

## Curriculum Vitae

Han-Bom Moon

September 4, 2017

### Contact

---

Address: 203 von Neumann Drive, Institute for Advanced Study, Princeton, NJ 08540

E-mail: [hanbommoon@gmail.com](mailto:hanbommoon@gmail.com)

Phone: (706)-201-5662

Homepage: <http://www.hanbommoon.net>

### 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.

---

## Publications

---

1. (with K. Chung) Birational geometry of the moduli space of pure sheaves on quadric surface. *C. R. Math. Acad. Sci. Paris.*, to appear, arXiv:1703.00230.
2. (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*, Vol. 21, (2017) No. 3, 621–652.
3. (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.
4. (With K. Chung) Chow ring of the moduli space of stable sheaves supported on quartic curves. *Q. J. Math.*, to appear, arXiv:1506.00298.
5. (With K. Chung) Moduli of sheaves, Fourier-Mukai transform, and partial desingularization. *Math. Z.*, 283 (2016), no. 1-2, 275–299.
6. (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.
7. (With D. Swinarski) Effective curves on  $\overline{M}_{0,n}$  from group actions. *Manuscripta Math.*, 147 (2015), no. 1-2, 239–268.
8. Mori program for  $\overline{M}_{0,7}$  with symmetric divisors. *Canad. J. Math.*, 69 (2017), no. 3, 613–649.
9. Mori program for  $\overline{M}_{0,6}$  with symmetric divisors. *Math. Nachr.*, 288 (2015), no. 7, 824–836.
10. (With A. Gibney, D. Jensen and D. Swinarski) Veronese quotient models of  $\overline{M}_{0,n}$  and conformal blocks. *Michigan Math. J.*, 62 (2013), no. 4, 721–751.
11. (With N. Giansiracusa and D. Jensen) GIT compactifications of  $M_{0,n}$  and flips. *Adv. in Math.*, 248, (2013), 242–278.
12. A family of divisors on  $\overline{M}_{g,n}$  and their log canonical models. *J. Pure Appl. Algebra*, 219 (2015), no. 10, 4642–4652.
13. Log canonical models for the moduli space of stable pointed rational curves. *Proc. Amer. Math. Soc.*, 141 (2013), no. 11, 3771–3785.
14. (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.
15. (With Y.-H. Kiem) Moduli spaces of stable maps to projective space via GIT. *Internat. J. Math.*, 21 (2010), no. 5, 639–664.

---

## Preprints

---

16. (With S.-B. Yoo) Finite generation of the algebra of type A conformal blocks via birational geometry. submitted to *Duke Math. J.*, arXiv:1709.00519.
17. (with D. Swinarski) On the  $S_n$ -invariant F-conjecture. submitted to *J. of Algebra*, arXiv:1606.02232.

## In Preparation

---

18. (With D. Swinarski) GIT polarizations on moduli spaces of stable pointed curves, in preparation.
19. (With A. Caminata, N. Giansiracusa, and L. Schaffler) Equations for points to lie on a rational normal curve, in preparation.

## Invited Talks

---

### 2017

- (upcoming) Seminar talk, Johns Hopkins University, November.
- (upcoming) Workshop on Topics in Algebraic Geometry, University of North Carolina at Chapel Hill, November.
- (upcoming) Colloquium talk, Swarthmore College, September.
- Birational geometry of moduli spaces of parabolic bundles, KAIST, June.
- Birational geometry of moduli spaces of parabolic bundles, Seoul National University, June.
- Rationality of moduli spaces of hyperplane arrangements, One-day workshop on hyperplane arrangements and singularities, KIAS, June.
- Birational geometry of moduli spaces of parabolic bundles, KIAS, June.
- Birational geometry of moduli spaces, Colloquium talk, University of Seoul, June.
- Let's count points!, Colloquium talk at Department of Mathematics Education, Seoul National University, June.
- Some facts that you may not know about right triangles, Math Club talk, Fordham University, May.
- Birational geometry of moduli spaces of parabolic bundles, Courant Institute, April.
- Birational geometry of moduli spaces, Colloquium talk, Claremont McKenna College, February.
- Birational geometry of moduli spaces, University of Arizona, February.
- Birational geometry of moduli spaces, Colloquium talk, University of Kentucky, January.
- Classical invariant theory and birational geometry of moduli space of parabolic bundles, Joint Mathematics Meeting, Atlanta, January.

### 2016

- Classical invariant theory and birational geometry of moduli spaces, Workshop on Combinatorial Moduli Spaces, Fields Institute, December.

- Classical invariant theory and birational geometry of moduli spaces, Princeton University, November.
- A computational approach to the F-conjecture, KIAS, May.
- A computational approach to the F-conjecture, KAIST, May.
- Geometric invariant theory and construction of moduli spaces, Colloquium talk, Kyungbuk National University, May.
- Moduli spaces and birational geometry, Colloquium talk at Department of Mathematics Education, Seoul National University, May.
- Birational geometry of moduli spaces of parabolic bundles, Seoul National University, May.
- Algebraic geometry, moduli spaces, and invariant theory, Ewha Women's University, May.
- A computational approach to the F-conjecture, Workshop on Rational Curves and Moduli, Damyang, May.

