BOSTON UNIVERSITY NUMBER THEORY SEMINAR

Picard curves with good reduction away from p=3

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Monday, April 9 at 4:15 pm
111 Cummington Mall, MCS B21
Tea and cookies in MCS 144 at 4:00 pm

Abstract: In 1997, Nigel Smart determined all genus 2 curves defined over the rationals with good reduction at all primes except $p = 2$. Nearly 20 years later, Chris Rasmussen and I solved a very natural follow up: determining all Picard curves (genus 3 curves of the form $y^3 = f(x)$, where f has degree 4) with good reduction away from $p = 3$. Even with the intervening advances in computing technology, enumeration problems like these are still often extremely difficult. This talk will outline our methods, which hinge on the deceptively simple problem of finding all solutions in the S-units to the equation $x + y = 1$.

Important ingredients include Alan Baker's theorem on linear forms in logarithms and related work of Kunrui Yu. This work has potential applications in enumerating modular curves.