Contribution ID: **91** Type: **not specified**

HIgher spins as saviour of Quantum Universe

Friday 16 October 2015 17:45 (25 minutes)

We consider toy example of 3 dimensional universe defined via definite thermal properties. This is modelled by Eucledian Einstein gravity with positive cosmological constant. In this background we couple higher spin interactions with pure gravity and calculate Euclidean path integral perturbatively. We confine ourselves to the static patch of the 3 dimensional de Sitter space. This geometry, when Euclideanlized is equivalent to 3-sphere. However, infinite number of topological quotients of this space by discrete subgroups of the isometry group are valid Euclidean saddles as well. Pure Einstein gravity is known to diverge, when all saddles are included as contribution to the thermal partition functions (also interpreted as the Hartle Hawking state of in the cosmological scenario). We show how higher spins, described by metric-Fronsdal fields help making the partition function finite. Curiously, the convergence is not achieved by mere inclusion of spin-3, but requires spin-4 interactions. This explains thermal stability of the quantum universe in presence of higher spins, albeit in a toy model

Presenter: Dr BASU, Rudranil (Indian Institute of Science Education and Research, Pune)

Session Classification: Parallel