A. V. JAYANTHAN

Associate Professor
Department of Mathematics
Indian Institute of Technology Madras
Chennai - 600036, India.

Email : jayanav@iitm.ac.in

Academic Background :

- **Doctor of Philosophy**
  Indian Institute of Technology Bombay, Mumbai, India
  Title : *Hilbert coefficients and depth of Blowup algebras*
  Advisor : J. K. Verma.
  Thesis submitted: July, 2002.
  Thesis defended: March, 2003.

- **Master of Science** (Mathematics, 1997)
  University of Mumbai, Mumbai, India.

- **Bachelor of Science** (Mathematics, 1995)
  Sree Sankara College, Kalady, India.

Areas of Research Interests :

- Studying high depth properties of the Rees algebra, fiber cone and associated graded ring, of $\mathfrak{m}$-primary ideals via the Hilbert function, Hilbert polynomial and its coefficients.

- I am also studying a generalization of Hilbert-Samuel function and polynomials to the case of modules, known as Buchsbaum-Rim function, the corresponding polynomial and its coefficients.

- I have also been studying various connections between the algebraic invaraints of the monomial and binomial edge ideals of finite simple graphs with the associated combinatorial invariants such as independence matching number, chromatic number, co-chordal number etc.

Publications/Preprints :

1. *Regularity of binomial edge ideals of certain block graphs*, (Preprint), with N. Narayanan and B. V. Raghavendra Rao.

2. *Regularity of powers of bipartite graphs*, J. Algebraic Combin. (To Appear) with N. Narayanan and S. Selvaraja.

3. *On a Northcott-type inequality for Buchsbaum- Rim coefficients*, J. Commut. Algebra, **8** (2016), no. 4, 493–512. (with R. Balakrishnan).

4. *On the number of generators of ideals defining Gorenstein Artin algebras with Hilbert function* $(1, n+1, 1+\binom{n+1}{2}, \ldots, \binom{n+1}{2}+1, n+1, 1)$, Beiträge Algebra Geom., **57** (2016), no. 1, 173–187. (with Sabine El Khoury and Hema Srinivasan).

5. *On fiber cones of stretched* $\mathfrak{m}$*-primary ideals*, Indian J. Pure Appl. Math. **45** (2014), no. 6, 925–942. (with Ramakrishna Nanduri)

6. *Periodic Occurrence of Complete Intersection Monomial Curves*, Proc. Amer. Math. Soc. **141** (2013), no. 12, 4199–4208. (with Hema Srinivasan).

7. *Castelnuovo-Mumford regularity and Gorensteinness of fiber cone* (With Ramakrishna Nanduri) Comm. Algebra **40** (2012), no. 4, 1338–1351.

8. *On the depth of graded rings associated to lex-segment ideals in k[x,y]*, Beiträge Algebra Geom. **51** (2010) no.1 147–153.

9. *On fiber cones of* $\mathfrak{m}$*-primary ideals*, Canadian J. Math. **59** (2007) no. 1, 109–126. (with Tony J. Puthenpurakal and J. K. Verma)

10. *Graded rings associated with contracted ideals*, J. Algebra, **284** (2005) 593–626. (with A. Conca, E. De Negri and M. E. Rossi).

11. *Fiber cones of ideals with almost minimal multiplicity*, Nagoya Math. J., 177 (2005) 155–179. (with J. K. Verma)

12. *Hilbert coefficients and depth of fiber cones*, J. Pure Appl. Algebra, 201 (2005) 97-115. (with J. K. Verma).

13. *Hilbert Coefficients and Depths of Form Rings*, Comm. Algebra, 32 no. 4 (2004), 1445–1452. (with J. K. Verma and Balwant Singh).

14. *Local cohomology of bigraded Rees algebras*, Advances in Algebra and Geometry (Hyderabad, 2001), 39–52, Hindustan Book Agency, New Delhi, 2003. (with J. K. Verma).

15. *Grothendieck-Serre Formula and Bigraded Cohen-Macaulay Rees Algebras*, J. Algebra, 254 no. 1 (2002), 1–20 (with J. K. Verma).

Professional Experience:

Institution	**Position**	**Period**
University of Genova, Italy	Research Associate	September 2002 - February 2003
T.I.F.R. Mumbai	Post-doctoral Fellow	March 2003 - December 2004
Harish-Chandra Research Institute	Visiting Scientist	January 2005 - September 2005
I.I.T. Madras	Assistant Professor	September 2005 - July 2015
I.I.T. Madras	Associate Professor	July 2015 - Present

Courses Taught at IIT Madras:

- **B.Tech.:** Calculus I, II; Linear Algebra and Numerical Analysis; Linear Algebra and Optimization; Complex Variables and Transform Techniques; Differential Equations.

- **M.Sc.:** Elements of Real Analysis and Topology; Linear Algebra; Algebra; Topology, Introduction to Commutative Algebra; Galois Theory; Introduction to Algebraic Topology.

