

A journey to algebraic Montgomery-Yang problem

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Abstract

A normal projective surface with the same Betti numbers of the projective plane $\mathbb{CP}^2$ is called a rational homology projective plane or a $\mathbb{Q}$ -homology $\mathbb{CP}^2$. People working in algebraic geometry and topology have long studied a $\mathbb{Q}$ -homology $\mathbb{CP}^2$ with possibly quotient singularities.

It is well-known that it has at most five such singular points, but it is still mysterious what is the optimal upper bound for the number of quotient singular points. This is the *algebraic Montgomery-Yang problem*, which is one of the most famous conjectures in this field.

Recently, we announced a complete resolution of the algebraic Montgomery-Yang problem. The goal of this talk is to give an overview on it, and then we explain briefly how to resolve it.

This is a joint work with Woohyeok Jo and Kyungbae Park.