Temple University Mathematics Colloquium

Peter Fleischmann

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will speak on

Algorithmic and structural aspects of modular invariant rings

Let F be a field and G a finite group, acting on the polynomial ring $A := F[x_1, \ldots, x_d]$ by graded F - algebra automorphisms. The ring of invariants $A^G := \{f \in A \mid g(f) = f\}$ is a central object of study in Invariant theory. The general theory is very well developed in the "classical case" where the characteristic of F is zero, but far less so in the case of positive characteristic p, in particular the "modular case" where p divides the group order $|G|$. For example, unlike the classical case, modular invariant rings are in general not Cohen - Macaulay rings. Due to a fundamental theorem of Emmy Noether, A^G is always finitely generated, however in the modular situation the known proofs for this are non-constructive. Hence there are open questions about the constructive complexity of modular invariant rings, which can be measured for example by degree bounds for generators and about the structural complexity, measured for example by the depth of A^G.

In my talk I will report on some recent results dealing with both, the structural and constructive aspects of invariant theory. Among other things I will present a new construction algorithm for A^G, developed joinly with G Kemper and C F Woodcock, which is based on ideas from algebraic number theory.

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MONDAY, MARCH 14, 2005
LECTURE AT 4:00 PM ($\sharp$)
COFFEE, TEA, AND REFRESHMENTS FROM 3-5 PM.
ROOM 617, WACHMAN BUILDING
DEPARTMENT OF MATHEMATICS

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