

Mumbai-Pune Number Theory Seminar 2018

Abstracts

Friday, February 16, 2018

Speaker: Preeti Raman

Title: Classification of hermitian forms over fields of arithmetic interest

Abstract: We discuss classification of hermitian forms by Galois cohomological invariants over function fields of curves over number and local fields.

Speaker: Tathagata Mandal

Title: Modular endomorphism algebras at supercuspidal primes

Abstract: Let f be a primitive non-CM cusp form of weight two or more. The endomorphism algebra X_f (attached to f) is a 2-torsion element in the Brauer group of some number field. We give a formula for the ramification of X_f locally for all places lying above supercuspidal primes. For $p = 2$, we also treat the interesting case where the image of the Weil-Deligne representation attached to f is an exceptional group. We have completed the programme initiated by Eknath Ghate to give a satisfactory answer to a question of Ken Ribet. This is a joint work with Debargha Banerjee.

Speaker: Dipendra Prasad

Title: Groups with involutions: their place in geometry and representation theory

Abstract: “Algebras with involutions”, a topic of much classical interest, crystallized in Andre Weil’s 1960 paper, and on which there is by now already a classic book by Knus-Merkurjev-Rost-Tignol, continues to be of basic importance in mathematics. In this talk, we will discuss “Groups with involutions”, a topic which arises in the work of Elie Cartan on symmetric spaces, and one which is of fundamental importance for representation theory.

Saturday, February 17, 2018

Speaker: Arghya Mondal

Title: Automorphic representations and geometric cycles

Abstract: Let G be a semisimple linear algebraic group defined over \mathbb{Q} . Let Γ be a cocompact arithmetic subgroup of G . Let \mathfrak{g} be the Lie algebra of $G(\mathbb{R})$ and let K be a maximal compact subgroup of $G(\mathbb{R})$. We are interested in the set of (\mathfrak{g}, K) -modules V , which appear as the Harishchandra modules of irreducible components of the G -module $L^2(G(\mathbb{R})/\Gamma)$, for which the relative Lie algebra cohomologies $H^*(\mathfrak{g}, K; V)$ do not vanish. The set of (\mathfrak{g}, K) -modules with non-vanishing cohomology is known. Our effort will be to see when a member of the later set is also a member of the former. An old result of Kobayashi-Oda(1998), involving geometric cycles, seems to point to a promising approach. We will describe an example when $G(\mathbb{R}) = SU(p, q)$ and discuss the complications in the general case.

Speaker: Radhika Ganapathy

Abstract:

Title: On some Hecke algebra isomorphisms over close local fields

Two non-archimedean local fields F and F' are m -close if the rings $\mathfrak{O}_F/\mathfrak{p}_F^m$ and $\mathfrak{O}_{F'}/\mathfrak{p}_{F'}^m$ are isomorphic. For a split, connected reductive group G over \mathbb{Z} , Kazhdan proved that the Hecke algebras $\mathcal{H}(G, K_m)$ and $\mathcal{H}(G', K'_m)$ are isomorphic if the fields F and F' are sufficiently close, where $G = G(F)$, $K_m := \text{Ker}(G(\mathfrak{O}_F) \rightarrow G(\mathfrak{O}_F/\mathfrak{p}_F^m))$, and G', K'_m are the corresponding objects over F' . In this talk, we will discuss a variant of this isomorphism with the K_m 's replaced by filtration subgroups of an Iwahori subgroup of G , some applications of such an isomorphism towards understanding representations of p -adic groups over close local fields, and some ingredients in its generalization to non-split groups.

Speaker: Kaneenika Sinha.

Title: Pair correlation statistics for Hecke eigenvalues

Abstract: We derive the pair correlation statistics for eigenvalues of Hecke operators T_p (p denotes a prime) acting on spaces of modular cusp forms with prescribed weights and levels. Our results can be generalized to derive similar statistics in the context of Hilbert modular forms and modular forms on hyperbolic 3-spaces. This is a report on joint work with Baskar Balasubramanyam.