

## ICTS PhD Seminar

Title : Aspects of open quantum field theory

Speaker : Chandan Kumar Jana (ICTS-TIFR, Bangalore)

Date : Friday, 10<sup>th</sup> September 2021

Time : 11:00 am (IST)

Abstract : Open quantum systems have been studied quite extensively since its advent. However, a transition to open field theories, in particular interacting relativistic open field theories, is mostly underexplored. A model for relativistic open fields can be implemented in the study of a relativistic heavy-ion collision, plasma physics, cosmology, etc. More fundamentally, one can try to understand decoherence in field theory.

In my talk, I shall describe the challenges in the study of relativistic open systems. First, we shall consider toy models consisting of scalar and Fermion fields and study one loop renormalizability of these field theories. We show that one loop integrals in open field theories are non-local divergent. A cure to this problem is absent till date. In the second part of the talk, I shall show that one can construct an interacting open effective action for a probe scalar field using holography. The effective action in a thermal bath manifestly contains non-linear fluctuation-dissipation relations along with the linear fluctuation-dissipation relation.

Online Seminar : Zoom link:  
<https://us06web.zoom.us/j/82808796527?pwd=aVBkaWUzVWZ3cXp3RnRlYERkZlIICdz09>  
Meeting ID: 828 0879 6527  
Passcode: 167377