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Fermi Large Area Telescope highlights after five years of operations

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The Fermi Large Area Telescope (LAT) has been collecting high-energy gamma rays from 20 MeV to more than 300 GeV for 5 years, and is still performing nearly flawlessly.

With about 800 million gamma rays to date, and a uniform coverage of the whole sky, LAT data allowed for the first time high statistics observations of gamma-ray sources of known and diverse classes, like active galaxies, pulsars, supernova remnants and gamma-ray bursts, as well as discovery of new emitters, like Novae, radio-quiet millisecond pulsars and terrestrial gamma-ray flashes, that in most cases evolved into actual catalogs or population studies.

The study of diffuse gamma-ray emission not associated to sources, which constitutes roughly 90% of the LAT photon events, constrains cosmic-ray production and propagation in our own Galaxy and models of gamma-ray propagation through the Universe, and allows accurate modeling of the bright and structured foreground for searches of gamma rays originating from Dark Matter.

The LAT also detected and identified millions of cosmic-ray electrons and positrons, enabling access to Dark Matter signatures complementary to those in gamma rays.

In this talk I will review some of the most important LAT discoveries, and discuss future prospects for astroparticle physics with Fermi in the next years.

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