Contribution ID: **36** Type: **not specified**

Grand Covariance in Quantum Gravity

Wednesday, 18 December 2019 16:30 (30 minutes)

The laws of physics should not depend on how we choose to describe them, and we should not be able to change the physical predictions of our theory just by changing notation. However, this is exactly what happens in the standard formulation of quantum field theories. The effective action receives different quantum corrections depending on how we parametrise our fields. Even Feynman diagrams, a fundamental building block for QFT calculations, yield results that depend on the definition of the fields we choose to work with. In this talk I will rectify these problems by introducing the notion of grand covariance, in which the quantum fields are treated as coordinates on a manifold, known as the grand field space. Field redefinitions are then simply diffeomorphisms of this manifold and thus we can impose reparametrisation invariance using well-known techniques from differential geometry. I show how we can apply this formalism to scalar-tensor theories of quantum gravity. This talk is based on arXiv:1910.06661.

Primary authors: FINN, Kieran (University of Manchester); KARAMITSOS, Sotirios (University of Manchester); Prof. PILAFTSIS, Apostolos (University of Manchester)

Presenter: FINN, Kieran (University of Manchester)

Session Classification: Parallel Session 2