

Abstract Submitted  
for the APR20 Meeting of  
The American Physical Society

**Milky Way Satellite Census - Constraining Galaxy Formation and Dark Matter at the Smallest Scales** ALEX DRLICA-WAGNER, Fermilab, DES COLLABORATION — Ultra-faint Milky Way satellite galaxies are the most ancient, most chemically pristine, and most dark-matter-dominated stellar systems ever observed. These extreme galaxies are critical to our understanding of galaxy formation and provide a unique opportunity to test the standard cold dark matter model of cosmology. Due to their low luminosity, the discovery of the faintest galaxies has only recently become possible thanks to the unprecedented sensitivity of digital sky surveys. I will describe a systematic search for ultra-faint satellite galaxies combining data from the Dark Energy Survey and the Pan-STARRS1 3pi Survey to cover  $\sim 75\%$  of the high-Galactic-latitude sky. We apply the same search pipeline to a suite of simulated satellite galaxies to derive an observational selection function that describes the sensitivity and efficiency of our search. We then apply this selection function to cosmological zoom-in simulations to constrain the spatial anisotropy of the satellite population and a model of the galaxy–halo connection. Our analysis constrains the minimum mass of dark matter halos that host galaxies and the microphysics of dark matter (e.g., particle mass and interaction cross section).

Alex Drlica-Wagner  
Fermilab

Date submitted: 10 Jan 2020

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