April 2, 2014: Benjamin Harris (LSU), *On the Orbit Method for Reductive Groups*

Suppose G is a real, reductive algebraic group, and suppose that X is a homogeneous space for G with an invariant measure. We wish to know the decomposition of $L^2(X)$ into irreducible representations of G. This is a difficult question in general. Despite decades of work, only a few families of special cases have been completely worked out. For many spaces X, we know next to nothing about the decomposition of $L^2(X)$.

The orbit method is a way of drawing a picture of this decomposition. Though this picture does not model the representation theory perfectly, it gives us a rough idea of what should happen in great generality.

In this talk, the speaker will present recent work showing that a piece of the orbit method picture correctly models the asymptotics of a piece of the decomposition of $L^2(X)$. This result is partially based on joint work with Hongyu He and Gestur Olafsson. If time permits, the author will give additional conjectures concerning the validity of the orbit method.