K-Theory, Quadratic Forms and Number Theory Seminar

Title: The hexagonal versus the square lattice

Speaker: Pieter Moree (Max-Planck-Institute for Mathematics, Bonn)

Date: Wed 2nd November 2005 at 4:00PM

Location: Mathematical Sciences Seminar Room

Abstract: Schmutz-Schaller formulated in 1995 a conjecture concerning lattices of dimensions 2 to 8 and proved its analogue in hyperbolic geometry. As a particular case he mentioned that the hexagonal lattice ought to be 'better' than the square lattice. This statement is equivalent with the statement that for every x the number of integers n¡=x that can be written as a sum of two squares is not less than the number of integers m¡=x that can be written as a sum of square and three times a square.

Together with Herman te Riele (CWI, Amsterdam) I recently proved this by methods from computational number theory and the asymptotic theory of arithmetic functions.

As a byproduct I disproved some claims on the divisibility of the tau-function Ramanujan made in his unpublished intriguing manuscript on the partition and tau function (two famous functions in number theory).