

October 28, 2015: Beth Romano (Boston College), *Representations of p -adic groups via geometric invariant theory*.

Let G be a semisimple split reductive group over a finite extension k of \mathbb{Q}_p . In recent work Reeder and Yu have given a new construction of supercuspidal representations of $G(k)$. Each rational point x in the Bruhat-Tits building of G determines a group G_x and an \mathbb{F}_p -representation V_x of G_x . Given a stable (in the sense of geometric invariant theory) linear functional on V_x , the recipe of Reeder-Yu produces a finite set of irreducible supercuspidal representations. For small p , these would be new representations. However, it is precisely for small p that it has been difficult to determine those points x for which V_x has stable functionals.

In joint work, Jessica Fintzen and I have classified those points x such that V_x has stable linear functionals. Our methods do not depend on p . In my talk, I will give an overview of this work, as well as explicit examples for the case when $G = G_2$, the automorphism group of the octonions. For these examples, I will explicitly describe the locus of all stable functionals on V_x , as well as the parameters which correspond under the local Langlands correspondence to the representations given by the construction of Reeder-Yu.