

Superspace revisited

or,

Who ordered the metric?

There are interesting analogies between the cobordism two-category of smooth spin four-manifolds with homology three-sphere boundaries, and Graeme Segal's category with Riemann surfaces as morphisms. The algebraic K -theory of even indefinite unimodular lattices defines a natural representation for this new category; I will discuss the conjecture that Donaldson theory extends in this context to define a homomorphism from the homology of the diffeomorphism group of a four-manifold to certain automorphic cohomology groups associated to its middle homology lattice.

[Some details can be found at math.DG/0007018.]