

Michael DiPasquale

CONTACT INFORMATION	Oklahoma State University Department of Mathematics 401 Mathematical Sciences Building Stillwater, OK 74078	Mobile: 217-552-7673 E-mail: mdipasq@okstate.edu WWW: www.math.okstate.edu/~mdipasq
RESEARCH INTERESTS	Computational commutative algebra and algebraic geometry. Emphasis on pure and applied problems which can be approached with the tools of algebraic geometry and commutative algebra.	
EDUCATION	University of Illinois Urbana-Champaign (UIUC) , Urbana, IL Ph.D. , Mathematics, May 2015 <i>Advisor</i> : Professor Hal Schenck <i>Thesis</i> : Splines on Polytopal Complexes Wheaton College , Wheaton, IL B.S. , Mathematics, May 2009	
ACADEMIC APPOINTMENTS	Oklahoma State University , Stillwater, OK <i>Visiting Assistant Professor</i>	August 2015 -
PUBLICATIONS	<ol style="list-style-type: none">1. <i>The Rees Algebra of a Two-Borel Ideal is Koszul</i> (with C. Francisco, J. Mermin, J. Schweig, and G. Sosa), to appear in Proc. Amer. Math. Soc. arXiv:1706.074622. <i>Semialgebraic Splines</i> (with F. Sottile and L. Sun), Comput. Aided Geom. Design 55 (2017), 26-47. arXiv:1604.059473. <i>Dimension of Mixed Splines on Polytopal Cells</i>, to appear in Math. Comp. (DOI: 10.1090/mcom/3224). arXiv:1411.21764. <i>Generalized Splines and Graphic Arrangements</i>, J. Algebraic Combin. (2016), 1-19. arXiv:1606.030915. <i>Associated Primes of Spline Complexes</i>, J. Symb. Comput. (2016), 158-199. arXiv:1410.68946. <i>Lattice-Supported Splines on Polytopal Complexes</i>, Adv. in Appl. Math. 55 (2014), 1-21. arXiv:1312.32947. <i>Shellability and Freeness of Continuous Splines</i>, J. Pure Appl. Algebra. 216 (2012), 2519-2523.8. <i>Asymptotic Connectivity of Hyperbolic Planar Graphs</i> (with P. Bahls), Discrete Math. 310 (2010), 3462-3472.9. <i>On the Order of a Group Containing Nontrivial Gassmann Equivalent Subgroups</i>, Rose-Hulman Undergraduate Mathematics Journal 10, Issue 1 (2009).	
UNDER REVIEW	<ol style="list-style-type: none">10. <i>Free and Non-free Multiplicities on the A_3 Arrangement</i> (with C. Francisco, J. Mermin, and J. Schweig) arXiv:1609.0033711. <i>Inequalities for Free Multi-Braid Arrangements</i> arXiv:1705.0240912. <i>Free Multiplicities on the Moduli of X_3</i> (with M. Wakefield) arXiv:1707.03961	
AMS-SIMONS TRAVEL GRANT	\$4,000 over 2-3 years for travel to support collaborative research	07/2015-07/2018
CONFERENCE PRESENTATIONS	<ol style="list-style-type: none">1. <i>The Toric Ring of a Two-Borel ideal is Koszul</i> AMS-MAA Joint Mathematics Meetings, San Diego, CA <i>AMS Special Session on Combinatorial Commutative Algebra and Polytopes</i>2. <i>Freeness of Multi-Coxeter Arrangements of type A</i> AMS Sectional Meeting, Denton, TX <i>Special Session on Algebraic Combinatorics of Flag Varieties</i>	01/2018 09/2017

