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Searching for Dwarf Spheroidal Galaxies with DES and the Fermi-LAT

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The population of Milky Way satellite galaxies includes the least luminous, least chemically evolved, and most dark matter dominated galaxies in the known universe. Due to their proximity, high dark matter content, and lack of astrophysical backgrounds, dwarf spheroidal galaxies are promising targets for the indirect detection of dark matter via gamma rays. Prior to 2015, roughly two dozen dwarf spheroidal galaxies were known to surround the Milky Way. From combined observations of these objects, the dark matter annihilation cross section has been constrained to be less than the generic thermal relic cross section for dark matter particles with mass $\lesssim 100$ GeV. Since the beginning of 2015, new optical imaging surveys have discovered over twenty new dwarf galaxy candidates, potentially doubling the population of Milky Way satellite galaxies in a single year. I will discuss recent optical searches for dwarf galaxies, focusing specifically on results from the Dark Energy Survey (DES) and the implications for gamma-ray searches for dark matter annihilation with the Fermi Large Area Telescope.

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