

IMIA Operator Algebra and Noncommutative Geometry Seminar
University of Wollongong

Title: Noncommutative arithmetic manifolds

Speaker: Bram Mesland (University of Warwick, UK)

Time and Date: 3:30pm Thursday 5 February 2015

Location: Room 39C.meeting room

Abstract: In joint work in progress with M.H. Sengun (Sheffield), we establish an explicit relation between the K -homology of boundary crossed product algebras associated to groups of hyperbolic isometries, and the cohomology of such groups. We show that the notion of Hecke operator for arithmetic groups has a natural definition in terms of Kasparov's KK -theory. In the case of Bianchi groups $\Gamma = PSL_2(O_K)$, with O_K the ring of integers in an imaginary quadratic field, we establish an explicit Hecke equivariant isomorphism $H^1(\Gamma, \mathbb{Z}^2) \cong K^1(C(\mathbb{P}^1(\mathbb{C})) \rtimes \Gamma)$. A similar result holds for cocompact arithmetic Kleinian groups. These results are achieved in the context of unbounded Fredholm modules, shedding light on noncommutative geometric aspects of the boundary crossed product.