1067-19-185 **Paul Frank Baum*** (baum@math.psu.edu), Mathematics Department, University Park, PA 16802. *Expanders and K-theory for discrete groups.*

Let G be a locally compact Hausdorff second countable topological group. In particular, G can be any countable discrete group. The BC (Baum-Connes) conjecture proposes an answer to the problem of calculating the K-theory of the (reduced) C^* algebra of G. A very natural generalization of BC is BCC (Baum-Connes with coefficients). This talk will explain why a discrete group G which contains an expander in its Cayley graph is a counter-example to BCC. The reason is that in BCC, the proposed answer to the original K-theory problem "sees" any group G as if G were an exact group. A group which contains an expander in its Cayley graph is not exact, and is not even K-theoretically exact — and thus is a counter-example to BCC.

Of course this raises the question of whether or not a group containing an expander in its Cayley graph exists. M.Gromov indicated how such a group can be constructed. After several years of work by a number of mathematicians, the existence of such a group has now been proved. This group is known as the Gromov group.

BCC might be true for a group G iff G is exact. At the present time the only known examples of non-exact groups are the Gromov group and closely related groups constructed using the Gromov group. (Received July 29, 2010)