HW3 Questions

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January 30, 2018

1 Table

Galaxy Name	Halo Mass $1 \times 10^{12}\,M_\odot$	Disk Mass $1 \times 10^{12}\,M_\odot$	Bulge Mass $1 \times 10^{12}\,M_\odot$	Total Mass $1 \times 10^{12}\,M_\odot$	f_b	Total Mass of Local Group $1 \times 10^{12}\,M_\odot$	$f_b for Local Group$
Milky Way	1.975	0.075	0.01	2.06	0.0413	4.316	0.054
M31	1.921	0.12	0.019	2.06	0.0675		
M33	0.187	0.009		0.196	0.0459		

Table 1: Mass Break Down of the Local Group

2 Answer to Questions

1. The total mass of the MW and M31 are the same in this simulation. The Halo Mass component dominates in the Total Mass.
2. The Stellar Mass of the MW is 0.085 and for M31 it's 0.139, I didn't expect M31 to be more luminous, but we can see Andromeda with our naked eye, so with it's Stellar Mass being greater than ours, I expect M31 to be more luminous.
3. The ratio between the MW and M31 is 0.526, I don't find it that surprising considering M31 has a bigger Stellar Mass.
4. From the table above, we can see that the Baryon fraction for each galaxy is lower than the Baryon fraction in the Universe. They might differ between each due to our little understanding of Dark Matter, not to mention that for M33 it contains no bulge, yet it's Baryon fraction is still greater than our own galaxy's Baryon fraction. With this we can say that the different Baryon fractions will vary with the structure of the object, taking in account of the whole Universe will be different than taking in account individual galaxies.