Guidance:

- **Ph.D.:** 5 (3 Ongoing)
- **M.Sc.:** 8

Grants, Awards and Fellowships :

- **BOYSCAST Fellowship** instituted by the Department of Science and Technology. Visited the University of Missouri-Columbia during June-December, 2011.
- Travel Grant by N.B.H.M. to attend International Congress of Mathematicians 2006 held at Madrid, Spain from 22nd to 30th August 2006.
- Tavel grant by I.C.T.P. under China-India-Vietname network with Visiting Fellowship of Institute of Mathematics, Hanoi to visit Institute of Mathematics, Hanoi during November-December, 2004.
- Visiting Fellowship at the University of Genova, Italy, from September 2002 to February 2003.
- C. L. Chandana Award for promising young Ph. D. students, given by Canadian World Education Foundation, 2000.

Talks given in Workshops/Conferences:

- Taught at different levels in the Mathematics Training and Talent Search Programme during 2007–2016.
- Delivered a short course on Algebra in the Pedagogical Training for Mathematics Teachers, held at St. Berchmans College, Changanacherry, Kerala from 19th to 24th, November 2012.
- On certain classes of complete intersection monomial curves, Talk delivered at the National Conference on Algebra and Number Theory, held at Cochin University of Science and Technology during 16 - 18 August, 2012.
- Castelnuovo-Mumford Regularity and Gorensteinness of Fiber cone, Talk delivered at the International Conference on Commutative Algebra and Algebraic Geometry, held at I.I.Sc. Bangalore during 6 - 10 December, 2010.
- *Blowup algebras of* $\mathfrak{m}$*-primary ideals*, talk delivered at the **One Day Colloquium** at the Ramanujan Institute For Advanced Studay in Mathematics, Chennai, March 24, 2009 .
- *On depth of graded rings associated to lex-segment ideals in* $K[x, y]$, talk delivered at the **International Workshop and Conference in Commutative Algebra** held during 2nd to 12th January, 2008 at I.I.T. Bombay.
- *Graded rings associated with contracted ideals*, talk delivered at the **School on Commutative Algebra and Interactions with Algebraic Geometry and Combinatorics**, held at ICTP, Trieste, Italy, during 24 May to 11 June, 2004.
- *Initial ideals and blowup algebras*, talk delivered at the International Conference on **Commutative Algebra & Combinatorics**, held at Harish-Chandra Research Institute, Allahabad, during 8th to 13th of December, 2003.

- *Grothendieck-Serre formula and Bigraded Cohen-Macaulay Rees algebras*, talk delivered in the International conference, **Commutative Algebra : Presentation by Young Researchers**, held at Salt Lake City, Utah, USA, 19-24, July, 2003.
- *Introduction to Macaulay 2*, 3 talks delivered in **Workshop on LaTeX and Free Mathematical Softwares**, held at Bhaskaracharya Prathishthana, Pune, 9-14, June, 2003.
- *Fiber cones of ideals with almost minimal multiplicity*, talk delivered in the **Fifth National Meeting in Commutative Algebra and Algebraic Geometry**, April 1-4, 2003.
- *Fiber cones of ideals with almost minimal multiplicity*, Colloquium at the Department of Mathematics, University of Barcelona, 21st February 2003.
- *Hilbert Coefficients and Depths of Form Rings*, talk delivered in **3rd National meeting in Commutative Algebra and Algebraic Geometry** held at IISc Bangalore, 16 - 20 October, 2000.
- *Local Cohomology and Hilbert Function of Bigraded Algebras*, International Workshop on **Trends in Commutative Algebra**, sponsored by NBHM, held at IIT Bombay, from 13th January to 15th January, 2000.
- Delivered 7 lectures based on experiments prepared using Macaulay2, at the winter school on **Algorithms in Invariant Theory and Algebraic Geometry**, held at University of Pune, from 9th December, 1999 to 1st January, 2000.

Workshops/Conferences Organized :

- *Mathematics Training and Talent Search* - MTTS funded by National Board for Higher Mathematics, during 23rd May to 18th June 2016.
- *Advanced Instructional School in Commutative Algebra* funded by National Center for Mathematics, 14th December 2015 to 1st January 2016 at Chennai Mathematical Institute. (Co-organizer: Dr. Manoj Kummini).
- *Annual Foundation School – I* funded by the National Board for Higher Mathematics, 1st to 27th December, 2014 at I.I.T. Madras. (Co-organizer: Dr. T. E. Venkata Balaji).
- *Advanced Instructional School in Commutative Algebra*, funded by National Board for Higher Mathematics, 7th to 26th May, 2012 at I.I.T. Madras. (Co-organizer: Dr. T. E. Venkata Balaji).
- *National Conference on Commutative Algebra and Algebraic Geometry* (CAAG-09), funded by National Board for Higher Mathematics, 6th to 10th July, 2009 at I.I.T. Madras. (Co-organizer: Dr. T. E. Venkata Balaji).
- *Golden Jubilee Workshop on Multiplicity Conjectures, Resolution of Singularities and Toric Geometry*, funded by National Board for Higher Mathematics and I.I.T. Madras, Dec. 22nd 2008 - Jan. 3rd 2009 at I.I.T. Madras (Co-organizers: Dr. V. Uma and Dr. T. E. Venkata Balaji).
- *Advanced Training in Mathematics Workshop in Commutative Algebra and Algebraic Geometry*, funded by National Board for Higher Mathematics, 10th to 23rd June, 2007. (Co-organizer: Dr. V. Uma).