

APR17-2016-000394

Abstract for an Invited Paper
for the APR17 Meeting of
the American Physical Society

The GeV Excess in the Galactic Center

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Over the last seven years, Fermi-LAT observations have convincingly found an excess in gamma-ray emission emanating from the center of the Milky Way galaxy. The excess has three definitive properties: (1) it has a hard spectrum that peaks at an energy of 2 GeV, (2) it extends from within 0.1 degrees to more than 10 degrees from Sgr A* with a three-dimensional intensity that falls roughly as r^{-2} , (3) it is approximately spherically symmetric. Several models for this excess have been formulated, including the collective emission from a population of individually dim gamma-ray pulsars, outbursts of cosmic-ray electrons from the central molecular zone, or potentially even dark matter annihilation. In this overview, I will discuss the observational data, and the arguments for and against each theoretical model. Additionally, I will discuss significant improvements in gamma-ray diffuse emission modeling that enhance our understanding of high energy astrophysics near the Galactic center, and will describe the impact of these models on our understanding of the gamma-ray excess.