Twistor Space of an Hyperkähler Manifold

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Hyperkähler manifolds are riemannian manifolds with $\mathrm{Sp}(n)$ holonomy. To each such, there is an associated complex manifold : the *twistor space* [HKLR87].

The goal of this talk is to explain what information on the manifold are encrypted whithin the twistor space. For this we will consider two examples :

First, we will see how a powerfull tool, twistor space is, to deal with *hyperbolicity* (in Brody's sense) for hyperkahler manifolds ; by presenting a result of F. Campana [Cam92].

Then, we will describe the "classical" twistor theory. In this case, the *Penrose transform* yields a marvellous interplay between the riemannian structure (curvature) on one side, and the complex structure on the other side.

References

[Cam92] F. Campana, *An application of twistor theory to the non-hyperbolicity of certain compact symplectic kähler manifolds.*, Journal für die reine und angewandte Mathematik **425** (1992), 1–8.

[HKLR87] N. J. Hitchin, A. Karlhede, U. Lindström, and M. Roček, *Hyperkahler metrics and supersymmetry*, Comm. Math. Phys. **108** (1987), no. 4, 535–589. MR 877637 (88g:53048)