Christopher A. Francisco
Curriculum Vitae

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Education:

- Ph.D., Mathematics, Cornell University, August 2004
  Ph.D. Thesis: *Hilbert functions and graded free resolutions.* Advisor: Michael Stillman.
- M.S., Mathematics, Cornell University, January 2002
- B.S., Mathematics, A.B., Economics, University of Illinois at Urbana-Champaign, May 1999. *Graduated Summa Cum Laude with Highest Distinction in Mathematics.*

Employment:

- Vice Provost, Division of Academic Affairs, and Professor of Mathematics, Oklahoma State University, August 2022-present.
- Interim Vice Provost for Undergraduate Education and Professor of Mathematics, Oklahoma State University, June 2021-August 2022.
- Professor and Head, Department of Mathematics, Oklahoma State University, July 2018-May 2021.
- Associate Professor and Interim Head, Department of Mathematics, Oklahoma State University, Fall 2017.
- Associate Professor and Associate Head for Lower-Division Instruction, Department of Mathematics, Oklahoma State University, 2012-2018.
- Assistant Professor of Mathematics, Oklahoma State University, 2007-2012
- Postdoctoral Fellow in Mathematics, University of Missouri-Columbia, 2004-2007

Teaching and service awards:

- Outstanding First-Year Student Advocate, National Resource Center for the First-Year Experience and Students in Transition, 2018
- Oklahoma State University Regents Distinguished Teaching Award, 2016
- Mathematical Association of America Oklahoma-Arkansas Section Award for Distinguished College or University Teaching of Mathematics, 2015-6
- Oklahoma State University Service Award, 2015 faculty recipient
- Clark Award for Distinguished Teaching, Cornell University College of Arts and Sciences, 2004
- Graduate Student Teaching Award for Cornell mathematics department's most outstanding graduate student teacher, 2002

- "Incomplete List of Teachers Ranked as Excellent by Their Students" at University of Illinois; appeared twice with instructor ratings "outstanding" (top 10% of all TA's), 1998-1999

Selected other awards, fellowships, scholarships, and honors:

- Cornell Graduate School Olin Fellow, 2003-2004
- Eleanor Norton York Award for achievement in graduate study of mathematics, Cornell Department of Mathematics, 2001-2
- NSF Graduate Research Fellow, 1999-2002
- Phi Beta Kappa member
- Barry M. Goldwater Scholar, 1998-1999

Research interests:

- Commutative algebra, its interactions with combinatorics, and computational algebra

Publications:
(Note: In keeping with the standard practice in mathematics, all authors are listed alphabetically by last name in these publications.)

Refereed publications:

1. M. DiPasquale, C. A. Francisco, J. Mermin, and J. Schweig, Free and non-free multiplicities on the A_3 arrangement. *J. Algebra* **544** (2020), 498-532.
2. M. DiPasquale, C. A. Francisco, J. Mermin, and J. Schweig, Asymptotic resurgence via integral closures. *Trans. Amer. Math. Soc.* **372** (2019), no. 9, 6655-6676.
3. M. DiPasquale, C. A. Francisco, J. Mermin, J. Schweig, and G. Sosa, The Rees algebra of a two-Borel ideal is Koszul. *Proc. Amer. Math. Soc.* **147** (2019), no. 2, 467-479.
4. C. A. Francisco, J. Mermin, and J. Schweig, Boij-Söderberg and Veronese decompositions. *J. Commut. Algebra* **9** (2017), no. 3, 367-386.
5. C. A. Francisco, J. Mermin, and J. Schweig, LCM lattices supporting pure resolutions. *Proc. Amer. Math. Soc.* **144** (2016), no. 6, 2315-2325.
6. J. Biermann, C. A. Francisco, H. T. Hà , and A. Van Tuyl, Colorings of simplicial complexes and vertex decomposability. *J. Commut. Algebra* **7** (2015), no. 3, 337-352.
7. C. A. Francisco, J. Mermin, and J. Schweig, Catalan numbers, binary trees, and pointed pseudotriangulations. *European J. Combin.* **45** (2015), 85-96.
8. C. A. Francisco, J. Mermin, and J. Schweig, A survey of Stanley-Reisner theory. In *Connections Between Algebra, Combinatorics, and Geometry*, a Springer Proceedings in Mathematics & Statistics (PROMS) volume, edited by S. Cooper and S. Sather-Wagstaff. Vol. 76, 2014, 209-234.
9. C. A. Francisco, J. Mermin, and J. Schweig, Generalizing the Borel property. *J. London Math. Soc.* (2) **87** (2013), 724-740.
10. C. A. Francisco, H. T. Hà, and J. Mermin, Powers of square-free monomial ideals and combinatorics. In *Commutative Algebra: Expository Papers Dedicated to David Eisenbud on the Occasion of His 65th Birthday*, I. Peeva (ed.). Springer, 2013, 373-392.

