

Automorphism groups of del Pezzo surfaces of low degree over an arbitrary perfect field

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DESCRIPTION OF TOPIC

Del Pezzo surfaces are algebraic surfaces with quite special properties, that play an important part in the classification of projective algebraic surfaces up to birational transformations.

The classification of smooth rational del Pezzo surfaces of degree d over an arbitrary perfect field is classical for $d = 7, 8, 9$ and new for $d = 6$. The same is the case for the description of their groups of automorphisms. Their classification and the description of their automorphism groups is much more difficult for $d \leq 5$, as one can see already if the ground field is the field of real numbers, and the classification is open over a general perfect field. Partial classifications exist over finite fields. Accordingly, we do not know their automorphism groups in general. The objectif of the thesis is to classify the smooth rational del Pezzo surfaces of degree ≤ 5 over an arbitrary perfect field and describe their automorphism groups.

The PhD student will stay twice 2-3 months at the Department of Mathematics at Pohang University of Science and Technology in South-Korea, to profit from the expertise, advice and scientific input of Prof. Jihun Park.