1 HOMEWORK 4

The correlation function of Milky-Way type galaxies can be well approximated as the power law:

$$\xi(r) = \left(\frac{r}{r_0}\right)^{-1.8},\tag{1}$$

where $r_0 = 5h^{-1}$ Mpc. Using this correlation function and the luminosity function of galaxies at low redshifts, find:

• the average number of galaxies brighter than M_* inside a randomly selected sphere of radius $10h^{-1}$ Mpc.

• the average number of galaxies brighter than M_* inside a sphere of radius $10h^{-1}$ Mpc which center is at a Milky-Way type galaxy.

• How (un)probable is to find a pair of galaxies like our MW and M31. What is the probability to have another bright galaxy brighter than M_* inside a sphere of 1 Mpc centered on the Milky Way.