Speed of light:	c = 299 792 458 m/s	
Year:	a = 31 557 600 s	(=365.25×24×60×60 s)
Lightyear:	ly = 9.4607·10^{15} m	(=a×c)
Age of universe:	A_U ≈ 13.8 Ga	
→ *Radius of universe:*	R_U ≈ 13.8 Gly	
but <u>current</u> radius:	$R_{U,C}$ ≈ 46.5 Gly	(it expanded ever since)
Gravitational constant:	G = 6.67·10^{-11} N·m^2/kg^2	
Avogadro constant:	N_A = 6.02·10^{23} /mol	
Nucleons per kilogram:	N_K = 6.02·10^{26} /kg	(1 mol ≙ 1 g)
Mass of nucleon:	M_N = 1.67·10^{-27} kg	
Mass of Solar system:	M_S = 1.99·10^{30} kg	

(Sun's mass is 99.87% of solar system, and Sun is an average star)

Average stars per galaxy:	N_S ≈ 10^{11}	(Milky Way: 3×10^{11})
Galaxies in universe:	N_G ≈ 10^{11}	(Hubble Deep Field Images)

Nucleons in all stars in universe: $N_U = N_K \times M_S \times N_S \times N_G$

$$= 6.02 \cdot 10^{26} \times 1.99 \cdot 10^{30} \times 10^{11} \times 10^{11} \quad ≈ \mathbf{1.2 \times 10^{79}}$$

Including interstellar and intergalactic matter: ≈ **1.2×10^{80}**

    Since the universe contains mainly hydrogen this is the ***no. of atoms in the universe***.

Mass of all stars in the universe: $M_{U,S} = N_U \times M_N$ ≈ **2·10^{52} kg**

Mass of all atoms in the univ.: $M_{U,N} = 10 \times M_{U,S}$ ≈ **2·10^{53} kg**

Mass in universe: Normal matter: 4%, dark matter: 23%, dark energy: 73%.

Schwarzschild radius of universe, based on normal matter:

$$\mathbf{R_{S,N}} = 2GM_{U,N}/c^2 ≈ \quad \mathbf{31.4\ Gly > R_U} \quad → \underline{\text{Is it a black hole?}}$$

    With current radius of univ.:   **31.4 Gly < $R_{U,c}$**   → <u>No, it isn't!</u>

Including dark matter:

    ((23+4)/4)×31.4 =   **212 Gly ≫ $R_{U,c}$**   → <u>Yes, it is!</u>

Including dark energy as well:

    ((73+23+4)/4)×31.4 =   **784 Gly ≫ $R_{U,c}$**   → <u>Definitely it is!</u>

How is the inside of a black hole?
Well, look around!