ICTS Seminar

Title : A Membrane Paradigm : The Next to Leading Order Story and instability.

Speaker : Subhajit Mazumdar, Tata Institute of Fundamental Research, Mumbai

Date : Thursday, November 17, 2016

Time : 3:00 PM

Venue : Nambu Discussion Room (Right), ICTS Campus, Bangalore.

Abstract : It has recently been demonstrated that black hole dynamics can be reformulated as the equations of motion of a co-dimension one membrane (roughly the black hole event horizon). These membrane equations have previously been determined at leading order in the large D expansion. In this talk we implement this `duality' to next order in 1/D and thereby determine the leading corrections to the membrane equations of motion and the metric. Our results obey several consistency checks; in particular upon linearizing our equations about a spherical membrane we reproduce the known quasi-normal mode frequencies of large D Schwarzschild black holes, including first sub leading corrections in 1/D. Our membrane equations, which admit a static solution in the sphere times black brane manifold, capture the Gregory Laflamme instability with small fluctuations in scaled amplitude and length scale. This result thus identifies the ‘black brane’ equations as a special limit of the membrane equations.