COLLOQUIA

Nine years of physics with the MAGIC gamma ray telescopes

Friday, March 1, 2013 - 15:00

Juan Cortina

Instituto de Física de Altas Energías (IFAE)

Abstract:

During the past nine years the MAGIC telescope at the island of La Palma have explored the Very High Energy (VHE, >100 GeV) gamma ray sky with nprecedented sensitivity. VHE represents a new window of astronomy: it does not only offer a new handle to understand the rare astrophysical objects which are able to accelerate particles to these high energies, but also enables to measure key astrophysical parameters such as the density of Cosmic Rays in our galaxy and in external galaxies or clusters of galaxies, the density of the Extragalactic Background Light, or the magnitude of the Intergalactic Magnetic Fields. Instruments such as MAGIC may also shed light on Fundamental Physics issues such as the nature and distribution of Dark Matter in our Universe. I will make a personally biased selection of results of MAGIC during these years of operation and briefly comment on the prospects of the instrument for the near future.

Event simulation for the Large Hadron Collider

Thursday, April 4, 2013 - 15:00 **Bryan Webber** Cambridge University

Abstract:

Tests of the Standard Model and searches for new phenomena at the Large Hadron Collider depend heavily on computer simulations of signal and background processes. Monte Carlo event generators aim to simulate the final states of high-energy collisions in full detail, down to the level of individual stable particles. The talk will review the physics behind these programs, their main ingredients and theoretical status, with emphasis on recent work to improve their precision. Comparisons with LHC data will include the latest results on the Higgs boson candidate.

The Standard Model of Nature and its Legacy

Friday, April 19, 2013 - 15:00 **Gabriele Veneziano**

Collège de France

Abstract:

Our present standard model of Nature is based on general relativity for gravity and on a gauge theory for all other fundamental interactions. Its amazing successes --and its puzzles-- may carry some important lessons for our quest of a truly unified theory of space, time, and matter.

Cosmology on small scales

Friday, May 17, 2013 - 15:00 **Anatoly Klypin** New Mexico State University

Abstract:

The standard cosmological model LCDM had a remarkable success with predicting and explaining many properties of the Universe. However, it faces difficult challenges on small scales with properties and abundances of dwarf galaxies being the most difficult problems. The situation is confusing and fluent because it involves complicated physics and dynamics of smallest galaxies known, which are difficult to observe. I will give a review of the situation and will discuss possible solution for some of the problems.

Waiting for Higgs

Thursday, October 3, 2013 - 15:00

Chris Llewellyn-Smith

Oxford U.

Abstract:

The text book history of the discovery of a mechanism that can give mass to gauge bosons, which implies the existence of a Higgs boson or bosons, glosses over many convolutions. I will review what actually happened and why initially the work of Higgs and others did not excite much attention. I will then describe, from a personal perspective, how it became mainstream in the 1970s and 1980s before reviewing searches for Higgs bosons at LEP and then the LHC. Finally I will touch briefly on the discovery of a (probably 'the') Higgs boson at CERN, announced on 4 July 2012, and its implications.