

## Number Theory Seminar

### *Counting Elliptic Curves Over Number Fields*

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**Abstract:** Let  $E$  be an elliptic curve over a number field  $K$ . By the Mordell-Weil Theorem, the set of rational points  $E(K)$  forms a finitely generated abelian group, which can be expressed as  $E(K) \cong E(K)_{\text{tors}} \times \mathbb{Z}^r$ , where  $E(K)_{\text{tors}}$  is the finite torsion subgroup and  $r$  is the rank of  $E$ . In this talk, I will present results on the frequency with which elliptic curves exhibit a prescribed torsion subgroup, and how to establish bounds on the average analytic rank of elliptic curves over number fields. A key approach underlying these results involves employing techniques from Diophantine geometry to count points of bounded height on genus zero modular curves.

Friday, October 18 at 9:00 AM in 636 SEO