SOUTHERN CALIFORNIA NUMBER THEORY DAY, OCTOBER 22, 2011

ABSTRACTS

Ralph Greenberg, *A proof of the derivative formula for Kubota-Leopoldt p-adic L-functions at trivial zeros.*

There is an old formula proved by Ferrero and myself in the 1970's which gives the value of the derivative for a Kubota-Leopoldt p-adic L-function at $s = 0$ when the function itself vanishes at that point. We will describe in this talk a different proof which makes use of properties of the two-variable p-adic L-function for imaginary quadratic fields constructed by Katz.

Adebisi Agboola, *Galois modules and equidistribution*

Let K be a global field, and G a finite abelian group. I shall discuss the asymptotic behaviour of the number of tamely ramified G-extensions of K with ring of integers of fixed realisable class as a Galois module. The answers that one obtains are rather surprising in that they very much depend upon how one counts the number of rings of integers of a given realisable class.

Alina Cojocaru, *Elliptic curves modulo p*

For an elliptic curve E over $\mathbf{Q}$, we denote by E_p its reduction modulo a prime p (of good reduction). The number of $\mathbf{F}_p$-rational points of the resulting elliptic curve E_p is $p+1-a_p$ for some integer a_p, whose complex absolute value is at most $2p^{1/2}$. I will discuss results focused on various questions about the behaviour of the curves E_p, for varying p: how often is a_p a fixed integer?; how often is the field $\mathbf{Q}((a_p^2-4p)^{1/2})$ a fixed imaginary quadratic field?; how often is $\#E_p(\mathbf{F}_p)$ a prime number? These questions, formulated by Serge Lang and Hale Trotter, and by Neal Koblitz, are still open and may be viewed as analogues of classical open questions about primes such as the Schinzel Hypothesis and the Twin Prime Conjecture.

Fernando Rodriguez Villegas, *Hypergeometric motives: the case of Artin L-functions*

I will describe some generalities of the motives of the title and then focus on those of weight zero, which give rise to Artin L-functions. The main example will be the case where the corresponding Galois group is the (a subgroup of) the Weyl group of $\mathbf{F}_4$. This group has order 1152 and a natural irreducible representation of dimension 4. I will discuss how we may explicitly compute the associated degree four L-functions and their relation to the lines in certain affine cubic surfaces. This is joint work with H. Cohen.