

# Jeffrey Mermin Curriculum Vitae

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## Education:

- Ph.D., Mathematics, Cornell University, May 2006.
- B.S., Mathematics, Duke University, May 2000.

## Employment:

- NSF Mathematical Sciences Postdoctoral Fellow, Kansas University, 2007-present
- Assistant Professor of Mathematics, Kansas University, 2006-2007.
- Graduate Student in Mathematics, Cornell University, 2000-2006.  
*Advisors: Irena Peeva, Michael Stillman*
- Mathematician at the National Security Agency, Summer 2001
- Intern at the National Security Agency, Director's Summer Program, Summer 1999

## Research Interests:

- Primary research interest: Commutative algebra.
- Other research interests: Algebraic geometry, computational algebra.

## Publications:

- J. Mermin, S. Murai: The Lex-Plus-Powers conjecture holds for pure powers, submitted.
- J. Mermin: Compressed ideals, *Bull. London Math. Soc.* **40** (2008), 77–87.
- J. Mermin, I. Peeva, M. Stillman, Ideals containing the squares of the variables, *Adv. Math* **217** (2008), 2206–2230.
- J. Mermin, I. Peeva: Hilbert functions and lex ideals, *J. Algebra* **313** (2007), 642–656.
- J. Mermin: Monomial regular sequences, submitted.
- J. Mermin, I. Peeva: Lexifying ideals, *Math. Res. Letters* **13** (2006), 409–422
- J. Mermin: Lexlike sequences, *J. Algebra* **303** (2006), 295–308.

- S. Malone, J. Mermin, D. Neill: Air Traffic Control, *UMAP Journal* **21.3** (2000), 241–256.
- J. Mermin, W. G. Mitchener, J. Thacker, Alternatives to the Grade Point Average for Ranking Students, *UMAP Journal* **19.3** (1998), 279–298.

### **Fellowships, scholarships, and teaching:**

- NSF VIGRE Graduate Fellow, 2000-2003
- Recitation instructor for Math 294 at Cornell, a linear algebra course, Fall 2001 and Fall 2002
- Grader for Math 631 and 632 at Cornell, the graduate abstract algebra sequence, Fall 2003-Spring 2004
- Graduate Research Assistantship, Cornell University, Fall 2004
- Instructor for Math 112 at Cornell, a second-semester calculus course, Spring 2005
- Graduate Research Assistantship, Cornell University, Fall 2005
- Grader for Math 632 at Cornell, a graduate algebra course, Spring 2006
- Instructor for Math 115 at Kansas, a first-semester calculus course, Fall 2006.
- Instructor for Math 116 at Kansas, a second-semester calculus course, Spring 2007.
- NSF Postdoctoral Fellow, 2007-2009

### **Invited talks:**

- “The Eliahou-Kervaire resolution is cellular” at the AMS Fall Central Section Meeting in Chicago, October 2007.
- “Hilbert functions and Lex ideals” at KUMUNU VII in Lawrence, November 2006.
- “Compression” at the AMS Spring Western Section Meeting in San Francisco, April 2006.
- “Compression” at the AMS Spring Southeastern Section Meeting in Miami, April 2006.
- “Compression” at the Joint Meetings in San Antonio, January 2006.
- “Ideals containing the squares of the variables” at the Union College Conference in Schenectady, November 2005.
- “Ideals containing the squares of the variables” at the AMS Fall Western Section Meeting in Eugene, November 2005.
- “The Eisenbud-Green-Harris Conjecture for ideals containing a regular sequence of monomials” at the Route 81 Conference, Kingston, October 2005.

- “Ideals containing the squares of the variables” at the AMS Fall Eastern Section Meeting in Annandale-on-Hudson, October 2005.
- ”Lexifying Ideals” at the AMS Fall Southeastern Section Meeting in Nashville, October 2004.
- “Hilbert Functions”, at the workshop on resolutions, Cornell, October 2004.
- “Air Traffic Control” at MITRE corp., MacLane, VA, May 2001.
- “Grade Inflation” at the MCM special session at Mathfest in Toronto, July 1998.

