



INDIAN STATISTICAL INSTITUTE

Theoretical Statistics and Mathematics Unit, Kolkata

Number Theory Seminar

Date: August 29, 2024

Time: 02:30 PM

VENUE:

L- infinity

(5th Floor, A.N. Kolmogorov Bhavan), ISI Kolkata

TITLE:

Isolation of the Cuspidal Spectrum

SPEAKER:

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ABSTRACT:

Let \mathbb{Q} be the rationals. Let $\mathbb{A}_{\mathbb{Q}}$ denote the adèles over \mathbb{Q} . Let $G_n = GL_n$ and consider the space $G = G(\mathbb{Q}) \backslash G(\mathbb{A}_{\mathbb{Q}}) / K$ where K is the standard maximal compact of $G_n(\mathbb{A}_{\mathbb{Q}})$. The space of automorphic cusp forms is a subspace $L^2_{\text{cusp}}(G)$ of $L^2(G)$. We know that L^2 admits a spectral decomposition consisting of $L^2_{\text{cusp}} \oplus L^2_{\text{res}} \oplus L^2_{\text{Eis}}$ (the plus over the Eisenstein is in fact a direct integral) following Langlands, Mœglin-Waldspurger and/or Arthur. Let $\mathcal{S}(G)$ denote the space of Schwartz functions on G . Then the right regular representation of G on $L^2(G)$ extends to $\mathcal{S}(G)$ via $\pi(f)v(g_0) = \int_G f(g) v(g_0g) dg$ for $v \in L^2(G)$. Following a paper of Beuzart-Plessis, Liu, Zhang and Zhou, we shall construct Schwartz functions f such that the image of $\pi(f)$ is purely cuspidal. In fact, we shall construct a multiplier i.e. a continuous map $\mu : \mathcal{S}(G) \rightarrow \mathcal{S}(G)$ s.t. given a finite collection of cuspidal representations π_1, \dots, π_m we have that $\mu(f)(\pi_i)(v) = \pi_i(f)(v)$ for all i and $v \in \pi_i$.

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