1145-11-1827 **Michael Cerchia*** (`cercm17@wfu.edu`). *Classifying the image of the Arboreal Galois representation.*

Suppose $E/\mathbb{Q}$ is an elliptic curve and $\alpha \in E(\mathbb{Q})$ is a point of infinite order. How often is it the case that α has odd order when we reduce E mod p? If we let S be the set of primes $p \leq x$ for which $E/\mathbb{F}_p$ is non-singular and $\alpha \in \mathbb{F}_p$ has odd order, then our general goal is to determine

$$\lim_{x \to \infty} \frac{\pi_S(x)}{\pi(x)}$$

where $\pi_S(x)$ is the number of primes p with $p \in S$ and $p \leq x$, and $\pi(x)$ is the total number of primes $p \leq x$. It turns out that the answer to this question is contingent upon determining all possible images of a particular Galois representation – the Arboreal Galois representation. This talk will explore this connection. (Received September 24, 2018)