

# Homework 3

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February 4, 2025

## Mass Break Down of the Local Group

Name	Halo Mass ( $10^{12} M_{\odot}$ )	Disk Mass ( $10^{12} M_{\odot}$ )	Bulge Mass ( $10^{12} M_{\odot}$ )	Total Mass ( $10^{12} M_{\odot}$ )	$f_{bar}$
MW	1.975	0.075	0.01	2.06	0.041
M31	1.921	0.12	0.019	2.06	0.067
M33	0.187	0.009	0.0	0.196	0.046

## Questions

1.

Total masses for MW and M31 are the same. For both galaxies the halo mass dominates.

2.

M31 contains more stellar mass than MW, and should therefore be more luminous.

3.

MW and M31 have roughly the same halo mass. One might expect halo mass to roughly scale with stellar mass, so this is somewhat surprising.

4.

$f_{bar}$  here ranges from 4 – 7%, much less than the universal baryon fraction. The missing baryon might be explained by gas in the intergalactic medium.