Noncommutative geometry, conformal geometry, and cyclic homology of group actions on manifolds

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In this talk I shall explain how to apply tools of noncommutative geometry to obtain a local index formula in conformal geometry that are take into account of an arbitrary group of conformal diffeomorphisms. This uses the framework of twisted spectral triples of Connes-Moscovici. This leads us to a construction of a whole new family of conformal invariants. These invariants are expressed in terms of equivariant characteristic classes. Their computation was the main impetus for the explicit calculation of the cyclic homology of crossed-product algebras associated with group actions on manifolds. We shall also report on this cyclic homology computation, which enables us to recover and extend earlier results of Baum-Connes, Brylinski-Nistor, Connes, Crainic, and Wassermann, among others.