11. C. A. Francisco, J. Mermin, and J. Schweig, Borel generators. *J. Algebra* **332** (2011), no. 1, 522-542.
12. C. A. Francisco, H. Tài Hà, and A. Van Tuyl, Colorings of hypergraphs, perfect graphs, and associated primes of powers of monomial ideals. *J. Algebra* **331** (2011), no. 1, 224-242.
13. C. A. Francisco, H. Tài Hà, and A. Van Tuyl, Associated primes of monomial ideals and odd holes in graphs. *J. Algebraic Combin.* **32** (2010), no. 2, 287-301.
14. C. A. Francisco, H. Tài Hà, and A. Van Tuyl, A conjecture on critical graphs and connections to the persistence of associated primes. *Discrete Math.* **310** (2010), no. 15-16, 2176-2182.
15. C. A. Francisco, H. Tài Hà, and A. Van Tuyl, Splittings of monomial ideals. *Proc. Amer. Math. Soc.* **137** (2009), no. 10, 3271-3282.
16. D. Edidin and C. A. Francisco, Grassmannians and representations. *J. Commut. Algebra* **1** (2009), no. 3, 381-392.
17. C. A. Francisco, A. Hoefel, and A. Van Tuyl, EdgeIdeals: a package for (hyper)graphs. *J. Softw. Algebra Geom.* **1** (2009), 1-4.
18. C. A. Francisco and H. Tài Hà, Whiskers and sequentially Cohen-Macaulay graphs. *J. Combin. Theory Ser. A* **115** (2008), no. 2, 304-316.
19. C. A. Francisco, Tetrahedral curves via graphs and Alexander duality. *J. Pure Appl. Algebra* **212** (2008), no. 2, 364-375.
20. C. A. Francisco and A. Van Tuyl, Some families of componentwise linear monomial ideals. *Nagoya Math. J.* **187** (2007), 115-156.
21. C. A. Francisco and A. Van Tuyl, Sequentially Cohen-Macaulay edge ideals. *Proc. Amer. Math. Soc.* **135** (2007), no. 8, 2327-2337.
22. C. A. Francisco, J. C. Migliore, and U. Nagel, On the componentwise linearity and the minimal free resolution of a tetrahedral curve. *J. Algebra* **299** (2006), no. 2, 535-569.
23. C. A. Francisco, New approaches to bounding the multiplicity of an ideal. *J. Algebra* **299** (2006), no. 1, 309-328.
24. C. A. Francisco, Resolutions of small sets of fat points. *J. Pure Appl. Algebra* **203** (2005), no. 1-3, 220-236.
25. C. A. Francisco, Almost complete intersections and the Lex-Plus-Powers Conjecture. *J. Algebra* **276** (2004), no. 2, 737-760.
26. C. A. Francisco, Minimal graded Betti numbers and stable ideals. *Comm. Algebra* **31** (2003), no. 10, 4971-4987.

<u>Preprint:</u>

27. C. A. Francisco, M. Mastroeni, J. Mermin, and J. Schweig, Frobenius powers of monomial ideals.

<u>Invited, published papers not individually refereed:</u>

(These two papers were invited contributions to an edited book. The papers were not individually peer-reviewed, but the publisher had the book as a whole refereed.)

28. C. A. Francisco and B. Richert, Lex-plus-powers ideals. In *Syzygies and Hilbert functions*, I. Peeva (ed.), Lect. Notes Pure Appl. Math. **254**, Chapman & Hall/CRC, Boca Raton, FL, 2007, 113-144.
29. C. A. Francisco and H. Srinivasan, Multiplicity conjectures. In *Syzygies and Hilbert functions*, I. Peeva (ed.), Lect. Notes Pure Appl. Math. **254**, Chapman & Hall/CRC, Boca Raton, FL, 2007, 145-178.

