

Kevin Tucker - Curriculum Vitae - March 2018

Contact Information

Department of Mathematics, Statistics, & Computer Science
University of Illinois at Chicago
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Education

University of Michigan - Doctor of Philosophy, Mathematics, May 2010
Dissertation: Multiplier Ideals and Jumping Numbers on Algebraic Surfaces
Advisor: Professor Karen Smith

University of Chicago - Bachelor of Science, Mathematics, June 2004

Appointments

Associate Professor, 2016 - Present
University of Illinois at Chicago

Assistant Professor, 2013 - 2016
University of Illinois at Chicago

Program Associate, Spring 2013, Spring 2019
Mathematical Sciences Research Institute

Instructor/NSF Postdoctoral Fellow, 2011-2013
Princeton University

NSF Postdoctoral Fellow, 2010-2011
University of Utah

Visiting Scholar:

- Johannes Gutenberg Universität (Germany), June 2010, 2011, 2012, and 2013
- University of Jyväskylä (Finland), April 2010
- Katholieke Universiteit Leuven (Belgium), March 2010

Graduate Student Program Associate, Spring 2009
Mathematical Sciences Research Institute

Research Interests

Singularities and invariants arising in positive characteristic commutative algebra (such as test ideals and F-signature) and birational complex algebraic geometry (including multiplier ideals and jumping numbers).

Publications

Published or accepted since arrival at UIC

1. T. Polstra and K. Tucker: F-signature and Hilbert-Kunz Multiplicity, A Combined Approach. To appear in Algebra and Number Theory. ~33 pages.
2. B. Bhatt, J. Carvajal-Rojas, P. Graf, K. Schwede, and K. Tucker: Étale Fundamental groups of strongly F-regular schemes. To appear in International Mathematics Research Notices. ~10 pages.
3. J. Carvajal-Rojas, K. Schwede, and K. Tucker: Fundamental Groups of F-regular Singularities via F-signature. To appear in Annales scientifiques de l'Ecole normale supérieure. ~22 pages.
4. K. Smith and K. Tucker: Appendix to "Contribution of jumping numbers by exceptional divisors" by H. Baumers and W. Veys, Journal of Algebra, 2018.~5 pages
5. K. Schwede, K. Tucker, and Z. Patakfalvi: Notes for the workshop on positive characteristic algebraic geometry, arXiv:1412.2203. Proceedings of Symposia in Pure Mathematics volume for the 2015 AMS Algebraic Geometry Bootcamp, 2017.~40 pages.
6. M. Blickle, K. Schwede, and K. Tucker: F-singularities via alterations, American Journal of Mathematics 137 (1), 61-109, 2015.
7. T. de Fernex, R. Docampo, S. Takagi and K. Tucker, Comparing multiplier ideals to test ideals on numerically Q-Gorenstein varieties, Bulletin of the London Mathematical Society 47 (2), 359-369, 2015.
8. K. Schwede and K. Tucker: Explicitly Extending Frobenius Splittings over Finite Maps, Communications in Algebra 10 (43), 4070-4079, 2015.
9. K. Schwede and K. Tucker: Test ideals of non-principal ideals: Computations, Jumping Numbers, Alterations and Division Theorems, Journal de Mathématiques Pures et Appliquées (9) 102, no. 5, 891-929, 2014.

Published or accepted prior to arrival at UIC

10. K. Schwede and K. Tucker: On the behavior of test ideals under finite morphisms, Journal of Algebraic Geometry 23 (2014), no. 3, 399-443.
11. M. Blickle, K. Schwede, and K. Tucker: F -signature of pairs: Continuity, p-fractals and minimal log discrepancies, Journal of the London Mathematical Society (2) 87 (2013), no. 3, 802-818.
12. K. Tucker: F-signature exists, Inventiones Mathematicae 190 (2012), no. 3, 743-765.

