Parangama Sarkar

Ph.D. Indian Institute of Technology Bombay
Assistant Professor, Mathematics
parangama@iitpkd.ac.in
https://iitpkd.ac.in/people/parangama

Research Interests

- Commutative Algebra

Brief Summary of Research

My research interests lie in the field of Commutative Algebra and its connections to Algebraic Geometry, Homological Algebra and computational Algebra. My research concerns local Noetherian rings and modules over the rings associated to algebraic varieties. It is mainly focused on the numerical invariants of rings and ideals. For instance, the degree and coefficients of the Hilbert polynomial of an admissible filtration of ideals. These invariants provide a rich source of numerical invariants from which one can read off many important properties of ideals and projective varieties. I am also interested in the theory of blow-up algebras, integral closure and reduction of an ideal which overlap with many topics including singularity theory and resolution of singularities.

Recent Publications

- Frobenius Betti numbers and syzygies of finite length modules (with Ian M. Aberbach), Proc. Amer. Math. Soc., 148, (2020), no. 8, 3245–3262.
- Rees' theorem for filtrations, multiplicity function and reduction criteria, J. Pure Appl. Algebra, 224 (2020), no. 2, 789-805.
- Mixed multiplicities of filtrations (with Steven Dale Cutkosky and Hema Srinivasan), Trans. Amer. Math. Soc., 372 (2019), no. 9, 6183-6211.
- Multigraded regularity, reduction vectors and postulation vectors, J. Algebra, 491 (2017), 58-77.
- Local cohomology of multi-Rees algebras, joint reduction numbers and product of complete ideals (with J. K. Verma), Nagoya Math. J., 228 (2017), 1-20.
- Postulation and reduction vectors of multigraded filtrations of ideals (with J. K. Verma), J. Commut. Alg., 9 (2017), no. 4, 563-597.
- Variations on the Grothendieck-Serre formula for Hilbert functions and their applications (with Shreedevi K. Masuti and J. K. Verma), Algebra and its applications, 123–158, Springer Proc. Math. Stat., 174, Springer, Singapore, 2016.
- Hilbert polynomials of multigraded filtrations of ideals (with Shreedevi K. Masuti and J. K. Verma), J. Algebra, 444 (2015), 527-566.