

CANONICAL METRICS AND KÄHLER-RICCI FLOW

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ABSTRACT

These lectures aim to provide an introduction to some recent developments in Kähler geometry. We shall cover the following topics:

- (1) Compact Kähler manifolds
 - Examples, canonical metrics
 - Quasi-plurisubharmonic functions
- (2) Singular Kähler-Einstein metrics
 - Singular Calabi-Yau conjecture
 - Uniform a priori estimates
- (3) Degenerate complex Monge-Ampère equations
 - Finite energy classes
 - Variational approach
- (4) The Yau-Tian-Donaldson conjecture
 - Mabuchi geometry
 - Properness and stability
- (5) The Kähler-Ricci flow
 - Smooth minimal models
 - Parabolic pluripotential theory

PREREQUISITES

Differential calculus and geometry, complex analysis of one variable.

REFERENCES

- [1] S.Boucksom & P.Eyssidieux & V.Guedj. An introduction to the Kähler-Ricci flow. Lecture Notes in Math. 2086, Springer (2013).
- [2] J.-P. Demailly, Complex Analytic and Differential Geometry. <https://www-fourier.ujf-grenoble.fr/~demailly/manuscripts/agbook.pdf>
- [3] V.Guedj & A.Zeriahi, Degenerate complex Monge-Ampère equations. EMS Tracts in Math. (2017), 496p.
- [4] C. Voisin, Hodge theory and complex algebraic geometry. I. Cambridge University Press, Cambridge, 2002. x+322 pp