

MANOJ KUMMINI
Curriculum Vitæ

Chennai Mathematical Institute
SIPCOT IT Park
Siruseri, Tamilnadu 603103. INDIA.

Ph: +91-44-2747 0226.
E-mail: mkummini@cmi.ac.in
URL: <http://www.cmi.ac.in/~mkummini/>

Education

- Ph. D., University of Kansas, Lawrence, KS. Advisor: C. Huneke. Aug 2008. Dissertation: *Homological Invariants of Monomial and Binomial Ideals*.
- M. A. (Mathematics), University of Kansas, Lawrence, KS. Aug 2005.
- M. E. (Telecommunication Engineering), Indian Institute of Science, Bangalore, India. Jan 2002.
- B. Tech. (Electronics and Communication Engineering), University of Calicut, India. Mar 1999.

Work Experience

- Assistant Professor, Chennai Mathematical Institute. Jun 2011 — .
- Research Assistant Professor, Purdue University, West Lafayette, IN. Aug 2008 — May 2011.
- Graduate Teaching Assistant, University of Kansas, Lawrence, KS. Aug 2003 – Aug 2008.
- Texas Instruments India, Bangalore, India. Senior Design Engineer, Jan – Jul 2003. Design Engineer, Feb 2002 – Jan 2003.
- Sasken Communication Technologies, Bangalore, India. Software Engineer, Apr 1999 – Jul 2000.

Publications

(Available at http://arxiv.org/a/kummini_m_1)

- [1] (with C. Berkesch, D. Erman, and S. Sam.) *Tensor complexes: Multilinear free resolutions constructed from higher tensors* (2011), arXiv:1011.4604 [math.AC]
- [2] (with U. Walther.) *Étale cohomological dimension, a conjecture of Lyubeznik and bounds for arithmetic rank* (2010), arXiv:1011.6648v1 [math.AC]
- [3] (with C. Berkesch, D. Erman, and S. Sam.) *Poset structures in Boij–Söderberg theory* (2010), arXiv:1010.2663 [math.AC]
- [4] (with K. Dalili.) *Dependence of Betti numbers on characteristic* (2010), arXiv:1009.4243v1 [math.AC]
- [5] (with G. Caviglia.) *Poset embeddings of Hilbert functions* (2010), arXiv:1009.4488v1 [math.AC]
- [6] (with S. Murai.) *Regularity of canonical and deficiency modules for monomial ideals* (2010), to appear in Pacific J. Math.
- [7] (with M. Basavaraju and L. S. Chandran.) *d-regular graphs of acyclic chromatic index at least $d + 2$* , J. Graph Theory **63** (2010), 226–230
- [8] *Regularity, depth and arithmetic rank of bipartite edge ideals*, J. Algebraic Combin. **30** (2009), 429–445
- [9] (with G. Caviglia.) *Some ideals with large projective dimension*, Proc. Amer. Math. Soc. **136** (2008), 505–509 (electronic)
- [10] *Alexander duality and Serre’s property (S_i) for square-free monomial ideals* (2007), preprint
- [11] *Multiplicity bounds for quadratic monomial ideals* (2007), arXiv:0707.1311v2 [math.AC]
- [12] (with G. Thiagarajan.) *The effect of sampling jitter in OFDM systems*, Proc. IEEE Intern. Conf. Commun., 2061–2065 (2003)
- [13] (with B. S. Rajan.) *Full Rank Distance Codes and Optimal STBC for BPSK Modulation*, Proc. IEEE Intern. symp. on Inform. Theory, 276 (2002)

Talks

- *Lectures on local cohomology (in four parts)*, Workshop on local cohomology, Mumbai, India. July 2011.
- *Multilinear free resolutions from higher tensors*, AMS Spring Central Section meeting, Iowa City, IA. March 2011.
- *Multilinear free resolutions from higher tensors*, University of Illinois, Urbana, IL. March 2011.

