

Further Connections Between Algebra and Geometry – Poster Abstracts

February 2-3, 2013

Presenter: Brandon Goodell, North Dakota State University

Title: Factorization, Partial Orders, and Homology

Abstract: A one-to-one correspondence between the saturated multiplicative systems in a domain and the convex directed subgroups of its (partially ordered) group of divisibility can be exploited to develop structure theorems describing integral domains and cochain complexes of order-preserving maps. These complexes provide a homological flavor to factorization questions regarding localizations of integral domains at their saturated multiplicatively closed sets. With these tools, we can characterize the depths to which concepts like atomicity can fail.

Presenter: Sema Gunturkun, University of Kentucky

Title: A Construction of Homogeneous Gorenstein Ideals

Abstract: In 1983 Kustin and Miller introduced a construction of Gorenstein ideals in local rings. We review their construction in the case of graded rings and modify it by avoiding ring extensions. We also discuss this construction with respect to liaison theory. (This is a joint work with Uwe Nagel.)

Presenter: Sara Malec, Georgia State University

Title: On the Intersection Algebra of Principal Ideals

Abstract: Given two ideals in a Noetherian ring R , the intersection algebra is an object that captures some information on the relationships between those two ideals. We use a connection to semigroup rings to describe some properties of the intersection algebra, including an algorithm that produces its generating set.

Presenter: Saeed Nasseh, North Dakota State University

Title: Contracting Endomorphisms and Dualizing Complexes

Abstract: We investigate how one can detect the dualizing property for a chain complex over a commutative local noetherian ring R . Our focus is on homological properties of contracting endomorphisms of R , e.g., the Frobenius endomorphism when R contains a field of positive characteristic. This is joint work with Sean Sather-Wagstaff.

Presenter: Denise Rangel, University of Texas at Arlington

Title: A Filtration of Totally Reflexive Modules

Abstract: Representation theory of Maximal Cohen-Macaulay modules over commutative local Gorenstein rings has been well-developed. The analog of maximal Cohen-Macaulay modules over commutative local non-Gorenstein rings are called totally reflexive (TR) modules. In this case, their representation theory is very limited. What is known is that if there is one non-free TR module, then there are infinitely many non-isomorphic indecomposable ones. In this poster, we will present some background information for totally reflexive modules as well as some preliminary representation theory results over commutative local non-Gorenstein rings. In particular, for certain rings we will introduce a subcategory of TR modules that have a saturated filtration by other TR modules. These turn out to be precisely the TR modules with an upper-triangular presentation matrix.

Presenter: Rich Wicklein, North Dakota State University

Title: Codualizing Modules And Complexes

Abstract: Let R be a commutative, noetherian ring. A finitely generated R -module C is said to be semidualizing if $\text{Ext}_R^i(C, C) = 0$ for all $i > 0$ and $R \xrightarrow{\cong} \text{Hom}_R(C, C)$. When R is local, an artinian R -module T is said to be quasidualizing if $\text{Ext}_R^i(T, T) = 0$ for all $i > 0$ and $\widehat{R} \xrightarrow{\cong} \text{Hom}_R(T, T)$. Using the notion of I -cofiniteness, we introduce a unifying notion that recovers each of the above notions as special cases. This is joint work with Sean Sather-Wagstaff.
