





- X: Mass fraction of Hydrogen (most common element in the Universe). Here, now: $X \approx 0.71$
- Y: Mass fraction of Helium (second most common element in the Universe)
 Here, now: Y ≈ 0.27
- Z: Mass fraction of all heavier elements combined. Also known as "Metallicity". Here, now: Z ≈ 0.02







Cosmic Ray Spallation Nucleosynthesis due to high-energy impacts of cosmic rays Can form ³He + certain isotopes of Li, Be, B, Al, C, Cl, I and Ne







 $d + d \longrightarrow He^{3} + n \qquad d + d$ $d + d \longrightarrow H^{3} + p$ $H^{3} + d \longrightarrow He^{4} + n$ $He^{3} + d \longrightarrow He^{4} + p$

































exhibiting redshifts due to the expansion of the Universe. The more distant they are, the higher the redshift.

However, Hubble's law has now been falsified, since we know that certain galaxies exhibit blueshifts, instead of redshifts. For example, Andromeda is moving towards (not away from) us, and will eventually collide with the Milky Way. This proves that the Universe is not expanding."

No, no, n<u>o...</u>



