

## CURRICULUM VITAE

### MATT KERR

Department of Mathematics  
Washington University in St. Louis  
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Born August 5th, 1975 in Washington, D.C.  
Citizenship: U.S.

#### Education:

Ph.D. Princeton University, January 2003  
Advisor: Phillip A. Griffiths

B.A. University of Virginia, May 1997, *summa cum laude* in mathematics and physics  
Undergraduate Advisor: David Brydges

#### Employment:

Professor, Washington University in St. Louis, July 2018 - present  
Associate Professor, Washington University in St. Louis, July 2013 - June 2018  
Member, Institute for Advanced Study, Princeton, NJ, Sept 2014 - July 2015  
Assistant Professor, Washington University in St. Louis, Aug. 2010 - June 2013  
Lecturer, Durham University, Fall 2007 - July 2010  
L.E. Dickson Instructor, University of Chicago, Fall 2004 - Summer 2007  
Postdoctoral Fellow, Max-Planck-Institute for Mathematics, Bonn, Germany, Jan.-Aug. 2005  
Adjunct Assistant Professor, UCLA Math Department, Fall 2002 - Summer 2004

#### Grants and Academic Honors:

Simons Foundation Collaboration Grant 634268 (PI), Sep. 2019 - Aug. 2024, \$42,000.  
Invited (semi-plenary) speaker, 2017 Mathematical Congress of the Americas  
NSF FRG Grant DMS-1361147 (PI), July 2014 - June 2019, \$301,874  
NSF Conference Grants DMS-1259024 (PI, \$28,030), and DMS-1600159 (co-PI, \$24,740)  
NSF Standard Grant DMS-1068974 (PI), July 2011 - June 2014, \$127,412  
EPSRC First Grant EP/H021159/1 (PI), Jan. 2010 - July 2010, 102K GBP, terminated by move  
National Science Foundation Graduate Fellowship, 1997-2000  
E.J. McShane Prize, University of Virginia Mathematics Department, 1997  
James W. Elkins Award, University of Virginia Physics Department, 1997  
Barry M. Goldwater Scholarship, 1996-7

#### Research Interests:

Algebraic Geometry  
Hodge Theory  
Mathematical Physics

#### Memberships:

Member, Intl. GdT on Differential Equations, March 2019 - present  
Member, American Mathematical Society, Aug. 2009 - present  
Fellow, Higher Education Academy (UK), Nov. 2008 - present

### Research Publications – Books:

1. “Hodge theory, complex geometry, and representation theory (v. 1)”, joint with M. Green and P. Griffiths, CBMS Reg. Conf. Series in Math, No. **118**, AMS, 2013, 406 pp.
2. “Mumford-Tate groups and domains: their geometry and arithmetic”, joint with M. Green and P. Griffiths, Annals of Math. Studies, no. **183**, Princeton University Press, 2012, 289 pp.

