo) Birational geometry of the moduli space of rank 2 parabolic bundles on a rational curve. *Int. Math. Res. Not. IMRN* (2016), no. 3, 827–859.
6. (With D. Swinarski) Effective curves on $\overline{M}_{0,n}$ from group actions. *Manuscripta Math.*, 147 (2015), no. 1-2, 239–268.
7. Mori program for $\overline{M}_{0,7}$ with symmetric divisors. *Canad. J. Math.*, 69 (2017), no. 3, 613–649.
8. Mori program for $\overline{M}_{0,6}$ with symmetric divisors. *Math. Nachr.*, 288 (2015), no. 7, 824–836.
9. (With A. Gibney, D. Jensen and D. Swinarski) Veronese quotient models of $\overline{M}_{0,n}$ and conormal blocks. *Michigan Math. J.*, 62 (2013), no. 4, 721–751.
10. (With N. Giansiracusa and D. Jensen) GIT compactifications of $M_{0,n}$ and flips. *Adv. in Math.*, 248, (2013), 242–278.
11. A family of divisors on $\overline{M}_{g,n}$ and their log canonical models. *J. Pure Appl. Algebra*, 219 (2015), no. 10, 4642–4652.
12. Log canonical models for the moduli space of stable pointed rational curves. *Proc. Amer. Math. Soc.*, 141 (2013), no. 11, 3771–3785.
13. (With Y.-H. Kiem) Moduli spaces of weighted pointed stable rational curves via GIT. *Osaka J. of Math.*, Vol. 48, (2011) No. 4, 1115–1140.
14. (With Y.-H. Kiem) Moduli spaces of stable maps to projective space via GIT. *Internat. J. Math.*, 21 (2010), no. 5, 639–664.

Preprints

15. (with K. Chung) Birational geometry of the moduli space of pure sheaves on quadric surface. preprint, arXiv:1703.00230.
16. (with D. Swinarski) On the S_n -invariant F-conjecture. preprint, arXiv:1606.02232.

In Preparation

17. (With D. Swinarski) GIT polarizations on moduli spaces of stable pointed curves, in preparation.
18. (With S.-B. Yoo) Conformal blocks and Mori's program for moduli spaces of rank r parabolic bundles, in progress.

Invited Talks

- (upcoming) algebra seminar, KIAS, Korea, June 2017.
- (upcoming) colloquium talk, Seoul University, Korea, June 2017.
- (upcoming) colloquium talk at department of mathematics education, Seoul National University, Korea, June 2017.
- Some facts that you may not know about right triangles, math club talk, Fordham University, May 2017.
- Birational geometry of moduli spaces of parabolic bundles, algebraic geometry seminar, Courant Institute, April 2017.
- Birational geometry of moduli spaces, colloquium, Claremont McKenna College, February 2017.
- Birational geometry of moduli spaces, algebra and number theory seminar, University of Arizona, February 2017.
- Birational geometry of moduli spaces, Colloquium talk, University of Kentucky, January 2017.
- Classical invariant theory and birational geometry of moduli space of parabolic bundles, contribution talk, Joint Mathematics Meeting, Atlanta, January 2017.
- Classical invariant theory and birational geometry of moduli spaces, Workshop on Combinatorial Moduli Spaces, Fields Institute, December 2016.
- Classical invariant theory and birational geometry of moduli spaces, Seminar talk, Princeton University, November 2016.
- A computational approach to the F-conjecture, Seminar talk, KIAS, Korea, May 2016.
- A computational approach to the F-conjecture, Seminar talk, KAIST, Korea, May 2016.
- Geometric invariant theory and construction of moduli spaces, Mathematics Colloquium, Kyoungbook National University, Korea, May 2016.
- Moduli spaces and birational geometry, Colloquium talk at Department of Mathematics Education, Seoul National University, Korea, May 2016.
- Birational geometry of moduli spaces of parabolic bundles, Seminar talk, Seoul National

University, Korea, May 2016.

