

Triangular Modular Curves of Low Genus and Geometric Quadratic Chabauty

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Abstract

In this talk, we will first discuss an introduction to problems in Diophantine geometry. Then, we will have two parts. For the first part, we will study triangular modular curves, generalizations of modular curves that arise from quotients of the upper half-plane by congruence subgroups of hyperbolic triangle groups. The main result in this part will be that there are finitely many triangular modular curves of any given genus. With this in mind, we will discuss an algorithm to enumerate all such curves of a fixed genus. This is joint work with John Voight. For the second part, we will change gears to discuss the geometric quadratic Chabauty method, an algebro-geometric method to compute rational points on certain curves. We will present a comparison theorem with the (classical) quadratic Chabauty method and algorithms for applying geometric quadratic Chabauty to hyperelliptic curves. This is joint work with Sachi Hashimoto and Pim Spelier.