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Simone Cecchini (Georg-August-Universität Göttingen)

„Callias-type operators in C*-algebras and positive scalar curvature on noncompact manifolds.“

Abstract:
A Dirac-type operator on a complete Riemannian manifold is of Callias-type if its square is a Schrödinger-type operator with a potential uniformly positive outside of a compact set. We discuss the theory of Callias-type operators twisted with Hilbert C*-module bundles and present an index theorem for such operators. As an application, we present an obstruction to the existence of complete Riemannian metrics of positive scalar curvature on noncompact spin manifolds in terms of closed submanifolds of codimension one. In particular, when N is a closed spin manifold, we show that if the cylinder NxR carries a complete metric of positive scalar curvature, then the (complex) Rosenberg index on N must vanish.