- Algebraic geometry, moduli spaces, and invariant theory, Seminar talk, Ewha Women's University, Korea, May 2016.
- A computational approach to the F-conjecture, Workshop on Rational Curves and Moduli, Damyang, Korea, May 2016.
- Let's count points!, Math Club talk, Fordham University, December 2015.
- Birational geometry of moduli spaces of parabolic bundles, Seminar talk, Stony Brook University, November 2015.
- Classical invariant theory and birational geometry of moduli spaces, Mathematics Colloquium, Rutgers University-Newark, November 2015.
- Effective curve class computation on moduli of rational curves, Seminar talk, KIAS, Korea, August 2014.
- Alternative compactifications of the moduli space of pointed rational curves, Seminar talk, IBS-CGP, Korea, July 2014.
- Do we really need integrals?, Math Club talk, Fordham University, March 2014.
- Alternative compactifications of the moduli space of pointed rational curves, Seminar talk, KIAS, Korea, January 2014.
- Alternative compactifications of the moduli space of pointed rational curves, Seminar talk, Seoul National University, Korea, December 2013.
- Alternative compactifications of the moduli space of pointed rational curves, Seminar talk, Yale University, November 2013.
- Birational geometry of $\overline{M}_{0,n}$ and conformal blocks, Seminar talk, KIAS, Korea, July 2013.
- Moduli spaces and their birational geometry, Seminar talk, Ehwa Women's University, Korea, July 2013.
- Euler's product formula and its geometric interpretation, Colloquium talk at Department of Mathematics Education, Seoul National University, July 2013.
- Birational geometry of $\overline{M}_{0,n}$ and conformal blocks, Seminar talk, KAIST, Korea, July 2013.
- Mori's program for $\overline{M}_{0,n}$, Seminar talk, KAIST, Korea, July 2013.
- GIT compactifications of $M_{0,n}$, The Asian Mathematical Conference 2013, Busan, Korea, July 2013.
- Compactifications of moduli of curves, Lecture series at KIAS, Korea, June 2013.
- Birational geometry of $\overline{M}_{0,n}$ and conformal blocks, Seminar talk, Princeton University, March 2013.
- Moduli spaces and their birational geometry, Seminar talk, Fordham University, February 2013.
- Moduli spaces and their birational geometry, Seminar talk, University of Georgia, February

2013.

- Toward a classification of projective modular compactifications of $M_{0,n}$, Seminar talk, University of Georgia, October 2012.
- Introduction to Geometric Invariant Theory, Four hours lecture on Summer School on Algebraic Geometry, Sol Beach, Korea, June 2012.
- New family of nef divisors on $\overline{M}_{0,n}$, Seminar talk, KIAS, Korea, June 2012.
- GIT compactifications of $M_{0,n}$, Seminar talk, KIAS, Korea, June 2012.
- GIT compactifications of $M_{0,n}$, Seminar talk, Seoul National University, Korea, June 2012.
- Mori's program for moduli spaces of pointed curves and psi-classes, Seminar talk, University of Georgia, September 2011.
- Moduli spaces and their birational geometry, Algebra camp, Seoul National University, Korea, August 2011.
- Mori's program for moduli spaces of pointed curves and psi-classes, Workshop on Moduli and Birational Geometry, Gyeongju, Korea, July 2011.
- Mori's program for $\overline{M}_{0,n}$, Seminar talk, Brown University, May 2011.
- Moduli spaces and its birational geometry, Seminar talk, Chungnam University, Korea, April 2011.
- Mori's program for the moduli space of pointed stable rational curves, Global KMS International Conference, Postech, Korea, October 2010.
- Introduction to moduli spaces, Workshop for Young Mathematicians in Korea, KAIST, Korea, July 2010.
- Elementary construction of the moduli spaces of rational curves via GIT, Mini workshop on curves, Seoul National University, Korea, March 2010.
- On GIT constructions of Kontsevich moduli spaces of stable maps, Joint Meeting of the KMS and AMS, Ewha Women's University, Korea, December 2009.
- Cohomology of moduli spaces of stable maps to projective space, Algebra camp, Seoul National University, Korea, January 2008.

