

Seminar on
THEORETICAL PARTICLE PHYSICS

on Wednesday, 4 November 2015, at 2.00 p.m. c.t.
Theresienstraße 37 / III, Seminar Room A318

Speaker: Juan Gonzalez-Fraile
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Title: “The Higgs Legacy of the LHC Run I“

Abstract

The run I of the LHC established the existence of the Higgs boson, a particle that seems to be directly related to the electroweak symmetry breaking (EWSB). The study of its properties opens then a path to start deciphering the details behind this mechanism.

In this seminar, we will focus on the study of the Higgs interactions using run I data, but highlighting the benefits of several complementary approaches for the current run II. First, we will present the results of a global analysis in the simplest of the frameworks: SM operators with free couplings. This parametrization is well aligned with the LHC Higgs experimental measurements, so it allows us to compare the couplings of the observed state to the SM Higgs boson hypothesis. It is useful to test several technical details of the statistical analysis as well. Second, we will focus on the study of the EWSB sector using the Effective Lagrangian approach. We will review some of its details: from the ingredients of the most common formulations, to the details behind the optimal implementation of kinematic distributions into the global fit. We will discuss what can be learned from this addition, and how in the Effective Lagrangian approach the correlations between different interactions and data sets may help us to understand more of the nature of the observed Higgs boson.