Abstracts Week 2

Lecture series

Kristin DeVleming

Title: K-moduli spaces of Fano varieties

Abstract: The "right" stability notion to impose to construct well-behaved moduli spaces of Fano varieties and log Fano pairs turns out to be K-stability, a notion with origins in differential geometry. We will discuss constructions of K-moduli spaces along with several tools to determine whether or not a given variety is K-(semi)stable. We will also discuss wall crossing for K-moduli spaces of log Fano pairs, and provide many explicit examples along the way.

Chenyang Xu

Title: K-stability of Fano varieties

Abstract: The notion of K-stability of Fano varieties was first introduced to characterize the existence of Kähler-Einstein metrics. Recently, a purely algebro-geometric theory has been developed and it has yielded many striking results, such as the solution of the Yau-Tian-Donaldson Conjecture for all Fano varieties, as well as the construction of a projective moduli scheme, called K-moduli, parametrizing K-polystable Fano varieties.

In this lecture series, I will survey the recent progress. The first two lectures will be devoted to explain the evolution of algebraic geometer's understanding of various aspects of the notion of K-stability. Lectures 3 and 4 will be devoted to discuss the construction of the K-moduli space.

Research talks

Paolo Cascini

Title: Foliated flops over a complex threefold

Abstract: I will survey some recent results on the Minimal Model Program for foliations over a complex threefold. I will focus, in particular, on the existence and non-existence of flops. This is a joint work with C. Spicer.

James McKernan

Title: The log canonical threshold revisited

Abstract: The log canonical threshold plays a fundamental role in algebraic geometry, especially birational geometry and Mori theory. Recently the problem of classifying foliations on algebraic varieties has been revolutionized by introducing ideas from Mori theory.

We introduce a version of the log canonical threshold in this context. We conjecture that this satisfies the ascending chain condition and we check that this conjecture holds up to dimension three. On the way we introduce an interpolated canonical divisor and we show that we can run the MMP for such divisors.