David Zureick-Brown* (dzb@mathcs.emory.edu) and Eric Katz. Rational points on curves and chip firing.

Let $X$ be a curve over $\mathbb{Q}$ with genus $g \geq 2$, $p > 2r$ a prime, $J$ the Jacobian of $X$, $r = \text{rank } J(\mathbb{Q})$, and $\mathcal{X}$ a regular proper model of $X$ at $p$. Suppose $r < g$. We prove that $\# X(\mathbb{Q}) \leq \# X(\mathbb{F}_p) + 2r$, extending the refined version of the Chabauty-Coleman bound to the case of bad reduction.

In this talk I’ll review the setup of Chabauty-Coleman and explain a new technical insight from tropical geometry which generalizes the classical rank of a divisor on a curve to a notion better suited for singular curves and which satisfies Clifford’s theorem. (Received September 15, 2013)