

Classifying Cubic Surfaces over a Finite Field

Anton Betten, Colorado State University

Classifying Cubic Surfaces over the complex numbers was one of the highlights of nineteenth century mathematics. The geometry is beautiful, with 27 lines contained in each surface. Nice pictures can be found on the internet.

In this talk, we want to consider the problem of classifying cubic surfaces over a finite field. We will report on a project to classify those surfaces by computer. This work combines the classical theory around Schlaefli's double six with modern combinatorics centered around group actions on partially ordered sets. We will present the results of the classification so far. We will look at some interesting families of surfaces with six Eckardt points.

This is joint work with Fatma Karaoglu and James Hirschfeld from the University of Sussex in the UK.

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