

Title: “Non-local compact stars as blackhole mimickers”

Abstract:

In this talk I will argue that quantum gravity effects can be seen at macroscopic scales as compared to the standard notion that quantum gravity effects can be seen only at very high energies and at very small time scales and distances. I will show that a particularly novel solution of ghost free and singularity free infinite derivative gravity is to realize a non-singular compact object which is larger than the photosphere, but it is made up of purely gravitons interacting with each other with non-local gravitational interactions. Such non-local stars are as compact as neutron stars and provides a non-vacuum solution, whose life time is even larger than the standard blackholes. I will provide metric for such a compact object and will discuss the consequences for fundamental physics such as gravitational entropy, temperature and information-loss paradox. Furthermore, such compact objects can be tested in future by LIGO-VIRGO due to the tidal effects, but there will be no echoes what-so-ever.