13. M. Blickle, K. Schwede, and K. Tucker: F-signature of pairs and the asymptotic behavior of Frobenius splittings, *Advances in Mathematics* 231 (2012), no. 6, 3232-3258.
14. K. Schwede, K. Tucker, and W. Zhang: Test ideals via a single alteration and discreteness and rationality of F-jumping numbers, *Mathematical Research Letters* 19 (2012), no. 01, 191-197.
15. K. Schwede and K. Tucker: A Survey of Test Ideals, *Progress in Commutative Algebra* (2011), deGruyter, Berlin, 2012, pp. 39–99.
16. K. Schwede and K. Tucker: On the number of compatibly Frobenius split subvarieties, prime F-ideals, and log canonical centers, *Annales de L'Institut Fourier (Grenoble)* (60) 2010, no. 5, 1515-1531.
17. K. Tucker: Jumping numbers on algebraic surfaces with rational singularities, *Transactions of the AMS* 362 (2010), 3223-3241.
18. K. Tucker: Integrally closed ideals on log terminal surfaces are multiplier ideals, *Mathematical Research Letters* (16) 2009, no. 5, 903–908.

Submitted / in preparation / preprints

19. K. Tucker: Test ideals in F-regular rings. ~10 pages.
20. M. Herring and K. Tucker: F-splitting Ratios of Seminormal Monoid Rings. ~10 pages.
21. S. Shideler and K. Tucker: Limit F-signature Functions of Diagonal Hypersurfaces. ~20 pages.
22. L. Ein and K. Tucker: pg-Vector Bundles. ~15 pages.
23. I. Coskun and K. Tucker: Limit F-signature Functions of Sums of Certain Binomials. ~15 pages.

Honors and awards

- PI National Science Foundation Grant DMS 1602070, Computing and Interpreting Frobenius Invariants, \$205,000, 2016 – 2019
- Alfred P. Sloan Foundation Fellowship, \$55,000, 2016-2018
- Co-PI (with L. Ein, I. Coskun, R. Takloo-Bighash, D. Marker) National Science Foundation Research Training Grant (RTG) in Algebraic Geometry and Arithmetic Geometry, \$2,500,000, 2013-2018

- PI National Science Foundation Grant DMS 1419448, Frobenius singularities and related invariants, \$144,000, 2013 - 2016
- Co-PI (with W. Zhang and K. Schwede) National Science Foundation Conference Grant 1160927, Computational Workshop on Singularities and Invariants Defined by Frobenius, \$10,000, 2012
- PI National Science Foundation Post Doctoral Research Fellowship Grant DMS 1004344, \$135,000, 2010 - 2013
- 2010 University of Michigan Distinguished Dissertation Award
 - This award is presented annually to around ten graduating doctoral students at the University of Michigan, and aims to recognize exceptional and unusually interesting work produced by doctoral students in the last phase of their graduate work.
- 2010 Sumner B. Myers Prize
 - This award is presented by the Mathematics Department at the University of Michigan to recognize the best dissertation in a given year.
- 2010 Wirt & Mary Cornwell Award
 - This award is presented by the Mathematics Department at the University of Michigan to a student who, during the four previous years, has demonstrated the greatest intellectual curiosity and has given the most promise of original study and creative work in mathematics. The award is available to both undergraduate and graduate students.
- 2004 Paul R. Cohen Memorial Prize
 - This award is presented by the Mathematics Department at the University of Chicago to the graduating seniors in the field of Mathematics who have achieved the highest record in mathematics.
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- 2003 - 2004 Student Marshal, University of Chicago
 - Student Marshals are third-year students who have excelled academically and demonstrated outstanding commitment to significant extra-curricular activities on campus and in the community.
- Academic Honor Societies, University of Chicago
 - Inducted into membership in Sigma Xi in 2004.
 - Inducted into membership in Phi Beta Kappa in 2003.

