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K-HOMOLOGY AND INDEX THEORY ON CONTACT MANIFOLDS

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K-homology is the dual theory to K-theory. The BD (Baum-Douglas) isomorphism of Atiyah-Kasparov K-homology and K-cycle K-homology provides a framework within which the Atiyah-Singer index theorem can be extended to certain differential operators which are hypoelliptic but not elliptic. This talk will consider such a class of differential operators on compact contact manifolds. These operators have been studied by a number of mathematicians. Operators with similar analytic properties have also been studied (e.g. by Alain Connes and Henri Moscovici). Working within the BD framework, the index problem will be solved for these operators. The Connes-Thom isomorphism plays an essential role in the proof. This is joint work with Erik van Erp.

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