

CENTRE D'ETUDES NUCLÉAIRES DE BORDEAUX-GRADIGNAN

Vendredi 19 Février 2016

à

11H

Un café sera servi à partir de 10h45

Aion VIANA

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The Galactic Centre as a powerful cosmic PeVatron

The energy spectrum of Cosmic Rays (CRs) extends without any major feature until particle energies of few PeVs, where it steepens originating a feature called the knee. This implies our galaxy hosts PeVatrons (extreme particle accelerators reaching such PeV energies). The CRs accelerated by these Pevatrons interact in the interstellar medium producing gamma rays, which provides a powerful probe to search for such accelerators. The discovery of such objects is a key ingredient to solving the century-long puzzle of the origin of Galactic cosmic rays. However, no Pevatron has been found so far.

The Galactic Centre region has been observed by the High Energy Stereoscopic System (H.E.S.S.) I array of ground-based Cherenkov telescopes since 2004 leading to the detection of the very-high-energy (VHE, $E > 100$ GeV) gamma-ray source HESS J1745-290 spatially coincident with the supermassive black hole (SMBH) Sgr A*. Diffuse TeV gamma-ray emission has been detected along the Galactic ridge, most likely due to cosmic-ray interactions with the dense gas of the Central Molecular Zone.

I will present the results of a detailed spectral and morphological study of the inner 200 pc of the Galactic Centre region, based on the full data set of 2004-2013 observations, which finally reveals the presence of a cosmic PeVatron with a likely link to the central SMBH. I will discuss possible implications of the observed emission, in particular, in the context of the origin of Galactic cosmic rays and large-scale emissions (Fermi bubbles, extraterrestrial neutrinos and others).

Salle des Séminaires du CENBG

Le Haut Vigneau - BP 120 - F-33175 Gradignan Cedex