Speaker: Dubravka Ban

Title: From $GL_2(\mathbb{Q}_p)$ to $SL_2(\mathbb{Q}_p)$

Abstract: Let E be a finite extension of $\mathbb{Q}_p$. The p-adic Langlands correspondence for $G = GL_2(\mathbb{Q}_p)$ is a bijection between the set of absolutely irreducible 2-dimensional E-representations of Gal$(\overline{\mathbb{Q}_p}/\mathbb{Q}_p)$ and the set of absolutely irreducible admissible non-ordinary E-Banach space representations of G. We study the corresponding objects for $H = SL_2(\mathbb{Q}_p)$. Let Π be an irreducible admissible Banach space representation of G. Then $\Pi|_H$ decomposes as a direct sum of inequivalent representations.

Let ψ: Gal$(\overline{\mathbb{Q}_p}/\mathbb{Q}_p) \rightarrow GL_2(E)$ be the associated Galois representation. Assume that ψ is de Rham with Hodge-Tate weights 0 and 1. We compute the centralizer in $PGL_2(\overline{E})$ of the image of the corresponding projective Galois representation $\overline{\psi}$: Gal$(\overline{\mathbb{Q}_p}/\mathbb{Q}_p) \rightarrow PGL_2(E)$. We show that the order of the centralizer is equal to the number of components of $\Pi|_H$.

Encapsulated in the p-adic Langlands correspondence for G is the classical smooth Langlands correspondence. The representation Π contains a smooth representation π. In the case when ψ is non-trianguline, π is supercuspidal. We investigate the connection between $\Pi|_H$ and $\pi|_H$. This is a joint work with Matthias Strauch.

Speaker: Adam Brown

Title: Unitary representations of GL(n) and the geometry of Langlands parameters

Abstract: Harish-Chandra's Lefschetz principle suggests that representations of real and p-adic split reductive groups are closely related, even though the methods used to study these groups are quite different. The local Langlands correspondence indicates that these representation theoretic relationships stem from geometric relationships between real and p-adic Langlands parameters. In this talk, we will discuss how the geometric structure of real and p-adic Langlands parameters lead to functorial relationships between representations of real and p-adic groups. I will describe work in progress, joint with Peter Trapa, which applies this functoriality to the study of unitary representations and signatures of invariant hermitian forms, for GL(n). The result expresses signatures of invariant hermitian forms on graded affine

Hecke algebra modules in terms of signature characters of Harish-Chandra modules, which are computable via the unitary algorithm for real reductive groups by Adams–van Leeuwen–Trapa–Vogan.

Speaker: Chris Jantzen

Title: Generic representations for quasi-split similitude groups

Abstract: In this talk, we discuss the classification of irreducible generic representations for quasi-split p-adic similitude groups, as well as some of the background needed to determine the classification.

Speaker: Stella Sue Gastineau

Title: Diving into the Shallow End

Abstract: In 2013, Reeder–Yu gave a construction of supercuspidal representations by starting with stable characters coming from the shallowest depth of the Moy–Prasad filtration. In this talk, we will be diving deeper—but not too deep. In doing so, we will construct examples of supercuspidal representations coming from a larger class of "shallow" characters. Using methods similar to Reeder–Yu, we can begin to make predictions about the Langlands parameters for these representations.

Speaker: Tamanna Chatterjee

Title: Study of parity sheaves arising from graded Lie algebras

Abstract: Let G be a complex, connected, reductive, algebraic group, and $\chi: \mathbb{C}^\times \to G$ be a fixed cocharacter that defines a grading of $\mathfrak{g}$, the Lie algebra of G. Let G_0 be the centralizer of $\chi(\mathbb{C}^\times)$. In this paper, we study G_0-equivariant parity sheaves on $\mathfrak{g}_n$, under some assumptions on the field $\Bbbk$ and the group G. The assumption on G holds for GL_n and for any G, it recovers results of Lusztig in characteristic 0. The main result is that every parity sheaf occurs as a direct summand of the parabolic induction of some cuspidal pair.