

Can you regularise gravity on a supermanifold?

Wednesday, 18 December 2019 14:45 (30 minutes)

In this talk, we take inspiration from studies of using $SU(N|N)$ to construct a manifestly gauge invariant renormalisation procedure and attempt to apply this to gravity, preserving diffeomorphism invariance and incorporating allowing us to fit gravity into the renormalisation group (a rather well-known problem in physics). This means introducing a supermanifold and attempting to find the degrees of freedom by looking at the second order action.

For this to work like gauge theory, we are required to break the supersymmetry and be left with the normal diffeomorphism invariance. Fortunately, a mass very naturally appears in the superfield formalism, however we find that it doesn't act like a mass at the level of the propagator. Nonetheless, we find many interesting and useful results about gravity on a supermanifold and offer ways which this approach may yet work.

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