The Oliver Club

www.math.cornell.edu/~oliver/

Ranks of Elliptic Curves

An elliptic curve is a plane curve (of genus 1) defined by a cubic polynomial in two variables. The problem of finding the rational points on an elliptic curve has fascinated mathematicians since the time of the ancient Greeks. In 1922, L. Mordell proved that the rational points form a finitely generated abelian group (a fact already "known" by Poincaré, although he gave no proof). However, to this day, we do not even know a proven algorithm to find the rank of the group. One of the Clay Millennium problems, the Birch and Swinnerton-Dyer conjecture, which came out of computer calculations in the 1960s, proposes an analytic way to find the rank.

In this talk we will first discuss the state-of-the-art methods and techniques used to overcome the problems that arise when trying to find the rank. Later we will present results which study, for a fixed elliptic curve, the growth of the rank in towers of fields.

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Refreshments will be served at 3:55 PM in the Mathematics Department lounge (532 Malott Hall).

Thursday, January 31, 2008
at 4:25 PM in 406 Malott Hall