

Brian T. Lehmann

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EMPLOYMENT

Associate Professor, Boston College, 2019 - present
Assistant Professor, Boston College, 2014 - 2019
NSF Postdoctoral Fellow/Evans Instructor, Rice University, 2011 - 2014
NSF Postdoctoral Fellow, University of Michigan, 2010 - 2011

EDUCATION

Ph.D., Mathematics, Massachusetts Institute of Technology, May 2010
Advisor: James M^cKernan
Certificate of Advanced Study, Cambridge University, U.K., June 2005
Graduated with Distinction
B.S., Mathematics, Yale University, May 2004
Summa Cum Laude

AWARDS AND GRANTS

PI, AGNES NSF grant, 2019
Co-PI, AGNES NSF grant, 2016
National Science Foundation Grant, 2016
NSA Young Investigators Grant, 2015
National Science Foundation Postdoctoral Research Fellowship, 2010
National Science Foundation Graduate Fellowship, 2004
Barry Goldwater Scholarship, 2003
Phi Beta Kappa Junior Year, Yale University, 2003
Yale Undergraduate Math Prizes: Deforest, Stanley, and Barge, 2001– 2004

PUBLICATIONS

1. A cone theorem for nef curves
J. Algebraic Geom. 21 (2012), no. 3, 473-493
2. Reduction maps and the minimal model program (w/ Y. Gongyo)
Compos. Math. 149 (2013), no. 2, 295-308
3. Comparing numerical dimensions
Algebra Number Theory 7 (2013), no. 5, 1065-1100
4. On Eckl's pseudo-effective reduction map
Trans. of the A.M.S. 366 (2014), no. 3, 1525-1549
5. Algebraic bounds on analytic multiplier ideals
Ann. Inst. Fourier 64 (2014), no. 3, 1077-1108
6. Numerical triviality and pullbacks
J. Pure Appl. Algebra 219 (2015), no. 12, 5637-5649
7. Zariski decompositions of numerical cycle classes (w/ A.M. Fulger)
J. Alg. Geom. 26 (2017), no. 1, 43-106

8. The movable cone via intersections
arXiv:1111.3928
9. Volume-type functions for numerical cycle classes
Duke Math. J. 165 (2016), no. 16, 3147-3187
10. Asymptotic behavior of the dimension of the Chow variety
Adv. Math. 308 (2017), 815-835
11. Positive cones of dual cycle classes (w/ A.M. Fulger)
Algebraic Geometry 4 (2017), no. 1, 1-28
12. Kernels of numerical pushforwards (w/ A.M. Fulger)
Adv. Geom. 17 (2017), no. 3, 373-378
13. Morphisms and faces of pseudo-effective cones (w/ A.M. Fulger)
Proc. London Math. Soc. 112 (2016), no. 4, 651-676
14. Balanced line bundles on Fano varieties (w/ S. Tanimoto, Y. Tschinkel)
J. Reine Angew. Math. 743 (2018), 91-131
15. Volume and Hilbert function of \mathbb{R} -divisors (w/ A.M. Fulger, J. Kollár)
Mich. Math. J. 65 (2016), no. 2, 371-387
16. Convexity and Zariski decomposition structure (w/ J. Xiao)
Geom. Funct. Anal. 26 (2016), no. 4, 1135-1189
17. Positivity functions for curves on algebraic varieties (w/ J. Xiao)
Algebra Number Theory 13 (2019), no. 6, 1243-1279
18. On the geometry of thin exceptional sets in Manin's Conjecture (w/ S. Tanimoto)
Duke Math. J. 166 (2017), no. 15, 2815-2869
19. Correspondences between convex geometry and complex geometry (w/ J. Xiao)
EpiGA 1 (2017), Art. 6
20. A snapshot of the Minimal Model Program
Proc. of Symp. in Pure Math. 95 (2017), AMS, 1-32
21. Geometric Manin's Conjecture and rational curves (w/ S. Tanimoto)
Compos. Math. 155 (2019), no. 5, 833-862
22. Positivity of the diagonal (w/ J.C. Ottem)
Adv. Math. 335 (2018), 664-695
23. Iitaka dimension for cycles
Trans. of the A.M.S. 371 (2019), no. 7, 4815-4835
24. Geometric Consistency of Manin's Conjecture (w/ A.K. Sengupta, S. Tanimoto)
submitted, arXiv:1805.10580 [math.AG]
25. On exceptional sets in Manin's Conjecture (w/ S. Tanimoto)
Res. Math. Sci. 6 (2019), Paper no. 12., 41 pp.
26. Rational curves on prime Fano threefolds of index 1 (w/ S. Tanimoto)
to appear in J. of Alg. Geom., arXiv:1808.05590 [math.AG]
27. Classifying sections of del Pezzo fibrations, I (w/ S. Tanimoto)
submitted, arXiv:1912.04369 [math.AG]

