PHYS-738

Quantum Field Theory Methods in Gravity and Cosmology

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Cursus	Sem.	Type
Physics		Obl.

Language of teaching	English
Credits	1
Session	
Exam	Oral
Workload	30h
Hours	**16**
Courses	12
Exercises	4
Number of positions	

Frequency

Only this year

Remark

Next time: Spring 2020

Summary

The course will 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
   1a) Radiation of particles by moving mirrors and Hawking radiation of black holes
   1b) Production of particles in an expanding universe

2) The theory of cosmic inflation
   2a) Production of primordial gravitational waves and density perturbations in the slow-roll model
   2b) Statistical properties of the primordial spectra

Learning Prerequisites

Required courses

Foundations of quantum field theory and general relativity