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Astroparticle physics with Fermi gamma-ray AGN laboratories

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Content

The Fermi Gamma-Ray Space Telescope lives its maturity as the reference, all-sky survey and all-timing monitoring, mission for the observation of the violent high-energy gamma-ray Universe. This is true for the past data heritage as well as for future perspectives, especially in the rapidly growing science of multi-wavelength and multi-messenger astroparticle physics. The Large Area Telescope of Fermi is providing, in real time, the richest database of high-energy photons available publicly to the community: more than 1 billion photons above 100 MeV energy. This is revolutionizing our knowledge of gamma-ray emission from a multitude of different high-energy sources in our Galaxy and the extragalactic sky.
After short highlights about some exciting and recent science results from Fermi, this talk will address mainly to results about the most huge and powerful cosmic particle accelerators in the Universe: the gamma-ray active galactic nuclei, blazars in particular. Blazar phenomenology includes, among the other, high-energy radiation at X-ray and gamma-ray bands, and rapid, irregular and strong flux variability on very different time scales and at all the energy bands of the electromagnetic spectrum. Under an astrophysical point of view, emission regions and radiative processes in blazars, nature and physics of their relativistic jets, accretion, variability mechanisms, particles composition and acceleration mechanisms, disk-jet connection, object populations and cosmological evolution are all rather controversial topics. Under a multi-messenger astroparticle physics point of view, they represent, for example, one of the main target and laboratory for researches about cosmic PeV-energy neutrinos and UHE cosmic rays, for the search of evidence and signals of axion-like supersymmetric particles, for the emission of very-low frequency gravitational waves.

Session

Cosmic ray and astroparticle physics

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