Teaching Experience

- At Fordham University
 - Four sections of Calculus II (Spring 2016, Fall 2016, Spring 2017)
 - Discrete Mathematics (Fall 2015)
 - Mathematical Modeling (Spring 2015, Spring 2016)
 - Finite Mathematics (Spring 2015)
 - Two sections of Math for Business: Precalculus (Fall 2014)

- Three sections of Abstract Algebra (Spring 2014, Fall 2014, Fall 2016)
- Two sections of Math for Business: Calculus (Spring 2014)
- Multivariable Calculus I (Fall 2013)
- Three sections of Math for Business: Finite (Fall 2013, Fall 2015)
- Calculus I recitation (Spring 2017)
- Multivariable Calculus II recitation (Spring 2017)
- At University of Georgia
 - Four sections of Calculus for Engineering and Science II (Fall 2012, Spring 2013)
 - Two sections of Calculus for Engineering and Science I (Spring 2012)
- At Seoul National University
 - Teaching Assistant (2005 - 2011): Calculus I, Calculus II, Honors Calculus I, Honors Calculus II.
 - Grading Assistant (2005 - 2010): Graduate Algebra, Undergraduate Algebra, Algebraic Geometry, Linear Algebra, Differential Geometry, Engineering Mathematics, Geometric Algebra
- Obtained the secondary school mathematics teacher's license in South Korea, February 2005.

Mentoring

- Guided summer research of three undergraduate students Charles Summers, James von Al-bade, Ranze Xie in Summer 2015. Resulting in the research paper "Birational contractions of $\overline{M}_{0,n}$ and combinatorics of extremal assignments", arXiv:1508.03915. Supported by Summer Undergraduate Research Grant at Fordham University.
- Guided two reading seminars on topology and cryptography (Spring 2017).
- Guided a reading seminar on algebraic geometry (Fall 2016).
- Co-advising Math Club at Fordham University since Fall 2016.
- Guided a reading seminar on combinatorics (Summer 2014).
- Organized Graduate student algebraic geometry seminar in University of Georgia (Fall 2011, Fall 2012, Spring 2013).
- Guided Math Club SEHM in Department of Mathematics Education, Seoul National University during 2005–2011.

Service and Outreach

- NSA grant reviewer.
- Papers refereed for Journal of Algebra, Bulletin of the Korean Mathematical Society, Journal

of Mathematical Society of Japan, and The American Mathematical Monthly.

- Advising Korean Students Association at Fordham University since Fall 2014.
- Organized “Mini workshop on toric varieties”, a graduate student workshop in Seoul National University (January 14–18, 2011).

Honors and Awards

- SQuaREs Program Grant on “Computational aspects of GIT with a view toward geometry of moduli spaces”, American Institute of Mathematics.
- Excellent Thesis Award, College of Natural Sciences, Seoul National University, August 2011.
- Award for Outstanding Teaching Assistant, the Faculty of Liberal Education, Seoul National University, February 2006.

Computing

- Used Sage, Macaulay2, and Python for research and teaching since 2010.

References

- Young-Hoon Kiem (Thesis advisor), Seoul National University, kiem@math.snu.ac.kr
- Izzet Coskun, University of Illinois at Chicago, coskun@math.uic.edu
- Maksym Fedorchuk, Boston College, maksym.fedorchuk@bc.edu
- Angela Gibney, University of Georgia, agibney@math.uga.edu
- Joseph Harris, Harvard University, harris@math.harvard.edu
- Ian Morrison, Fordham University, morrison@fordham.edu
- Cris Poor (Teaching), Fordham University, poor@fordham.edu