The Higher Dimensional Sarkisov Program

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Abstract: The minimal model program predicts that for any complex projective manifold X, there exists a sequence of well understood birational maps (flips and divisorial contractions) whose output X' is either

1. a minimal model (i.e. $K_{X'} \cdot C \geq 0$ for any curve $C \subset X'$), or
2. admits a Mori fiber space $f : X' \to S$ (i.e. a surjective morphism with connected fibers such that $\rho(X'/S) = 1$, $\dim X' > \dim S$ and $-K_{X'} \cdot C > 0$ for any curve $C \subset X'$ contracted by f).

Kawamata has shown that any two minimal models are connected by a finite sequence of flops. We will explain a similar result for Mori fiber spaces known as the Sarkisov program: If X is a complex projective manifold $X' \to S'$ and $X'' \to S''$ are two Mori fiber spaces given by running a K_X minimal model program, then the rational map $X' \dashrightarrow X''$ may be factored by a finite sequence of Sarkisov links. (This is joint work with J. M^{c}Kernan.)