Teaching

Instructor

University of Illinois at Chicago

- Math 553, Algebraic Geometry II, Spring 2016
Graduate course for second year students, ~ 15 students
- Math 517, Graduate Algebra II, Spring 2018

Graduate course for first year students, ~ 12 students

- Math 571, Topics in Algebraic Geometry, Spring 2017
 - Topics course on positive characteristics methods in algebraic geometry and commutative algebra, ~15 students
- Math 516, Graduate Algebra, Fall 2016
 - Graduate course for first year students, ~ 14 students
- Math 517, Graduate Algebra II, Spring 2016
 - Graduate course for first year students, ~ 12 students
- Math 516, Graduate Algebra I, Fall 2015
 - Graduate course for first year students, ~ 12 students
- Math 520, Commutative and Homological Algebra, Fall 2014
 - Graduate course aimed at second year students, ~12 students
- Math 310, Applied Linear Algebra, Fall 2014
 - Advanced lecture course for non-mathematics undergraduates, ~80 students
- Math 215, Introduction to Advanced Mathematics, Spring 2014
 - A first proofs course aimed at undergraduate mathematics and computer science majors, ~ 20 students
- Math 552, Algebraic Geometry I, Fall 2013
 - Graduate course aimed at second year students, ~ 15 students

Princeton University

- Math 447, Commutative Algebra, Fall 2012
 - Advanced undergraduate course for senior math majors, ~ 20 students
- Math 189, Number, Shape, & Symmetry, Spring 2012
 - Designed to give non-science majors a way to fulfill their general education quantitative reasoning course requirement without calculus, this course covered an introduction to elementary number theory and group theory, ~ 15 students
- Math 201, Calculus III, Fall 2011
 - Multivariable calculus course for freshman and sophomores, ~ 35 students

University of Michigan

- Math 115, Calculus I, Fall 2005
- Math 116, Calculus II, Winter 2006, Fall 2006
 - First and second semester calculus courses, respectively, largely for freshman, ~30 students each semester

Course grader and assistant

University of Michigan

- Math 631, Algebraic Geometry I, Fall 2006, 2007, & 2009
- Math 632, Algebraic Geometry II, Winter 2008
- Math 513, Graduate Linear Algebra, Fall 2004

University of Chicago

- Math 161-163, Honors Calculus I - III, 2003-2004

Mentoring

Graduate Students

- *Ph.D. Thesis advisor for Graduate Students at UIC:* Janet Page (expected August 2018), Samuel Shideler (expected August 2018), Wesley Townsend (expected 2020), Austyn Simpson (expected 2021)
- *Weekly meetings with Graduate Students at UIC:* Samuel Shideler (Fall 2013 - Present), Christopher Perez (Fall 2013 - Spring 2014), Janet Page (Spring 2014 - Present), Xudong Zheng (Spring 2014 - Spring 2015)
- *Official Reading Courses with Graduate Students at UIC:*
 - UIC Reading Course with Nathan Bliss and Jeff Sommars on Toric Varieties, Spring 2014
 - UIC Reading course with Amit Shah on Local Cohomology, Spring 2014
 - UIC Reading course with Shuhang Yang on Algebraic Geometry, Spring 2013
 - UIC Reading course with Xudong Zheng (doctoral student of Lawrence Ein) on Positive Characteristic Methods in Algebraic Geometry, Fall 2013
- *RTG Reading Seminars at UIC:*
 - Co-organized (with Izzet Coskun and Lawrence Ein) an RTG Reading Seminar on Important Examples in Algebraic Geometry, Spring 2016
 - Co-organized (with Izzet Coskun) an RTG Reading Seminar on Algebraic Surfaces for ~10 graduate students in Spring 2015
 - Co-organized (with Izzet Coskun) an RTG Reading Seminar on Representation Theory for ~10 graduate students in Fall 2014
- Teaching apprenticeship organizer for the graduate students at Princeton University in Fall 2012, supervising and mentoring ~ 10 graduate students in giving guest lectures in various undergraduate classes
- University of Utah Reading Course on Differential Geometry with Brian Mann and Sonya Leibman (students of Mladen Bestvina), Spring 2011

