Speaker: Julia Gordon

Title: Coefficients of the local character expansion are motivic

Abstract: In 1994, M. Assem observed that with a suitable choice of Haar measures, the unipotent orbital integrals on a connected reductive group G over a p-adic field are rational-valued for rational-valued test functions. He concluded that Shalika germs, and in some cases, the coefficients of the Harish-Chandra's local character expansion are rational, and conjectured that it should always be the case. I will try to outline a proof of the general case, which now uses the new kind of local character expansion due to Loren Spice, and motivic integration (to get a uniform result for almost all local fields) This is joint work in progress with Thomas Hales and Loren Spice.

Speaker: David Schwein

Title: The formal degree of a regular supercuspidal representation

Abstract: Supercuspidal representations are the building blocks for the representation theory of reductive p-adic groups. Using a general and explicit construction of supercuspidals due to J. K. Yu, one can probe the fine structure of these representations. This talk studies a positive real number called the "formal degree" that measures the size of the representation. In the first part we calculate the formal degree of a Yu representation. In the second part we explain how the local Langlands correspondence predicts our calculation, verifying a conjecture of Hiraga, Ichino, and Ikeda.

Speaker: Monica Nevins

Title: Interpreting the Harish-Chandra–Howe local character expansion via branching rules

Abstract: The Harish-Chandra–Howe local character expansion expresses the character of an admissible representation of a p-adic group G as a linear combination of Fourier transforms of nilpotent orbital integrals $\hat{\mu}_{\mathcal{O}}$ near the identity. We show that for $G = SL(2,k)$, where the branching rules to maximal compact open subgroups K are known, each of these terms $\hat{\mu}_{\mathcal{O}}$ can be interpreted as the character $\tau_{\mathcal{O}}$ of an infinite sum of representations of K, up to an error term arising from the

zero orbit. Moreover, the irreducible components of $\tau_{\mathcal{O}}$ are explicitly constructed from the K-orbits in $\mathcal{O}$. This work in progress offers a conjectural alternative interpretation of branching rules of admissible representations.

Speaker: Aaron Pollack

Title: Singular modular forms on quaternionic E_8

Abstract: The exceptional group $E_{7,3}$ has a symmetric space with Hermitian tube structure. On it, Henry Kim wrote down low weight holomorphic modular forms that are "singular" in the sense that their Fourier expansion has many terms equal to zero. The symmetric space associated to the exceptional group $E_{8,4}$ does not have a Hermitian structure, but it has what might be the next best thing: a quaternionic structure and associated "modular forms". I will explain the construction of singular modular forms on $E_{8,4}$ and the proof that these special modular forms have rational Fourier expansions, in a precise sense. This builds off of work of Wee Teck Gan and uses key input from Gordan Savin.

Speaker: Michael Harris

Title: Ramification of supercuspidal parameters

Abstract: Let G be a reductive group over a local field F of characteristic p. Genestier and V. Lafforgue have constructed a semi-simple local Langlands parametrization for irreducible admissible representations of G, with values in the ℓ-adic points of the L-group of G; the local parameterization is compatible with Lafforgue's global parametrization of cuspidal automorphic representations. Using this parametrization and the theory of Frobenius weights, we can define what it means for a representation of G to be *pure*.

Assume G is split semisimple. In work in progress with three collaborators, whose names will be revealed on October 18, we have shown that a pure supercuspidal representation has ramified local parameter, provided the field of constants in F has at least three elements and has order prime to the order of the Weyl group of G. In particular, if the parameter of a pure representation π is unramified then π is a constituent of an unramified principal series. We are also able to prove in some cases that the ramification is wild.