September 4 and 11, Peter Trapa (Utah/Harvard), "Restrictions on characteristic cycles of Harish-Chandra modules."

Suppose G is a complex reductive Lie group. Fix a special nilpotent orbit $\mathcal{O}$ for G. We are interested in finding "nice" orbits of $G_{\mathbb{R}}$ on $\mathcal{O} \cap \mathfrak{g}_{\mathbb{R}}$ for some real form $G_{\mathbb{R}}$ of G. The definition of nice is technical and won't we spelled out here; it can be thought of as specifying a crude relationship between certain cells of Harish-Chandra modules for $G_{\mathbb{R}}$ and certain geometric cells in the conormal variety (or Steinberg variety) attached to $G_{\mathbb{R}}$. Our main result provides the existence of nice real forms in types A and C. The techniques should apply to give the existence in types B and D as well.

The point to all this is as follows. Suppose that X is a Harish-Chandra module for *any* real form $H_{\mathbb{R}}$ of G such that the associated variety of the annihilator of X coincides with the closure of $\mathcal{O}$. Then each nice real form of $\mathcal{O}$ gives a nontrivial restriction on the form that the characteristic cycle of X can take. In this way information from nice real forms is transfered to Harish-Chandra modules for arbitrary real forms. When we consider the case of Harish-Chandra modules for the complex group G itself, for instance, we find that the nice real forms lead to new and significant restrictions on the associated variety of a simple highest weight module. These considerations also lead to new computations of irreducible components of characteristic cycles themselves.