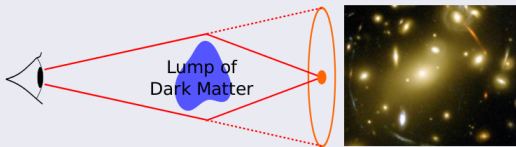
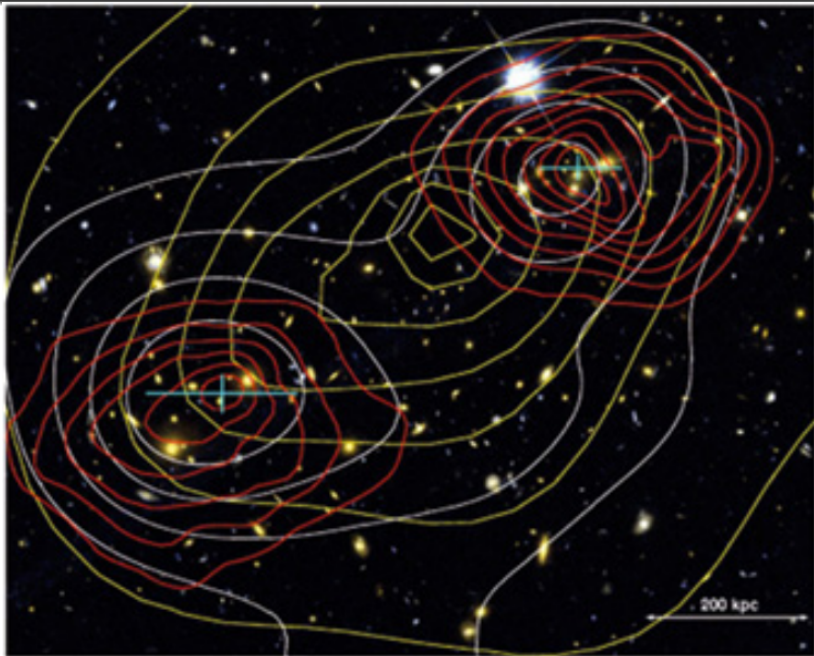