Computer packages authored:

30. C. A. Francisco, A. Hoefel, and A. Van Tuyl, EdgeIdeals.
    This is a refereed Macaulay 2 computer algebra package that implements algebraic algorithms for studying graphs and hypergraphs. It is available at https://faculty.math.illinois.edu/Macaulay2/doc/Macaulay2/share/doc/Macaulay2/EdgeIdeals/html/index.html
31. C. A. Francisco, LexIdeals.
    This is a Macaulay 2 computer algebra package enabling users to work with lexicographic and other similar monomial ideals. It is available at https://faculty.math.illinois.edu/Macaulay2/doc/Macaulay2/share/doc/Macaulay2/LexIdeals/html/index.html

Books co-edited:

32. C. A. Francisco, L. Klingler, S. Sather-Wagstaff, and J. Vasseliv, editors, *Progress in Commutative Algebra I: Combinatorics and Homology*. de Gruyter, 2012, 361 pp.
33. C. A. Francisco, L. Klingler, S. Sather-Wagstaff, and J. Vasseliv, editors, *Progress in Commutative Algebra II: Closures, Decompositions, and Factorization*. de Gruyter, 2012, 315 pp.

Funding:

External research funding awarded on which I am a PI:

1. **Simons Foundation Collaboration Grant for Mathematicians**, "Collaborations in Combinatorial Commutative Algebra." Grant number 422465. Provides $35,000 September 1, 2016, to August 31, 2021 (no-cost extensions due to COVID until August 31, 2023). (Sole PI)
2. **Simons Foundation Collaboration Grant for Mathematicians**, "Collaborative Work in Commutative Algebra." Grant number 199124. Provided $35,000 for July 1, 2011, to August 31, 2016. (Sole PI)
3. **National Security Agency Young Investigator Grant**, "Interactions between Commutative Algebra and Combinatorics." Grant number H98230-08-1-0067. Provided $29,998 for April 2008 to April 2010. (Sole PI)

External workshop and conference grants on which I am a PI:

4. **Five-day workshop at Casa Matemática Oaxaca** (BIRS facility in Mexico), "Ordinary and Symbolic Powers of Ideals," co-organized with H. T. Hà and A. Van Tuyl. Workshop number 17w5027, held May 14-19, 2017. Funding for 42 participants.

5. **National Science Foundation Algebra and Number Theory Conference Grant**, "Southwest Local Algebra Meeting 2015," C. A. Francisco, PI; L. Christensen, L. Fouli, J. Mermin, and J. Schweig, co-PIs. Grant number DMS-1502192. Funded for $15,799 for Feb. 15, 2015, to Jan. 31, 2016, to support the conference held at OSU on Feb. 28-Mar. 1, 2015.
6. **Research in Teams Week at the Banff International Research Station (BIRS)**, joint with H. T. Hà and A. Van Tuyl. Provided room, board, and facilities for the three of us to work for a week at BIRS from May 25, 2008, to June 1, 2008. BIRS event number 08rit124.

External grants for instruction:

7. **Schusterman Family Foundation Grant**, $100,000 awarded (in grants of $60,000 and $40,000) to fund a pilot corequisite model for gateway math classes to speed students' paths to graduation and decrease the need for remedial classes. Awarded for 2015-2018. (Written with W. Jaco; he and I received no funds from this grant.)
8. **AT&T Foundation Grant**, $15,000 awarded to fund an enhancement of our corequisite tutoring program in the MLSC and replace six accessible computers in the MLSC lab. (Written with the OSU Foundation. I received no funds from this grant.)

External funding awarded on which I am Senior Personnel:

9. **Senior Personnel on the NSF Major Research Instrumentation Grant**, "MRI: Acquisition of a High Performance Computer Cluster for Multidisciplinary Research," Dana Brunson, PI. Grant number 1126330. Provided $908,812 for September 1, 2011, to August 31, 2014, to purchase and maintain a high-performance computing cluster for the OSU community that I use in my research. (I received no funds from this grant.)

External proposal pending:

10. **Howard Hughes Medical Institute Driving Change Grant**, "Advancing the Land-Grant Mission by Leveraging Strengths and Building Communities to Support Students," K. Baum, Program Director. I am the co-Program Director, and there are six additional Core Team Members. Proposed budget of $2.5 million over five years from 2022 to 2027. Funds would support STEM research experiences for students from historically-excluded groups and inclusive teaching practices. (I would receive no funds from this grant.)

