1154-11-479 **Jason P Bell*** (jpbell@uwaterloo.ca), **Dragos Ghioca** and **Matthew Satriano**. *A gap conjecture for heights of iterates.*

Let X be a quasi-projective variety defined over a field K of characteristic 0, endowed with the action of an étale endomorphism Φ, and $f\colon X \to Y$ is a morphism with Y a quasi-projective variety defined over K. Then we show that a uniform result of the following type holds: if for a given $x \in X(K)$, for each $y \in Y(K)$ the set $S_y := \{n \in \mathbb{N}\colon f(\Phi^n(x)) = y\}$ is finite, then there exists a positive integer N such that $\#S_y \le N$ for each $y \in Y(K)$. We use this to prove that a "gap" theorem holds for étale endomorphisms, which we now describe. Let K be a number field, $f : X \to \mathbb{P}^1$ a rational map, and Φ be an étale endomorphism of X. If $\mathcal{O}$ denotes the forward orbit of x under the action of Φ, then either $f(\mathcal{O})$ is finite, or $\limsup_{n\to\infty} h(f(\Phi^n(x)))/\log(n) > 0$, where $h(\cdot)$ represents the usual logarithmic Weil height for algebraic points. We conjecture that this dichotomy should hold for general endomorphisms of quasi-projective varieties when everything is defined over a number field. (Received September 05, 2019)