- *On a conjecture of Lyubeznik on etale cohomological dimension*, University of Nebraska, Lincoln, NE. January 2011.
- *Bounds for arithmetic rank*, Joint Mathematics Meetings, New Orleans, LA. January 2011.
- *Poset structures in Boij–Söderberg theory: II - Supernatural sheaves*, AMS Fall Central Section meeting, South Bend, IN. November 2010.
- *Dependence of Betti numbers on characteristic*, University of Kentucky, Lexington, KY. October 2010.
- *Bounds for arithmetic rank of monomial ideals*, University of Notre Dame, South Bend, IN. October 2010.
- *Poset structures in Boij–Söderberg theory and homomorphisms of Cohen–Macaulay modules*, University of Missouri, Columbia, MO. September 2010.
- *Degree sequences and homomorphisms of Cohen–Macaulay modules*, University of Illinois, Urbana, IL. September 2010.
- *Poset Embeddings of Hilbert Functions*, Università degli Studi di Genova, Genova, Italy. June 2010.
- *Poset Embeddings of Hilbert Functions*, University of California, Berkeley, CA. May 2010
- *Poset Embeddings of Hilbert Functions*, AMS Spring Western Section meeting, Albuquerque, NM. April 2010.
- *Regularity of Ext Modules*, algebra seminar, Texas Tech University, Lubbock, TX. April 2010.
- *Arithmetic Rank of Ideals*, colloquium, Texas Tech University, Lubbock, TX. April 2010.
- *Regularity of Canonical and Deficiency modules for Monomial Ideals*, AMS Spring Southeastern Sectional meeting, Lexington, KY. March 2010.
- *Arithmetic Rank of Monomial Ideals*, AMS Fall Central Sectional meeting, Waco, TX. October 2009.
- *Arithmetic Rank of Monomial Ideals*. Purdue-UIUC Algebra, Geometry, Combinatorics Day, UIUC, Urbana, IL. September 2009.
- *Solving Polynomial Equations Using Gröbner Bases*, Undergraduate colloquium, Fairfield University, Fairfield, CT. November 2008.
- *Homological invariants of bipartite edge ideals*, commutative algebra seminar, CUNY, New York, NY. November 2008.
- *Free resolutions of quadratic monomial ideals*, commutative algebra seminar, University of Nebraska, Lincoln, NE. March 2008.
- *Multiplicity Bounds for Quadratic Monomial Ideals*, Joint Mathematics Meetings, San Diego, CA. January 2008.
- *Multiplicity Conjectures*, seminar, Indian Institute of Science, Bangalore, India. July 2007.
- *Multiplicity Conjectures*. Graduate Student Research Conference On Algebra And Representation Theory, Kansas State University, Manhattan, KS. May 2006.
- *Some Ideals with Large Projective Dimension*, Cornell University, Ithaca, NY. May 2006.
- *Some Ideals with Large Projective Dimension*, Joint Mathematics Meetings, San Antonio, January 2006.

Workshops and Conferences

Workshops.

- *Applications of Schubert Calculus*, Iowa City, IA. March 2011.
- *Local Rings and Local Study of Algebraic Varieties*, ICTP, Trieste, Italy. July 2010.
- Pan American Study Institute in Commutative Algebra and its Connections to Geometry, Olinda, Brazil. August 2009.
- American Mathematical Society Mathematical Research Communities Workshop, *Computational Algebra and Convexity*, Snowbird, UT. June 2008.
- Workshop on *Commutative Algebra and Algebra Geometry*, Indian Institute of Technology, Chennai, India. June 2007.
- Workshop on *Advances in Algebra and Geometry*, Mathematical Sciences Research Institute, Berkeley, CA. January 2010 and May 2007.
- Workshop on *Syzygies and Hilbert Functions*, Banff International Research Station, Banff, AB. October 2006.
- Workshop on *Computational and Combinatorial Algebra*, Fields Institute, Toronto, ON. July-August 2006.
- Summer school on *Valuation Theory and Integral Closure*, University of Ottawa, Ottawa, ON. July 2006.
- Workshop on *Monomial Resolutions and Hilbert Functions*, Cornell University, Ithaca, NY. May 2006.

- Summer school on *Local Cohomology and Its Applications*, Snowbird, UT. June 2005.
- Summer school on *Interactions between and Homotopy Theory and Commutative Algebra*, University of Chicago, Chicago, IL. July-August 2004.
- Workshops on Macaulay2. Cornell University, Ithaca NY. March 2008. Mathematical Sciences Research Institute, Berkeley, CA. May 2005.

Conferences.

- Purdue-UIUC Algebra, Geometry, Combinatorics Day. West Lafayette, IN, April 2010 and Urbana, IL, September 2009.
- Bluegrass Algebra Conference, University of Kentucky, Lexington KY. March 2009.
- AMS-MAA-SIAM Joint Mathematics Meetings: San Antonio TX. (January 2006) San Diego CA (January 2008), Washington DC (January 2009).
- UIC-Purdue Workshop on Algebraic Geometry and Commutative Algebra, Purdue University, West Lafayette IN. December 2006.
- Graduate Student Research Conference On Algebra And Representation Theory, Kansas State University, Manhattan KS. May 2006.
- AMS Fall Central Sectional meeting, Lincoln, NE. October 2005.
- “Midwest Algebra, Geometry and their Interactions Conference” (MAGIC), University of Notre Dame, South Bend, IN. April, 2010 and October, 2005.
- 30th Arkansas Spring Lecture Series: *Recent Developments in Tight Closure Theory*, University of Arkansas, Fayetteville, AR. April 2005.
- KUMUNU 5, September 2003; KUMUNU 6, October 2004; KUMUNU 7, November 2006. Lawrence, KS. KUMUNU 8, September 2007; Lincoln, NE.

Professional Activities

- Dissertation committees: M. Lindsey (Purdue, 2011 (expected). adv: G. Caviglia)
- Referee: *J. Algebra*, *J. Algebraic Combin.*, *Communications in Algebra*, *Rocky Mountain Math. J.*, *Math. Scand.*, *Proc. Amer. Math. Soc.*, *AMS reviewer for grants*
- Panelist, *What I wish I had known before I went to graduate school*, organized by the AMS Committee on the Profession, Chair: C. Huneke. AMS-MAA-SIAM Joint Mathematical Meetings, Washington, DC. January 2009.
- Student co-organizer, Math. Awareness Month activities, University of Kansas. 2005–07.
- Panelist, on a discussion on graduate school. Chair: T. Marley, AMS Fall Central Sectional meeting, Lincoln, NE. October 2005.
- Member, American Mathematical Society.