Séminaire de théorie des nombres

Le 5 Juin à 14h

Upper bounds for torsion in class groups

Exposé de A. Venkatesh

Résumé : I will discuss the problem of giving upper bounds on the ℓ-torsion part of the class group of a number field.

One believes that this is "quite small" relative to the size of the entire class group ; such results

are quite useful (e.g. to bound ranks of elliptic curves by descent) but seem to be quite hard to come by. For instance, for $\mathbf{Q}(\sqrt{-D})$ the size of the entire class group is about $D^{1/2}$; one believes that the size of the 3-torsion part is $\ll D^{\epsilon}$, and the best known bound is $D^{1/3}$.

I will discuss some of the existing work (by L. Pierce, Heath-Brown, Helfgott/Venkatesh) and then discuss recent work with Jordan Ellenberg, which gives some new results (such as the $D^{1/3}$ mentioned above, as well as certain results for fields of higher degree).