**2015**

- Let's count points!, Math Club talk, Fordham University, December.
- Birational geometry of moduli spaces of parabolic bundles, Stony Brook University, November.
- Classical invariant theory and birational geometry of moduli spaces, Colloquium talk, Rutgers University-Newark, November.

**2014**

- Effective curve class computation on moduli of rational curves, KIAS, August.
- Alternative compactifications of the moduli space of pointed rational curves, IBS-CGP, July.
- Do we really need integrals?, Math Club talk, Fordham University, March.
- Alternative compactifications of the moduli space of pointed rational curves, KIAS, January.

**2013**

- Alternative compactifications of the moduli space of pointed rational curves, Seoul National University, December.
- Alternative compactifications of the moduli space of pointed rational curves, Yale University, November.
- Birational geometry of  $\overline{M}_{0,n}$  and conformal blocks, KIAS, July.
- Moduli spaces and their birational geometry, Ewha Women's University, July.
- Euler's product formula and its geometric interpretation, Colloquium talk at Department of Mathematics Education, Seoul National University, July.
- Birational geometry of  $\overline{M}_{0,n}$  and conformal blocks, KAIST, July.

- Mori's program for  $\overline{M}_{0,n}$ , KAIST, July.
- GIT compactifications of  $M_{0,n}$ , The Asian Mathematical Conference 2013, Busan, July.
- Compactifications of moduli of curves, Lecture series at KIAS, June.
- Birational geometry of  $\overline{M}_{0,n}$  and conformal blocks, Princeton University, March.
- Moduli spaces and their birational geometry, Fordham University, February.
- Moduli spaces and their birational geometry, University of Georgia, February.

## 2012

- Toward a classification of projective modular compactifications of  $M_{0,n}$ , University of Georgia, October.
- Introduction to Geometric Invariant Theory, Four hours lecture on Summer School on Algebraic Geometry, Sol Beach, June.
- New family of nef divisors on  $\overline{M}_{0,n}$ , KIAS, June.
- GIT compactifications of  $M_{0,n}$ , KIAS, June.
- GIT compactifications of  $M_{0,n}$ , Seoul National University, June.

## ~ 2011

- Mori's program for moduli spaces of pointed curves and psi-classes, University of Georgia, September 2011.
- Moduli spaces and their birational geometry, Seoul National University, August 2011.
- Mori's program for moduli spaces of pointed curves and psi-classes, Workshop on Moduli and Birational Geometry, Gyeongju, July 2011.
- Mori's program for  $\overline{M}_{0,n}$ , Brown University, May 2011.
- Moduli spaces and its birational geometry, Chungnam University, April 2011.
- Mori's program for the moduli space of pointed stable rational curves, Global KMS International Conference, Postech, October 2010.
- Introduction to moduli spaces, Workshop for Young Mathematicians in Korea, KAIST, July 2010.
- Elementary construction of the moduli spaces of rational curves via GIT, Mini workshop on curves, Seoul National University, March 2010.
- On GIT constructions of Kontsevich moduli spaces of stable maps, Joint Meeting of the KMS and AMS, Ewha Women's University, December 2009.
- Cohomology of moduli spaces of stable maps to projective space, Seoul National University, January 2008.

---

## Teaching Experience

---

- At Fordham University
  - Four sections of Calculus II (Spring 2016, Fall 2016, Spring 2017)
  - Discrete Mathematics (Fall 2015)
  - Two sections of 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), which will appear on J. Algebraic Comb.
- Guided four reading seminars on combinatorics, topology, algebraic geometry, and cryptog-raphy (Summer 2014, Fall 2016, Spring 2017).
- Co-advised Math Club at Fordham University (Fall 2016 – Spring 2017).
- 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 Uni-

versity 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.
- Advised Korean Students Association at Fordham University (Fall 2014 – Spring 2017).
- 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](mailto:kiem@math.snu.ac.kr)
- Izzet Coskun, University of Illinois at Chicago, [coskun@math.uic.edu](mailto:coskun@math.uic.edu)
- Maksym Fedorchuk, Boston College, [maksym.fedorchuk@bc.edu](mailto:maksym.fedorchuk@bc.edu)
- Angela Gibney, Rutgers University, [angela.gibney@gmail.com](mailto:angela.gibney@gmail.com)
- Joseph Harris, Harvard University, [harris@math.harvard.edu](mailto:harris@math.harvard.edu)
- Ian Morrison, Fordham University, [morrison@fordham.edu](mailto:morrison@fordham.edu)
- Cris Poor (Teaching), Fordham University, [poor@fordham.edu](mailto:poor@fordham.edu)