

## "Cotangent Bundles with General Natural Kahler Structures".

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Abstract: We study the conditions under which an almost Hermitian structure  $(G,J)$  of general natural lift type on the cotangent bundle  $T^*M$  of a Riemannian manifold  $(M,g)$  is Kählerian. First, we obtain the algebraic conditions under which the manifold  $(T^*M,G,J)$  is almost Hermitian. Next we get the integrability conditions for the almost complex structure  $J$ , then the conditions under which the associated 2-form is closed. The manifold  $(T^*M,G,J)$  is Kählerian iff it is almost Kählerian and the almost complex structure  $J$  is integrable. It follows that the family of Kählerian structures of above type on  $T^*M$  depends on three essential parameters (one is a certain proportionality factor, the next two are parameters involved in the definition of  $J$ ). The final theorem gives the condition under which the Kählerian manifold  $(T^*M,G,J)$  of general natural lift type has constant holomorphic sectional curvature.