Manipal Academy of Higher Education
Impressions@MAHE

University Departments | MAHE Student Work

Summer 4-20-2016

# Gravitational structure formation in the universe

Sriyasriti Acharya

Follow this and additional works at: https://impressions.manipal.edu/maheud

 Part of the Physical Sciences and Mathematics Commons

## Abstract

The universe shows us rich structures in various different scales. At the largest scale ($\gtrsim 100MPc$) the universe exhibits a methodical distribution of galaxies in the form of clusters and superclusters, which lie at the intersection of long filaments of the galaxies. Gigantic regions with relatively few galaxies between the walls and filaments of high density are known as voids. From the observed distribution of galaxies we can extract information of the universe such as matter contents. We studied some aspects of the "Origami Model" [1] of cosmological structure formation which was proposed recently by Dr. Mark Neyrinck. In this cosmological model the 'dark matter sheet' folds up to assemble accumulation of matter and fabricate an idealized cosmic web with filaments, walls and voids. We discovered examples of multiple folding in 2D origami model where the density increases by odd multiple of initial density. We also examined the prediction of origami model on the spin correlation between two neighbouring galaxies by comparing it with numerical simulation. We found the agreement between the prediction of origami model and numerical simulation.