Mathematics Department Colloquium

Organizer: Olga Holtz

Thursday, 4:10–5:00pm, 60 Evans

Dec. 4   **Akshay Venkatesh**, Stanford University
The Cohen-Lenstra heuristics over global fields

Abstract: In the 1980s Cohen and Lenstra formulated a notion of "random abelian p-group" to explain certain statistics observed in number theory. (For instance, the "class group" of a number field is more likely to contain a Z/9Z factor than a Z/3Z x Z/3Z factor.) I will review this circle of ideas (the "Cohen-Lenstra heuristics") along with theoretical and numerical evidence for the heuristics; no background in number theory is presumed.

I will then describe joint work with Jordan Ellenberg and Craig Westerland where we study the Cohen-Lenstra heuristics over function fields, i.e., finite extensions of $F_p(t)$. In this case, the questions are intimately connected to purely topological (!) questions about Hurwitz spaces of large dimension. I will recall the definition of Hurwitz spaces and discuss some conjectures (and theorems) inspired by the Cohen-Lenstra heuristics.