



Seminar

K-Theory, Quadratic Forms and Number Theory

Title: Extensions of the Gauss-Wilson theorem

Speaker: Dr John Cosgrave (<http://staff.spd.dcu.ie/johnbcos/>)

Date: Wed 26th March 2008 at 5:00PM

Location: Mathematical Sciences Seminar Room

Abstract: Karl Dilcher and I have made the first extension of the G-W theorem since the appearance of Gauss' *Disquisitiones*. Defining $N_n! - \text{the 'Gauss factorial' of } N \text{ with respect to } p$ — to be the product of the residue classes in $[1, N]$ that are relatively prime to p , we have given a completed determination of $(p-1/2)_n! \bmod n$. This is a composite modulus extension of Mordell's 1961 result concerning the order of $(p-1/2)_n! \bmod p$ (prime p).

I will outline work-in-progress concerning the order of $(n-1/M)_n! \bmod n$ for $M = 3$ and 4 , introduce a new 4-primes), and outline a number of open problems.