Mathematical Colloquia

Monday, 13 May 2024
17:15 h, lecture room B6 (ExWi)

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Rational points on del Pezzo surfaces

Abstract: Describing rational solutions to polynomial equations is one of the foundational goals in number theory, going back to Diophantus of Alexandria. In arithmetic geometry we study these solutions by looking at the geometric objects that the polynomials describe: every rational solution corresponds to a rational point on the geometric object.

Questions one might ask for such an object are: does it contain any rational points? And if so, how many? How are they distributed? In this talk I will give an overview of some of the results on rational points on curves, before moving on to surfaces, for which a lot less is known.

I will focus on a special class called del Pezzo surfaces and motivate why these surfaces are interesting to study. We will go over different ways to talk about 'many' rational points, highlight results on the rational points and the geometry of del Pezzo surfaces, and show how these relate to some of the major open questions on the arithmetic of surfaces.