Mumbai-Pune Number Theory Seminar 2021

Abstracts

Friday, April 09, 2021

Speaker: Baskar Balasubramanyam

Title: Endoscopic points on Siegel eigenvariety

Abstract: We study critical points in the Siegel eigenvariety constructed from Yoshida lifts. We compare the dimensions of classical eigenpackets at stable and endoscopic points to show that our critical points support non-classical eigenpackets on the eigenvariety. This is joint work with Tian An Wong.

Speaker: Sumit Mishra

Title: Local-global principles for norms over semi-global fields

Abstract: Let K be a complete discretely valued field with the residue field κ . Let F be a function field in one variable over K and \mathfrak{X} be a regular proper model of F with reduced special fibre X a union of regular curves with normal crossings. Suppose that the dual graph associated to X is a tree (e.g. F = K(x)). Let L/F be a Galois extension of degree n with Galois group G such that $\operatorname{char}(\kappa)$ does not divide n. Suppose that κ is algebraically closed field or a finite field containing a primitive n^{th} root of unity. Then we show that the local-global principle holds for the norm one tori corresponding to the extension L/Fi.e. an element in F^{\times} is a norm from the extension L/F if it is a norm from the extensions $L \otimes_F F_{\nu}/F_{\nu}$ for all discrete valuations ν of F.

Speaker: Jishnu Ray

Title: Iwasawa theory of automorphic representations of GL(2n) at non-ordinary primes

Abstract: Iwasawa Theory has played a key role in studying the arithmetic of elliptic curves providing a p-adic approach to the celebrated Birch and Swinnerton-Dyer conjecture. A central theme in Iwasawa Theory has been to construct bounded p-adic L-functions in the analytic side and Selmer groups in the algebraic side; they are then related by the Iwasawa Main Conjecture. Thanks to the contributions of many well-known mathematicians in this subject, such constructions were earlier carried out for elliptic curves and modular forms. In this talk, building upon works of Barrera-Dimitrov-Williams, under certain hypotheses, we will construct bounded p-adic L-functions for automorphic representations of GL(2n) which are non-ordinary at the prime p. We will further construct Selmer groups on the Galois side and frame the Iwasawa Main Conjectures. This is joint work with Antonio Lei.

Saturday, February 17, 2018

Speaker: Tanmay Deshpande

Title: On the geometric Whittaker model

Abstract: If G is a reductive group over a finite (or local) field, then a Whittaker model of an irreducible representation is an embedding into an induced representation from a non-degenerate multiplicative character of a maximal unipotent subgroup U. The irreducible representations which admit such an embedding are in a certain sense "generic" and moreover the embedding is unique up to scaling.

In this talk I will discuss certain geometric analogues of these ideas and explain their relationship with the theory of character sheaves on reductive groups. This talk is based on ongoing joint work with R. Bezrukavnikov.

Speaker: Shashank Singh

Title: Arithmeticity of some symplectic hypergeometric groups

Abstract: There are 14 symplectic hypergeometric groups corresponding to the pairs of degree four polynomials f, g where $f = (x - 1)^4$, g is product of cyclotomic polynomials with g(0) = 1, $g(1) \neq 0$ and f, g forms a primitive pair. It is known that exactly half of these 14 symplectic hypergeometric groups are arithmetic and the other half of them are thin. It is natural to ask if the same dichotomy holds in the case of degree six polynomials satisfying the same conditions. There are 40 such pairs of polynomials f, g where $f = (x - 1)^6$. We will show that 18 of the 40 symplectic hypergeometric groups (corresponding to the 40 pairs of the polynomials) are arithmetic. We will introduce a SageMath code which helps in finding some new arithmetic symplectic hypergeometric group and use that in showing the arithmeticity of the 18 groups.

This is join work with J. Bajpai, D. Dona, and S. Singh.

Speaker: Basudev Pattanayak

Title: Principal series component of Gelfand-Graev representation

Abstract: Let **G** be a connected reductive group defined over a nonarchimedean local field F. Let **B** be a minimal F-parabolic subgroup with Levi factor **T** and unipotent radical **U**. Let ψ be a non-degenerate character of $U = \mathbf{U}(F)$ and λ a character of $T = \mathbf{T}(F)$. Let (K, ρ) be a Bushnell-Kutzko type associated to the Bernstein block of $G = \mathbf{G}(F)$ determined by the pair (T, λ) . We study the ρ -isotypical component $(c\text{-ind}_U^G(\psi))^{\rho}$ of the Gelfand-Graev(induced) representation $c\text{-ind}_U^G(\psi)$ realized by functions whose support is compact mod U. We show that $(c\text{-ind}_U^G(\psi))^{\rho}$ is cyclic module for the Hecke algebra $\mathcal{H}(G, \rho)$ associated to the pair (K, ρ) . When **T** is split, we describe it more explicitly in terms of $\mathcal{H}(G, \rho)$. Our results generalize the main result of "Iwahori component of the Gelfand-Graev representation" by Kei Yuen Chan and Gordan Savin, who treated the case of $\lambda = 1$ when **T** is split. This is joint work with Manish Mishra.