**Summary**

The aim of the course is to address several topics in the modern theory of gravity and cosmology, which involve in an essential way the quantum properties of fundamental fields.

**Content**

Topics to be covered:
1. Quantum fields in curved space-time
   1. a) Hawking radiation of black holes and the information paradox
   1. b) Production of particles in an expanding universe
2. The theory of cosmic inflation
   2. a) Production of primordial gravitational waves and density perturbations in the slow-roll model
   2. b) Extensions of the simplest model: effective theory of inflation
   2. c) Statistical properties of the primordial spectra

**Learning Prerequisites**

**Required courses**

Foundations of quantum field theory and general relativity