

Abstract

Many Diophantine problems are related to quadratic twists of elliptic curves, and ternary quadratic forms. For example, a positive integer n is a congruent number (i.e. the area of some right triangle with rational lengths) if and only if the elliptic curve $ny^2=x^3-x$ has a rational point of infinite order. It is also related to integral solutions of $2x^2+y^2+8z^2$ etc. In this talk, we introduce some progress on arithmetic problem of elliptic curves under quadratic twists and ternary quadratic forms.