Internal funding awarded:

11. **College of Arts and Sciences Summer Research (ASR) Grant**, Summer 2012. Provided a month of summer salary to work on research with J. Mermin and J. Schweig.
12. **College of Arts and Sciences Travel Grant**, Fall 2011. Provided $985.61 to give a talk at the 2011 Fall American Mathematical Society Central Section Meeting.
13. **Big 12 Faculty Fellowship**, $1,232 to visit the University of Kansas in Spring 2009.
14. **Dean's Incentive Grants**, 2008 and 2009. Provided $3,000 each summer.

Conferences organized:

- Co-organizer (with A. Bhat and J. Mermin), Special Session on Interactions Between Combinatorics and Commutative Algebra at Fall AMS Southeastern Section Meeting in Fayetteville, AR. (Nov. 2018)
- Co-organizer (with H. T. Hà and A. Van Tuyl), Five-day workshop at Casa Matemática Oaxaca (BIRS facility in Mexico), "Ordinary and Symbolic Powers of Ideals." Workshop number 17w5027. (May 2017)
- Co-organizer (with L. Christensen, L. Fouli, D. Jorgensen, J. Mermin, and J. Schweig), Southwest Local Algebra Meeting 2015, held at OSU. (Feb.-Mar. 2015)
- Co-organizer (with H. T. Hà and A. Van Tuyl), Special Session on Combinatorial Commutative Algebra at Fall AMS Southeastern Section Meeting in New Orleans. (Oct. 2012)
- Co-organizer (with J. Mermin and J. Schweig), Special Session on Combinatorial Commutative Algebra at Spring AMS Central Section Meeting in Lawrence, KS. (Mar.-Apr. 2012)
- Co-organizer (with I. Peeva), Special Session on Graded Resolutions at Fall AMS Southeastern Section Meeting in Boca Raton. (Oct.-Nov. 2009)
- Co-organizer (with S. Cooper and B. Richert), Special Session on Hilbert Functions and Free Resolutions at Fall AMS Western Section Meeting in Vancouver. (Oct. 2008)
- Co-organizer (with I. Peeva), Special Session on Resolutions at Fall AMS Western Section Meeting in Eugene. (Nov. 2005)
- Co-organizer (with I. Peeva), Special Session on Syzygies and Hilbert Functions at Spring AMS Southeastern Section Meeting in Tallahassee. (Mar. 2004)

Invited research talks:

- "Unique sets of graded Betti numbers and forbidden cancellations," in the virtual Scientific Session on Commutative Algebra at the Canadian Mathematical Society Winter 2021 Meeting. (Dec. 2021)
- "Studying monomial ideals via posets," an hour-long talk at the Combinatorial Algebra Meets Algebraic Combinatorics conference at Dalhousie University in Halifax, Nova Scotia, Canada. (Jan. 2020)
- "Hilbert functions with a unique set of graded Betti numbers," in the Scientific Session on Commutative Algebra at the Canadian Mathematical Society Winter 2019 Meeting in Toronto. (Dec. 2019)
- "Some new results on asymptotic resurgence," in the Scientific Session on Symbolic and Regular Powers of Ideals at the Canadian Mathematical Society Winter 2018 Meeting in Vancouver. (Dec. 2018)
- "Borel ideals and their surprising appearance in discrete geometry," in the Special Session on Applicable and Computational Algebraic Geometry at the AMS Fall Central Section Meeting in Denton, TX. (Sept. 2017)

