

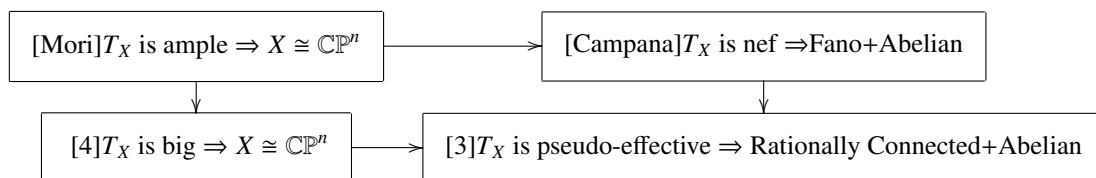
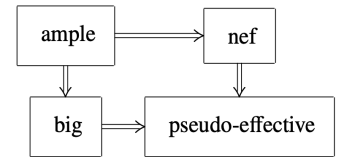
Summaries of researches and results (Masataka Iwai)

I outline my papers [3][4][5] on my list of publications. My major is **complex algebraic geometry**. I research about a classification of algebraic varieties (closed sub-manifolds in $\mathbb{C}P^N$) by using methods of **algebraic geometry, complex geometry and several complex analysis**.

Research A. The structure theorems of varieties with positive tangent bundles.

It is known that the structures of algebraic varieties are restricted if tangent bundles T_X or anticanonical divisors $-K_X := \det T_X$ are positive. A typical example is Mori's theorem: "If T_X is ample, then X is biholomorphic to $\mathbb{C}P^n$ ".

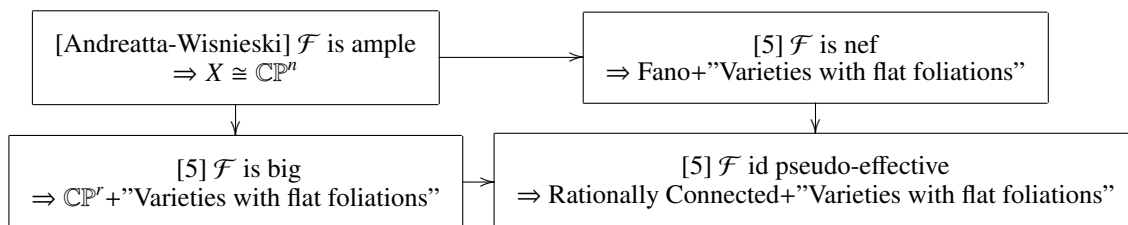
In addition to ample, the concept of positivity used in algebraic geometry includes nef, big, and pseudo-effective, and there is a relationship as shown in the table on the right. Therefore, even if T_X is nef, big, or pseudo-effective, the structure of algebraic varieties is expected to be restricted. In fact, Campana et al. proved that if T_X is nef, then X consists of Fano varieties (varieties with ample anticanonical divisors) and Abelian varieties (tori). In Research A, I studied the structures of algebraic varieties when T_X is big or pseudo-effective. We summarize including previous researches, and it is as follows. (The paper [3] is a joint work with Shin-ichi Matsumura and Genki Hosono in Tohoku University.)



It is well known that $\mathbb{C}P^n$ is Fano and that Fano varieties are rationally connected. Therefore, Research A is a generalization of previous studies. The classification of algebraic varieties with positive tangent bundles has been completed, since pseudo-effective is the weakest positivity used in algebraic geometry.

Research B. The structure theorems of varieties whose tangent bundles contain positive subbundles.

Peternell proposed that the structure of X will be restricted even if the subbundle \mathcal{F} of T_X has positivity (ample, nef, and so on). In fact, Andreatta-Wisnieski proved that if \mathcal{F} is ample, then X is biholomorphic to $\mathbb{C}P^n$. In Research B, I studied the structure of X if T_X contains a positive subbundle foliation \mathcal{F} . We summarize including previous researches, and it is as follows.



"Varieties with flat foliations" are classified by Druel et al. In particular, if T_X is flat, then X is a finite quotient of Abelian varieties. Therefore Research B is a generalization of the structure theorem in Research A.