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Very High Energy Gamma-Ray Astronomy and the search for PeVatrons

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Gamma-ray astronomy studies the most extreme and violent phenomena in the Universe. Thanks to the continuous improvement in experimental techniques in the last decades a growing number of sources have been detected at very high energy showing a large variety of different types of emitters proving that particle acceleration and transport is occurring in different astrophysical conditions and environments. The last few years have been particularly exiting with the spectacular detection by LHAASO of a dozen of PeV particle accelerators (PeVatrons) in our Galaxy. This discovery has opened the ultra-high energy frontier in gamma-ray astronomy contributing to shed light on the 100 years old question on the origin of galactic cosmic ray sources. In the presentation a review of present operating instruments will be given focusing on the latest results on the PeVatron search. In particular the complementarity and the need of the different experimental techniques will be highlighted. Finally, the next generation ground based gamma-ray telescopes will be presented together with the expected science potential in the search and characterization of galactic cosmic ray sources.

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