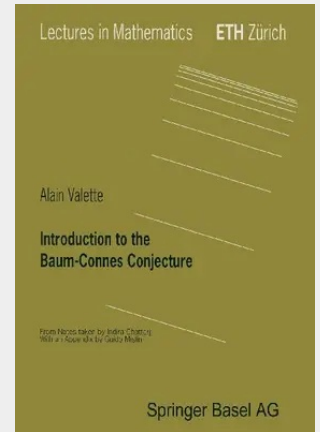


Introduction to the Baum-Connes Conjecture

A quick description of the conjecture The Baum-Connes conjecture is part of Alain Connes' tantalizing "noncommutative geometry" programme [18]. It is in some sense the most "commutative" part of this programme, since it bridges with classical geometry and topology. Let r be a countable group. The Baum-Connes conjecture identifies two objects associated with r , one analytical and one geometrical/topological. The right-hand side of the conjecture, or analytical side, involves the K theory of the reduced C^* -algebra c_r^* , which is the C^* -algebra generated by r in its left regular representation on the Hilbert space $C(r)$. The K-theory used here, $K_i(C_r)$ for $i = 0, 1$, is the usual topological K-theory for Banach algebras, as described e.g. in [85]. The left-hand side of the conjecture, or geometrical/topological side $RK_i^r(E_r)$ ($i=0,1$), is the r -equivariant K-homology with r -compact supports of the classifying space E_r for proper actions of r . If r is torsion-free, this is the same as the K-homology (with compact supports) of the classifying space B_r (or $K(r,l)$ Eilenberg-Mac Lane space). This can be defined purely homotopically.

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