

## **Elliptic curves and Hilbert's Tenth Problem**

Kirsten Eisentrager, Penn State

Hilbert's Tenth Problem in its original form was to find an algorithm to decide, given a multivariate polynomial equation with integer coefficients, whether it has a solution over the integers. Matiyasevich proved that no such algorithm exists, i.e. Hilbert's Tenth Problem is undecidable. Since then, analogues of this problem have been studied by asking the same question for polynomial equations with coefficients and solutions in other commutative rings. Hilbert's Tenth Problem over the rationals and over number fields in general is still open.

In this talk we will discuss how elliptic curves can be used to prove the undecidability of Hilbert's Tenth Problem for various rings and fields, including (large) subrings of number fields and certain function fields.