two different Kähler complex structures, the Hodge decomposition of H^* may vary — the rank of the groups $(H^{p,q}(M) \oplus H^{q,p}(M)) \cap H^{p+q}(M, \mathbb{Z})$ may even jump — but the Lefschetz isomorphism and decomposition remain the same.

1992. 7. 11. 五. Ann Arbor.

1. Complex Algebraic Varieties.

An algebraic variety is defined to be the set of complex zeros of homogeneous polynomials in projective space and may be viewed a priori as an analytic subvariety of $\mathbb{P}^n$.

In case the variety is smooth, we may consider the associated abstract compact complex manifold, whose properties will be intrinsic to — i.e not depending on the particular embedding of — the variety. Broadly speaking, we will approach algebraic geometry as the study of the interplay between the intrinsic and extrinsic or projective properties of algebraic varieties.

In section 1, we introduce the notion of divisors and line bundles; the material here is central for all that follows. Since a compact complex manifold admits no global holomorphic functions, we might rather expect its structure to be reflected in the global meromorphic functions. and related linear systems of divisors on the manifold; this notion is basic one in classical algebraic geometry. Associated to a divisor is a holomorphic line bundle, to a meromorphic function a line bundle together with a holomorphic section, and to a line bundle its Chern class. The subsequent formalism, developed by Kodaira and Spencer and others in the early 1950s, gives an extremely useful technique