Homework 6

(1) Find the total (gas + stars + DM) mass of a spherical cluster of galaxies inside radius of 1 Mpc. X-ray measurements give the gas temperature $T = T_0 = 10^8$K. Density of the gas declines with the distance as

$$\rho(r) \propto r^{-2.5}. \tag{1}$$

Molecular weight is $\mu = 0.6$. Note that density of gas, density of stars and density of dark matter are all different.