Combinatorics Seminar

Monday, Oct. 12, 2009
2:00 pm in Hume 331

Dr. X. Zhou

Department of Mathematics and Statistics
wright state university

Clones in representable matroids over a finite field

ABSTRACT

A matroid is a pair \((E, \mathcal{I})\) where \(E\) is a finite set and \(\mathcal{I}\) is a collection of subsets of \(E\) that satisfies the following axioms:

1) \(\emptyset \in \mathcal{I}\);

2) if \(I \in \mathcal{I}\) and \(I' \subseteq I\), then \(I' \in \mathcal{I}\);

3) if \(I, J \in \mathcal{I}\) and \(|I| < |J|\), then there exists \(x \in J\setminus I\) such that \(I \cup \{x\} \in \mathcal{I}\).

Two elements \(x\) and \(y\) of a matroid \(M\) are clones if the map that interchanges \(x\) and \(y\) and that fixes all other elements is an automorphism of \(M\).

It is clear that if \(E\) is the set of columns of a matrix over a field and \(\mathcal{I}\) is the collection of subsets of \(E\) that are linearly independent, then \((E, \mathcal{I})\) is a matroid. Such a matroid is essentially a sub-structure of the projective space over that field.

We study clones in matroids that arise from matrices over a finite field. This is joint work with Reid, Robbins, and Wu.