



Seminar

K-Theory, Quadratic Forms and Number Theory

Title: The arithmetic of hypergeometric functions

Speaker: Professor Fernando Rodriguez Villegas (UT-Austin and Oxford)

Date: Wed 20th January 2010 at 4:00PM

Location: Mathematical Sciences Seminar Room

Abstract: In this talk I will discuss some arithmetic aspects of the classical hypergeometric differential equations. We know since Igusa that counting points on certain families of elliptic curves over finite fields is tied with hypergeometric series. This connection was greatly elaborated and expanded by Dwork.

Starting from examples analogous to that of Igusa I will give a conjectural description of the Hodge structure and the action of Frobenius on a corresponding space via Katz's hypergeometric trace. We will see, for example, how in this description the case where all solutions to the equation are algebraic functions (determined by Beukers and Heckman) precisely corresponds to weight zero, in other words, to Artin L-functions.

From a computational point of view, I will argue that hypergeometric motives provide a large supply of computable L-functions not easily accessible by standard methods (for example, from automorphic forms).