Undergraduate Students

- UIC Honors College Faculty Fellow 2017-present

- *Undergraduate research supervisor at UIC:*
 - LASURI Faculty Mentor and Honors Capstone Project Advisor for Michael Perlmann 2014-2015 on computations of limit F-signature functions
- *Official Reading Courses with Undergraduate Students at UIC:*
 - UIC Reading course with Michael Perlmann on Commutative Algebra, Fall 2014
- Senior thesis advisor for Samuel Shideler at Princeton University in 2013
- Junior paper advisor for Sarah Trebat-Leider at Princeton University in Spring 2012

Service

Committees

- UIC Mathematics Department Advisory Committee, Spring 2018 - present
- UIC Senate Student Recruitment Committee 2017-2019
- UIC Mathematics Department Research Training Grant Coordinator 2016-2017, Spring 2018
- UIC Senate Student Recruitment Committee 2015-2017
- UIC Mathematics Department Admissions, Fellowships, Assistantships Committee 2015-2016
- UIC Mathematics Department Tenure-Track Hiring Committee 2014-2015
- UIC Mathematics Department Graduate Studies Committee 2013 – 2015, 2017-2018
- UIC Mathematics Department Research Assistant Professor Hiring Committee 2013-2014

Referree & Editor

- Editor of the Proceedings of the conference “Local and global methods in algebraic geometry” in honor of Lawrence Ein’s 60th birthday, Chicago, now in publication (with N. Budur, R. Docampo, and T. de Fernex)
- UIC Chancellor’s Award Fellowship Application Reviewer (2016)
- Grant Reviewer for the National Science Foundation (2014, 2018)
- Grant Reviewer for the National Security Agency (2012, 2013, 2014, 2015)
- Referee for numerous articles for journals including *Advances in Mathematics*, *Annals of Mathematics*, *Compositio*, *Proceedings of the AMS*, *Journal of Commutative Algebra*, *Algebra & Number Theory*, and *Communications in Algebra*

Conference Organizer

- Upcoming:
 - “Algebraic Geometry and its Broader Implications: A Conference in honor of Hartshorne’s 80th and the book’s 40th” at UIC, March 2018 (Funded by NSF RTG Grant DMS #1246844, with L. Ein, C. Polini, and B. Ulrich)
 - Midwest Algebraic Geometry Graduate Conference at UIC Faculty Sponsor, May 2018 (Funded by NSF RTG Grant DMS #1246844, with I. Coskun)
 - “Undergraduate Mathematics Symposium” at UIC, November, 2018 (Funded by NSF RTG Grant DMS #1246844 and #1602070, with D. Dumas and J. Ross)

