

## Search for Galactic Pevatrons with H.E.S.S.

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### Summary

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 identification of such objects is a key issue for the solution of the century-long puzzle of the origin of Galactic cosmic rays given that all proposed models of particle accelerators in our Galaxy encounter non-trivial difficulties at exactly these energies. The recent advances of ground-based gamma-ray astronomy, thanks to observations of Atmospheric Cherenkov Telescope Arrays, have resulted in the discovery of tens of TeVatrons – Galactic particle accelerators reaching TeV energies. However, until recently, none of the currently known accelerators, not even the handful of measured shell-type supernova remnants commonly believed to supply most Galactic cosmic rays, had shown PeV features: power-law spectra of gamma rays extending without a cutoff or a spectral break to tens of TeV, thereby implying the acceleration of parent cosmic rays to PeV energies. I will review the gamma-ray observations with the High Energy Stereoscopic System (H.E.S.S.) I array of ground-based Cherenkov telescopes of a few Pevatron candidates, and

report on deep H.E.S.S. observations of the Galactic Centre region which recently revealed the existence of a PeVatron within the central 10 parsecs of our Galaxy. 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).

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