### Research Publications – Articles:

3. *Two applications of the integral regulator*, joint with M. Li, Pacific J. Math. **306** (2020), no. 2, 539-556.
4. *Polarized relations on horizontal  $SL(2)$ s*, joint with G. Pearlstein and C. Robles, Documenta Math. **24** (2019), 1179-1249.
5. *Specialization of cycles and the  $K$ -theory elevator*, joint with J. Iyer, J. Lewis, P. del Angel, S. Müller-Stach and D. Patel, CNTP **13** (2019), 299-349.
6. *Normal functions over locally symmetric varieties*, joint with R. Keast, SIGMA **14** (2018), 116-133.
7. *An explicit basis for the rational higher Chow groups of an abelian number field*, joint with Y. Yang, Ann. K-Theory **3** (2018), no. 2, 173-191.
8. *Local mirror symmetry and the sunset Feynman integral*, joint with S. Bloch and P. Vanhove, Adv. Theor. Math. Phys. **21** (2017), no. 6, 1373-1453.
9. *Simplicial Abel-Jacobi maps and reciprocity laws*, joint with J. Burgos Gil, J. Lewis, and P. Lopatto, J. Algebraic Geom. **27** (2018), 121-172.
10. *Variations of Hodge structure and orbits in flag varieties*, joint with C. Robles, Adv. in Math **315** (2017), 27-87.
11. *Classification of smooth horizontal Schubert varieties*, joint with C. Robles, European J. Math **3** (2017), no. 2, 289-310.
12. *Boundary components of Mumford-Tate domains*, joint with G. Pearlstein, Duke Math. J. **165** (2016), no. 4, 661-721.
13. *Arithmetic of degenerating principal variations of Hodge structure: examples arising from mirror symmetry and middle convolution*, joint with G. da Silva Jr. and G. Pearlstein, Canadian J. Math **68** (2016), v. 2, 280-308.
14. *Normal functions, Picard-Fuchs equations, and elliptic fibrations on  $K3$  surfaces*, joint with X. Chen, C. Doran, and J. Lewis, J. reine angew. Math **721** (2016), 43-79.
15. *A Feynman integral via higher normal functions*, joint with S. Bloch and P. Vanhove, Compositio Math. **151** (2015), no. 12, 2329-2375.
16. *Algebraic and arithmetic properties of period maps*, in “Calabi-Yau varieties: arithmetic, geometry, and physics”, 173-208, Fields Inst. Monogr. **34**, Toronto, 2015.
17. *Naive boundary strata and nilpotent orbits*, joint with G. Pearlstein, Ann. Inst. Fourier **64** (2014), no. 6, 2659-2714.
18. *Algebraic cycles and local quantum cohomology*, joint with C. Doran, CNTP **8** (2014), no. 4, 703-727.
19. Appendix to *Reciprocity laws on algebraic surfaces via iterated integrals*, joint with I. Horozov, J. K-Theory **14** (2014), no. 2, 304-310.
20. *Cup products in automorphic cohomology: the case of  $Sp_4$* , in “Hodge theory, complex geometry, and representation theory (v. 2)”, Contemp. Math. **608**, AMS, 2014, 199-234.
21. *Notes on the representation theory of  $SL_2(\mathbf{R})$* , 34 pp., in “Hodge theory, complex geometry, and representation theory (v. 2)”, Contemp. Math. **608**, AMS, 2014, 173-198.
22. *Special values of automorphic cohomology classes*, joint with M. Green and P. Griffiths, Memoirs of the AMS **231**, No. 1088, 2014, 145 pp.
23. *Shimura Varieties: a Hodge-theoretic perspective*, 45 pp., in “Hodge Theory”, Math. Notes **49**, Princeton Univ. Press, 2014.
24. *On the isomorphism question for complete Pick multiplier algebras*, joint with J. McCarthy and O. Shalit, Integral Equations and Operator Theory **76** (2013), no. 1, 39-53.
25. *Indecomposable  $K_1$  of elliptically fibered  $K3$  surfaces: a tale of two cycles*, in “Arithmetic