- “Undergraduate Mathematics Symposium” at UIC, November, 2017 (Funded by NSF RTG Grant DMS #1246844 and #1602070, with D. Dumas)
- Midwest Algebraic Geometry Graduate Conference at UIC Faculty Sponsor, April 2017 (Funded by NSF RTG Grant DMS #1246844, with I. Coskun)
- RTG Graduate Student Workshop on the Homological Conjectures at UIC, November 18-20, 2016 (Funded by NSF RTG Grant DMS #1246844, with C. Skalit)
- RTG Undergraduate REU on Topics in Commutative Algebra, May 23-June 3, 2016 (Funded by NSF RTG Grant DMS #1246844, with L. Ein)
- “Undergraduate Mathematics Symposium” at UIC, October 15, 2016 (Funded by NSF RTG Grant DMS #1246844 and #1602070, with D. Dumas)
- “Undergraduate Mathematics Symposium” at UIC, October 24, 2015 (Funded by NSF RTG Grant DMS #0952869, with D. Dumas, S. Hurder, A. Austin)
- RTG Graduate Student Workshop on Syzygies of Algebraic Varieties at UIC, November 21 – November 22, 2015 (Funded by NSF RTG Grant DMS #1246844, with L. Ein)
- RTG Graduate Student Workshop on Higher Codimension Cycles in Algebraic Geometry at UIC, November 21 – November 22, 2015 (Funded by NSF RTG Grant DMS #1246844, with I. Coskun, J. Lesieutre)
- “Local and Global Methods in Algebraic Geometry: A Conference in Honor of Lawrence Ein’s 60th Birthday” at UIC, May 12 – 15, 2016 (Funded by NSF RTG Grant DMS #1246844, with T de Fernex, N. Budur, R. DoCampo)
- AMS Special Session on “The Geometry of Algebraic Varieties” at the AMS Central Section Meeting at Michigan State University in March 2015 (with B. Lehmann)
- Graduate Student Workshop on Local Cohomology at UIC, February 27 – March 1, 2015 (Funded by NSF RTG Grant DMS #1246844, with W. Zhang, C. Raicu, U. Walther)
- “Undergraduate Mathematics Symposium” at UIC, October 18, 2014 (Funded by NSF RTG Grant DMS #0952869, with D. Dumas, S. Hurder, A. Austin)
- Graduate Student Workshop on Positive Characteristic Algebraic Geometry at UIC, March 19-21, 2014 (Funded by NSF RTG Grant DMS #1246844, with K. Schwede, Z. Patakfalvi)
- Tight closure and Singularities focus period at the Mathematical Sciences Research Institute (MSRI), April 29, 2013 to May 24, 2013 (with S. Takagi, H. Brenner)
- Conference on “Computational workshop on Frobenius singularities and invariants” at the University of Michigan, Ann Arbor, MI, May 2012. (Co-PI NSF Grant DMS #1160927, with W. Zhang, K. Schwede)
- American Institute of Mathematics workshop “Relating Test Ideals and Multiplier Ideals” in Palo Alto, CA, August 2011 (with K. Schwede)
- AMS Special Session on “Birational Geometry and Moduli Spaces” at the Joint Mathematics Meetings, New Orleans, LA, scheduled January 2011 (with D. Chen, A. Knecht, D. Swinarski)

Seminar Organizer

- Algebraic Geometry Seminar, UIC, 2013 – Present
- Commutative Algebra Seminar, UIC, 2015 – Present
- Algebraic Geometry Seminar, Princeton University, 2011-2012.
- University of Michigan Student Algebraic Geometry Seminar during the Fall 2007, Winter 2008, and Fall 2009 semesters.
- Graduate Student Seminar at the Spring 2009 program in Algebraic Geometry at the Mathematical Sciences Research Institute (MSRI, with D. Erman)

Outreach Activities

- Volunteered to lead a problem session in a continuing education program for mathematics educators at the University of Utah, Spring 2011
- Graduate assistant for the MMSS (Michigan Math and Science Scholars) program for high school students in the summer of 2006.
- Counselor in the YSP (Young Scholars Program) at the University of Chicago in the summer of both 2002 and 2004, working with children from grades 7 through 12.
- Course assistant in the SESAME (Seminars for Endorsement of Science and Mathematics Educators) program at the University of Chicago in the summer of both 2003 and 2004, a continuing education and recertification program for middle school mathematics teachers.

Presentations

Upcoming

- Oberwolfach conference on Algebraic Geometry: Singularities and Homological Aspects of Commutative Algebra, Oberwolfach, Germany, February 2019
- Commutative Algebra Conference in honor of Bernd Ulrich's 60th, June 2019

