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Poisson Structures on Twistor Spaces of Hyperkähler and HKT Manifolds.

HKT structures (an abbreviation for hyperkähler with torsion) were first introduced in String Theory as the structures induced on the target manifolds of (4,0)- supersymmetric sigma models with Wess-Zumino term. From a mathematical viewpoint, compact HKT manifolds share many properties with Kähler manifolds. We characterize HKT structures in terms of a nondegenerate complex Poisson bivector on a hypercomplex manifold and extend the characterization to the twistor space. After considering the flat case in some detail, we show that the twistor space of a hyperkähler manifold admits a holomorphic Poisson structure. We briefly mention the relation to quaternionic and hypercomplex deformations on tori and K3 surfaces. (Received August 31, 2016)