

ALGEBRA
SEMINAR

*Torsion subgroups of elliptic curves over quintic and sextic
number fields*

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Abstract: The determination of which finite abelian groups can occur as the torsion subgroup of an elliptic curve over a number field has a long history starting with Barry Mazur who proved that there are exactly 15 groups that can occur as the torsion subgroup of an elliptic curve over the rational numbers. It is a theorem due to Loïc Merel that for every integer d the set of isomorphism classes of groups occurring as the torsion subgroup of a number field of degree d is finite. If a torsion subgroup occurs for a certain degree, then one can also ask for how many distinct pairwise non-isomorphic elliptic curves this happens. The question which torsion groups can occur for infinitely many non-isomorphic elliptic curves of a fixed degree is studied during this talk. The main result is a complete classification of the torsion subgroups that occur infinitely often for degree 5 and 6. This is joint work with Andrew Sutherland and heavily builds on previous joint work with Mark van Hoeij.

Thursday, February 9, 2017, 4:00 pm
Mathematics and Science Center: W306

MATHEMATICS AND COMPUTER SCIENCE
EMORY UNIVERSITY