



Department of  
Theoretical Physics

# THE QUANTUM SPACETIME SEMINAR SERIES



## Local Operators and State Dependence in AdS/CFT

**SUVRAT RAJU**

(International Centre for  
Theoretical Sciences, Bengaluru)

**Date:** October 5, 2015

**Time:** 11.30 am

**Venue:** A-304, TIFR

(Duration and Location are subject to irreducible jitter)

We show how recent versions of the information paradox can be phrased as precise questions about the existence of operators with certain properties in the AdS/CFT correspondence. We review an explicit construction of such operators, but this also has the property that it is state-dependent: the correct operators required to describe approximately classical bulk degrees of freedom depend on the state of the CFT. We show how this is necessary even for the eternal black hole and discuss its possible semi-classical origins. We describe how this leads to a precise version of the ER=EPR proposal. We conclude with several open questions that reveal a tension between expectations from effective field theory, statistical mechanics, and unitarity.