Contribution ID: **188** Type: **Oral**

Searching for Dark Matter Annihilation in Milky Way Satellite Galaxies

Wednesday, 9 August 2017 14:30 (15 minutes)

Milky Way dwarf spheroidal satellite galaxies are the most dark-matter-dominated galaxies known. Due to their proximity, high dark matter content, and lack of astrophysical backgrounds, dwarf spheroidal galaxies are one of the most promising targets for the indirect detection of dark matter annihilation via gamma rays. Indeed, Fermi-LAT observations of previously known dwarf galaxies have robustly constrained the dark matter annihilation cross section to be less than the generic thermal relic cross section for dark matter particles with mass < 100 GeV. Recently, large optical surveys, such as the Dark Energy Survey and Pan-STARRS, have nearly doubled the known population of confirmed and candidate dwarf galaxies. We will present an updated gamma-ray analysis combining previously known and recently discovered dwarf galaxies, and discuss how current and future optical surveys will improve the sensitivity of gamma-ray searches for dark matter annihilation in dwarf galaxies.

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Session Classification: Dark matter

Track Classification: Dark matter (direct detection, indirect detection, theory, etc.)