

**FAKULTÄT für PHYSIK
LUDWIG-MAXIMILIANS-UNIVERSITÄT
MÜNCHEN/GARCHING**

**PHYSIK-DEPARTMENT
TECHNISCHE UNIVERSITÄT MÜNCHEN
MÜNCHEN/GARCHING**

MLL-KOLLOQUIUM

Donnerstag, 23.05.2019, 16¹⁵ Uhr

Hörsaal der LMU in Garching, Am Coulombwall 1
Treffen zum gemeinsamen Kaffee 16 Uhr

**Prof. Georgi Dvali
(LMU München)**

Quantum Memories

In this talk I introduce a phenomenon of enhancement of quantum memory storage capacity that is taking place in a wide class of systems with high occupancy of cold bosons at criticality. The S-matrix formulation shows that black holes are prominent members of this category. From particle physicists perspective a black hole is describable as a critical state of maximal memory storage capacity of soft gravitons at an extremely high occupation number. The same is true about a de Sitter type Universe. Both systems carry a maximal amount of quantum information that is protected against the standard semi-classical evolution. This leads to some important consequences. In particular, the primordial quantum memory pattern carried by the de Sitter Hubble patch from which our Universe evolved as a result of cosmic inflation was not erased by the latter process and is of observational importance. This opens up a conceptually new opportunity of catching the glimpses of the Universes's primordial quantum hair. The universal nature of the enhanced memory phenomenon allows to study and simulate black hole and de Sitter type quantum information storage and processing in laboratory systems with cold bosons.

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