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On the gamma-ray emission of Milky Way satellites and globular clusters

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One of the most elusive unknowns in particle physics and astrophysics today is the fundamental nature of dark matter. It is theoretically well-motivated that dark matter is a weakly interacting massive particle (WIMP) – a particle lying within the GeV to TeV energy ranges that interacts very weakly with Standard Model particles. Such behavior makes dark matter extremely difficult to detect with terrestrial detectors. However, there are still many ways to probe the fundamental nature of dark matter. One such way is by searching for astrophysical signatures of dark matter annihilation. Supposing that dark matter is a WIMP which self-annihilates, we can look for inexplicable excesses of Standard Model particles from astrophysical sources. In particular, we can look for high-energy gamma-rays with energies in the range of GeV to TeV. In this talk, I will discuss recent results on both the dark matter distributions and gamma-ray emissions of a selection of Milky Way satellites and globular clusters with an emphasis on the Sagittarius dwarf galaxy system and the Omega Centauri globular cluster.

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