# Theory of Deformations of Complex Structures

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## Abstract

After defining the notion of holomorphic family of compact complex manifolds, we will prove Ehresmann's theorem on the smooth (but, in general, non-holomorphic) local triviality of any such family. We will then present the Kodaira-Spencer theory of deformations, including the upper-semicontinuity of the Hodge numbers of the fibres via a study of smooth families of elliptic differential operators. Two major results will then be presented: the Kodaira-Spencer theorem stating the deformation openness of the Kähler property of compact complex manifolds and the Bogomolov-Tian-Todorov theorem stating the unobstructedness of the Kuranishi family of any compact Kähler manifold whose canonical bundle is trivial.