Universität Hamburg
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CLUSTER OF EXCELLENCE
QUANTUM UNIVERSE

DESY.

QUANTUM UNIVERSE LECTURES

Claudia de Rham (Imperial College, London)

Effective Field Theory approaches for Gravity and Cosmology

13 June 2023 at 3.15 pm, 14 and 15 June 2023 at 2.30 pm

DESY, building 2a, seminar room 2

and via Zoom: https://uni-hamburg.zoom.us/j/92293543262
(Meeting ID: 922 9354 3262, Passcode: 97540703)

Abstracts:
In the study of our Universe, we are constantly challenged with physics a very different energy scales, starting from close to the Planck scale during inflation, to physics at the dark energy scale during the late time period of the Universe, hence covering physics over close to 60 orders of magnitude. The use of effective field theories (EFTs) valid within a range of energy scales with a particular field content therefore naturally plays an important role in understanding of gravity and cosmology.

In this series of lectures, we will start with reviewing the EFT framework, building blocks and consistent constraints we can infer from a low-energy perspective. We will then consider their applications in gravitational situations relevant for the study of cosmology, black holes and more generic situations, where even if weak, gravity can play a significant role. We will then establish how demanding that these low-energy EFTs can be embedded in a standard Wilsonian high-energy completion leads to constraints that can be diagnosed already at low-energy and can complement observations in segregating between different classes of EFTs.

Registration on Geventis:

https://www.geventis.uni-hamburg.de/course?course=-7600799439208130712