3. *Splines on planar semi-algebraic partitions* 09/2017
AMS Sectional Meeting, Denton, TX
Special Session on Applicable and Computational Algebraic Geometry
4. *Algebraic Methods in Spline Theory* 08/2017
SIAM Conference on Applied Algebraic Geometry, Atlanta, GA
Minisymposium on Multivariate Splines and Algebraic Geometry
5. *Multi-derivations on the moduli of the X_3 arrangement* 04/2017
AMS Sectional Meeting, Pullman, WA
Special Session on Combinatorial and Computational Commutative Algebra and Algebraic Geometry
6. *Splines on Tetrahedral Decompositions* 05/2016
15th International Conference on Approximation Theory, San Antonio, TX
Minisymposium on Approximation Theory and Algebraic Geometry
7. *Generalized Splines and Graphic Multi-Arrangements* 10/2015
AMS Sectional Meeting, Chicago, IL
Special Session on Combinatorial and Computational Algebra
8. *Piecewise Polynomials and Regularity* 04/2015
Mathematisches Forschungsinstitut Oberwolfach, Germany
Workshop on Multivariate Splines and Algebraic Geometry
9. *Castelnuovo-Mumford Regularity of Mixed Spline Spaces* 01/2015
AMS-MAA Joint Mathematics Meetings, San Antonio, TX
Session on Commutative Algebra
10. *Regularity of Planar Splines* 04/2014
AMS Sectional Meeting, Lubbock, TX
Special Session on Commutative Algebra and Algebraic Geometry
11. *Regularity and Piecewise Polynomial Functions* 04/2014
KUMUNU jr, Lincoln, NE
12. *Local Properties of Splines* 03/2014
Southwest Local Algebra Meeting, College Station, TX
Graduate Student Poster Session
13. *Lattice-Supported Splines on Polytopal Complexes* 01/2014
AMS-MAA Joint Mathematics Meetings, Baltimore, MD
AMS Special Session on Hyperplane Arrangements and Applications
14. *Lattice-Supported Bases for Polyhedral Splines* 08/2013
SIAM Conference on Applied Algebraic Geometry, Fort Collins, CO
Session on Approximation Theory, Geometric Modeling, and Algebraic Geometry
15. *Bivariate Continuous Splines on Polyhedral Complexes* 04/2013
14th International Conference on Approximation Theory, San Antonio, TX
Minisymposium on Multivariate Splines
16. *Shellability and Freeness of Continuous Splines* 10/2012
AMS Sectional Meeting, Tulane, LA
Special Session on Approximation Theory, Geometric Modelling, and Algebraic Geometry
17. *Exploring Gassmann Triples* 01/2009
AMS-MAA Joint Mathematics Meetings
Undergraduate Student Poster Session (\$100 prize)

SEMINAR &
COLLOQUIUM
TALKS

1. *Homological Obstructions to Freeness of Multi-Arrangements* 10/2017
Geometry Seminar, Texas A&M University, College Station, TX
2. *The Best Way to Divide up a Cheese* 10/2017
High School Math Day, Oklahoma State University, Stillwater OK
3. *Free Multi-Braid Arrangements and Resolutions* 03/2017
Algebra Seminar, University of Arkansas, Fayetteville, AK

4. *The Pizza Cutting Problem* 02/2017
Stillwater High School Math Seminar, Stillwater High School, Stillwater, OK
5. *Dimensions of Spline Spaces and Commutative Algebra* 11/2016
Colloquium, Towson University, Towson, MD
6. *Two Tales of Freeness* 11/2016
Colloquium, US Naval Academy, Annapolis, MD
7. *Multi-Derivations of Braid Arrangements* 09/2016
Combinatorics Seminar, University of Kansas, Lawrence, KS
8. *Piecewise Polynomials and Algebraic Geometry* 04/2016
Colloquium, University of Idaho, Moscow, ID
9. *Semialgebraic Splines* 03/2016
Valley Geometry Seminar, University of Massachusetts, Amherst, MA
10. *Counting Piecewise Linear Functions* 03/2016
Center for Women in Mathematics, Smith College, Northampton, MA
11. *Commutative Algebra meets Approximation Theory* 11/2015
Numerical Analysis Seminar, Oklahoma State University, Stillwater, OK
12. *Commutative Algebra and Approximation Theory* 09/2015
Colloquium, Oklahoma State University, Stillwater, OK
13. *Splines, Syzygies, and Freeness* 09/2015
Algebra Seminar, Oklahoma State University, Stillwater, OK
14. *Regularity of Planar Splines* 09/2015
Geometry Seminar, Texas A&M University, College Station, TX
15. *Algebraic Geometry and Approximation Theory* 02/2015
Colloquium, University of South Florida, Tampa, FL
16. *Jumping Dimensions and Projecting Polytopes* 12/2014
Colloquium, Bradley University, Peoria, IL
17. *Associated Primes of Complexes Arising in Approximation Theory* 11/2014
Commutative Algebra Seminar, UIUC
18. *Castelnuovo-Mumford Regularity in Approximation Theory* 11/2014
Algebraic Geometry Seminar, UIUC
19. *Continuous Piecewise Polynomials and Static Equilibrium* 10/2014
Rose-Hulman Mathematics Seminar, Terra-Haute, IN
20. *Lehmer's Picturesque Exponential Sums with a Twist (with Daniel Schultz)* 02/2010
Number Theory Seminar, UIUC

