

Higher Fano manifolds

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Fano manifolds are smooth complex projective varieties having ample anti-canonical class. They form a very special class of varieties. For every fixed dimension, there is only a finite number of deformation types of Fano manifolds. So in principle they can be classified, and in fact classification has been achieved for dimension at most three. In a landmark paper, Mori showed that Fano manifolds contain rational curves through every point. Since then, many other special properties of Fano manifolds have been established, such as rationally connectedness.

A few years ago, de Jong and Starr introduced a special class of Fano manifolds, namely, Fano manifolds X with positive second Chern character $ch_2(X) > 0$. They proved that, under some conditions, such X contains a rational surface through a general point. Unfortunately, very few examples of such higher Fano manifolds were known.

In this talk I will present a recent joint work with Ana-Maria Castravet on higher Fano manifolds. Our approach is via the study of rational curves of minimal degree through a general point $x \in X$. Our results in particular recover de Jong and Starr's theorem and enables us to find new examples of higher Fano manifolds.

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