ASIF ZAMAN, University of Toronto
Improving the trivial bound for class group torsion

Let $K \neq \mathbb{Q}$ be a number field of degree $[K : \mathbb{Q}]$ and absolute discriminant $D_K = |\mathrm{Disc}(K)|$. Let Cl_K be the class group of K. For an integer $\ell \geq 2$, the ℓ-torsion of the class group of K satisfies the well-known trivial bound

$$|\mathrm{Cl}_K[\ell]| \leq |\mathrm{Cl}_K| \ll_{[K:\mathbb{Q}]} D_K^{1/2} (\log D_K)^{[K:\mathbb{Q}]-1}$$

due to Landau. Improvements over this trivial bound, both conditional and unconditional, have generated significant interest in many cases depending on ℓ, the degree $[K : \mathbb{Q}]$, and the subfield structure of K. In this talk, I will discuss an unconditional log-power savings improvement over this trivial bound for all ℓ and all number fields K. The method will be traced back to the teachings of Greg Martin.

This is joint work with Robert Lemke Oliver.