

BIRATIONAL GEOMETRY IN POSITIVE CHARACTERISTIC
MOSCOW, 3–7 APRIL 2017
ABSTRACTS

Paolo Cascini & Hiromu Tanaka (Imperial College)
Minimal Model Programme in positive characteristic

We will survey some recent results in the Minimal Model Programme in positive characteristic. We will begin with a general introduction to the MMP, we will focus on the main differences within working in zero and positive characteristic. To this end, we introduce the notion of F -singularities and Keel's semi-ampleness method. The main goal is to present some recent developments such as Hacon–Xu existence of minimal models in dimension three in characteristic $p > 5$. We will present few examples and applications of this programme.

Yoshinori Gongyo (University of Tokyo)
Globally F -regular varieties and Fano type

I will lecture about some relation of globally F -regular varieties and varieties of Fano type through local to global correspondence of strongly F -regular and Kawamata log terminal singularities.

Dmitry Kaledin (Steklov Institute and HSE)
Symplectic varieties in positive characteristic

Symplectic algebraic varieties are interesting because they lie on the crossroads, in some sense: one can simply treat them as a special case of Calabi–Yau varieties, or study features specific to the symplectic theory such as deformation quantization. I will try to give a brief overview of how all this works in positive characteristic.

Nicholas Shepherd-Barron (King's College)
The Schottky problem at the boundary, for curves and surfaces

The Schottky problem is that of describing the image of a moduli space under the period mapping. I shall describe some phenomena at the boundary of various moduli spaces, of curves and of surfaces; this extends earlier joint work with Codogni.

Nicholas Shepherd-Barron (King's College)

Fano 3-folds in positive characteristic

I will discuss Kodaira vanishing and multiple projection for smooth Fano threefolds in positive characteristic.

Nicholas Shepherd-Barron (King's College)

Exceptional groups and del Pezzo surfaces

I shall extend the construction by Brieskorn and others that contains the simultaneous resolution of du Val singularities to the environment of principal bundles under exceptional groups over elliptic curves. This recovers the simultaneous log resolutions of simply elliptic singularities and gives a direct geometrical path from exceptional groups to del Pezzo surfaces. This is jointwork with Grojnowski.

Andrey Trepalin (IITP and HSE)

Del Pezzo surfaces over finite fields

Let X be a del Pezzo surface of degree d over a finite field \mathbb{F}_q , where $2 \leq d \leq 6$. Then the Galois group $\text{Gal}(\overline{\mathbb{F}}_q/\mathbb{F}_q)$ acts on the Picard group $\text{Pic}(X \otimes \overline{\mathbb{F}}_q)$, and its image Γ is a cyclic subgroup in the corresponding Weyl group, that is the group of automorphisms of the Picard group $\text{Pic}(X \otimes \overline{\mathbb{F}}_q)$ preserving the intersection form. Classification of such cyclic subgroups up to conjugation is well-known. We discuss methods how to construct a del Pezzo surface X , such that the group Γ has a given conjugacy class in the Weyl group.