

**Meeting:** 1003, Atlanta, Georgia, SS 32A, AMS Special Session on Arithmetic Algebraic Geometry, I

1003-11-183      **Robert L. Benedetto\*** (r1b@cs.amherst.edu), Department of Mathematics and Comp Sci,  
Amherst College, Amherst, MA 01002. *Towards Uniform Boundedness for Quadratic Polynomial  
Dynamics.*

Let  $K$  be a number field, and let  $\phi \in K(z)$  be a rational function. Write  $\phi^n$  for the  $n$ -fold composition  $\phi \circ \phi \circ \cdots \circ \phi$ . We consider the action of  $\phi^n$  on the projective line  $\mathbb{P}^1(K)$ . A point  $x \in \mathbb{P}^1(K)$  is said to be preperiodic if  $\phi^m(x) = \phi^n(x)$  for some  $n > m \geq 0$ .

In 1950, Northcott proved that for any fixed  $\phi$  of degree at least two, there are only finitely many  $K$ -rational preperiodic points. In 1994, Morton and Silverman formulated a broad conjecture stating that the number of  $K$ -rational preperiodic points is bounded by a constant depending only on  $[K : \mathbb{Q}]$  and the degree of  $\phi$ .

In this talk, we will present evidence supporting the conjecture, and we will describe some recent non-uniform but improved bounds for the number of rational preperiodic points of a quadratic polynomial over  $\mathbb{Q}$ . (Received August 20, 2004)