Abstract:

Mori fiber spaces (MFS) are one of the building blocks in the Minimal Model Program. These are maps $X \to Y$ between normal varieties with nice singularities, such that $\dim Y < \dim X$, $\rho(X/Y) = 1$ and $-K_X$ is ample on every fiber. In particular, most fibers will be $Q$-Fano varieties. Starting from classical results on the topology of fibrations, I will try to explain how the above conditions place strong restrictions on what varieties can appear as fibers of MFS. I will give characterizations for low-dimensional varieties and explain what happens in the toric category. Moreover, we will show that this question can be connected to the question of existence of Kaehler-Einstein metrics. Joint work with G. Codogni, A. Fanelli, L. Tasin.