Algebraic Dynamics and Dynamical Iitaka Theory

Tianle Yang
base on the joint work with Sheng Meng and Long Wang

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SCHOOL OF
MATHEMATICAL SCIENCES
EAST CHINA NORMAL UNIVERSITY

Kawaguchi-Silverman Conjecture

Work over $\overline{\mathbb{Q}}$. X: smooth projective variety, $f : X \to X$: surjective endomorphism. H: ample divisor on X. $h : X(\overline{\mathbb{Q}}) \to \mathbb{R}_{\geq 1}$: a height function associated to H.

Conjecture: Kawaguchi-Silverman Conjecture = KSC

If the orbit $O_f(x) := \{f^n(x) \mid n \geq 0\}$ is Zariski dense in X, then

$$\alpha_f(x) = \delta_f.$$

here,

$$\alpha_f(x) := \lim_{n\to\infty} h(f^n(x))^{1/n},$$

arithmetic invariant at x,

$$\delta_f := \lim_{n\to\infty} ((f^n)^* H \cdot H^{\dim X - 1})^{1/n},$$

geometric invariant of f.

An example

Let $X = \mathbb{P}^2$ and $f : [x : y : z] \mapsto [x^d : y^d : z^d]$ with $d \geq 2$.

$$[1 : 2 : 3] \xrightarrow{f} [1 : 2^d : 3^d] \xrightarrow{f} [1 : 2^{d^2} : 3^{d^2}] \xrightarrow{f} \cdots$$

Three orbit conjecture

Dynamical Iitaka Theory

Settings

Main results

Strategies and Techniques

Thank You!