Invited Conference Speaker

- Seventh Iberoamerican Congress on Geometry, Special Session on Algebraic Surfaces, January 2018 – *"pg Vector Bundles on Normal Surfaces"*
- Special Session on "Commutative Algebra" at University of North Texas, September 2017 – *"F-signature of a Cartier Module"*
- Oberwolfach conference on Algebraic Geometry: Birational Classification, Derived Categories, and Moduli Spaces, Oberwolfach, Germany, September 2017
- The Prospects for Commutative Algebra, Hotel Nikko Osaka, Osaka, Japan, July 2017 – *"F-signature of a Cartier Module"*
- Oberwolfach conference on Asymptotic Phenomena in Local Algebra and Singularity Theory, Oberwolfach, Germany, December 2016 – *"Fundamental Groups of F-regular Singularities via F-Signature"*
- Differential forms in algebraic geometry, University of Friburg, Friburg, Germany, September 2016 – *"Fundamental Groups of F-regular Singularities via F-Signature"*
- CIRM conference on Higher dimensional algebraic geometry and characteristic $p > 0$ CIRM, Luminy, France, September 2016 – *"Fundamental Groups of F-regular Singularities via F-Signature"*
- Commutative Algebra and Its Interactions with Algebraic Geometry (in honor of Craig Huneke's 65th Birthday), University of Michigan, July 2016 – *"Fundamental Groups of F-regular Singularities via F-Signature"*
- Higher dimensional algebraic geometry, University of Utah, July 2016 – *"Fundamental Groups of F-regular Singularities via F-Signature"*
- Minischool on Invariants of Singularities in zero and positive characteristic, Stonybrook University, December 2015 - *"Frobenius invariants of singularities"*
- Upper Midwest Commutative Algebra Conference, University of Wisconsin, November 2015 – *"Limits of Frobenius Invariants"*
- Special Session on Commutative Algebra at the AMS Central Section Meeting, Loyola University, October 2015 – *"On the limit as p goes to infinity of the Hilbert-Kunz Multiplicity"*
- Lecture Series speaker at the Multiplier Ideals, Test Ideals, and Bernstein Sato Polynomials Conference, Facultat de Matemàtiques i Estadística Universitat Politècnica de Catalunya, Barcelona, Spain, September 2015 – *"An Introduction to Multiplier Ideals" (three 90 minute lectures)*

- Midwest commutative algebra conference, Purdue University, August 2015 – *“On the limit as p goes to infinity of the Hilbert-Kunz Multiplicity”*
- Graduate student boot camp mentor and speaker for the AMS Summer Research Institute in Algebraic Geometry, University of Utah, July 2015 – *“Recent Methods in Positive Characteristic Algebraic Geometry”*
- Conference on Rings of Frobenius Operators and Cartier Algebras, Georgia State University, March 2015 – *“An Introduction to Cartier Algebras”*
- KUMUNU Commutative Algebra Conference, University of Missouri, September 2014 – *“Limit F -signature Functions of Diagonal Hypersurfaces”*
- Meeting On Combinatorial Commutative Algebra (MOCCA 2014), Levico Terme, Italy, September 2014 – *“Limit F -signature Functions of Diagonal Hypersurfaces”*
- Special Session on “Toric Varieties” at University of Wisconsin Eau Claire, September 2014 – *“The F -splitting Ratio of a Monoid Algebra”*
- RIMS Workshop on Commutative Algebra, December 2013 – *“The rationality of the F -pure Threshold in a Power Series Ring”*
- Centre International de Rencontres Mathématiques (CIRM) conference on “Commutative algebra and its interactions with algebraic geometry,” Luminy, France, July 2013 – *“Positivity of the F -splitting Ratio”*
- Special Sessions on Algebraic Geometry and Commutative Algebra at the Joint Meeting of the AMS and RMS, Alba Iulia, Romania, June 2103 – *“ F -splitting Ratio of Monoid Algebras” and “A Uniform Description of Test Ideals and Multiplier Ideals”*
- Thematic program on Motivic Invariants and Singularities, Notre Dame University, May 2013 – *“A Uniform Description of Test and Multiplier Ideals”*
- Mathematical Sciences Research Institute (MSRI) conference on “The Commutative Algebra of Singularities in Birational Geometry: Multiplier Ideals, Jets, Valuations, and Positive Characteristic Methods,” May 2013 – *“ F -Signature and Relative Hilbert-Kunz Multiplicity”*
- Conference on “Trends in Arithmetic Geometry” at the Lorentz Center, Leiden, the Netherlands, January 2013 – *“An Introduction to F -singularities” (three lectures)*
- Joint University of British Columbia (Vancouver) and University of Washington (Seattle) Algebraic Geometry Conference, November 2012 – *“A Uniform Description of Test and Multiplier Ideals”*
- Conference on “Characteristic p and p -adic Geometry” at Johannes Gutenberg Universität, Mainz, Germany, June 2012 – *“A Uniform Description of Test and Multiplier Ideals”*
- Special Session on “Singularities in Commutative Algebra and Algebraic Geometry” at the AMS Central Section Meeting, Lawrence, KA, April 2012 – *“On the Number of Compatibly F -split Subvarieties and Log Canonical Centers”*
- Special Session on Commutative algebra at the AMS Western Section Meeting, Salt Lake City, UT, October 2011 – *“On the Number of Compatibly F -split Subvarieties and Log Canonical Centers”*
- Western Algebraic Geometry Seminar (WAGS), Colorado State University, October 2011 – *“On the the behavior of multiplier ideals and test ideals under finite morphisms in positive characteristic”*
- Midwest Commutative Algebra and Geometry Conference, Purdue University, May 2011 – *“On the the behavior of multiplier ideals and test ideals under finite morphisms in positive characteristic”*
- Show-Me Algebraic Geometry Meeting, University of Missouri, May 2011 – *“On the the behavior of multiplier ideals and test ideals under finite morphisms in positive characteristic”*
- Special Session on “Commutative Algebra and its Interactions with Algebraic Geometry” at the AMS Central Section Meeting, South Bend, IN, November 2010 – *“ F -signature Exists”*
- Special Session on “Singularity Theory and Algebraic Geometry” at the joint meeting of the AMS and the Sociedad Matematica Mexicana, Berkeley, CA, June 2010 – *“ F -signature Exists”*
- Frobenius splitting in algebraic geometry, commutative algebra, and representation theory, University of Michigan, May 2010 – *“On the behavior of multiplier ideals and test ideals under finite morphisms in positive characteristic”*
- AMS Special Session on Commutative Algebra at the Joint Mathematics

