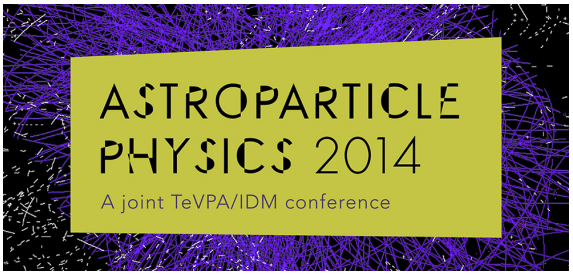

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HESS J1640−465 - an exceptionally luminous TeV gamma-ray SNR

Wednesday, June 25, 2014 2:35 PM (15 minutes)

HESS J1640−465 is among the brightest Galactic TeV gamma-ray sources ever discovered by the High Energy Stereoscopic System (H.E.S.S.). Its likely association with the shell-type supernova remnant (SNR) G338.3−0.0 at a distance of ∼10 kpc makes it the most luminous Galactic source in the TeV regime.

Our recent analysis of follow-up observations with H.E.S.S. reveal a significantly extended TeV morphology with a substantial overlap with the northern part of the SNR shell. Furthermore, the source features a seamless powerlaw spectrum over four orders of magnitude from GeV to TeV energies, with a spectral index of $\Gamma = 2.15 \pm 0.10_{\rm stat} \pm 0.10_{\rm sys}$ and a cut-off energy of $E_c = 7.3^{+2.5}_{-1.8}$ TeV. These new spectral and morphological results suggest that at least part of the TeV emission is likely of hadronic origin where the product of total proton energy and mean target density could be as high as $W_p n_H \sim 4 \times 10^{52} (d/10{\rm kpc})^2$ erg cm^{-3}.

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