K-Theory, Quadratic Forms and Number Theory Seminar

Title: Pythagoras Number of Function Fields of Conics

Speaker: David Grimm (UCD)

Date: Wed 26th September 2007 at 5:00PM

Location: Mathematical Sciences Seminar Room

Abstract: Abstract: In the study of pythagorean fields, there is a well known "Going-down" (Diller-Dress Theorem), which states that if any finite extension of a base field is pythagorean (sums of squares are square, i.e. has pythagoras number 1), then so must be the base field.

While Prestel showed that in general the analogous statement fails for pythagoras number 2 (He showed that there are fields with arbitrarily high pythagoras number, that allow quadratic extensions with pythagoras number 2), it is still interestig to ask, whether the analogous is true for special base fields, namely for rational function fields in one variable (for which the 2 is the smallest possible pythagoras number).

In this talk, an affirmative answer is given for a special sort of quadratic extensions of the rational function field k(X): it will be shown, that if the pythagoras number is 2 for any function field of a Conic (over k), then it must be 2 for the underlying rational function field k(X).