Algebra and Number Theory Seminar

Title: Common Zeros for Subspaces of Hermitian Forms over Finite Fields

Speaker: Professor Roderick Gow

Date: Mon 2nd April 2012 at 4:00PM

Location: Mathematical Sciences Seminar Room (Ag 1.01)

Abstract: Let M be a non-empty set of hermitian forms defined over a field L with an involutory automorphism, whose fixed point field is K. A non-trivial common zero for the forms in M is a non-zero vector v such that f(v,v)=0 for all forms f in M. For the purposes of investigating common zeros, we may as well assume that M is a subspace over K. When L is a finite field, we discuss a formula which calculates the number of common zeros in terms of the ranks of the elements in M. This formula implies, in particular, that when all the ranks are even, there are non-trivial common zeros. This conclusion does not hold for arbitrary fields. We then investigate whether there are canonical forms for a subspace of hermitian forms over a finite field, all of whose non-zero elements have rank 2, and whose dimension is as large as possible.

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