Invited Seminar Speaker

- University of Edinburgh Algebra Seminar, United Kingdom, September 2017 – “Bertini Theorems for F -signature”
- Beijing International Center of Mathematical Research, Peking University, Beijing, China, September 2017 – “Bertini Theorems for F -signature”
- Purdue University Commutative Algebra Seminar, February 2016 – “Fundamental Groups of F -regular Singularities via F -Signature”
- Texas A&M Geometry and Topology Seminar, January 2016 – “Fundamental Groups of F -regular Singularities via F -Signature”
- École polytechnique fédérale de Lausanne (EPFL) Algebraic Geometry Seminar, Lausanne, Switzerland, December 2016 – “Fundamental Groups of F -regular Singularities via F -Signature”
- University of Michigan Commutative Algebra Seminar, October 2016 – “Transformation rules for F -signature under finite morphisms”
- University of Illinois Algebraic Geometry Seminar, April 2016 – “Test Ideals in F -regular rings”
- Princeton Algebraic Geometry Seminar, March 2016 – “Test Ideals in F -regular rings”
- University of Arkansas Mathematics Colloquium, October 2015 – “Limits of Frobenius Invariants”
- University of Arkansas Algebra Seminar, October 2015 – “The F -splitting Ratio of a Monoid Algebra”
- University of Minnesota Mathematics Colloquium, October 2015 – “Limits of Frobenius Invariants”
- University of Minnesota Commutative Algebra Seminar, October 2015 – “The Rationality of the F -pure Threshold in Power Series Rings”
- Georgia State University Colloquium, August 2015 – “Limit F -signature Functions of Diagonal Hypersurfaces”
- Utah Commutative Algebra Seminar, April 2015 – “Limit F -signature Functions of Diagonal Hypersurfaces”
- Queens University Algebraic Geometry Seminar, March 2015 – “Limit F -signature Functions of Diagonal Hypersurfaces”
- Notre Dame Commutative Algebra Seminar, January 2015 – “On the Limit of the F -signature Function in Characteristic Zero”
- Texas A&M Algebra and Combinatorics Seminar, January 2015 – “Limit F -signature Functions of Diagonal Hypersurfaces”
- Yale Algebraic Geometry Seminar, December 2014 – “Comparing multiplier ideals to test ideals on numerically QQ -Gorenstein varieties”
- Princeton Algebraic Geometry Seminar, March 2014 – “Comparing multiplier ideals to test ideals on numerically QQ -Gorenstein varieties”
- Purdue Algebraic Geometry and Commutative Algebra Seminars, March 2014 – “Comparing multiplier ideals to test ideals on numerically QQ -Gorenstein varieties” and “On the Limit of the F -signature Function in Characteristic Zero”
- Wisconsin Algebraic Geometry Seminar, March 2014 – “Comparing multiplier ideals to test ideals on numerically QQ -Gorenstein varieties”
- Michigan Algebraic Geometry Seminar, October 2013 – “ F -Signature of a Cartier Module”
- Johns Hopkins Algebraic Geometry Seminar, October 2013 – “Rationality of the F -Pure Threshold in Power Series Rings”
- Algebraic Geometry Seminar, UCLA, May 2013 – “An Introduction to F -signature”
- Algebraic Geometry Seminar, University of Illinois at Chicago, April 2012 – “A uniform description of test and multiplier ideals”
- Algebraic Geometry Seminar, Stony Brook University, October 2011 – “A uniform description of test and multiplier ideals”
- Commutative Algebra Seminar, University of Utah, September 2011 – “ F -signature Exists”

