

Fei Hu (Nanjing University). **An upper bound for polynomial volume growth of automorphisms of zero entropy**

Let  $X$  be a normal projective variety of dimension  $d$  and  $f$  an automorphism of  $X$ . Suppose that the pullback  $f^*$  of  $f$  on the real Néron–Severi space  $N^1(X)_{\mathbb{R}}$  is unipotent and denote the index of the eigenvalue 1 by  $k + 1$ . We prove an upper bound for the polynomial volume growth  $\text{plov}(f)$  of  $f$ , or equivalently, for the Gelfand–Kirillov dimension of the twisted homogeneous coordinate ring associated with  $(X, f)$ , as follows:

$$\text{plov}(f) \leq (k/2 + 1)d.$$

We also show that  $k \leq 2(d - 1)$ , extending a result of Dinh–Lin–Oguiso–Zhang for compact Kähler manifolds to arbitrary characteristic. Combining these two inequalities together, we obtain an optimal inequality that

$$\text{plov}(f) \leq d^2,$$

which affirmatively answers questions of Cantat–Paris–Romaskevich and Lin–Oguiso–Zhang.

This is joint work with Chen Jiang.

Alexander Zaitsev (HSE University). **Boundedness of finite subgroups of rational Cremona group of rank 3.**

In 2009 J.-P. Serre provided an explicit multiplicative bound for orders of finite subgroups of plane Cremona group of rank 2 over finitely generated fields over  $\mathbb{Q}$  and asked a question: is it true that order of finite subgroups of Cremona groups of arbitrary rank over mentioned fields are bounded, and how the bound can be estimated?

In 2013, Yu. Prokhorov and C. Shramov answered the first part of the question in more general setup. They proved that group of birational automorphisms of arbitrary variety of arbitrary dimension over finitely generated fields over  $\mathbb{Q}$  has bounded finite subgroups. But their bounds were no longer explicit. I will discuss how we can try to answer the second part of Serre’s question in case of  $\text{Cr}_3(\mathbb{Q})$ .

Guolei Zhong (Institute for Basic Science). **Dynamical restrictions on the positivity of tangent bundles**

Motivated by Fakhruddin’s conjecture and the equivariant MMP (with respect to endomorphisms) developed by Meng–Zhang, it is expected that a complex projective manifold admitting an int-amplified endomorphism, up to a finite cover, is a locally trivial toric bundle over an abelian variety. In a previous joint work with Meng and Zhang, we proved this conjecture for Fano threefolds, i.e., it is toric, extending the works of Amerik–Rovinsky–Van de Ven and Hwang–Mok on the case of Picard number 1.

In this talk, we show that equipped with such an endomorphism, the underlying variety has strongly pseudo-effective tangent bundle; this allows us to unify

the structure theorems developed by Meng–Zhang, Yoshikawa, and Hosono–Iwai–Matsumura under such a dynamical assumption. Besides, we confirm this conjecture if the endomorphism has totally invariant ramifications; as an application, based on the previous work of Meng–Zhang, we verify the Kawaguchi–Silverman conjecture for int-amplified endomorphisms. The talk is based on a joint work with Sheng Meng.