ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

5. Differential Geometry and Global Analysis

1991 MS Classification: 53

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Hyperkähler metrics on cotangent bundles

By constructing the twistor space and proving the existence of twistor lines, we show that there exists a hyperkähler metric in a neighbourhood of the zero section of the cotangent bundle of any real-analytic Kähler manifold. This metric is compatible with the canonical holomorphic-symplectic structure of the cotangent bundle, the circle action by scalar multiplication in the fibres is isometric and the induced metric on the zero section coincides with the original Kähler metric.

These results are part of work in progress for a Ph. D. thesis supervised by Professor N. J. Hitchin.