K-Theory, Quadratic Forms and Number Theory Seminar

Dr. Lara Thomas (EPFL)

will speak on

On the Galois module structure of extensions of local fields

Wed 10th February 2010 at 4:00PM

Location: Mathematical Sciences Seminar Room

Let L/K be a finite Galois extension of fields, with Galois group G. The normal basis theorem asserts the existence of an element x in L such that the conjugates of x under G form a basis of L as a vector space over K. Such an element is called a normal basis generator for L/K. Now assume that K (respectively L) is a local field. In this talk, we will consider the following question:

Is there an integer d so that every x in L with discrete valuation $v_L(x) = d$ $is a normal basis generator for L/K$?

We will determine all extensions of local fields for which the answer to this question is positive. Our arguments are essentially based on ramification theory as well as represention theory of finite groups.

This question was recently suggested by Nigel Byott and Griffith Elder when looking at the algebraic structure of the valuation ring of certain extensions of local fields. Thus, our investigation will also lead us to present a survey of some normal basis theorems for rings of local fields, including recent contributions to this subject. This is presented as a branch of the theory of Galois module structure that includes the notion of associated orders.

This talk is part of the **K-Theory, Quadratic Forms and Number Theory** series. For more, see
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