- and geometry of  $K3$  surfaces and Calabi-Yau threefolds”, 387-409, Fields. Inst. Commun. 67, Springer, New York, 2013.
26. *Algebraic K-theory of toric hypersurfaces*, joint with C. Doran, CNTP **5** (2011), no.2, 397-600.
  27. *Normal functions and the GHC*, joint with G. Pearlstein, RIMS Kokyuroku **1745** (2011), 71-75.
  28. *Mumford-Tate domains*, joint with M. Green and P. Griffiths, Bollettino dell’Unione Math. Ital. **3** (2010), no. 2, 281-308.
  29. *An exponential history of functions with logarithmic growth*, joint with G. Pearlstein, in “Topology of Stratified Spaces”, MSRI Pub. **58**, Cambridge Univ. Press, 2011, 281-374.
  30. *The sheaf of nonvanishing meromorphic functions in the projective algebraic case is not acyclic*, joint with X. Chen and J. Lewis, C. R. Acad. Sci. Paris, Ser. I **348** (2010), 291-293.
  31. *Néron models and limits of Abel-Jacobi mappings*, joint with M. Green and P. Griffiths, Compositio Math. **146** (2010), 288-366.
  32. *Some enumerative global properties of variations of Hodge structure*, joint with M. Green and P. Griffiths, Moscow Math J. **9** (2009), 469-530.
  33. *Higher Abel-Jacobi Maps for 0-cycles*, J. of K-theory **1** (2008), 1-55.
  34. *Neron models and boundary components for degenerations of Hodge structures of mirror quintic type*, joint with M. Green and P. Griffiths, in “Curves and Abelian Varieties (V. Alexeev, Ed.)”, Contemp. Math **465** (2007), AMS, 71-145.
  35. *The Abel-Jacobi Map for Higher Chow Groups, II*, joint with J. Lewis, 67 pp., Invent. Math. **170** (2007), 355-420.
  36. *A survey of transcendental methods in the study of Chow groups of 0-cycles*, in “Mirror Symmetry V (Banff, 2003)”, AMS/IP Stud. Adv. Math. **38** (2006), 295-349.
  37. *Exterior products of 0-cycles*, J. reine angew. Math **600** (2006), 1-23.
  38. *The Abel-Jacobi Map for Higher Chow Groups*, joint with J. Lewis and Stefan Muller-Stach, Compositio Math. **142** (2006), no. 2, 374-396.
  39. *An Elementary Proof of Suslin Reciprocity*, Canad. Math. Bull. **48** v.2 (2005), pp. 221-236.
  40. *A Regulator Formula for Milnor K-groups*, K-Theory **29** (2003) pp. 175-210.

### Research Preprints:

41. *Apéry extensions*, 2020, joint with V. Golyshev and T. Sasaki, submitted.
42. *Unipotent extensions and differential equations (after Bloch-Vlasenko)*, 2020, submitted.
43. *Hodge theory of degenerations (II): vanishing cohomology and geometric applications*, 2020, joint with R. Laza, submitted.
44. *Geometric interpretation of toroidal compactifications of moduli spaces of points in the line and cubic surfaces*, 2020, joint with P. Gallardo and L. Schaffler, submitted.
45. *Smoothing of rational singularities and Hodge structure*, 2019, joint with R. Laza and M. Saito, submitted.
46. *Hodge theory of degenerations (I): consequences of the decomposition theorem*, 2019, joint with R. Laza, with an appendix by M. Saito, submitted.
47. *Motivic irrationality proofs*, 2017, submitted.
48. “Geometric Construction of Regulator Currents with Applications to Algebraic Cycles”, Princeton Ph.D. Thesis, 355 pp.

### Volumes Edited:

49. “Recent advances in Hodge theory: period domains, algebraic cycles, and arithmetic”, M. Kerr and G. Pearlstein, eds., Cambridge Univ. Press, 2016, 514 pp.

### Expository Publications:

50. *Math as Social Endeavor: Groupwork and the Blackboard*, joint with S. Frankel, AMS Notices **67** (2020), no. 9, 1357-1358 (Early Career Section).
51. *Counting, Sums, and Series*, to appear in ASMI volume (C. Doran, Ed.).

