Elliptic fibrations and K3 surfaces

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Among algebraic surfaces, those that have an elliptic fibration, i.e., that are endowed with a proper morphism to a smooth curve whose fibers are, almost all, elliptic curves, play a special role: they can be regarded as an elliptic curve over the function field of the base curve and as a family of curves over the base curve. This two folded description makes such objects simultaneously intriguing and simpler to treat.

If one classifies algebraic surfaces by Kodaira dimension, one finds elliptic surfaces in all (Kodaira) dimensions but for $\kappa = 2$. But the only subclass that might admit more than one elliptic fibration with a section is that of K3 surfaces. It is therefore natural to search for a classification of elliptic fibrations on K3 surfaces.

I this talk I will introduce the definitions above and discuss the classification of elliptic fibrations on K3 surfaces, focusing, towards the end, in a special class given by the ones endowed with a non-symplectic involution.

Joint work with Alice Garbagnati (Univ. Milano).