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**Session:** Cosmic ray and Astro-particle physics  
**Title:** 10 years of Fermi AGN astroparticle physics  

**Abstract:**

The Fermi Gamma-Ray Space Telescope reaches 10 years of operation this year and still represents the reference observatory of the violent high-energy gamma rays Universe. The Large Area Telescope (LAT) on board Fermi is providing the richest database of high-energy photons available publicly to the community (more than 1 billion of photon at energies greater than 100 MeV). The LAT has revolutionized our knowledge about gamma-ray emission from a multitude of different sources in our Galaxy and the extragalactic sky. The majority of the sources detected in the extragalactic sky are the largest and most powerful cosmic particle accelerators in the Universe: Active Galactic Nuclei (galaxies powered by a super massive black hole at their center), in particular blazars, which are characterized by particle jets pointing towards Earth. Under an astrophysical point of view, emission regions and radiative processes in blazars, their nature and physics of their relativistic jets, disk-jet connection, and cosmological evolution are all rather controversial topics.

In a multi-messenger context, blazars are considered one of the main targets and laboratories for researches about cosmic PeV-energy neutrinos and UHE cosmic rays, for the search of evidence and signals of axion-like supersymmetric particles, and for the emission of very-low frequency gravitational waves.

In this talk, I will review some of the most exciting science results from Fermi-LAT and discuss their implications for the future observations in the rapidly growing science of multi-wavelength and multi-messenger astroparticle physics.