September 11 and 18, 2013: Dan Ciubotaru (University of Utah), *Dirac cohomology of graded Hecke algebra modules and spin representations of Weyl groups I, II.*

Graded affine Hecke algebras were introduced by Lusztig in the study of smooth representations of reductive p-adic groups and Iwahori-Hecke algebra modules. Motivated by the Dirac theory for $(\mathfrak{g}, K)$-modules of real reductive groups and the notion of Dirac cohomology defined by Vogan, a Dirac operator and Dirac cohomology were defined in the setting of graded Hecke algebras. Here, the Dirac cohomology is a module for a certain Pin double cover of the finite Weyl group. The irreducible characters of this cover had been classified by Schur for symmetric groups and A. Morris and others for the other simple Coxeter groups. In these talks I intend to present:

- a new realization of the irreducible characters of the pin cover of the Weyl group, intimately related to Springer theory for ordinary representations of Weyl groups;
- connections between the Dirac index and elliptic representation theory of (graded) affine Hecke algebras;
- a realization of the discrete series modules of graded Hecke algebras in the kernel/index of certain "global" Dirac operators acting on spaces of real analytic functions.

The talks are based on joint work with D. Barbasch, X. He, E. Opdam, and P. Trapa.