LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN | ARNOLD SOMMERFELD CENTER FOR THEORETICAL PHYSICS

Sommerfeld Theory Colloquium

Wednesday, 27th April 2022
at 16.15 h

Prof. Daniel Harlow
(MIT, Cambridge, USA)

Symmetry in quantum gravity

It has long been expected that the symmetry structure of quantum gravity is highly constrained. In particular it has been conjectured that global symmetries do not exist, and also that there must exist objects carrying all possible gauge charges. Until recently however there has been no systematic way of deriving such statements. In this talk I'll explain how these two conjectures can be derived in the special case of quantum gravity with negative cosmological constant, and also argue they are true more generally in any theory of quantum gravity where the evaporation of black holes is a unitary process. Along the way I'll clarify what is really meant by ``global'' and ``gauge'' symmetries, consider possible implications of these conjectures for particle physics, and present a new formula counting how many microstates of a black hole transform in each representation of a finite gauge group.

via ZOOM

Dieter Lüst