COLLOQUIUM

Re-Examining the Astrophysical Constraints on the Dark Matter Model

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The cosmological model based on cold dark matter (CDM) and dark energy has been hugely successful in describing the observed evolution and large scale structure of our Universe. However, at small scales (in the smallest galaxies and at the centers of larger galaxies), a number of observations seem to conflict with the predictions of CDM cosmology, leading to recent interest in alternative dark matter models. I will summarize a number of ways that including baryonic physics (the physics of gas and stars) can resolve the conflict between theory and observations, by significantly altering the structure and evolution of galaxies. Despite all of the successes of baryonic physics in reconciling CDM with observations, I will explain why alternative dark matter models are still viable and interesting.