



Seminar

## K-Theory, Quadratic Forms and Number Theory

**Title:** On the anisotropic splitting of division algebras

**Speaker:** Professor Ulf Rehmann (Universitaet Bielefeld)

**Date:** Thu 19th April 2012 at 4:00PM

**Location:** Mathematical Sciences Seminar Room (Ag 1.01)

**Abstract:** To understand division algebras, a classical method is to simplify their structure by extending their base field, e.g., algebras can be "split", that is, made isomorphic to a full matrix ring over a suitable extension.

It is more interesting to find field extensions for which a given division algebra stays "anisotropic", i.e., it remains a division algebra over that extension, but of possibly simpler structure.

There are two interesting recent results:

1. A theorem of Hasse-Brauer-Noether states that every central simple algebra over a number field is cyclic. This does not hold for arbitrary fields. However, we have the following result: For any given field  $F$  there exists a regular field extension  $E/F$  such that i) any central simple  $E$ -algebra is cyclic, ii) for any central simple  $F$ -algebra, index and exponent over  $E$  (after field extension) are the same as over  $F$ , iii) the

restriction homomorphism  $\text{res Br}(F) \rightarrow \text{Br}(E)$  is injective.

2. For given "disjoint" algebras  $A_1, \dots, A_n$  and any set of "admissible" values for indices and exponents for

This will be discussed in the talk. (Results based on joint work with S. Tikhonov and V. Yanchevskii.)