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Cosmic-Ray Super-PeVatron and Other Discoveries by LHAASO

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A gigantic bubble of γ-rays with energies up to 2 PeV is detected by LHAASO in the Cygnus region. It implies the existence of a CR accelerator in the core of the bubble which is continuously injecting CR particles with energies up to few tens of PeV in the ambient HI gas thus emitting the UHE photons. This evidences the galactic origin of CRs above the knee which concentrate towards the core and diffuse out over a range of at least 150 pc. The accelerator(s) has yet been identified in the core which has a very complicated morphological structure with several possible UHE photon emitters. The young massive star cluster OB2 is the most favorable candidate of the Super-PeVatron.

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