Colloquium

University of Notre Dame
Department of Mathematics

Speaker: Kevin Tucker

University of Illinois, Chicago

Will give a lecture entitled

Symbolic and Ordinary Powers of Ideals in Hibi Rings

Date: Friday, October 12, 2018
Time: 4:00 PM
Location: 117 Hayes-Healy Hall
Departmental Tea: Tea in Room 257 (lounge in Hurley Hall) at 3:30 p.m.

Abstract:

The study of symbolic powers has a long history in commutative algebra and related fields. For instance, they arise quite naturally in algebraic geometry: if P is the ideal of polynomials vanishing on an affine algebraic variety $X \subseteq \mathbb{C}^n$, then the m-th symbolic power $P^{(m)}$ is the set of polynomials vanishing to order at least m at a general point $x \in X$. Ordinary powers P^m are contained in symbolic powers, though the inclusion $P^m \subseteq P^{(m)}$ is strict in general. A celebrated result of Ein-Lazarsfeld-Smith gives a uniform containment $P^{(mn)} \subseteq P^m$ for all primes P in a complex polynomial ring with n variables, with generalizations by Hochster-Huneke (in positive characteristic) and recently by Schwede-Ma (in mixed characteristic) to regular rings. In this talk, I will review the importance and history of some of these results, with a view towards recent work on extending such bounds to certain singular rings. In particular, we discuss such bounds for a class of rings in combinatorial commutative algebra, which are called Hibi rings and are associated to a finite poset. In joint work with Page and Smolkin, we show that many Hibi rings satisfy precisely the same uniform symbolic power bounds as regular rings, and moreover we give limited symbolic power bounds for all Hibi rings.

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