Robert T. Davis

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Education

University of Kentucky, Lexington, KY

- Ph.D., Mathematics, May 2015 (anticipated)
  - Dissertation Topic: Unimodality Questions in Ehrhart Theory
  - Advisor: Benjamin Braun
- M.A., Mathematics, May 2012

Susquehanna University, Selinsgrove, PA

- B.A., Magna cum Laude, Mathematics, May 2010

Research

Research Interests:

- Discrete geometry, algebraic combinatorics

Publications:

- "Ehrhart Series of Polytopes Related to Symmetric Doubly-Stochastic Matrices," submitted. Available at arXiv:1409.2742.
- "Ehrhart Series, Unimodality, and Integrally Closed Reflexive Polytopes," with Benjamin Braun, submitted. Available at arXiv:1403.5378.
- "Compositions Constrained by Graph Laplacian Minors," with Benjamin Braun, Ashley Harrison, Jessica McKim, Jenna Noll, and Clifford Taylor. *INTEGERS*, 13 (2013), A41.

Awards and Fellowships

External Awards

- Fulbright U.S. Student Award, Fall 2013 – Spring 2014

University of Kentucky, Lexington, KY

- Mathematics Fellowship, Spring 2013 and Spring 2014
- Dissertation Enhancement Award, Summer 2013
- Daniel R. Reedy Quality Achievement Fellowship Award, Fall 2010 – Spring 2013

Invited Presentations

San Francisco State University, San Francisco, California

- "Integrally Closed Polytopes and an Application to Symmetric Magic Squares" AMS Sectional Meeting, Fall 2014

Free University of Berlin, Berlin, Germany

- "Ehrhart Series, Unimodality, and Integrally Closed Reflexive Simplices" Discrete Geometry seminar, Spring 2014

Royal Institute of Technology (KTH), Stockholm, Sweden

- "Examining the Ehrhart Series of Reflexive Polytopes" Combinatorics seminar, Fall 2013

Primary Instructor: Duties included designing syllabi, writing and grading homework and exams, lecturing and leading class discussions, and holding office hours.

- *Math 322, Matrix Algebra and its Applications*, University of Kentucky, Spring 2015
- *Math 109, College Algebra*, University of Kentucky, Fall 2014
- *Math 111, Introduction to Contemporary Mathematics*, University of Kentucky, Spring 2012, Spring 2013

Recitation Leader: Duties included leading recitation sections, grading quizzes and exams, and holding office hours.

- *Math 114, Calculus II*, University of Kentucky, Fall 2011
- *Math 113, Calculus I*, University of Kentucky, Spring 2011, Fall 2012
- *Math 110, Precalculus*, University of Kentucky, Fall 2010

Additional Experience: Duties included grading quizzes, organizing group projects, and assisting the primary instructor with lecturing

- *Math 330, History of Mathematics*, University of Kentucky, Spring 2013

Contributed Presentations

Joint Mathematics Meetings, San Antonio, Texas

- "Integrally Closed Polytopes and an Application to Symmetric Magic Squares," Winter 2015

University of Jyväskylä, Jyväskylä, Finland

- "Magic Squares and Geometry: The Difficulty of Counting" Fulbright seminar, Spring 2014

Aalto University, Espoo, Finland

- "Ehrhart theory and Unimodal Sequences," Algebra and combinatorics seminar, Fall 2013

University of Minnesota, Minneapolis, Minnesota

- "Unimodality of h^*-vectors for Lattice Polytopes," Graduate Student Combinatorics Conference, Minneapolis, MN, Spring 2013

University of Illinois, Urbana-Champaign, Illinois

- "Compositions Constrained by Graph Laplacian Minors," Graduate Student Combinatorics Conference, Urbana, Indiana, Spring 2012

University of Kentucky, Lexington, Kentucky

- "Gelfand-Tsetlin Polytopes," Graduate Student Colloquium, Fall 2014
- "Integrally Closed Polytopes and an Application to Symmetric Magic Squares," Discrete CATS Seminar, Fall 2014
- "Examining the Ehrhart Series of Reflexive Polytopes," Discrete CATS Seminar, Spring 2014
- "A Generalization of a Combinatorial Theorem of Macaulay," Course on algebraic geometry, Spring 2013
- "Unimodality of h^*-vectors," Discrete CATS Seminar, Spring 2013
- "Lattice Polytopes and their h^*-vectors," Graduate Student Colloquium, Spring 2013
- "The h^*-vector of Gorenstein Polytopes with Regular, Unimodular Triangulations," (Qualifying Exam) Discrete CATS Seminar, Fall 2012
- "(Some of) The Magic Behind Magic Squares," Graduate Student Colloquium, Fall 2012
- "Simplicial Alexander Duality," Course on Schubert varieties, Spring 2012

- "Mahonian Partition Identities via Polyhedral Geometry," (Master's Exam) Discrete CATS Seminar, Fall 2011

Outreach

Math Circle Assistant, September 2011
- Math Circles brings students from local K-12 schools together to learn about topics not typically encountered in their mathematics classes. There is an emphasis on developing a mathematical interest and creating a dialogue among the students.

Conferences and Workshops Attended

Applications of Real Algebraic Geometry, Espoo, Finland, February 27 – March 2, 2014
Joint Meetings of the AMS and MAA
- San Antonio, TX, January 10–13, 2015
- Baltimore, MD, January 15–18, 2014
- Washington, D.C., January 5–8, 2009

Graduate Student Combinatorics Conference
- Lexington, KY, March 27–29, 2015 (upcoming)
- Minneapolis, MN, April 19–21, 2013
- Urbana, IL, April 13–15, 2012

Triangle Lectures in Combinatorics
- High Point, NC, October 4, 2014
- Winston-Salem, NC, February 9, 2013
- Raleigh, NC, September 22, 2012

AMS Sectional Meetings
- San Francisco, CA, October 25–26, 2014
- Akron, OH, October 20–21, 2012

Algebraic Geometry for Applications, Atlanta, GA, June 17–July 6, 2012
- IMA summer program for graduate students

MAA Mathfest, Lexington, KY, August 4–6, 2011
SIAM Regional Applied Mathematics Conference, Shippensburg, PA, March 20, 2010

Professional Memberships

American Mathematical Society, Member, Fall 2010 – present

References

Matthias Beck, San Francisco State University, `mattbeck@sfsu.edu`
Benjamin Braun, University of Kentucky, `benjamin.braun@uky.edu`
Alex Engström, Aalto University, `alexander.engstrom@aalto.fi`
Carl Lee, University of Kentucky, `lee@ms.uky.edu`
Uwe Nagel, University of Kentucky, `uwe.nagel@uky.edu`