Curriculum Vitae

Han-Bom Moon

January 10, 2018

Contact

Address: 217 Simonyi Hall, 1 Einstein Drive, Institute for Advanced Study, Princeton, NJ 08540
E-mail: hmoon@ias.edu
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.*, 355 (2017), no. 10, 1082–1088.
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.*, Vol. 68, (2017), No. 3, 851–887.
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, preprint, arXiv:1709.00519.
17. (with D. Swinarski) On the S_n-invariant F-conjecture, preprint, arXiv:1606.02232.
18. (With A. Caminata, N. Giansiracusa, and L. Schaffler) Equations for points to lie on a rational

normal curve, preprint, arXiv:1711.06286.

In Preparation

19. (With D. Swinarski) GIT polarizations on moduli spaces of stable pointed curves, in preparation.

Invited Talks

2017

- Equations for point configurations to lie on a rational normal curve, Seoul National University, December.
- Birational geometry of moduli spaces, Fordham University, December.
- Birational geometry of moduli spaces of parabolic bundles, Johns Hopkins University, November.
- Birational geometry of moduli spaces of parabolic bundles, Workshop on Topics in Algebraic Geometry, University of North Carolina at Chapel Hill, November.
- Birational geometry of moduli spaces of parabolic bundles, Rutgers University, October.
- Let's count points!, 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, Kyoungbook 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, Ehwa 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.

$\sim$ **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 Albade, Ranze Xie in Summer 2015. Resulting in the research paper "Birational contractions of $\overline{\mathrm{M}}_{0,n}$ 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 cryptography (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 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.
- 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
- Izzet Coskun, University of Illinois at Chicago, coskun@math.uic.edu
- Maksym Fedorchuk, Boston College, maksym.fedorchuk@bc.edu
- Angela Gibney, Rutgers University, angela.gibney@gmail.com
- Joseph Harris, Harvard University, harris@math.harvard.edu
- Ian Morrison, Fordham University, morrison@fordham.edu
- Cris Poor (Teaching), Fordham University, poor@fordham.edu