## Invited Talks:

- Joint Math Colloquium, Harvard University, Cambridge, MA, Oct. 7, 2021 (planned).  
“Mathematical Foundations of the Swampland”, Sep. 13-24, MITP, Mainz, Germany (planned).  
CMS Special Session on “Fibrations and Degenerations in Algebraic Geometry”, Dec. 4-6, 2020 (Zoom).  
IMSA Workshop on “Recent Applications of the Theory of o-minimal Structures to Various Questions in Hodge Theory”, U. Miami, Nov. 16-20, 2020 (Zoom).  
CMSA Math-Physics Seminar, Harvard Univ., Nov. 16, 2020 (Zoom).  
Universität Duisberg-Essen, Seminar für Algebraische Geometrie und Arithmetik, July 2, 2020 (Zoom).  
Stockholm University Math. Dept. Seminar, June 17, 2020 (Zoom).  
AMS/JMM Special Session on “Algebraic Cycles in Arithmetic and Geometry”, Denver, Jan. 18, 2020.  
“The Legacy of Elie Cartan”, TSIMF, Sanya, China, Dec. 16-20.  
“Recent Advances in Mirror Symmetry (Yau 70th)”, TSIMF, Sanya, China, Dec. 18-20.  
“Algebraic Geometry and Arithmetic Geometry”, USTC, Hefei, China, Dec. 16-20.  
Donu Arapura’s 60th Birthday Conference, Madison, WI, Sept. 12-15, 2019.  
“Explicit Methods for Abelian and  $K3$  Varieties”, Logan, UT, July 5-7, 2019.  
“Beyond the Beilinson Conjectures”, St. Petersburg, Russia, June 22, 2019.  
Geometry & Algebra Seminar, U. Stockholm/KTH, Stockholm, Sweden, June 20, 2019.  
PIMS Postdoctoral Training School on Hodge Theory and Stochastic Dynamics, Edmonton, Canada, March 11-15, 2019.  
Stony Brook University Algebraic Geometry Seminar, Oct. 17, 2018.  
“Periods and  $L$ -values of motives”, Schloß Elmau, April 29 – May 5, 2018.  
“Modern Geometry (celebrating P. Griffiths’s 80th)”, Miami, Feb. 28 – March 4, 2018.  
“Periods and Regulators”, Hausdorff Institute of Mathematics, Bonn, Jan. 15-19, 2018.  
Cohomological Methods in Geometry (minicourse), Freiburg, Oct. 9-13, 2017.  
Higher School of Economics and Steklov Inst. (2 talks), Moscow, July 31-Aug. 1, 2017.  
Hodge Theory, Moduli, and Representation Theory, Stony Brook, Aug. 14-18, 2017.  
Second Mathematical Congress of the Americas (semi-plenary talk), July 23-28, 2017.  
Workshop on Flag Domains and Cycle Spaces, Korea Institute of Advanced Study, Seoul, Korea, May 22-26, 2017.  
Duke University Geometry Seminar, May 1, 2017.  
Purdue University Algebraic Geometry Seminar, March 22, 2017.  
“Amplitudes: practical and theoretical developments”, Mainz Institute of Theoretical Physics, Mainz, Germany, Feb. 6-10, 2017.  
Institute Henri Poincaré (seminar talk), Paris, Jan. 17, 2017.  
“Arithmetic and Algebraic Geometry”, University of Tokyo, Dec. 12-15, 2016.  
“Modular forms in string theory”, BIRS, Banff, Canada, Sept. 25-30, 2016.  
Fields Institute Workshop on “Calabi-Yau varieties: arithmetic, geometry, physics”, Sussex, UK, June 20-25, 2016.  
GANITA workshop, Fields Institute, June 13-17, 2016.  
Conference on “Arithmetic  $L$ -functions and differential geometric methods (Regulators IV)”, Paris, France, May 23-28, 2016.  
Workshop on Hodge Theory, Simons Centre, Stony Brook Univ., March 15-17, 2016.  
Workshop on Hodge Theory, Moduli and Representation Theory, Texas A&M, Jan. 13-17, 2016.  
Workshop on Algebraic Varieties, Fields Institute, Toronto, Nov. 21-22, 2015.  
Algebraic Geometry Seminar, Univ. Illinois – Chicago, Oct. 21, 2015.  
Group, Lie and Number Theory Seminar, University of Michigan, Ann Arbor, Sept. 28, 2015.  
Workshop on Hodge Theory and  $H$ -Surfaces, IAS, Princeton, NJ, June 3-4, 2015.  
Algebraic Geometry Seminar, Univ. California – San Diego, May 15, 2015.  
Math Department Colloquium, Rutgers Univ. – Newark, May 6, 2015.  
Workshop on Hodge Theory, Moduli, and Representation Theory, Stony Brook Univ., Jan. 4-9, 2015.

