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The LHAASO PeVatron bright sky: what we learned

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The recent detection of 12 gamma-ray Galactic sources well above $E > 100$ TeV by the LHAASO observatory has been a breakthrough in the context of Cosmic Ray (CR) origin search.

Although most of these sources are unidentified, they are often spatially correlated with leptonic accelerators, like pulsar and pulsar wind nebulae (PWNe). This dramatically affects the paradigm for which a gamma-ray detection at $E > 100$ TeV implies the presence of a hadronic accelerator of PeV particles (PeVatron). Moreover, the LHAASO results supports the idea that sources other than the standard candidates, Supernova Remnants, can accelerate Galactic CRs.

In this context, the good angular resolution of future Cherenkov telescopes, such as the ASTRI Mini-Array and CTA, and the higher sensitivity of future neutrino detectors, such as KM3NeT and IceCube-Gen2, will be of crucial importance.

In this brief review, we want to summarize the efforts done up to now, from both theoretical and experimental point of views, in order to fully understand the LHAASO results in the context of the CR acceleration issue.

Primary author: Dr CARDILLO, MARTINA (IAPS-INAF)

Co-author: GIULIANI, Andrea (INAF / IASF Milano)

Presenter: Dr CARDILLO, MARTINA (IAPS-INAF)

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