

Multi-wavelength studies on TeV gamma-ray binaries

Tuesday, 26 October 2021 08:55 (25 minutes)

TeV gamma-ray binaries, consisting of a compact object in orbit with a massive star, emit broad-band radiations from radio to TeV gamma-rays. The energy spectra of gamma-ray binaries peak above 1 MeV, distinguishing them from the well-known X-ray binaries. So far, less than ten such kinds of binaries have been found, and only 2 of them with the compact objects being identified as rotational pulsars. It is widely believed that non-thermal emissions are produced by synchrotron radiation and inverse-Compton (IC) scattering in the shock where the pulsar wind is terminated by stellar outflows from the massive companion. I will briefly summarize the basic observational properties of detected gamma-ray binaries and discuss our recent theoretical studies on these systems. Recently, LHAASO detected a 1.4 PeV gamma-ray event from LHAASO J2032+4102, which is likely associated with the gamma-ray binary PSR J2032+4127/MT91 213. I will discuss the possible mechanisms that produce such kinds of ultra-high energy photons in gamma-ray binaries.

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Gamma rays

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Session Classification: session