March 1: Nigel Higson (Penn State), "The Baum-Connes Conjecture and Group Representations." Followed by dinner.

The Baum-Connes conjecture in C^*-algebra theory asserts a sort of duality between the reduced unitary dual of a group and a variant of the classifying space of the group. The conjectured duality occurs at the level of K-theory. For example, for free abelian groups the conjecture amounts to a K-theoretic form of Fourier-Mukai duality.

The conjecture has well-known applications in topology and geometry, but it also resonates in some ways with Lie groups and representation theory. I'll try to indicate how this comes about, and then focus on one particular aspect of the relationship. Associated to any connected Lie group is its so-called "contraction" to a maximal compact subgroup. This is a smooth, one-parameter family of Lie groups, and a consequence of the Baum-Connes conjecture (which is a theorem for Lie groups) is that the duals of the groups in this family are all the same, at the level of K-theory. A somewhat surprising development is that in key cases the duals are the same at the level of sets.