Università degli Studi di Trieste

Dipartimento di Fisica

Seminario

S. Chakraborty

Inter University for Astronomy and Astrophysics, India

June 14, 2.30 PM - Room 204, 2nd floor, Dip. di Fisica – Strada Costiera 11 – Miramare, Trieste

Information retrieval from black holes.

It is generally believed that, when matter collapses to form a black hole, the complete information about the initial state of the matter cannot be retrieved by future asymptotic observers, through local measurements. This is contrary to the expectation from a unitary evolution in quantum theory and leads to (a version of) the black hole information paradox. Classically nothing else, apart from mass, charge and angular momentum is expected to be revealed to such asymptotic observers after the formation of a black hole. Semi-classically, black holes evaporate after their formation through the Hawking radiation. The dominant part of the radiation is expected to be thermal and hence one cannot know anything about the initial data from the resultant radiation. However, there can be sources of distortions which make the radiation non-thermal. Although the distortions are not strong enough to make the evolution unitary, these distortions carry some part of information regarding the in-state. In this work, we show how one can decipher the information about the in-state of the field from these distortions. We show that the distortions of a particular kind --- which we call non-vacuum distortions --- can be used to fully reconstruct the initial data. The asymptotic observer can do this operationally by measuring certain well-defined observables of the quantum field at late times. We demonstrate that a general class of in-states encode all their information content in the correlation of late time out-going modes. Further, using a (1+1) dimensional CGHS model to accommodate back-reaction self-consistently, we show that observers can also infer and track the information content about the initial data, during the course of evaporation, unambiguously.

Organizzazione a cura di: A. Bassi

dipartimento di TRIESTE fisica

UNIVERSITÀ DEGLI STUDI DI TRIESTE

INFN Istituto Nazionale di Fisica Nucleare

Everyone interested in the topic is welcome to attend

Informazioni: seminari@ts.infn.it