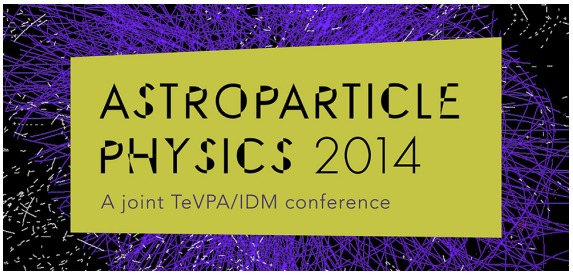

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Unprecedented results on the Crab nebula and pulsar with the MAGIC telescopes.

Friday 27 June 2014 14:30 (15 minutes)

MAGIC is a system of two atmospheric Cherenkov telescopes located in the Canary island of La Palma. MAGIC has low energy threshold, down to 50 Gev, well suited to study the still poorly explored energy band below 100 GeV. Although the space-borne gamma-ray telescope Fermi/LAT is sensitive up to 300 GeV, gamma-ray rates drop fast with increasing energy, and statistics are scarce above few GeV. Therefore, only recently the combination of MAGIC and Fermi/LAT observations have allowed to bridge the missing gap in the high-energy component of astrophysical spectra of several kind of sources,
e.g., flat spectrum radio quasars, distant BL Lac objects, pulsar wind nebulae and pulsars. In addition, it has allowed the discovery of a high-energy tail, up to 400 GeV, in the spectrum of the Crab pulsar, challenging all existing pulsar models which were predicting spectral cut offs at around few GeV.
In this talk we focus on the recent results on the Crab nebula and pulsar obtained with the stereoscopic MAGIC system. We will present a differential energy spectrum of the Crab nebula spanning from 50 GeV up to almost 30 TeV with an unprecedented statistical precision below 100 GeV. In this latter energy range, MAGIC results, combined with Fermi/LAT ones, provided the most precise measurement of the inverse Compton peak position so far, (52.5 +- 2.6) GeV. We also consider two state-of-the-art theoretical models to describe the available multiwavelength energy data, and we conclude that none of them can satisfactorily reproduce the comprehensive picture of the Crab nebula, given the available measurements at all wavelengths.
We will also report new, and more precise, measurements of the Crab pulsar profile obtained with a larger data sample. Among other findings, we will present the discovery of the bridge emission, between the two peaks, above 50 GeV. The overall picture of the Crab pulsar at high energies, as shown by the MAGIC results, is challenging even the most recent pulsar models.

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