- "Borel ideals with two Borel generators and Koszulness," in the Special Session on Combinatorial Commutative Algebra at the Mathematical Congress of the Americas in Montreal. (Jul. 2017)
- "Pure resolutions of monomial ideals," in the Special Session on Commutative Algebra and Its Interaction with Algebraic Geometry at the AMS Spring Central Section Meeting in Fargo. (Apr. 2016)
- "LCM lattices supporting a pure resolution," in the Special Session on Recent Advances in Commutative Algebra at the AMS Fall Southeastern Sectional Meeting in Memphis, TN. (Oct. 2015)
- "Borel ideals and discrete geometry," in the Special Session on Commutative Algebra at the AMS Fall Central Sectional Meeting in Chicago, IL. (Oct. 2015)
- "Some numerical results on decompositions of Betti diagrams," in the Special Session on Commutative Algebra and Its Interactions with Algebraic Geometry at the AMS Fall Eastern Sectional Meeting in Halifax, Canada. (Oct. 2014)
- "Developments on the persistence problem," in the Special Session on Interactions between Commutative Algebra and Algebraic Geometry at the AMS Spring Central Sectional Meeting in Lubbock, TX. (Apr. 2014)
- "Recent work on persistence of associated primes," in the Special Session on Interactions in Commutative Algebra at the AMS Western Spring Sectional Meeting in Albuquerque, NM. (Apr. 2014)
- "Partially whiskering a simplicial complex," in the Special Session on Commutative Algebra at the AMS Fall Central Sectional Meeting in St. Louis, MO. (Oct. 2013)
- "Catalan numbers, binary trees, and pointed pseudotriangulations," in the Special Session on Combinatorial Commutative Algebra at the AMS Fall Southeastern Sectional Meeting in Louisville, KY. (Oct. 2013)
- "Borel ideals, binary trees, and pointed pseudotriangulations," a 50-minute talk at the Interactions between Commutative Algebra and Algebraic Geometry II conference in New Orleans, LA. (Sep. 2013)
- "Connections between monomial ideals and combinatorics" in the Tulane University colloquium. (Apr. 2013)
- "Generalizing the framework of Borel ideals," a 50-minute talk at the Further Connections between Algebra and Geometry conference in Fargo, ND. (Feb. 2013)
- "Generalizing the Borel property," in the Special Session on Commutative Algebra and Algebraic Geometry at the Joint Mathematics Meetings in San Diego, CA. (Jan. 2013)
- "Borel ideals and generalizations," a 50-minute talk at the KUMUNU Algebra Conference in Columbia, MO. (Sep. 2012)
- "Borel ideals and connections to discrete geometry," in the Scientific Session on Interactions Between Algebraic Geometry and Commutative Algebra at the Summer 2012 Canadian Mathematical Society Meeting in Regina. (Jun. 2012)
- "Generalizing the Borel condition," at the AMS Fall 2011 Central Section Meeting in Lincoln, NE. (Oct. 2011)
- "Hypergraph colorings, perfect graphs, and associated primes," in the AMS Spring 2010 Southeastern Section Meeting in Lexington, KY. (Mar. 2010)

- "Edge ideals, cover ideals, and associated primes," a 50-minute talk at the inaugural Southwest Local Algebra Meeting (SLAM) at the University of Texas at Arlington. (Mar. 2010)
- "Detecting properties of graphs via commutative algebra," at the AMS Spring 2008 Central Section Meeting in Bloomington, IN. (Apr. 2008)
- "Detecting odd cycles in graphs via commutative algebra," Macaulay 2 conference in Ithaca. (Mar. 2008)
- "Tetrahedral curves via graphs and Alexander duality," at the AMS Fall Central Section Meeting in Chicago. (Oct. 2007)
- "Cycles and graphs in commutative algebra," in the Oklahoma State math colloquium. (Sep. 2007)
- "Commutative algebra, graphs, and Alexander duality," in the Oklahoma State math colloquium. (Mar. 2007)
- "Commutative algebra, graphs, and Alexander duality," in the UNC-Greensboro math colloquium. (Mar. 2007)
- "Commutative algebra, graphs, and Alexander duality," in the North Dakota State math colloquium. (Feb. 2007)
- "Commutative algebra, graphs, and Alexander duality," in the University of Missouri math colloquium. (Feb. 2007)
- "Commutative algebra, graphs, and Alexander duality," in the Penn State Combinatorics/Partitions Seminar. (Jan. 2007)
- "(Sequentially) Cohen-Macaulay graphs," in the "Syzygies and Hilbert Functions" workshop at the Banff International Research Station (BIRS). (Oct. 2006)
- "Making a graph sequentially Cohen-Macaulay," at the AMS Spring Central Section Meeting at Notre Dame. (Apr. 2006)
- "Sequential Cohen-Macaulayness of edge ideals," at the AMS Spring Southeastern Section Meeting in Miami. (Apr. 2006)
- "Some componentwise linear monomial ideals," at the Joint Mathematics Meetings in San Antonio. (Jan. 2006)
- "Some families of componentwise linear monomial ideals," at the AMS Fall Eastern Section Meeting at Bard College. (Oct. 2005)
- "Fat points and componentwise linear ideals," at the Second Workshop on Resolutions, Inverse Systems, and Coinvariants at the University of Ottawa. (Jan. 2005)
- "Bounds on the multiplicity of an ideal," at the KUMUNU 6 Algebra Day at the University of Kansas. (Oct. 2004)
- "Bounds on the multiplicity of an ideal," at the AMS Fall Southeastern Section Meeting in Nashville. (Oct. 2004)
- "Resolutions of small sets of general fat points," at the Route 81 Conference in Honor of Graham Evans at Cornell University. (Sep. 2004)
- "Some computational work on the Multiplicity Conjecture," at the Route 81 Conference on Commutative Algebra and Algebraic Geometry. (Oct. 2003)
- "Almost complete intersections and the Lex-Plus-Powers Conjecture," at the Route 81 Conference on Commutative Algebra and Algebraic Geometry. (Oct. 2002)
- "The Lex-Plus-Powers Conjecture," at the AMS Spring Eastern Section Meeting in Montreal. (May 2002)

