

The Cox ring of a variety is the total coordinate ring, i.e., the direct sum of all spaces of global sections of all divisors.

When this ring is finitely generated, the variety is called Mori dream (MD). A necessary condition for being MD is the finite generatedness of $\text{Pic}(X)$, i.e., the vanishing of the irregularity.

Smooth rational surfaces with big anticanonical divisor are MD. Thus all del Pezzo surfaces of any degree are.

A K3 surface or an Enriques surface is MD iff its automorphism group is finite.