Southern California Number Theory Day, UC San Diego, February 20, 2016

Ellen Eischen, University of Oregon

Title: p-adic families of Eisenstein series and applications

Abstract: One approach to studying the p-adic behavior of L-functions relies on the construction of certain p-adic families of Eisenstein series. I will introduce a construction of such p-adic families. I will also describe some applications to number theory and beyond.

David Hansen, Columbia University

Title: Period mappings in p-adic Hodge theory

Abstract: I'll describe a very general p-adic analogue of the "period mapping" from classical Hodge theory. This relies on Scholze's theory of diamonds, which I'll briefly review. Time permitting, I'll describe some applications to Shimura varieties.

Matthias Strauch, Indiana University

Title: Coverings of the p-adic upper half plane and arithmetic differential operators

Abstract: The p-adic upper half plane comes equipped with a remarkable tower of GL(2)-equivariant etale covering spaces, as was shown by Drinfeld. It has been an open question for some time whether the spaces of global sections of the structure sheaf on such coverings provide admissible locally analytic representations. Using global methods and the p-adic Langlands correspondence for $\mathrm{GL}(2, \mathbb{Q}_p)$, this is now known to be the case by the work of Dospinescu and Le Bras. For the first layer of this tower Teitelbaum exhibited a nice formal model which we use to provide a local proof for the admissibility of the representation (when the base field is any finite extension of $\mathbb{Q}_p$). The other key ingredients are suitably defined sheaves of arithmetic differential operators and $\mathscr{D}$-affinity results for formal models of the rigid analytic projective line, generalizing those of Christine Huyghe. This is joint work with Deepam Patel and Tobias Schmidt.

Xiaoheng Jerry Wang, Princeton University

Title: Density of polynomials with squarefree discriminant

Abstract: The problem of the density of squarefree discriminant polynomials is an old one, being considered by many people, and the density being conjectured by Lenstra. A proof has been out of question for a long time. The reason it was desired is that a squarefree discriminant polynomial f immediately gives the ring of integers of $\mathbb{Q}[x]/f(x)$ and its Galois group. In recent joint work with Manjul Bhargava and Arul Shankar, we counted the number of odd degree polynomials with squarefree discriminant and proved the conjecture of Lenstra. In this talk, I will explain the general strategy of the squarefree sieve and the specific strategy to deal with discriminants which in turn leads to counting integral orbits for a representation of a non-reductive group.