"Only a few find the way, some don't recognize it when they do - some... don't ever want to."

The Cheshire Cat, American McGee's Alice (2000)

The Trivial Notions Seminar
Proudly Announces

Local new forms for GL(n)

A talk by
Pei-Yu Tsai

Abstract

The L-functions have very good analytic properties and provide abundant arithmetic invariants. In the theory of holomorphic modular forms, one can associate to a Hecke eigenform an L-function. Such an L-function has the Euler product formula and we can hence study what happens at each prime. It is known that those Hecke eigenforms which are newforms can associate to a compatible family of smooth representations of $PGL(2, Q_p)$. We will start from such a representation and study how to find a special element in it to recover back the L-function, or the new form.

The key result is that such a new form is arisen from the invariant vectors of $\Gamma_0(p^m)$ in the smooth representation of $PGL(2, Q_p)$. The level p^m can be as small as the conductor and the L-function can be recovered by taking zeta integral on a specific invariant vector at this smallest level. This beautiful new form theory has been proven by Casselman in 1970s but people used to have a hard time finding the correct congruence subgroups for more general groups. I will show the generalization to $PGL(n)$ by Jacquet, Piatetski-Shapiro and Shalika to demonstrate the idea of what a possible strategy one can consider to form such a new form theory for general groups. If time permits, I will comment on the generalization to the B_n case, which is my work in progress.

Thursday December 6th, at 1:30 pm
Science Center 507