1077-AC-176 **Joseph H. Silverman***, Mathematics Department - Box 1917, Brown University, Providence, RI 02912. *Number Theory and Dynamical Systems.* Preliminary report.

A discrete dynamical system consists of a set S and a self-map $\phi : S \to S$, and one is then interested in classifying the points of S according to their behavior under iteration of the map ϕ. This subject has a long and storied history when S is an analytic space, for example $\mathbb{R}$, $\mathbb{C}$, or $\mathbb{CP}^1$, and there are many deep and beautiful results of a geometric and analytic nature. During the past 25+ years people have developed an arithmetic theory of discrete dynamics, in which S is an arithmetic set such as $\mathbb{Z}$, $\mathbb{Q}$, or $\mathbb{P}^1(\mathbb{Q})$, and the map ϕ is a polynomial or rational function. In this setting one studies arithmetic properties of orbits under iteration of ϕ. In this talk I will give a survey of this new field of arithmetic dynamics, including some of its history, some known results, and some of the conjectures that motivate current research. (Received August 07, 2011)