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Higher spin theory/O(N) vector model duality and Exact Renormalisation Group

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It has been conjectured that the 3d free O(N) vector model has an AdS4 dual which is Vasiliev's higher spin theory. Higher spins naturally arise in string theory, and they could soften the UV properties of quantum gravity. Since the boundary theory is a free theory, this duality is an ideal setting to understand higher spin theory through the much simpler free O(N) model. In fact, Vasiliev's theory is described in terms of equations of motion with a large number of auxiliary fields, and no action is known. In this context, there have been attempts to build the higher spin theory holographically from the free O(N) model. We will describe how Polchinski's ERG of the boundary currents can give us the bulk partition function with the action for the massless higher spin fields upto cubic order.

Presenter: DHARANIPRAGADA, Pavan

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