

SPEAKER: Mihnea Popa (Chicago Circle)

TITLE: BGG correspondence and the cohomology of compact Kaehler manifolds

ABSTRACT: The cohomology algebra of the sheaf of holomorphic functions on a compact Kaehler manifold can be naturally viewed as a module over the exterior algebra of a vector space. A well-known result of Bernstein-Gel'fand-Gel'fand gives a correspondence between such "exterior" modules and linear complexes of modules over the symmetric algebra, i. e. the polynomial ring. I will explain in an accessible way how one can use a modern view on this correspondence, together with the Generic Vanishing theory developed by Green and Lazarsfeld via Hodge-theoretic methods, in order to understand subtle algebraic structures of the cohomology algebra. As a bonus, homological and commutative algebra tools can be applied on the polynomial ring side to obtain new inequalities for the holomorphic Euler characteristic and the Hodge numbers of compact Kaehler manifolds. This is joint work with R. Lazarsfeld.