

## ***On torsion, gravity and the spectral action principle***

In this talk I will consider closed Riemannian manifolds equipped with orthogonal connections (with torsion). I will review Einstein-Cartan-Hilbert theory, a generalisation of the classical Einstein-Hilbert theory of gravity to connections with torsion. Next, I will consider Dirac operators which are induced by orthogonal connections. Connes' spectral action principle states that all physically relevant actions should be deducible from the spectrum of a suitable Dirac operator. Building on this principle, Chamseddine and Connes constructed a spectral action which is motivated by eigenvalue counting and which predicts the correct Lagrangian of the Standard Model of Particle Physics. I will present a formula for the Chamseddine-Connes action in the presence of torsion, discuss its critical points and describe a possible connection to Loop Quantum Gravity. This project is joint work with Frank Pfäffle.