- WORKSHOPS ATTENDED
- Macaulay 2 workshop** on coding in the computer algebra system Macaulay2 07/2017
Berkeley, CA
 - CMO workshop** on Ordinary and Symbolic Powers of Ideals 05/2017
Oaxaca, Mexico
 - Macaulay2 workshop** on coding in the computer algebra system Macaulay2 05/2015
Boise, ID
 - MFO workshop** on Multivariate Splines and Algebraic Geometry 04/2015
Oberwolfach, Germany
 - MSRI workshop** on Combinatorial Commutative Algebra 12/2012
San Francisco, CA
 - IMA summer school** in Applied Algebraic Geometry at Georgia Tech 06-07/2012
Atlanta, GA

- FUNDED AWARDS
- Bourgin Fellowship**, UIUC Spring 2013
 - REGS Summer Fellowships**, UIUC Summer 2009-2013
 - REU Summer Fellowships**, UNC Asheville & LSU Summer 2008-2009

CONFERENCE- SPECIFIC GRANTS	Supported Participant	05/2017
	at CMO Workshop on Symbolic and Ordinary Powers in Oaxaca, Mexico	
	Oberwolfach Leibniz Graduate Students grant	04/2015
	to attend MFO workshop in Oberwolfach, Germany	
	AMS Student Travel Grant	04/2014
	for presentation at AMS Sectional Meeting at Texas Tech	
	AMS Student Travel Grant	01/2014
	for presentation at AMS-MAA Joint Mathematics Meetings	
	Student Travel Award	08/2013
	for presentation at SIAM Conference on Applied Algebraic Geometry	
Travel Award	04/2013	
for presentation at 14th International Conference on Approximation Theory		
Supported Participant	12/2012	
at MSRI Workshop on Combinatorial Commutative Algebra		
AMS Student Travel Grant	10/2012	
for presentation at the AMS Sectional Meeting at Tulane		
Supported Participant	06-07/2012	
at IMA summer school in Applied Algebraic Geometry at Georgia Tech		

TEACHING
EXPERIENCE

Oklahoma State University, Stillwater, OK

Instructor for Calculus I ⁵	Fall 2015, Spring 2016, Fall 2016, Fall 2017
Instructor for Introduction to Real Analysis ³	Spring 2017

University of Illinois Urbana-Champaign, Urbana, IL

Instructor for A Mathematical World ³	Fall 2014
Instructor for College Algebra ^{3,4}	Fall 2013
Head Teaching Assistant for Calculus III	Fall 2011, Spring 2012, Fall 2012 ¹ , Spring 2015
Teaching Assistant for Calculus III ¹	Spring 2011
Merit Workshop Instructor for Calculus I ²	Fall 2010
Teaching Assistant for Calculus II ¹	Spring 2010
Grader for Differential Equations	Spring 2010
Teaching Assistant for Calculus I	Fall 2009

¹ Appeared on the *List of Teachers Ranked as Excellent* by their students.

² Created worksheets for and led 2 hour group-oriented workshops twice each week.

³ Instructor of record with full course responsibilities, including writing exams.

⁴ Course intended for students of historically underrepresented backgrounds.

⁵ Instructor of record with full course responsibilities, except writing exams.

Wheaton College, Wheaton, IL

Teaching Assistant for Analysis I	Fall 2008
Teaching Assistant for Algebra I	Spring 2008
Teaching Assistant for Discrete Mathematics	Spring 2007

OTHER
ACTIVITIES

Co-author (with Gwyneth Whieldon, Eliana Duarte, and Daniel Bernstein) of the Macaulay2 package <i>AlgebraicSplines</i>	
Mentor in the Illinois Geometry Lab	Spring 2014, Fall 2014
<i>Co-led undergraduate research on minimal energy configurations of particles.</i>	
Teaching mentor for junior graduate students	Fall 2013
<i>Mentored several first-year graduate students, visited classes and offered teaching feedback.</i>	
Organized reading seminar on <i>The Geometry of Syzygies</i>	Fall 2011, Spring 2012

ACADEMIC
SERVICE

Co-organizer (with Frank Sottile)

Minisymposium on Multivariate Splines and Algebraic Geometry at the SIAM conference on Applied Algebraic Geometry in Atlanta, GA, August 2017.

Co-organizer (with Tatyana Sorokina)

Minisymposium on Approximation Theory and Algebraic Geometry at the 15th International Conference on Approximation Theory in San Antonio, TX, May 2016.

Guest Referee

*Constructive Approximation, Computer-Aided Geometric Design,
Journal of Algebraic Combinatorics, Graphs and Combinatorics,
Proceedings of 15th International Conference on Approximation Theory*

Reviewer

Zentralblatt MATH, Mathematical Reviews

REFERENCES

Hal Schenck
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Frank Sottile
Texas A&M University
sottile@math.tamu.edu

Michael Stillman
Cornell University
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Chris Francisco
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