

Deformation groupoids and the Fredholm index

The aim of this talk is give an introduction to the study of the Fredholm index for classes of non-compact manifolds which model many types of singular foliations. We also discuss the techniques, based on deformation groupoids (similar to the tangent groupoid of Connes), to obtain Atiyah-Singer type index formulas for the Fredholm index of geometric Dirac operators that fulfill the Fredholm conditions. Another subject of interest are secondary invariants which arise whenever the Fredholm index vanishes. We review recent constructions of suitable deformation groupoids to introduce such secondary invariants on non-compact manifolds related to the study of compatible metrics of positive scalar curvature.