Seminar talks since 2004:

- "Borel ideals and connections to combinatorics," a virtual seminar talk in University of Arkansas Algebra Seminar (Apr. 2021)
- "Upper bounds for Betti numbers for a given Hilbert function," a seminar talk in the OSU Combinatorial and Commutative Algebra seminar (Mar. 2018)
- "Splittings of monomial ideals," a seminar talk in the OSU Combinatorial and Commutative Algebra seminar (Oct. 2017)
- "Ideas arising in work on the Multiplicity Conjectures," a seminar talk in the OSU Combinatorial and Commutative Algebra seminar (Apr. 2017)
- "Edge and cover ideals of graphs," two seminar talks in the OSU Combinatorial and Commutative Algebra Seminar. (Oct.-Nov. 2016)
- "What can Borel ideals teach us about arbitrary monomial ideals?", a seminar talk in the OSU Combinatorial and Commutative Algebra Seminar. (Apr. 2016)
- "Monomial ideals and poset stability conditions," a seminar talk in the McMaster University Algebra Seminar in Hamilton, Ontario, Canada, February 2016.
- "An introduction to Borel ideals," a seminar talk in the OSU Combinatorial and Commutative Algebra Seminar. (Sep. 2015)
- "Generalizing the Borel property," a seminar talk in the Purdue University Commutative Algebra Seminar. (Apr. 2015)
- "Monomial ideals from the perspective of Borel ideals," a seminar talk in the University of Arkansas Algebra Seminar. (Mar. 2015)
- "Syzygies through edge ideals," in the OSU MGSS seminar (Nov. 2013).
- "An algebraic characterization of perfect graphs," in the OSU Algebra & Geometry Seminar. (Nov.-Dec. 2009)
- "Characterizing perfect graphs," in the University of Kansas Algebra Seminar. (May 2009)
- "Graph colorings via commutative algebra," in the University of Kansas Algebra Seminar. (two talks, Mar. 2009)
- "Graphs, colorings, and commutative algebra," in the OSU Algebra & Geometry Seminar. (two talks, Oct. 2008)
- "Studying properties of graphs with commutative algebra," at the University of Missouri Algebra Seminar. (May 2008)
- "Detecting odd cycles in graphs using commutative algebra," at the University of Kansas Algebra Seminar. (Apr. 2008)
- "Componentwise linear ideals," in the OSU Algebra & Geometry Seminar. (two talks, Sep. 2007)
- "A combinatorial approach to tetrahedral curves," in University of Kansas Algebra Seminar. (Apr. 2007)
- "A combinatorial approach to tetrahedral curves," in University of Missouri Algebra Seminar. (Oct. 2006)
- "Edge ideals of graphs and (sequential) Cohen-Macaulayness," in University of Missouri Algebra Seminar. (Feb. 2006)
- "Families of componentwise linear monomial ideals," in University of Kansas Algebra Seminar. (Sep. 2005)