“Cohomological Realizations of Motives”, BIRS, Banff, Canada, Dec. 7-12, 2014.  
 Valley geometry Seminar, U. Mass – Amherst, Nov. 21, 2014.  
 AMS meeting, special sessions on “Mirror Symmetry” and “Geometry and Combinatorics on Homogeneous Spaces”, UNC-Greensboro, Nov. 8-9, 2014.  
 Workshop on Fundamental Groups and Periods, Institute for Advanced Study, Princeton, Oct. 13-17, 2014.  
 “Algebraic Varieties: Bundles, Topology, Physics”, VBAC, Freie Univ. Berlin, Sept. 1-5, 2014.  
 Workshop on Hodge Theory, Moduli, and Representation Theory, Texas A&M, Sept. 14-19, 2014.  
 Univ. of Alberta Geometry Seminar, June 23, 2014.  
 Texas A&M Algebraic Geometry Seminar, May 29, 2014.  
 Oregon State Math. Department Colloquium, May 12, 2014.  
 Workshop on “Hodge Theory in String Theory”, Fields Inst. (Toronto, Canada), Nov. 18-22, 2013.  
 Mathematical Congress of the Americas, Special Session on “Contemporary Trends in Algebraic Geometry and  $K$ -Theory”, Guanajuato, Mexico, Aug. 5-9, 2013.  
 “Polylogarithms as a Bridge Between Number Theory and Particle Physics”, Durham, UK, July 3-12, 2013.  
 Summer school and conference on “Recent Advances in Hodge Theory: Period Domains, Algebraic Cycles, and Arithmetic” (3 talks), UBC (Vancouver, Canada), June 10-20, 2013.  
 “Moduli Spaces and their Invariants in Mathematical Physics”, CRM (Montreal, Canada), June 3-14, 2013.  
 Univ. of Maryland Math Department Colloquium, March 13, 2013.  
 Workshop on “Algebraic cycles, motives, and geometry”, UNAM, Mexico City, Feb 18-23, 2013.  
 Université Paris XIII Math Department Seminar, Jan. 9, 2013.  
 Southern Illinois Univ. Carbondale Math Department Seminar, Nov. 13, 2012  
 AMS meeting, session on “Motives, Algebraic Cycles and  $K$ -Theory”, University of Arizona, October 27-28, 2012.  
 Canadian Number Theory Association XII Meeting, Special Session on Number Theory and Physics, University of Lethbridge, June 17-22, 2012  
 NSF/CBMS Conference on “Hodge Theory, Complex Geometry, and Representation Theory” (2 talks), Texas Christian University, June 18-22, 2012  
 Texas A&M Working Seminar in Geometry (5 talks), May 14-18, 2012  
 Special Number Theory Seminar, Institute for Advanced Study, Princeton, March 30, 2012  
 Algebra, Geometry, and Physics Seminar, Stony Brook University, March 14, 2012  
 Workshop on the Arithmetic and Geometry of Algebraic Varieties, Fields Institute, Nov. 19-20, 2011  
 Conference on the Arithmetic and Geometry of  $K3$  Surfaces and  $CY$  Threefolds, Fields Institute, Aug 16-25, 2011  
 “Number Theory and Physics at the Crossroads”, BIRS (Banff), May 8-13  
 Show-me Algebraic Geometry Conf., Columbia, MO, May 7-8, 2011  
 Texas A&M Geometry Seminar, Feb. 7, 2011  
 Purdue Algebraic Geometry Seminar, Jan. 19, 2011  
 AMS meeting, session on “Number Theory and Physics”, Notre Dame, Nov. 6, 2010  
 “Regulators III” Conference, Barcelona, July 12 - July 22, 2010  
 ICTP Summer School on Hodge Theory (7 talks), ICTP (Trieste), June 14 - July 3, 2010  
 University of Cambridge Geometry Seminar, May 19, 2010  
 Washington University Colloquium and Algebraic Geometry seminar, Jan. 25-26, 2010  
 University of Alberta Colloquium and Algebra Seminar, Jan. 18-19, 2010  
 University of Alberta Algebra Seminar, Nov. 30, 2009  
 Oxford University Algebraic Geometry Seminar, Oct. 13, 2009  
 Workshop on Homological Mirror Symmetry and Hodge Theory, Universität Wien (3 talks), Aug. 8-12, 2009  
 Hodge Theory and Algebraic Geometry, A Symposium in Honor of S. Usui, RIMS (Kyoto, Japan), June 23-July 3, 2009

