

Talk # 2

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Black Holes and Holography

Black Holes are a prediction of Einsteins theory of Relativity, but it wasn't until the 1960s that they were taken seriously due to the Black Hole 'singularity'. Einstein disregarded them as unphysical. In the late 1960s and early 1970s Penrose and Hawking proved a powerful set of 'singularity theorems' showing that Black Holes are a generic and inevitable prediction of General Relativity describing the fate of gravitational collapse. But General Relativity just gives a macroscopic description, the existence of Hawking radiation and Black Hole entropy means we need a fundamental microscopic 'statistical mechanics' description. One promising approach is to view the world as a hologram, in which macroscopic gravity is a manifestation of a non-gravitational microscopic theory living in lower dimensions.