### **Seminar Talks:**

- “The Lex-Plus-Powers Conjecture” in the Purdue Commutative Algebra Seminar, March 2008.
- “The Lex-Plus-Powers Conjecture” in the Cleveland State Algebra Seminar, March 2008.
- “Progress on the Lex-Plus-Powers Conjecture” in the Nebraska Commutative Algebra Seminar, November 2007.
- “Hilbert functions” in the Oklahoma State Algebra Seminar, November 2007.
- “The Eliahou-Kervaire Resolution” in the Kansas Commutative Algebra Seminar, September 2007.
- “The Lex-Plus-Powers conjecture” in the Kansas Commutative Algebra Seminar, May 2007.
- “Hilbert Functions” in the Kansas Commutative Algebra Seminar, September 2006.
- “The Eliahou-Kervaire resolution is cellular” in the Cornell Computational and Commutative Algebra Seminar”, February 2006.
- “Compressed ideals” in the Cornell Computational and Commutative Algebra Seminar”, February 2006.
- “The Eisenbud-Green-Harris Conjecture for ideals containing a regular sequence of monomials” in the Cornell Computational and Commutative Algebra seminar, October 2005.
- “Ideals containing the squares of the variables” in the Cornell Computational and Commutative Algebra seminar, October 2005.
- “Monomial regular sequences” in the Cornell Computational and Commutative Algebra seminar, April 2005.
- “A short proof of Macaulay’s theorem” in the Cornell Computational and Commutative Algebra Seminar, March 2005
- “Introduction to Hilbert functions” in the Cornell Number Theory and Algebraic Geometry Seminar, March 2005

- “Lexifying Ideals” in the Cornell Computational and Commutative Algebra Seminar, September 2004

### **Minicourses given at Cornell Number Theory and Algebraic Geometry Seminar:**

- “Basic Algebraic Geometry”, Fall 2005, (biweekly talks)
- “Toric Varieties”, Fall 2004 (biweekly talks from Fulton, *Introduction to Toric Varieties*)
- “Basic Algebraic Geometry”, Summer 2004, (5 talks)
- “Elliptic Curves”, Fall 2003, Spring 2004 (biweekly talks from Silverman, *The Arithmetic of Elliptic Curves*)
- “Schemes”, Fall 2002, Spring 2003 (biweekly talks from Hartshorne, *Algebraic Geometry*)
- “Local Fields”, Fall 2001, Spring 2002 (biweekly talks from Serre, *Local Fields*)

### **Awards:**

The Eleanor Norton York award, 2004

The Mathematical Contest in Modeling is a 4-day event in which about 500 three-person teams from undergraduate institutions around the world produce papers addressing real-world mathematical problems. Five to ten of these papers are designated as “outstanding” and published in the UMAP Journal. I was a member of an outstanding team twice: in 1998 and 2000.

### **Conferences Attended**

- AMS Math Research Communities workshop on Computational Algebra and Convexity, June 2008.
- A Macaulay 2 Conference, Ithaca, NY, March 2008.
- Workshop on Resolutions in Ithaca, NY, March 2008.
- Advances in Algebra and Geometry at MSRI, May 2007.
- Syzygies and Hilbert Functions, Banff International Research Meeting, Canada, October 2006.
- AMS Summer school on Local Cohomology in Snowbird, UT, June 2005.

### **Workshops taught**

- Summer School on Free Resolutions (with Irena Peeva and Mauricio Velasco) in Ithaca, New York, May 2006.

### **Referee for**

- Rocky Mountain Journal of Mathematics, Proceedings of the AMS, Journal of Commutative Algebra, Transactions of the AMS.

### **Other Math-related activities:**

- Ithaca High School Senior Seminar, a post-calculus enrichment program for seniors at Ithaca High (Ithaca, NY)
  - Designed and taught a six-week minicourse on voting theory, November-December 2005
  - Designed and taught a six-week minicourse on continued fractions, September-October 2004
  - Designed and taught a six-week minicourse on cryptology, November-December 2002
- Chapel Hill High School Math Club (Chapel Hill, NC)
  - “Baseball, Euclid, and continued fractions”, an invited expository talk, October 2004
  - “The Vigenere Cipher”, an invited expository talk, January 2003
- “What is  $e$ ”, an invited expository talk at the Cornell Educator Professional Development Day, March 2006.
- “Continued Fractions”, an invited expository talk at Cornell Mathematics Outreach Saturday Workshops for Teachers, November 2004