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On the Structure of Compact Complex Manifolds in $\mathscr{C}$

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Notations and conventions.

We use the following convention and terminology (cf. Ueno [43]). A complex manifold is always assumed to be *connected*. *A complex variety* is a reduced and irreducible complex space. A *fiber space* is a proper surjective morphism of complex spaces with general fiber irreducible.

a) Let X be a compact complex manifold and L a line bundle on X. Then:

$a(X)$: the algebraic dimension of X
$q(X)$ $:=\dim H^1(X, \mathcal{O}_X)$, the irregularity of X
K_X : the canonical bundle of X
$\kappa(L, X)$: the L-dimension of X
$\kappa(X)$ $:=\kappa(K_X, X)$ the Kodaira dimension of X

b) Let X be a compact complex variety, $\tilde{X}$ a nonsingular model of X, $A\subseteqq X$ an analytic subspace, E a holomorphic vector bundle on X. Then:

$a(X)$ $=a(\tilde{X})$
$q(X)$ $=q(\tilde{X})$
Aut X : the complex Lie group of biholomorphic automorphisms of X
$\mathrm{Aut}_0 X$: the identity component of Aut X
Aut (X, A) $:=\{g\in \mathrm{Aut}\, X;\, g(A)=A\}$
$\mathrm{Aut}_0 (X, A)$: the identity component of Aut (X, A)
$\boldsymbol{P}(E)$ $:=(E-\{0\})/\boldsymbol{C}^*$ ($\{0\}=$the zero section of E)
Θ_X : the sheaf of germs of holomorphic vector fields on X

A compact complex variety X' is called a bimeromorphic model of X if it is bimeromorphic to X.

c) Let Y be a complex variety. Then

$\pi_1(Y)$: the fundamental group of Y with respect to some reference point.
$\mathfrak{Q}(Y)$: the class of subsets of Y which is a complement of an at most countable union of proper analytic subvarieties of X, or

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