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Paul Frank Baum* (baum@math.psu.edu). *Expanders and K-Theory for Discrete Groups.*

An expander is a sequence X_1, X_2, X_3, \dots of finite graphs which is efficiently connected. Expanders have various uses in engineering — e.g. in designing and constructing fibre optic networks. A naturally arising question is :“Does there exist a finitely generated group G such that the Cayley graph of G contains a sub-graph which is an expander?” The answer to this question is “YES” provided that “contains” is suitably weakened. The group G is known as the Gromov group and is the only known example of a non-exact group. M. Gromov began the construction of this group and then the construction was completed by several mathematicians. The Gromov group is a counter-example to BCC (Baum-Connes with Coefficients). This talk will give the basic definitions : expander, K-theory, BC(Baum-Connes), BCC(Baum-Connes with coefficients) — and will indicate why the Gromov group is a counter-example to BCC. All this leads to the tentative conclusion that the natural class of groups for which BCC is true is exact groups. The relevant generalized cohomology theory is K -theory. (Received August 29, 2011)