Algebra Seminar

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1:00-2:00pm, HH3017

"A primeness property for the central polynomials of verbally prime P.I. algebras"

Abstract:

The question about the existence of nontrivial central polynomials for the matrix algebras $M_n(K)$ of $n \times n$ matrices over a field K was posed by Kaplansky in 1956. This question was answered in $1972 - 1973$ independently by Formanek and Razmyslov. As an analogue of the corresponding result for the polynomial identities of $M_n(K)$ Regev proved the following:

Theorem [Regev] Let K be an infinite field and let $f(x_1, \ldots, x_r)$ and $g(x_{r+1}, \ldots, x_s)$ be two noncommutative polynomials in disjoints sets of variables. Assume that $f(x_1, \ldots, x_r) \cdot g(x_{r+1}, \ldots, x_s)$ is central but not an identity for $M_n(K)$. Then both $f(x)$ and $g(x)$ are central polynomials for $M_n(K)$.

It turns out that the algebras $M_n(K)$ are examples of verbally prime algebras. These algebras were introduced by Kemer in his solution to the problem posed by Specht as to whether associative algebras have a finite basis of identities. Kemer also proved that verbally prime algebras have nontrivial central polynomials. In this talk we discuss this primeness property for the central polynomials of other verbally prime algebras.