Are We on the Dark Side of the Universe?

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This study investigates the content of dark matter in 150 spiral and 60 dwarf galaxies located at different cosmological distances from us. The goal was to test if nearby galaxies have more dark matter than distant ones. Observational data on radial velocity, inclination angle, distance, absolute and apparent magnitudes was collected for the sample galaxies to calculate their rotational velocities, luminosities, stellar, and dark matter masses. The results indicated that the masses of nearby spiral galaxies have more dark matter than the farther ones measured. This result coincides with a recent paper by Genzel et al, 2017. In their study, the scientists measured rotational speeds of six distant galaxies, and concluded that these early galaxies were dominated by stars and gas, rather than dark matter. The dwarf galaxies sample followed a random pattern and it could not be concluded that nearby ones have more dark matter than distant ones. These results are consistent with Libeskind et al, 2014's simulation for explaining the alignment of dwarf satellite galaxies orbiting the Milky Way. In their simulation, the dwarf satellites did not originate in the region immediately surrounding the MW. They come together farther away, inside of filaments in the cosmic web. Therefore, an early dwarf after traveling through the cosmic web could have more or less dark matter depending on the region it settles. Further studies on spiral and dwarf galaxies are needed to unfold the mystery of dark matter. We might be on the Dark Side of the Universe after all.

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