Positive scalar curvature, surgery classification of manifolds and Dirac type operators I and II - Part II

Paolo Piazza
Sapienza Università di Roma

Abstract

In these talks reporting on joint work with Thomas Schick, we will discuss exact sequences helping in the classification of positive scalar curvature metrics (the Stolz sequence) and in the classification of manifolds of a given homotopy type (Wall’s surgery sequence).

We will show how higher index theory of Atiyah-Patodi-Singer type directly allows to map Stolz’ sequence for metrics of positive scalar curvature to a sequence in K-theory due to Higson and Roe, which includes the Baum-Connes assembly map. The construction heavily relies on ideas from large scale index theory (coarse index theory).

We will also explain the analogous result for Wall’s surgery sequence, thus giving an alternative treatment to a theory due to Higson and Roe (developed in their papers “Mapping surgery to analysis I-III”). Again, our treatment is based directly on the index theory of the signature operator.