

**IMIA Operator Algebra Seminar**  
University of Wollongong

Title: Operator algebras in geometric quantisation

Speaker: Peter Hochs (University of Adelaide)

Time and Date: 3:30pm Thursday, 14 November 2013

Location: Room 39C.meeting room

Abstract: Geometric quantisation originates from physics, where it is a method to construct a quantum mechanical phase space (a Hilbert space) from a classical mechanical one (a symplectic manifold). In mathematics, this has led to some fundamental relations between symmetries of symplectic manifolds (Hamiltonian group actions) and of Hilbert spaces (unitary representations). Until the late 1990s, geometric quantisation was mainly studied for compact symplectic manifolds, with compact groups acting on them. Geometric quantisation, as defined by Bott, is then given by the equivariant index of a suitable Dirac operator on the manifold. For noncompact groups and/or manifolds, higher index theory can be used to study geometric quantisation. This involves K-theory of group  $C^*$ -algebras, and possibly also Roe algebras from coarse geometry, and K-homology of group  $C^*$ -algebras.