Research project for MSc student

Research Specialisation: Cosmology

Title: Effect cosmological dark matter and dark energy components at the current epoch

Abstract:

The recent observation evident that the expansion of the Universe appears to be accelerating, which has astonished cosmologists. There exist many reasonable realizations of a “dark energy” component that explain the Universe's expansion at an accelerating rate. In the standard model of cosmology, dark energy representing more than 70% of the total energy of the Universe. There are also deep theoretical issues with most dark energy models. One such issue is the coincidence problem; among the many surprising things about the unreasonable smallness of the dark energy density in magnitude that we happen to live in the very short epoch during which the dark energy density is comparable in magnitude to the matter density. The purpose of this project is to understand the effect of dark matter and dark energy at the current epoch and its evolution during the expansion of the Universe. A student will analyze a modified Einstein equation of the Friedmann-Lemaitre-Robertson-Walker equations. Then type Ia supernovae and Quasars updated data set will be used to constrain the dark matter and dark energy parameters and investigate their effect at the current epoch.

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