- "Intersections of Veronese ideals," in University of Missouri Algebra Seminar. (Aug. 2005)
- "Some componentwise linear monomial ideals," in University of Illinois at Urbana-Champaign Commutative Ring Theory Seminar. (Apr. 2005)
- "Fat points and componentwise linear ideals," in University of Missouri Algebra Seminar. (Feb. 2005)
- "Multiplicity and resolutions for a given Hilbert function," in University of Missouri Algebra Seminar. (two talks, Sep. 2004)

Referee/Reviewer for:

- *Compositio Mathematica*, *Mathematical Research Letters, Transactions of the AMS, Proceedings of the AMS, Journal of Algebra*, *Journal of Combinatorial Theory, Series A, Journal of Algebraic Combinatorics, Discrete Mathematics, Journal of Pure and Applied Algebra, Electronic Journal of Combinatorics, Advances in Applied Mathematics, Archiv der Mathematik, Illinois Journal of Mathematics, Michigan Mathematical Journal, Contemporary Mathematics, Communications in Algebra, Journal of Algebra and Its Applications, MSRI* special volume, *Springer* special volumes, *Abel Symposium Conference Proceedings, Proceedings of the ALGA 12 conference*, *Rocky Mountain Journal of Mathematics, Journal of Software for Algebra and Geometry, Journal of the Australian Mathematical Society, Journal of Approximation Theory, Australasian Journal of Combinatorics, International Journal of Algebra and Computation, International Electronic Journal of Algebra, Mathematical Reviews*
- Outside reviewer for International Centre for Mathematical Sciences (ICMS) grant program, 2019
- Outside reviewer for the National Security Agency mathematical grant program, 2012, 2013, 2014, 2015
- Reviewer for AMS-Simons Travel Grants, 2015, 2016, 2017
- Outside reviewer for Ph.D. thesis from the Centro de Investigación y de Estudios Avanzados del I. P. N. in Mexico, Sept. 2011
- Outside reviewer for Central Michigan internal grant program, Feb. 2012
- Outside reviewer for Cal Poly internal grant program, Feb. 2007, Feb. 2008

Students advised:

- **Ashwini Bhat** (Ph.D. advisor). Graduated August 2019. Thesis title: "Associated primes and Betti splittings of some generalized Borel ideals."
- **Guillermo Alesandroni** (Ph.D. co-advisor with J. Mermin). Graduated May 2015. Thesis title: "Monomial resolutions."
- **Chase Meadors** (M.S. advisor). Graduated May 2017. Creative component title: "Cohen-Macaulay monomial ideals arising from directed hypergraphs."
- **Burke McCray** (M.S. co-advisor with I. Aberbach). Graduated Dec. 2006.
- **Austin Warner** (Freshman Research Scholars advisor). Title: "Understanding algebraic structures related to graphs." Austin won "honorable mention" (a tie for second place) for his project.

- **Martha Gipson** (Senior Honors Thesis advisor). Thesis title: "Betti numbers of edge ideals of cyclic graphs." Gipson was the Orange Gown Graduate for CAS in 2015.
- **Markus Vasquez** (Wentz undergraduate research project advisor, second reader on Senior Honors Thesis).
- **Ashok Cutkosky** (2008 Siemens and Intel science competitions advisor). Cutkosky was a high school student from Columbia, MO. Ashok won fifth place nationally and $23,000 in scholarships in the Siemens competition and was a semi-finalist in the Intel contest, winning a $1,000 scholarship.
- Ph.D. committee member for Reid Buchanan (in progress), Hoai Dao (in progress), Jorge Dioses, Nishad Mandlik, Melissa Mills, Kedar Nepal, and Ben Wescoatt.
- Master's committee member for Travis Grigsby, Nafiseh Jahanbakht, Scott Larson, Sarah Owens, Heather Ranney, Pengcheng Xu, and Rachael Wood.

