SEMINARIO

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Castelnuovo-Mumford regularity of projective monomial curves via sumsets

Abstract: Given $A = \{a_0, \ldots, a_{n-1}\}$ a finite set of $n \geq 4$ non-negative integers that we will assume to be in normal form, i.e., such that $0 = a_0 < \cdots < a_{n-1} = d$ and relatively prime, the s-fold sumset of A is the set sA of integers obtained by collecting all the sums of s elements in A. On the other hand, given an infinite field k, one can associate to A the projective monomial curve C_A parametrized by A:

$$C_A = \{(v^d : u^{a_1} v^{d-a_1} : \cdots : u^{a_{n-2}} v^{d-a_{n-2}} : u^d)\}$$

where $(u : v)$ covers the whole projective line over k. In this talk, we will focus on the relation between the Castelnuovo-Mumford regularity of C_A and the behaviour of the sumsets sA and show how this provides a nice interplay between Commutative Algebra and Additive Number Theory.

This talk is based on a joint work with Philippe Gimenez.

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