

POSITIVE CONES IN KÄHLER GEOMETRY

HENRI GUENANCIA

ABSTRACT

This course will be devoted to the study of positive cones arising in the cohomology of a compact Kähler manifold; it will culminate with the characterization of the pseudo-effective cone as dual of the mobile cone.

- (1) Cohomology of a compact Kähler manifold
 - De Rham and Dolbeault cohomology
 - Intersection theory and Poincaré duality
 - Positive cones in $H^{1,1}(X)$
- (2) Mobile intersection product
 - Volume of a $(1, 1)$ class
 - Construction of the mobile intersection product
 - Convexity inequalities of Khovanskii-Teissier
- (3) The duality theorem
 - Holomorphic Morse inequalities
 - The orthogonality relation
 - Characterization of uniruled varieties

PREREQUISITES

First semester course on Complex analysis and differential geometry.

REFERENCES

- [1] S. Boucksom, J.-P. Demailly, M. Păun, T. Peternell, *The pseudo-effective cone of a compact Kähler manifold and varieties of negative Kodaira dimension*, J. Algebraic Geom. (22), 2013, p. 201-248.
- [2] C. Voisin, *Hodge theory and complex algebraic geometry*, I. Cambridge University Press, Cambridge, 2002. x+322 pp
- [3] D. Witt Nyström, *Duality between the pseudoeffective and the movable cone on a projective manifold*, J. Amer. Math. Soc. (32), 2019, p. 675–689.