

30th Annual Conference of the Ramanujan Mathematical Society
Symposium on Commutative Algebra and Algebraic Geometry
Abstracts of Talks

May 15, 2015

11:30 AM - 12:10 PM

Equality of linear and symplectic orbits

Ravi Rao, Tata Institute of Fundamental Research, Bombay

Abstract: We shall discuss the equality of the elementary and symplectic orbits of a unimodular row of even length. We shall also discuss the same problem over unimodular elements of a symplectic module. This is joint work with Pratyusha Chattopadhyay. We shall indicate some applications to improvement of injective stability results if time permits.

12:15 PM - 12:55 PM

Local cohomology of multi Rees algebras and an extension of Zariski's Product theorem about complete ideals

Jugal K. Verma, Indian Institute of Technology, Bombay

Abstract: Zariski proved that product of complete ideals is complete in two dimensional regular local rings. This is not true in dimension 3. We provide sufficient conditions in terms local cohomology of multi-Rees algebras for product of complete ideals to be complete in dimension three. This is joint work with Tony Puthenpurakal and Shreedevi Masuti.

2:00 PM - 2:40 PM

Hilbert polynomial associated to a derived functor

Ganesh S. Kadu, University of Pune, Pune

Abstract: Let A be a Noetherian Cohen-Macaulay local ring of dimension $d \geq 1$. Let M be a finitely generated A -module with $\dim M = d$ and I be an ideal of A . We investigate the following function

$$n \mapsto \ell(\mathrm{Tor}_1^A(M, A/I^{n+1})).$$

We observe that the length above is finite in the following cases and is given by a polynomial for $n \gg 0$:

(a) M maximal Cohen-Macaulay, I is locally a complete intersection with $\mathrm{ht}(I) = d - 1$ (b) A is an isolated singularity and M is maximal Cohen-Macaulay A -module (c) $\mathrm{depth} M = d - 1$ and I is either an equimultiple ideal or an ideal of analytic deviation one. We show that

degree of the polynomial is bounded above by $l(I) - 1$, where $l(I)$ denotes the analytic spread of I . Moreover, if the degree is less than $l(I) - 1$ then it can be shown that the fiber module $F_I(M)$ is free over the fiber cone $F(I)$. In the case when A is one dimensional hypersurface ring and M has rank, it can be shown that the bound above on the degree is attained. We also give an example of a module M not having rank to show that even if the fiber module $F_I(M)$ is free $F(I)$ -module, M need not be free A -module. This example suggests that the rank assumption on the module cannot be dropped.

2:45 PM - 3:25 PM

B. G. Kang, Pohang University of Science and Technology, Republic of Korea

To be announced.

May 16, 2015

11:30 AM - 12:10 PM

Autoduality for compactified Jacobian of a nodal curve

A. J. Parameswaran, Tata Institute of Fundamental Research, Bombay

Abstract: Let Y be a nodal curve and $\bar{J}(Y)$ be its moduli of torsion free sheaves of rank 1. Then we show that the torsion free sheaves of rank 1 on $\bar{J}(Y)$ is isomorphic to $\bar{J}(Y)$ under the map induced by the Abel-Jacobi map $Y \rightarrow \bar{J}(Y)$. This is a joint work with Usha Bhosle.

12:15 PM - 12:55 PM

When is a plane a coordinate plane?

Avinash Sathaye, U. Kentucky, USA

Abstract: We will discuss the Epimorphism Problem in three space. By a plane in three space, we mean a surface $f(X,Y,Z) = 0$ whose coordinate ring is isomorphic to that of a plane $Z=0$. It is said to be a coordinate plane if $f(X,Y,Z)$ can be arranged to be one of three ring generators of $k[X,Y,Z]$. We shall discuss known results and open questions.

2:00 PM - 2:40 PM

Sagar Kolte, Tata Institute of Fundamental Research, Bombay

To be announced.