

UHE Galactic gamma-ray sources

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Nowadays, we are witnessing spectacular discoveries of ultra-high energy ($E > 100$ TeV) gamma-ray sources in the Milky Way, revealing the sites of PeVatrons - Cosmic Ray Factories accelerating protons and electrons to energies of 1 PeV and higher. These perfectly designed by nature particle accelerators represent at least three galactic source populations - pulsars, microquasars, and stellar clusters. On the other hand, quite unexpectedly, there was no direct evidence of ultra-high energy gamma-rays from young Supernova Remnants, a source population that for decades was considered responsible for the locally measured Cosmic Ray flux up to the so-called “knee” at a few PeV. However, it cannot be ruled out that some unidentified UHE gamma-ray sources are associated with giant molecular clouds in the immediate vicinity of middle-aged supernova remnants. I will discuss the implications of these exciting and largely unexpected discoveries for the physics and astrophysics of pulsars and black holes, star formation in the Milky Way, and the origin of Galactic Cosmic Rays.

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