Mumbai-Pune Number Theory Seminar, 2020

3 – 4 July, 2020

Schedule and Abstracts of Talks

School of Mathematics

Tata Institute of Fundamental Research

Title of Talks

U. K. Anandavardhanan	*Distinction, base change, and formal degree*
Arvind Nair	*Cohomological representations of real reductive groups*
Dipendra Prasad	*Relating the Tate-Shafarevich group of an Elliptic curve with the class group.*
A. Raghuram	*Special values of L-functions for $GL(n)$ over a CM field*
Mihir Sheth	*Non-admissible irreducible mod p representations of $GL_2(\mathbb{Q}_{p^2})$*
Steven Spallone	*Spinorial Representations of $GL(n,q)$*

Abstracts

Friday, 03 July 2020 (14:30-15:30)

Speaker : Dipendra Prasad
Title : Relating the Tate-Shafarevich group of an Elliptic curve with the class group

The lecture will be an attempt to understand the classgroup of $\mathbb{Q}(E[p])$ for E an elliptic curve over $\mathbb{Q}$ as the $GL(2)$-analogue of the work of Herbrand-Ribet on classgroup of $\mathbb{Q}(\mu_p)$. A precise relationship between the classgroup of $\mathbb{Q}(E[p])$ and the Tate-Shafarevitch group will be discussed. Work done with Sudhanshu Shekhar.

Friday, 03 July 2020 (15:45-16:45)

Speaker : Mihir Sheth
Title : Non-admissible irreducible mod p representations of $GL_2(\mathbb{Q}_{p^2})$

We use a Diamond diagram attached to a generic 2-dimensional reducible split mod p representation of the absolute Galois group of $\mathbb{Q}_{p^2}$ to construct smooth irreducible non-admissible mod p representations of $GL_2(\mathbb{Q}_{p^2})$. This is a joint work with E. Ghate and is based on the work of Daniel Le who constructs such representations of $GL_2(\mathbb{Q}_{p^f})$ for $f > 2$.

Friday, 03 July 2020 (17:00-18:00)

Speaker : Steven Spallone
Title : Spinorial Representations of $GL(n, q)$

An orthogonal representation is *spinorial*, provided it lifts to the corresponding Spin group (or Pin group). For q odd, we give a criterion in terms of character values, which tells when an orthogonal representation of $GL(n, q)$ is spinorial. The proof applies the theory of Stiefel-Whitney classes and a cohomology detection theorem of Quillen. This is joint work with Rohit Joshi.

Saturday, 04 July 2020 (10:00-11:00)

Speaker : Arvind Nair
Title : Cohomological representations of real reductive groups

Unitary cohomological representations of real reductive groups were classified in the early 1980s by Vogan and Zuckerman and their Arthur packets were defined in 1987 by Adams and Johnson. We will show that cohomological Arthur packets are functorial for certain morphisms of Langlands dual groups and draw some consequences of this. This is based on joint work with D. Prasad.

Saturday, 04 July 2020 (11:15-12:15)

Speaker : A. Raghuram
Title : Special values of L-functions for $GL(n)$ over a CM field

I will talk about some new rationality results for the special values of L-functions for $GL(n)$ over a CM field. The proof uses my work with Harder on $GL(2n)$ over a totally real field, and certain period relations that Shahidi and I proved on the behaviour of Betti-Whittaker periods upon twisting by characters. I will also discuss compatibility of my results with Deligne's conjecture on the special values of motivic L-functions.

Saturday, 04 July 2020 (12:30-13:30)

Speaker : U. K. Anandavardhanan
Title : Distinction, base change, and formal degree

For the multiplicity free pair $(GL(n,E), GL(n,F))$, where E/F is a quadratic extension of p-adic fields, we look at the proportionality constant between two naturally occurring invariant linear forms on a distinguished (discrete series) representation. This involves base change from $U(n,E/F)$ and the formal degrees of the base changed and base changing representations. This work is joint with Nadir Matringe.