# 2. Space and time

- Content:

  – Expanding Universe, Newtonian derivation of the Friedmann-Lemaitre expansion equations, components of matter in the Universe

- Material:

  – Schneider:

    - Section 4.1: Introduction and Fundamental Observations

    - Section 4.2: An expanding universe

# 2. Homework

1) What is the dimension of $H_0$ ? What is the value of $H_0$ in cgs units ? (cm, gram, seconds).

2) Calculate the value of the critical density of the universe in solar mass per Mpc cubed. Take $H_0 = 73$ km/s/Mpc.

3) Derive eq. 4.18 and 4.19 following the instructions in the text in Section 4.2 in the book of Schneider

4) Derive eq. 4.24 following the instructions in the text in Section 4.2 in the book of Schneider

4) Derive eq. 4.29 following the instructions in the text in Section 4.2 in the book of Schneider