INVITED TALKS

- Higher Dimensional Arithmetic Geometry conference, Kumamoto University, “Sections of del Pezzo fibrations over \mathbb{P}^1 ”, February 2019
- Kumamoto Algebraic Geometry Seminar, “Positivity of the diagonal”, November 2018
- Rice University Colloquium, “Counting rational points and rational curves”, October 2018
- Northeastern Geometry, Physics, and Representation Theory seminar, “Rational curves on prime Fano threefolds”, September 2018
- BICMR workshop on Modern Algebraic Geometry, “Rational curves on prime Fano threefolds”, July 2018
- ICERM workshop on Birational geometry and arithmetic, “The exceptional set in Manin’s Conjecture”, April 2018
- Northwestern Algebraic Geometry Seminar, “The exceptional set in Manin’s Conjecture”, April 2018
- Spring Central AMS Sectional, “Convexity and Zariski decompositions”, March 2018
- Oberwolfach workshop on Algebraic geometry, “Geometric Manin’s Conjecture”, September 2017
- ICMS program on Positivity in algebraic and complex geometry, “Geometric Manin’s Conjecture”, April 2017
- BIRS program on Newton-Okounkov Bodies, Test Configurations, and Diophantine Geometry, “Geometric invariants in Manin’s Conjecture”, March 2017
- University of Copenhagen Number Theory Seminar, “Positivity for curves”, October 2016
- Princeton Algebraic Geometry Seminar, “Convexity in divisor theory”, October 2016
- Positivity of cycles workshop at AIM, “Numerical groups”, August 2016
- Higher dimensional algebraic geometry conference (University of Utah), “Exceptional sets and Manin’s Conjecture”, July 2016
- Tokyo-Princeton algebraic geometry conference, “Positivity for curves”, May 2016
- BIRS program on Free Resolutions, Representations, and Asymptotic Algebra, “Positivity for curves”, April 2016
- RTG Workshop on Higher Codimension Cycles on Algebraic Varieties (UIC), Speaker, March 2016
- Stony Brook Algebraic Geometry Seminar, “Positivity for curves”, November 2015
- Georgia Algebraic Geometry Symposium, “The geometric constants in Manin’s Conjecture,” October 2015
- Princeton Algebraic Geometry Seminar, “The geometric constants in Manin’s Conjecture,” October 2015
- Algebraic Geometry Northeastern Series, “Positivity for curves”, October 2015
- Bootcamp for the Algebraic Geometry Summer Research Institute, “An introduction to the Minimal Model Program,” July 2015
- UW Madison Algebraic Geometry Seminar, “Zariski decompositions of curve classes”, May 2015
- Boston College-Northeastern Algebraic Geometry Conference, “Zariski decompositions of curve classes”, April 2015
- UCSD Algebraic Geometry Seminar, “The geometric constants in Manin’s Conjecture”, April 2015
- Tufts University Algebraic Geometry Seminar, “Positivity of cycles and asymptotic invariants”, February 2015
- Yale University Algebraic Geometry Seminar, “Positivity of cycles and asymptotic invariants”, January 2015

- University of Utah Algebraic Geometry Seminar, “Positivity of cycles and asymptotic invariants,” November 2014
- Boston College Number Theory and Algebraic Geometry Seminar, “The geometric constants in Manin’s Conjecture,” September 2014
- Hausdorff Institute in Bonn, Workshop on Birational Geometry and Foliations, “Positivity of cycles and asymptotic invariants,” February 2014
- Boulder AMS Sectional Meeting, Special Session on Algebraic Geometry, “Big cycles and volume functions,” April 2013
- Harvard-MIT Algebraic Geometry Seminar, “Big cycles and volume functions,” March 2013
- Princeton Algebraic Geometry Seminar, “Big cycles and volume functions,” February 2013
- University of Michigan Algebraic Geometry Seminar, “Big cycles and volume functions,” January 2013
- Rice University Colloquium, “The minimal model program and curves,” September 2012
- Texas Algebraic Geometry Symposium, “An introduction to the minimal model program,” April 2012
- University of Houston Algebraic Geometry Seminar, “Duality for the movable cone,” April 2012
- Texas Christian University Colloquium, “An introduction to the minimal model program,” March 2012
- University of Illinois at Chicago Algebraic Geometry Seminar, “Numerical reduction maps,” February 2012
- Johns Hopkins University Algebraic Geometry Seminar, “Numerical reduction maps,” February 2012
- University of Utah Algebraic Geometry Seminar, “Algebraic bounds on analytic multiplier ideals,” November 2011
- Texas A&M University Algebraic Geometry Seminar, “Numerical reduction maps,” September 2011
- Rice University Colloquium, “Algebraic bounds on analytic multiplier ideals,” September 2011
- University of Washington Algebraic Geometry Seminar, “Algebraic bounds on analytic multiplier ideals,” April 2011
- Stanford University Algebraic Geometry Seminar, “Algebraic bounds on analytic multiplier ideals,” April 2011
- Ohio State University Algebraic Geometry Seminar, “Algebraic bounds on analytic multiplier ideals,” April 2011
- University of Michigan Algebraic Geometry Seminar, “Analytic multiplier ideals,” October 2010
- Rice University Algebraic Geometry Seminar, “Pseudo-effective reduction maps,” January 2010
- University of Michigan Algebraic Geometry Seminar, “Pseudo-effective reduction maps,” January 2010
- Harvard-MIT Algebraic Geometry Seminar, “Pseudo-effective reduction maps,” October 2009

