Abstract

Large scale properties of the universe can be explained by Einstein's general theory of relativity. A-CDM model incorporating general relativity predicts the accelerated expansion of universe and large scale distribution of galaxies. Structure formation equation obtained from this model are non linear and difficult to solve. Newtonian theory of gravity can be applied to situations after decoupling of matter and radiation. Newton himself tried to apply his theory to universe but failed. Reason for failure is that he considered static model with infinite stars. This result in divergences. The divergences can be avoided by assuming finite number of particles interacting only through gravitational attraction. This thesis is review of Newtonian cosmological theory of finite number of discrete particles interacting through gravitational attraction, also with Newtonian version of cosmological constant. Exact solution we get for Newtonian equations are homothetically expanding background with comoving positions constituting a central configuration. The scale factor satisfy Rauchaudhuri and Friedmann equations without making any uid approximation. These solutions can be linearised to get perturbation theory for structure formation calculations.