

Galaxy 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	N/A	0.196	0.046

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Total Mass of the Local Group [ $10^{12}M_{\odot}$ ]: 4.316

$f_{bar}$  of the Local Group: 0.054

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1. Total Mass of MW vs M31: Ratio of 1.0. Halo Mass dominates.

2. Stellar Mass of MW vs M31: Ratio of 0.612. As M31 contains more stellar mass, which is the only type of mass that directly contributes to the luminosity of a galaxy, we expect it to be more luminous.

3. Dark Matter Content of MW vs M31: Ratio of 1.0. Yes - despite the stark difference in stellar matter, they have almost exactly the same dark matter content!

4. Baryonic Fraction  $f_{bar}$  for each galaxy is MW:0.041, M31:0.067, M33:0.046. Our baryonic fractions are universally lower than the provided value of 16%. Here are the True Fraction / Provided Fraction values for the various galaxies: MW:0.25625, M31:0.41875, M33:0.2875. This discrepancy might come down to the large amounts of interstellar gas and dust between galaxies; as galaxies are mostly dark matter, their bayonic fraction is significantly lower than the rest of the universe.