PROFESSIONAL ACTIVITIES

Co-organizer, Algebraic Geometry Northeastern Series Conference, Boston College, September 2019

Co-organizer, AIM SquaREs workshop on “Geometric Manin’s Conjecture in characteristic p ”, June 2019

Organizer, Undergraduate summer research program, Boston College, Summer 2018

– Guided two undergraduate students in research projects concerning toric varieties

Co-organizer, BC-NEU Algebraic Geometry Conference, Boston College, November 2017

Co-organizer, Mini-workshop on Positivity in higher-dimensional geometry, Oberwolfach, September 2017

Co-organizer, BC-NEU Algebraic Geometry Conference, Boston College, October 2016

Co-organizer, AIM workshop on “Positivity of cycles”, American Institute of Mathematics, August 2016

Co-organizer, BC-NEU Algebraic Geometry Conference, Boston College, April 2016

Co-organizer, BC-NEU Algebraic Geometry Conference, Northeastern, September 2015

Session leader, Bootcamp for Algebraic Geometry Summer Research Institute, University of Utah, July 2015
Co-organizer, BC-NEU Algebraic Geometry Conference, Northeastern, April 2015
Co-organizer, Algebraic Geometry Northeastern Series Conference, Boston College, March 2015
Co-organizer, Special Session on the Geometry of Algebraic Varieties, Michigan State AMS Sectional, March 2015
Co-organizer, Rice Colloquium, Fall 2013-Spring 2014
Co-organizer, Rice Algebraic Geometry Seminar, Fall 2012-Spring 2014
Co-organizer, Rice Teaching Seminar, Fall 2012-Spring 2013
Guest speaker, Rice University Math Tournament, Spring 2012
Graduate Assistant, MRC Snowbird Conference, Summer 2010
Webpage Administrator, Harvard-MIT Algebraic Geometry Seminar, Fall 2008 - Spring 2010
Co-organizer, Harvard-MIT Baby Algebraic Geometry Seminar, Fall 2008
MIT Math Department Teacher Training Program, Fall 2008
Mentor, Research Science Institute (MIT), Summer 2007
– Guided two high school students in math research projects
Intern, Force and Motion Inc., Summer 1997 - Summer 1999
– Wrote and edited computer-based physics textbook for high school students

DEPARTMENT SERVICE

Graduate admissions committee, Boston College, Fall 2018-Spring 2019
Postdoc search committee, Boston College, Fall 2018-Spring 2019
Distinguished Lecture Series committee, Boston College, Fall 2016-Spring 2018, Fall 2019-Spring 2020
Graduate admissions committee, Boston College, Fall 2016-Spring 2017
Analysis Qual Author, Spring 2016
Postdoc search committee, Boston College, Fall 2015-Spring 2016
Undergraduate committee, Boston College, Fall 2014-Spring 2020
Website committee, Boston College, Fall 2014-Spring 2020

ADVISING

Graduate reading course, Jeeuhn Kim, Fall 2019
Senior Thesis, Ning Duan, Fall 2018
Summer Research, Ning Duan, Summer 2018
Summer Research, Wantong Wei, Summer 2018
Graduate reading course, Maria Fox, Spring 2017
Senior Thesis, Nicholas Denari, Fall 2015-Spring 2016

TEACHING EXPERIENCE

Boston College
Math 4455: Mathematical Problem Solving, Spring 2020
Math 1190: Fundamentals of Mathematics I, Fall 2019 (2 sections)
Math 4455: Mathematical Problem Solving, Spring 2019
Math 4961: Senior Thesis, Fall 2018
Math 8845: Introduction to the minimal model program, Fall 2018
Math 1190: Fundamentals of Mathematics I, Fall 2018
Math 3322: Analysis II, Spring 2018
Math 2216: Introduction to Abstract Mathematics, Spring 2017
Math 8845: Introduction to Algebraic Geometry, Fall 2016
Math 3310: Introduction to Abstract Algebra, Fall 2016
Math 8811: Complex Analysis, Spring 2016
Math 4961: Senior Thesis, Fall 2015 - Spring 2016
Math 2210: Linear Algebra, Fall 2015 (2 sections)

Math 4430: Introduction to Number Theory, Spring 2015
Math 3310: Introduction to Abstract Algebra, Fall 2014

Rice University

Math 464: Abstract Algebra III, Spring 2014
Math 365: Introduction to Number Theory, Fall 2013
Math 212: Multivariable Calculus, Spring and Fall 2013
Math 465/565: Introduction to Algebraic Geometry, Fall 2012

University of Michigan

Math 412: Introduction to Modern Algebra, Spring 2011
Math 115: Calculus I, Fall 2010

Massachusetts Institute of Technology

Head Teaching Assistant, 18.06: Introduction to Linear Algebra, Spring 2008
Teaching Assistant, 18.06: Introduction to Linear Algebra, Fall 2007