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Twistor families of categories

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I will give a definition of a twistor family (C_ζ) , ζ belonging to the Riemann sphere, of triangulated categories. The prototypical example is the family of derived categories of coherent sheaves on compact hyperkähler manifold, endowed with complex structures parametrized by twistor parameter ζ . Another basic example comes from Simpson's non-abelian Hodge theory. In a joint work (in progress) with Y. Soibelman we propose a general approach to twistor families using Fukaya categories associated with holomorphic symplectic manifolds.

The most clean case is the product of an elliptic curve and C^* . For $\zeta \neq 0, \infty$ the corresponding category has a description in terms of elliptic difference equations. Harmonic objects are solutions of Bogomolony equations on 3-dimensional torus with isolated singularities. The universal family of categories in this example is parametrized by the non-Hausdorff quotient $(CP^2 - RP^2)/GL(3; Z)$.

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