

1 Weekly assignment for week 14 AST3220

Prepare for class (to be discussed in plenary)

Answer the questions on the formation of structure in the universe listed below.

- a) What is an overdensity?
- b) Where do cosmologists believe that the earliest seeds of inhomogeneities or over- and underdensities in the universe stem from?
- c) How does gravity affect an inhomogeneous universe with underdensities and overdensities?
- d) How does pressure influence this process?
- e) What is the Jeans length?
- f) How does structure formation change with the evolution of early universe physics? What early universe processes are important?
- g) Is there a difference in how the structure formation described above works on baryons and dark matter? What would be different for dark matter? And subsequently, what effect would having dark matter in your universe have on structure formation?