

ICTS Colloquium

Title : Gravity and Decoherence

Speaker : Joseph Samuel, Raman Research Institute, Bangalore

Date : Monday, March 26, 2018

Time : 3:00 PM

Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore

Abstract : This talk concerns the relation between gravity and quantum theory. In quantum gravity, one studies the microscopic, small distance behaviour of gravity. The main idea of this colloquium is to reverse the emphasis and study the macroscopic, large distance behaviour of quantum theory. It has been suggested many years ago that gravity may be responsible for decoherence in quantum mechanics. I will make the discussion precise by analysing the double slit experiment from the perspective of standard relativistic quantum field theory. I propose some thought experiments and use only well established physics to analyse them. I suggest that gravity does induce decoherence in quantum systems. I will also discuss some subtle consequences of the effect of vacuum fluctuations on quantum coherence, which may be amenable to laboratory experiments.