

## Discovery of a giant peanut-shaped PeVatron below the Galactic plane

Here we report the discovery of a giant enigmatic extended source peanut-shaped source (PEANUT) emitting UHE  $\gamma$  rays with LHAASO. Observed spatial morphology and energy spectrum suggest a common origin of PEANUT substructures. The spectrum is described with a power-law with index of  $-1.92 \pm 0.13$  and an exponential cutoff at  $229 \pm 59$  TeV, implying a total luminosity of  $\approx 7.04 \times 10^{32} (D/3 \text{ kpc}) \text{ erg s}^{-1}$ . The absence of a spatial correlation between this LHAASO PEANUT and interstellar gas makes it unlikely that the observed signal is caused by hadronic  $\gamma$  radiation. The inverse Compton(IC) scattering from a luminous millisecond pulsar (MSP) J0218+4232 is more compelling. These findings suggest that MSPs have the potential to act as PeV accelerators (PeVatrons) of the Milky Way.

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