

Boundedness and Moduli Problems in Birational Geometry and Foliation Theory



Contribution ID: 3

Type: **not specified**

Fano 4-folds with large Picard number and blow-ups of cubic 4-folds

Monday, 27 October 2025 09:30 (1 hour)

We will present some classification results for (smooth, complex) Fano 4-folds X with Picard number $\rho(X) > 6$. First of all, if $\rho(X) > 9$, then X is a product of del Pezzo surfaces; this is sharp, since we know one family of Fano 4-folds with $\rho(X) = 9$ that is not a product of surfaces. In the range $\rho(X) = 7, 8, 9$, we will explain some partial classification results, based on a detailed and explicit study of the geometry of X using birational geometry in the framework of the MMP. In particular, if $\rho(X) > 6$ and X has no small contractions, then either X is a product of surfaces, or $\rho(X) = 7, 8, 9$ and X is a blow-up of a cubic 4-fold along $\rho(X) - 1$ planes that intersect pairwise at a point.

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