The geometry of the space of Kählerian potentials

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ABSTRACT

Kählerian Geometry lies at the crossroad of Riemannian, complex and symplectic geometries. The internal geometry of the space of Kählerian potentials, an essential object to be considered on Kähler manifolds, does reflect all these aspects.

The symplectic point of view remained for a long time unnoticed but it was recently given much more attention in the existence problem for Einstein-Kähler metrics on compact Fano manifolds, an extension of the uniformization problem on Riemann surfaces.

Understanding how these different aspects fit together is one of the most promising paths that should lead to a holomorphic necessary and sufficient condition as exemplified by recent results of Gang Tian and Xiu Xiong Chen. In this approach, a very special role is played by some special 1-forms that are naturally defined on this infinite dimensional space.