- Commutative Algebra Seminar, University of Osnabrück, Osnabrück, Germany, June 2011 – *“F-signature Exists”*
- Algebraic Geometry Seminar, University of British Columbia, April 2011 – *“On the behavior of multiplier ideals and test ideals under finite morphisms in positive characteristic”*
- Algebraic Geometry Seminar, University of Washington, April 2011 – *“On the behavior of multiplier ideals and test ideals under finite morphisms in positive characteristic”*
- Commutative Algebra Seminar, University of Kansas, March 2011 – *“F-signature Exists”*
- Commutative Algebra and Algebraic Geometry Seminars, University of Michigan, March 2011, September 2012 – *“On the behavior of multiplier ideals and test ideals under finite morphisms in positive characteristic”* and *“F-signature Exists”*
- Algebraic Geometry Seminar, Harvard University, October 2010 – *“On the behavior of multiplier ideals and test ideals under finite morphisms in positive characteristic”*
- Algebraic Geometry Seminar, University of Illinois, January 2010 – *“On the Number of Compatibly F-split Subvarieties and Log Canonical Centers”* and *“Jumping Numbers and Multiplier Ideals on Algebraic Surfaces”*
- Algebraic Geometry Seminar, Rice University, March 2008 and August 2012 – *“Jumping Numbers of Plane Curves”* and *“A uniform description of test and multiplier ideals”*
- Student Algebraic Geometry Seminar, Stanford University, March 2008 – *“Jumping Number of Plane Curves”*

Other Conference & Workshop Participation

- American Institute of Mathematics (AIM) Squares Participant, June 2017
- American Institute of Mathematics (AIM) conference on “The minimal model program in characteristic p ,” May 2013
- Participant in the AMS Mathematical Research Communities 2010 on Birational Geometry and Moduli Spaces, Salt Lake City, Utah.
- Poster contributor at the Pan-American Advanced Study Institute (PASI) 2009 conference in Commutative Algebra and its Connections to Geometry, Olinda, Brazil.
- Participant in the 2008 Park City Mathematics Institute (PCMI) / Institute for Advanced Study (IAS) program titled “Analytic and Algebraic Geometry: Common Problems – Different Methods.”
- Attended the 2008 Summer School and Conference on the “Aspects of Moduli” at the De Giorgi Center of the Scuola Normale Superiore in Pisa, Italy.
- Attended the 2007 Summer School “Geometry of Complex Projective Varieties and the Minimal Model Program” at the Fourier Institute, Grenoble, France.
- Participant in the University of Chicago Research Experiences for Undergraduates (REU) in the summer of both 2002 and 2003.