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 McKernan
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

Simons Foundation Collaboration Grant, 2021
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. Non-free sections of Fano fibrations (w/ E. Riedl, S. Tanimoto)
   submitted

2. Rational curves on del Pezzo surfaces in positive characteristic (w/ R. Beheshti, E. Riedl, S. Tanimoto)
   to appear in Trans. of the A.M.S.

3. Classifying sections of del Pezzo fibrations, II (w/ S. Tanimoto)
   Geom. and Top. 26 (2022), no. 6, 2565-2647

4. Restricted tangent bundles for general free rational curves (w/ E. Riedl)
   to appear in IMRN

5. Moduli spaces of rational curves on Fano threefolds (w/ R. Beheshti, E. Riedl, S. Tanimoto)
   Adv. Math. 408 (2022), part A, article 108557, 60 pp.

6. Classifying sections of del Pezzo fibrations, I (w/ S. Tanimoto)
   to appear in JEMS

7. Rational curves on prime Fano threefolds of index 1 (w/ S. Tanimoto)
   J. Alg. Geom. 30 (2021), no. 1, 151–188

8. On exceptional sets in Manin's Conjecture (w/ S. Tanimoto)
   Res. Math. Sci. 6 (2019), Paper no. 12., 41 pp.

9. Geometric Consistency of Manin's Conjecture (w/ A.K. Sengupta, S. Tanimoto)
   Compos. Math. 158 (2022), no. 6, 1375-1427

10. Iitaka dimension for cycles
    Trans. of the A.M.S. 371 (2019), no. 7, 4815–4835

11. Positivity of the diagonal (w/ J.C. Ottem)
    Adv. Math. 335 (2018), 664-695

12. Geometric Manin's Conjecture and rational curves (w/ S. Tanimoto)
    Compos. Math. 155 (2019), no. 5, 833-862

13. A snapshot of the Minimal Model Program
    Proc. of Symp. in Pure Math. 95 (2017), AMS, 1-32

14. Correspondences between convex geometry and complex geometry (w/ J. Xiao)
    EpiGA 1 (2017), Art. 6

15. On the geometry of thin exceptional sets in Manin's Conjecture (w/ S. Tanimoto)
    Duke Math. J. 166 (2017), no. 15, 2815-2869

16. Positivity functions for curves on algebraic varieties (w/ J. Xiao)
    Algebra Number Theory 13 (2019), no. 6, 1243-1279

17. Convexity and Zariski decomposition structure (w/ J. Xiao)
    Geom. Funct. Anal. 26 (2016), no. 4, 1135-1189

18. Volume and Hilbert function of R-divisors (w/ A.M. Fulger, J. Kollár)
    Mich. Math. J. 65 (2016), no. 2, 371-387

19. Balanced line bundles on Fano varieties (w/ S. Tanimoto, Y. Tschinkel)
    J. Reine Angew. Math. 743 (2018), 91-131

20. Morphisms and faces of pseudo-effective cones (w/ A.M. Fulger)
    Proc. London Math. Soc. 112 (2016), no. 4, 651-676

21. Kernels of numerical pushforwards (w/ A.M. Fulger)
    Adv. Geom. 17 (2017), no. 3, 373-378

22. Positive cones of dual cycle classes (w/ A.M. Fulger)
    Algebraic Geometry 4 (2017), no. 1, 1-28

23. Asymptotic behavior of the dimension of the Chow variety
    Adv. Math. 308 (2017), 815-835

24. Volume-type functions for numerical cycle classes
    Duke Math. J. 165 (2016), no. 16, 3147-3187

25. The movable cone via intersections
    arXiv:1111.3928

26. Zariski decompositions of numerical cycle classes (w/ A.M. Fulger)
    J. Alg. Geom. 26 (2017), no. 1, 43-106

27. Numerical triviality and pullbacks
    J. Pure Appl. Algebra 219 (2015), no. 12, 5637-5649

28. Algebraic bounds on analytic multiplier ideals
    Ann. Inst. Fourier 64 (2014), no. 3, 1077-1108

29. On Eckl's pseudo-effective reduction map
    Trans. of the A.M.S. 366 (2014), no. 3, 1525-1549

30. Comparing numerical dimensions
    Algebra Number Theory 7 (2013), no. 5, 1065-1100

31. Reduction maps and the minimal model program (w/ Y. Gongyo)
    Compos. Math. 149 (2013), no. 2, 295-308

32. A cone theorem for nef curves
    J. Algebraic Geom. 21 (2012), no. 3, 473-493

INVITED TALKS

- Nagoya University Conference, "Non-free sections of Fano fibrations", November 2022

- Zoom Algebraic Geometry Seminar, "Rational curves on del Pezzo surfaces in characteristic p", December 2021

- Princeton Algebraic Geometry Seminar, "Non-free curves on Fano varieties", November 2021

- Online Algebraic Geometry Seminar, Washington University of St. Louis, "Asymptotic geometry and convexity", September 2021

- PRIMA 2021 Summer School, Lecture series on rational curves, August 2021

- Online Algebraic Geometry Seminar, University of Wisconsin, "Sections of del Pezzo fibrations", April 2020

- 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, Online, October 2021
Co-organizer, BIRS conference on Geometry via Arithmetic, Online, July 2021
Co-organizer, Algebraic Geometry Northeastern Series Conference, Boston College, September 2019
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, Fall 2021-Spring 2022
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 2023
Website committee, Boston College, Fall 2014-Spring 2020

ADVISING
Thesis work, Enhao Feng, Fall 2022-present
Graduate reading course, Enhao Feng, Fall 2021
Graduate reading course, Siddharth Mahendraker, Fall 2020-Spring 2021
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 3321: Analysis I, Fall 2022
    Math 8865: Positivity in Algebraic Geometry, Fall 2021
    Math 3310: Introduction to Abstract Algebra, Fall 2021
    Math 8865: Algebraic Geometry II, Spring 2021
    Math 3310: Introduction to Abstract Algebra, Fall 2020
    Math 8865: Algebraic Geometry I, Fall 2020
    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

January 2021