ABSTRACT

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Title: Density function for the second coefficient of the Hilbert-Kunz function on projective toric varieties

Abstract: For a standard graded ring R over a perfect filed k of characteristic $p > 0$ with a homogeneous ideal I of finite colength and a finitely generated non-negatively graded module M, the Hilbert-Kunz density function of M, with respect to the ideal I is a continuous compactly supported function $f_{M,I} : \mathbb{R} \to \mathbb{R}$ which relates to the Hilbert-Kunz multiplicity $e_{HK}(M, I)$ via a simple integral formula.

In this talk, we will revisit the theory of Hilbert-Kunz multiplicity and Hilbert-Kunz density function, particularly on projective toric varieties. We will discuss the existence of a β-density function (similar to the Hilbert-Kunz density function) for the second coefficient of the Hilbert-Kunz function for a projectively normal toric pair, which is joint work with Prof. V. Trivedi. If time permits, we will discuss the existence of the β-density function for the monomial prime ideals of height one in the projective toric set up. This is an ongoing work.