December 11: Moshe Adrian (Queens College, CUNY), *On the sections of the Weyl group*

Let G be a connected reductive group over an algebraically closed field and W the Weyl group of a maximal torus. In 1966, Tits defined a representative n_α, in G, for each simple reflection s_α in the Weyl group. These representatives satisfy the braid relations, and therefore define a section of W. This section has been used extensively ever since, in many works. On the other hand, there exist sections of the Weyl group that are not Tits section. For example, in some cases (for example type B_n adjoint and even simpler, GL_2), W embeds into G, but the Tits section does not realize such an embedding. Motivated by a question about the Kottwitz homomorphism in p-adic groups, we have computed and classified all sections of the Weyl group, in types A through G. It turns out that these sections can be partially ordered by "how homomorphic they are," and this partially ordered set of sections has a unique maximal (i.e. "most homomorphic") element. We will describe this poset, which seems to be interesting in its own right. Moreover, we explain that the "most homomorphic" section answers our question from p-adic groups: it splits the Kottwitz homomorphism. Finally, essentially by definition, this most homomorphic section always realizes an embedding of W in G, whenever such an embedding exists.