Teaching experience since 2004:

At Oklahoma State University:

- Math 6690 (Topics in Algebra), a topics course in Computational and Combinatorial Commutative Algebra, Fall 2016.
- Math 5902 (TA preparation), Fall 2013, Fall 2014, Fall 2015, Fall 2016, Fall 2017 and as an informal class in Spring 2013.
- Math 4623/5013 (master's algebra, second semester), Spring 2010.
- Math 4613/5003 (master's algebra, first semester), Fall 2009.
- Math 3613 (undergraduate abstract algebra), Fall 2011.
- Math 3013 (linear algebra), Spring 2012.
- Math 2890/2910 (Honors add-on), as "Number 'Tricks' in Everyday Life," Fall 2016, Fall 2020.
- Math 2153 (second-semester calculus), Spring 2008, Fall 2009, Fall 2011, Spring 2013, Fall 2019, Fall 2020. Honors section: Spring 2010, Spring 2011, Spring 2012, Fall 2012, Fall 2013, Fall 2014, Fall 2015. Developed library of videos of Calculus II examples for the MLSC prior to the pandemic.
- Math 2144 (first-semester calculus), Fall 2007, Fall 2008, Fall 2010. Honors section: Fall 2008, Fall 2010.
- Math 5010 (readings course): Both with Kenneth Ward. Computational commutative algebra, Summer 2009. Expository project on class field theory, Fall 2011.
- Supervised 14 successful honors contracts.

At the University of Missouri:

- Designed and taught Math 8102, a graduate course on doing research in commutative algebra using the computer algebra system Macaulay 2, Fall 2005.
- Graduate readings course (Math 8085) in computational commutative algebra, Fall 2006.
- Math 4070, a basic abstract algebra course for prospective middle-school teachers, Winter 2007.
- Math 1400 (first-semester biology-oriented calculus), Fall 2005, Fall 2006, Winter 2007.

- Math 1300 (finite math for business majors), Fall 2004, Winter 2005, Winter 2006.

Selected university, college, and professional service at OSU:

- Member, OSU Student Success Council, 2020-present
- Member, University Honors Council, Spring 2014-2021
- Member, Honors College Wentz Scholarship Selection Committee, 2016-present
- Member, Provost's Undergraduate Retention to Graduation Committee, 2017-2019
- Member, Academic Integrity Advisory Group, 2017-2019
- Member, Graduate Dean's Committee on GTA/GRA Background Checks, Spring 2017-2018
- Member, AMS-Simons Travel Grants review committee, 2015-2018
- Member, Provost's Committee on Textbook Affordability, 2015-2018
- Member, Wentz Research Grant Review Committee, 2014-2018
- Reviewer, CAS Regents Distinguished Teaching Award nominees, Spring 2017, Spring 2018
- Member, Honors College Associate Dean Search Committee, 2016-17
- Member, Associate Provost's working group on Academic Integrity, 2015-16
- Member, OSRHE working group on Affordable Content, 2015-16
- Member, ITLE Faculty Teaching Fellows Selection Committee, Spring 2016
- Member, CAS Associate Dean for Research Search Committee, Fall 2014
- Member, University Assessment & Testing Asst. Director Search Committee, Fall 2014
- Reviewer, FY '15 A&S Fall Travel proposals
- Member, Associate Provost's working group on math placement, Spring 2013
- Member, OSU GTA Professional Development Task Force, 2012
- Member, University Academic Integrity Panel, Fall 2013-Summer 2018
- Academic Integrity Facilitator, Fall 2012-Summer 2018

Selected department service at OSU:

- Member, Departmental Advisory Committee, 2011-2018
- Member, Departmental Teaching Awards Committee, 2012-present
- Chair, Committee on Preparation for Calculus, 2016-2018
- Member, Departmental Calculus Committee, 2014-15 (Chair), 2015-2018
- Member, Departmental Cumulative Review Committee, 2017-18
- Coordinator, MLSC Task Force, 2011-14
- Member, Undergraduate Committee, 2011-12
- Member, Departmental Homecoming Committee, 2012
- Member, Department Head Search Committee, Spring 2011, Fall 2011
- Member, Personnel Committee, 2010-11, 2013-14, Chair in 2014-15
- Member, committee to help evaluate performance of MLRC tutors on the calculus qualifying exam, Spring 2011, Fall 2011, Spring 2012
- Member, Algebra Curriculum Review Committee, Fall 2010
- Member, Graduate Committee, 2009-10

- Member, Departmental Public Relations and Website Committee, Spring 2010
- Member, Algebra Comprehensive Exam Committee, 2009-10, 2010-11, 2011-12
- Member, Appointments Committee, 2008-09; Math Ed Appointments, Fall 2013, 2015-16; Clinical Appointments, 2016-17
- Member, Calculus Textbook Selection Committee, Spring 2008, 2014-15
- Member, High School Math Contest Committee, Fall 2007. Graded exams in Fall 2008.