Michigan State University Colloquium and Algebra Seminar, April 23-24, 2009  
Durham Arithmetic Study Group (3 talks), Feb.-March 2009  
MPIM-Bonn Number Theory Seminar, Jan. 12, 2009  
Universität Wien, Jan. 7, 2009  
University of Exeter Colloquium, Nov. 27, 2008  
University of Bristol Colloquium, Nov. 26, 2008  
Cambridge Geometry Seminar, Nov. 12, 2008  
COW/Geometry-Topology Seminar, Imperial College London, Nov. 6, 2008  
Algebraic and Differential Geometry, A Conference in Celebration of the 70th Birthday of  
Phillip Griffiths, IAS, Oct. 16-17, 2008  
BIRS Workshop (Banff, AB, Canada), Number Theory and Physics at the Crossroads,  
Sept. 21-26, 2008  
MSRI Workshop (Berkeley, CA), Topology of Stratified Spaces, Sept. 8-12, 2008  
University of Washington (US), Superseminar, April 17, 2008  
University of Alberta (Canada), Conference on Regulators and heights in Algebraic  
Geometry, April 11-16, 2008  
BIRS Workshop on Hodge Theory, April 6-11, 2008  
University of Chicago Algebra Seminar, April 2, 2008  
University of Durham Colloquium, Jan. 2008  
University of Washington conference on  $K3$  surfaces and string dualities (4 talks), July 2007  
University of Durham, May 18, 2007  
University of Georgia conference on Moduli of Curves and Abelian Varieties,  
Athens, GA, April 2007  
University of Wisconsin Geometry Seminar, March 2, 2007  
Georgia Tech Algebra Seminar, February 5, 2007  
Johns Hopkins University Colloquium, January 25, 2007  
Purdue University Algebraic Geometry Seminar, January 10, 2007  
CMS Conference, workshop on C-Y Varieties and Mirror Symmetry, Toronto, Dec. 7, 2006  
Texas A&M University, October 13, 2006  
Universität Mainz (2 talks), June-July 2006  
Motives and Periods Conference, PIMS/UBC, June 7, 2006  
Ohio State University Algebraic Geometry Seminar, May 18, 2006  
University of Chicago Algebraic Geometry Seminar, April 26, 2006  
UIC Algebraic Geometry Seminar, April 17, 2006  
Fields Institute Weekend Seminar, March 5, 2006  
University of Washington Special Seminar, February 23, 2006  
MPIM-Bonn Number Theory Seminar, August 17, 2005  
University of Durham, August 9, 2005  
MPIM-Bonn IMPRS Seminar, July 22, 2005  
Insitut de Jussieu, July 4, 2005  
Universita di Roma ("La Sapienza"), June 21, 2005  
Variations on Mahler Measure, CIRM-Luminy, May 31-June 4, 2005  
Antalya Algebra Days, May 17-23, 2005  
Bilkent University (3 talks), May 2005  
Purdue University Algebraic Geometry Seminar, November 17th, 2004  
University of Chicago Algebraic Geometry Seminar, November 10th, 2004  
University of Washington Algebra Seminar, November 2nd, 2004  
UCLA Perspectives in Mathematics Seminar, April 12th, 2004  
Fields Institute Weekend Seminar, March 27-28, 2004  
Lehigh University Math Department, February 12-13, 2004  
Ohio State University Math Department, February 4, 2004  
BIRS Workshop, Calabi-Yau Varieties and Mirror Symmetry, December 6-11, 2003  
Summer School on the Arithmetic, Geometry, and Topology of Algebraic Cycles,  
UNAM-Morelia (3 hour talks), June 15-July 4, 2003

Conference on Web Theory and Differential Equations, CIRM-Luminy, March 31 - April 4, 2003  
University of Alberta Math Department, April 5, 2002  
Brown University Math Department, January 25, 2002  
Johns Hopkins Algebraic Geometry Seminar, January 24, 2002  
Summer School on Transcendental Aspects of Algebraic Cycles, Université de Grenoble, June 18-July 6, 2001

