Valery Alexeev. Degenerations of elliptic $K3$ surfaces

I will describe degenerations of elliptic K3 surfaces, both via Weierstrass models and Kulikov models that lead to a geometrically meaningful toroidal compactification of their moduli. Based on joint work with Engel and Brunyate.

Valery Gritsenko. Reflective modular forms, Lorentzian Kac–Moody algebras and algebraic geometry

In my talk, I will review our recent joint results with Viacheslav Nikulin on Lorentzian Kac–Moody algebras, reflexive automorphic forms and their applications to algebraic geometry.

JongHae Keum. Automorphism groups of cubic surfaces in arbitrary characteristic

Shigeyuki Kondo. Enriques surfaces and Leech lattice

Let L be an even unimodular lattice of signature $(1, 25)$ which is unique up to isomorphisms. J.H. Conway found a fundamental domain C of the reflection group of L by using a theory of Leech lattice. Recently S. Brandhorst and I. Shimada have classified all primitive embeddings of $E_{10}(2)$ into L, where $E_{10}(2)$ is the pullback of the Picard lattice of an Enriques surface to the covering K3 surface. There are exactly 17 embeddings. By restricting C to the positive cone of $E_{10} \otimes \mathbf{R}$ we obtain 17 polyhedrons. In this talk I would like to discuss the automorphism groups of Enriques and Coble surfaces in terms of these polyhedrons.

Viacheslav Nikulin. Classification of degenerations and Picard lattices of Kahlerian K3 surfaces with finite symplectic automorphism group

I will speak about my results which I obtained during last years 2013–2020. This classification is almost finished now. Only for very small symplectic automorphism groups of order 4, 3, 2 and 1 it is not completely finished now.

Yuri Prokhorov. On the rationality of Fano threefolds over non-closed fields

We discuss rationality problem of smooth Fano threefolds of Picard number one over algebraically non-closed fields. The talk is based on a joint work with A. Kuznetsov.

Alessandra Sarti. K3 surfaces with maximal finite automorphism groups

In the 80's Nikulin classified all the finite abelian groups acting symplectically on a K3 surface and his results inspired an intensive study of automorphism groups of K3 surfaces. It was shown by Mukai that the maximum order of a finite group acting symplectically on a K3 surface is 960 and that the group is isomorphic to the Mathieu group M_{20}. Then Kondo showed that the maximum order of a finite group acting on a K3 surface is 3840 and this group contains the Mathieu group with index four. Kondo showed also that there is a unique K3 surface on which this group acts, which is a Kummer surface. I will present recent results on finite groups acting on K3 surfaces, that contain strictly the Mathieu group and I will classify them. I will show that there are exactly three groups and three K3 surfaces with this property. This is a joint work with C. Bonnafé.