Speaker: Adèle Bourgeois

Title: Restricting Representations via Restricting G-data and Kim-Yu Types

Abstract: Let $\mathbb{G}$ be a reductive group defined over a p-adic field F, and let $G = \mathbb{G}(F)$. We assume that $\mathbb{G}$ splits over a tamely ramified extension of F and that the residual characteristic p of F does not divide the order of the Weyl group of $\mathbb{G}$. Under this assumption, Fintzen showed that all irreducible supercuspidal representations of G are obtained via the J.K. Yu construction. From a G-datum Ψ, the J.K. Yu construction produces an irreducible supercuspidal representation of G, which we denote by $\pi_G(\Psi)$.

Given a reductive F-subgroup $\mathbb{H}$ that contains the derived subgroup of $\mathbb{G}$, we study the restriction $\pi_G(\Psi)|_H$ and obtain a description of its decomposition into irreducible components along with their multiplicities. We achieve this by describing a natural restriction process from which we construct H-data from the G-datum Ψ.

To study the restriction to H of irreducible representations of G which are not supercuspidal, one can use the theory of types. More specifically, given the underlying assumption on p, Fintzen showed that every irreducible representation of G contains a Kim-Yu type. The construction of Kim-Yu types is very similar to Yu's construction of supercuspidal representations. As such, we can define an analogous restriction process from which we construct Kim-Yu types for H from a Kim-Yu type for G, therefore obtaining information on the restriction to H of any irreducible representation of G.

Speaker: Rahul Dalal

Title: Statistics of Automorphic Representations through Simplified Trace Formulas

Abstract: Automorphic forms are very difficult to study individually so it is often good to study them in families instead. The Arthur-Selberg trace formula is a powerful tool for this. For certain very nice families (discrete series at infinity) the trace formula takes on a simpler form, allowing us to much more easily prove distributional results. I will discuss some of these results.

Speaker: Pol van Hoften

Title: Mod p points on Shimura varieties of parahoric level

Abstract: The conjecture of Langlands-Rapoport gives a conjectural description of the mod p points of Shimura varieties, with applications towards computing the (semi-simple) zeta function of these Shimura varieties. The conjecture was proven by Kisin for abelian type Shimura varieties at primes of (hyperspecial) good reduction, after having constructed smooth integral models. For primes of (parahoric) bad reduction, Kisin and Pappas have constructed 'good' integral models and the conjecture naturally generalises to this setting. In this talk we will discuss work in progress towards the conjecture for these integral models, under some hypotheses, building on earlier work of Zhou.

Speaker: Zhilin Luo

Title: On the stable transfer for Sym^n Lifting of GL_2: Archimedean case.

Abstract: Following the paradigm of R. Langlands, we are going to explore the the stable transfer factors for Sym^n lifting from GL_2 to GL_{n+1}. We give a complete answer for tempered principal series over any local fields of characteristic zero, which in particular resolve the case over complex field. Over real field, when n is odd, we provide a reduction formula, reducing the construction of the stable transfer factors to diagonal embedding of GL_2 to finitely many copies of GL_2. There are also partial results over p-adic fields.

This is a joint work with D. Johnstone. Preprint available arXiv:2002.09551.

Speaker: Hanneke Wiersema

Title: Serre's conjecture and two notions of minimal weight

Abstract: The strong form of Serre's conjecture states that every two-dimensional continuous, odd, irreducible mod p Galois representation arises from a modular form of a specific minimal weight, level and character. We will see how one can use modular representation theory to prove the minimal weight is equal to a notion of minimal weight inspired by the recipe for weights introduced by Buzzard, Diamond and Jarvis. We will also briefly touch on generalisations of this, again using modular representation theory, which is the subject of work in progress.

Speaker: Alex Youcis

Title: An approach to characterizing the local Langlands conjecture over p-adic fields

Abstract: In 2013 P. Scholze provided an alternative proof of the local Langlands correspondence (LLC) for GL_n and, in doing so, Scholze gave a new characterization of the LLC via a certain trace identity. In this talk the speaker will discuss joint work with A. Bertoloni Meli showing that a generalization of this trace identity characterizes the LLC for much more general groups if one assumes standard expected properties of such a correspondence.