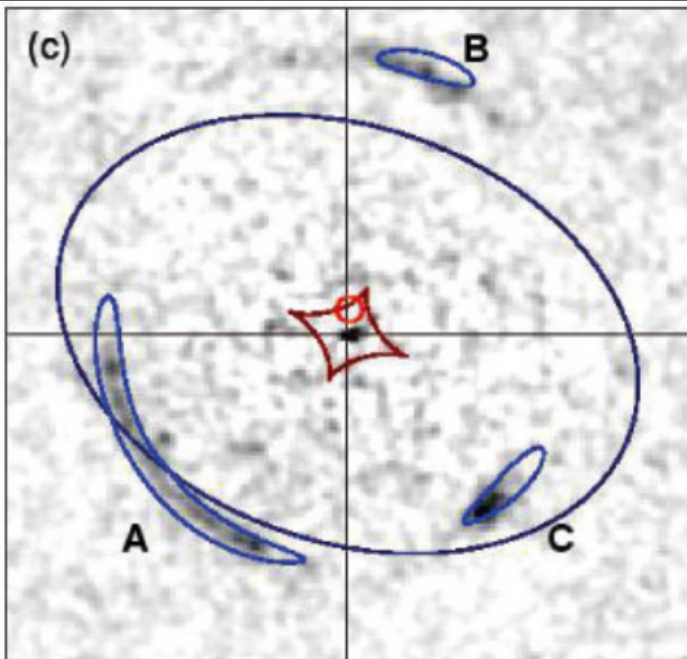
Bullet cluster

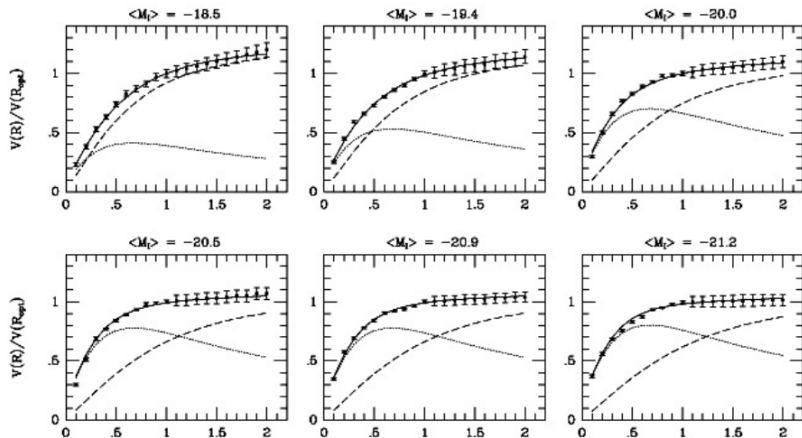


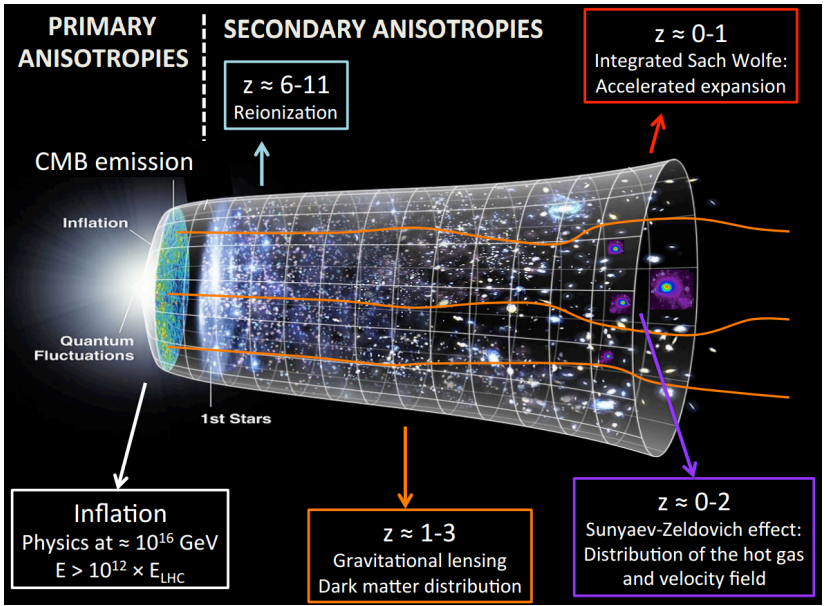
Gravitational lens

