

A Uniform Boundedness Theorem in Arithmetic Dynamics

John Doyle

In 1950, Northcott showed that if f is a rational function of degree $d \geq 2$ defined over a number field K , then f has finitely many K -rational preperiodic points – that is, points $\alpha \in K$ for which the sequence $\alpha, f(\alpha), f(f(\alpha)), \dots$ is eventually periodic. Inspired by the strong uniform boundedness conjecture (now Merel’s theorem) for torsion points on elliptic curves, Morton and Silverman conjectured in 1994 that the number of such points should be bounded by a constant depending only on d and the absolute degree of K . We will discuss recent progress on this problem, including a proof of a function field version of the conjecture for certain interesting families of maps. This is joint work with Bjorn Poonen.