Suppose that \( f : X \to X \) is a dominant rational self-map of a variety defined over a number field. For a point \( P \) on \( X \), Kawaguchi and Silverman have defined the arithmetic degree of \( f \) at \( P \), a measure of the asymptotic growth rate of the heights of points \( f^n(P) \). In this talk, I will introduce a definition of higher arithmetic degrees, measuring the growth rates of heights of higher-dimensional cycles. I will then describe efforts to develop a theory of arithmetic degrees in parallel to the much better established theory of dynamical degrees. This project is joint work with Nguyen-Bac Dang, Dragos Ghioca, Fei Hu, and Matthew Satriano. (Received September 11, 2019)