### Teaching:

Courses at WUSTL: Linear Algebra, Algebraic cycles, Matrix Algebra (twice), Hodge theory, Graduate Complex Analysis I/II (twice), Graduate Algebra I/II (twice, incl. current), Calculus II (2 sections), Calculus III (4 sections), Honors Mathematics I/II (current); developed and taught Number Theory and Cryptography (3 times)  
Number Theory and Cryptography book (250 pp., on webpage) written for Fall 2016 class  
Presenter at Littlebrook Elementary Science Expo, Princeton, NJ, May 21, 2015  
Alberta Science and Math Initiative (5 talks to high school students), Univ. of Alberta, July 2011 and August 2014  
Courses taught at Durham: Algebraic Geometry, Number Theory III/IV, Algebra and Number Theory II; ANT II and SMA (Calculus) tutorials  
Undergraduate Algebraic Geometry book (331 pp., on webpage) written for Fall 2009 - Spring 2010 class  
Supervised five Masters' theses (Project IV) at Durham (one co-supervised with H. Gangl); two were selected as best project in maths department (2008, 2009)  
Courses taught at Chicago: Basic Algebra I, Complex Analysis, Honors Calculus III, Summer REU class on Algebraic Curves, Calculus II, Algebraic Curves.  
Courses taught at UCLA (5/yr.): Finite Math, Calculus for Life Science, Multivariable Calculus, Honors Linear Algebra, Analysis, Differential Geometry, Game Theory; 10 lectures in graduate Hodge-theory seminar.  
Advanced Linear Algebra book (192 pp., on webpage) written for Fall 2002 Honors class  
Teaching Assistant, Princeton University Mathematics Department, 2000-2002

### Advising:

Current Ph.D. Students:

- Xiaojiang Cheng (3rd year)
- Haohua Deng (4th year)
- Soumya Sinha Babu (5th year)
- Ben Castor (5th year)

Past Ph.D. Students:

- Ryan Keast (grad. May 2016, followed by postdoc at Univ. of Toronto)  
Thesis: "Some results in higher weight Hodge theory"
- Genival da Silva Jr. (grad. May 2016, followed by postdoc at Imperial College London)  
Thesis: "On the limiting behavior of variations of Hodge structure"
- Yu Yang (grad. January 2017, followed by internship at China Securities (Beijing))  
Thesis: "Explicit bases of motives over number fields with applications to Feynman integrals"
- Muxi Li (grad. May 2018, now postdoc at USTC)  
Thesis: "Regulators on higher Chow cycles"
- Tokio Sasaki (grad. May 2019, now postdoc at U. Miami)  
Thesis: "Limits and singularities of normal functions"

Postdoctoral mentees:

- Humberto Diaz (2019-present)
- Patricio Gallardo (2017-19; now TT faculty at UC-Riverside)
- Ivan Horozov (2011-15; now TT faculty at CUNY-Bronx)

Undergraduate research students: Patrick Lopatto (research project + published paper);  
Thomas Morrell, Ethan Farber, and Joe Foster (senior theses)  
Masters' theses at Durham: Stephanie Belcher, Andrew Strangeway, Thomas Oliver,  
Adam Watts, Jason de Carvalho

