



Seminar

## K-Theory, Quadratic Forms and Number Theory

**Title:** The Tate module of Deligne's 1 motive and class groups as Galois modules

**Speaker:** Professor Cornelius Greither (Universitaet der Bundeswehr Muenchen)

**Date:** Wed 25th November 2009 at 3:00PM

**Location:** Mathematical Sciences Seminar Room

**Abstract:** We consider a  $G$ -Galois covering  $X \rightarrow Y$  of curves over a finite field. Deligne defined a certain 1-motive in this context (it is not necessary to know anything about motives for this talk!), and the  $\ell$ -adic Tate module  $M$  of this motive is a finitely generated free  $\mathbb{Z}_{\ell}$ -module with action of  $G$  and Frobenius. It is closely linked to the  $\ell$ -part of the class group of  $\overline{ar}X$  (the curve  $X$  base-changed to the algebraic closure of the base field), but it behaves better algebraically. In ongoing joint work, Popescu and I study  $M$  as a Galois module. Applications include the calculation of Fitting invariants of class groups of curves, and an a priori lower bound on class groups of some Fermat curves.