November 23: Peter Hochs (University of Adelaide), "K-type multiplicities of tempered representations via coadjoint orbits."

The 'quantization commutes with reduction' principle of Guillemin and Sternberg is a way to compute multiplicities of irreducible representations in representations obtained by quantizing symplectic manifolds in an appropriate sense. This principle was proved for compact Lie groups acting on compact symplectic manifolds by Meinrenken and others in the 1990s, after a version for compact Kähler manifolds by Guillemin and Sternberg themselves in 1982. It has since been generalised to noncompact groups and manifolds, and from symplectic manifolds to the more general Spin-c manifolds. The most important motivation for these generalisations is their potential for applications to representation theory. In joint work with Yanli Song (Dartmouth College) and Shilin Yu (Chinese University of Hong Kong), we use a version for noncompact Spin-c manifolds to express multiplicities of K-types of tempered representations as indices of Dirac operators on certain compact manifolds. These manifolds are constructed from coadjoint orbits via a Spin-c version of the symplectic reduction construction of Marsden and Weinstein. This extends work by Paradan, who did this for discrete series representations.