### Conferences Organized:

“I-70 Algebraic Geometry Symposium” (with R. Beheshti and M. Kumar), Nov. 2-3, 2019.  
“Symposium on Hodge Theory, Arithmetic, and Geometry” (with C. Doran, M. Lalin, J. Lewis,  
and G. Pearlstein), Pacific Inst. of Mathematical Sciences, UBC, Vancouver, May 13-17, 2019.  
“PIMS Postdoctoral Training School on Stochastic Dynamics and Hodge Theory” (with C. Doran  
and G. Pearlstein), March 11-15, 2019.  
“Algebraic varieties, Hodge theory and motives” (with J. Lewis, G. Pearlstein and N. Yui),  
Fields Institute, Toronto, March 19-22, 2018.  
“Hodge theory, moduli, and representation theory” (with P. Brosnan, R. Laza, G. Pearlstein,  
and C. Robles), Simons Center for Geometry and Physics, Stony Brook, August 14-18, 2017.  
Special session on “Motives and periods” (with C. Doran and J. Lewis), 2nd Mathematical  
Congress of the Americas, Montreal, July 24-28, 2017.  
Workshop on Algebraic Varieties (with P. Brosnan, J. Lewis, G. Pearlstein, C. Robles and N. Yui)  
Fields Institute, Toronto, March 9-12, 2017.  
FRG Workshop on Hodge Theory and Period Integrals, Washington University in St. Louis,  
January 4-8, 2017.  
CRM Workshop on “Algebraic cycles and moduli” (with P. Brosnan, M. Lalin, R. Laza, J. Lewis,  
G. Pearlstein and C. Robles), Montreal, June 2-8, 2016.  
FRG Workshop on Hodge Theory and Representation Theory, Washington University in St. Louis,  
April 25-29, 2015.  
Special session on “Algebraic Cycles and Coherent Sheaves” (with R. Beheshti and M. Kumar),  
AMS Central Sectional Meeting, Washington Univ., St. Louis, Nov. 18-20.  
Summer School and Conference on “Recent Advances in Hodge Theory: Period Domains,  
Algebraic Cycles, and Arithmetic” (with J. Lewis and G. Pearlstein), Pacific Institute of  
Mathematical Sciences, UBC, Vancouver, June 10-20, 2013.  
BIRS Workshop on “Hodge Theory and String Duality” (with A. Clingher, C. Doran, and  
J. Walcher), Banff, Dec. 4-9, 2011.

### Academic Service:

Member, HHMI-IE Steering Committee and Committee for Latinx Student Issues,  
Washington University, 2020-21.  
Reviewing Editor, *Experimetal Results* (Cambridge Univ. Press), 2019-present.  
Member, STEM-HLC Committee, Washington University, 2019-20.  
Washington University Math Circle: Nov. 14, 2010; Oct. 2, 2011; Oct. 7, 2012; Feb. 9, 2014;  
Oct. 25, 2015; April 9, 2017 (with T. Sasaki); March 25, 2018; March 31, 2019; Nov. 1, 2020.  
Organizer of WUSTL Algebraic Geometry Seminar and Int. Homology/ $\mathcal{D}$ -module Seminar;  
organized Roever Colloquium (2018) and Kirk Lecture (2011); Math Club supervisor, 2012-13;  
Graduate Colloquium organizer, 2013-14 and 2019-20; Putnam practice supervisor, Fall 2016  
Member of Math. Dept. Hiring Committee (2013-14), Graduate Committee (2011-12 and 2015-16),  
and Executive Committee (2020-21).  
Chair, WUSTL Math. Dept. Postdoctoral Hiring Committee, 2010-11 and 2016-17.  
Referee for papers submitted to American Journal of Mathematics, Journal of Number Theory,  
Mathematical Research Letters, Journal of Algebraic Geometry, Advances in Theoretical and  
Mathematical Physics, Nagoya Mathematical Journal, Journal of the London Math. Society,  
Mathematische Annalen, Mathematische Zeitschrift, Manuscripta Math., Canadian Math.  
Bulletin, Proceedings of the AMS, Communications in Number Theory and Physics,  
Duke Math. Journal, Journal of K-theory, Selecta Mathematica, Advances in Math,

Bol. Soc. Mat. Mexicana, IMRN, Comptes Rendus, SIGMA, Compositio Math., Exp. Math.  
NSF panelist (2012, 2015) and referee for three other funding bodies  
Reviewer for AMS Mathscinet, including book review (“Mixed Hodge Theory” by C. Peters  
and J. Steenbrink)  
Co-Organizer (with V. Kurlin): Durham Univ. Pure Maths Colloquium, Fall 2008-Spring 2010  
MAGIC Coordinator, Durham University, Fall 2009 - Spring 2010  
Member of six Ph.D. committees (5 at WUSTL, 1 at Durham)  
Principal Organizer: University of Chicago Algebraic Geometry Seminar, Winter-Spring 2007  
Registered as Undergraduate and Graduate Mentor, National Alliance for Doctoral Studies  
in the Mathematical Sciences