



Leibniz  
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Hannover

# Oberseminar

## Institut für Algebraische Geometrie

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### The Fano variety of lines on a cyclic cubic fourfold

Among Fano varieties of  $K3$  type (or FK3 for short) the cubic fourfold stands out for its historical significance. Indeed, long before the terminology FK3 was born there were already examples of a relation between this famous cubic hypersurface and irreducible holomorphic symplectic (or IHS for short) manifolds. One method to associate a smooth cubic fourfold with an IHS manifold involves the Fano variety of lines on it. This is, as proven by Beauville–Donagi, an IHS manifold of type  $K3^{[2]}$ . This relation becomes even more intriguing when considering mildly singular cubic fourfolds, e.g. cubic fourfolds  $Y$  that are triple covering of  $\mathbb{P}^4$  branched over a singular cubic threefold. In this case we have that  $F(Y)$ , the Fano variety of lines on  $Y$ , is birational to an IHS manifold of type  $K3^{[2]}$ . This fact has been used by Boissière–Camere–Sarti and by me to study some compactification of the moduli spaces of irreducible holomorphic symplectic manifolds with an order three non-symplectic automorphism. In order to achieve this result the authors do not consider the rich geometry of  $F(Y)$ . I will present recent results obtained in collaboration with Samuel Boissière and Paola Comparin that explain how the geometry of  $F(Y)$  gives us a better understanding of the deep relation between cyclic cubic fourfolds and IHS manifolds of type  $K3^{[2]}$  with a non-symplectic automorphism of order three.

**Donnerstag, 11.01.2024, 16:00 - 17:00, B302.**

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**Alle Interessierten sind herzlich eingeladen.**