

The 12th Takagi Lectures

May 25 (Sat)–26 (Sun), 2013
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ABSTRACT

L. Lafforgue:

Kernels of Langlands' automorphic transfer and non-linear Poisson formulas

In the first talk, we shall introduce the notion of kernels of Langlands' automorphic transfer and give some hints about the way we could try to construct such kernels. In the second talk, we shall introduce some kind of non-linear Poisson formulas which are implied by Langlands' transfer conjecture and which, in the other direction, would be enough to construct transfer kernels.

S. Popa:

Classification and rigidity in operator algebras arising from free groups

Higman has shown in 1939 that group algebras $\mathbb{C}\Gamma$ of torsion free orderable groups Γ can be isomorphic only if the groups are isomorphic. But letting $\mathbb{C}\Gamma$ act on the Hilbert space $\ell^2\Gamma$ by left convolution and then taking closure in the weak operator topology, gives rise to much larger algebras, denoted $L(\Gamma)$, that tend to forget the group Γ , for instance $L(\mathbb{Z} \wr \mathbb{Z}^n)$, $n \geq 1$ are all isomorphic (Connes 1976). The study of these algebras, now called *von Neumann algebras*, was initiated by Murray and von Neumann in 1936–1943. A famous problem going back to their work is whether the von Neumann algebras $L(\mathbb{F}_n)$, associated with the free groups on n generators, are non-isomorphic for different n 's. While this is still open, its “group measure space” version, asking whether the crossed product von Neumann algebras $L^\infty(X) \rtimes \mathbb{F}_n$ arising from free ergodic probability measure preserving actions $\mathbb{F}_n \curvearrowright X$ are non-isomorphic for $n = 2, 3, \dots$, independently of the actions, has recently been settled by Stefaan Vaes and myself. I will comment on this result, as well as on some related problems.