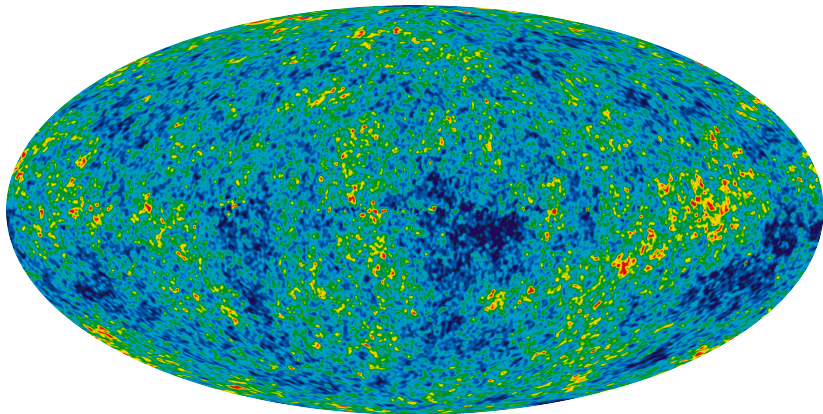


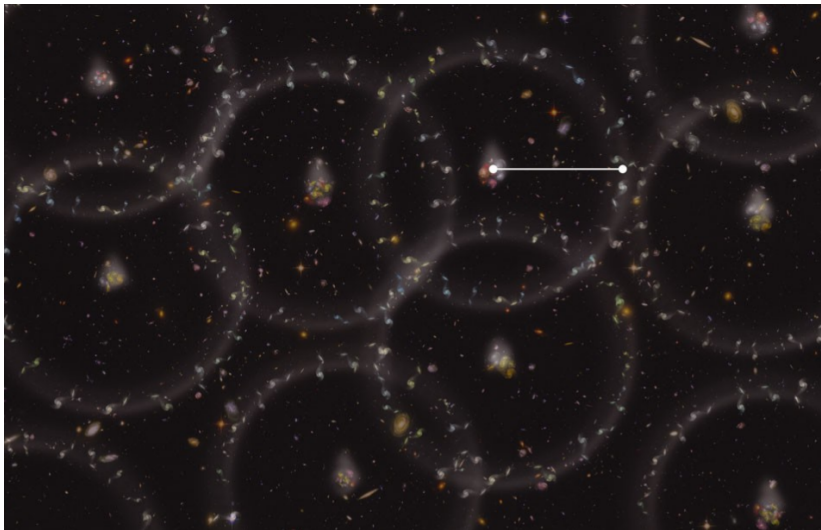


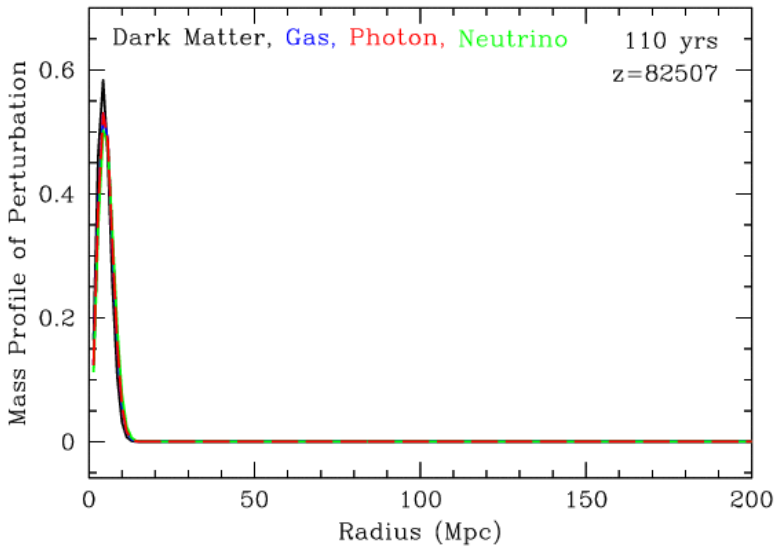


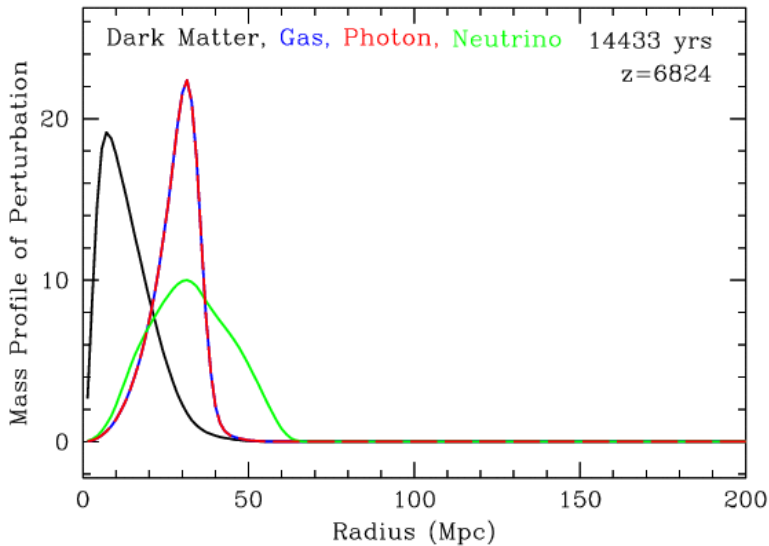


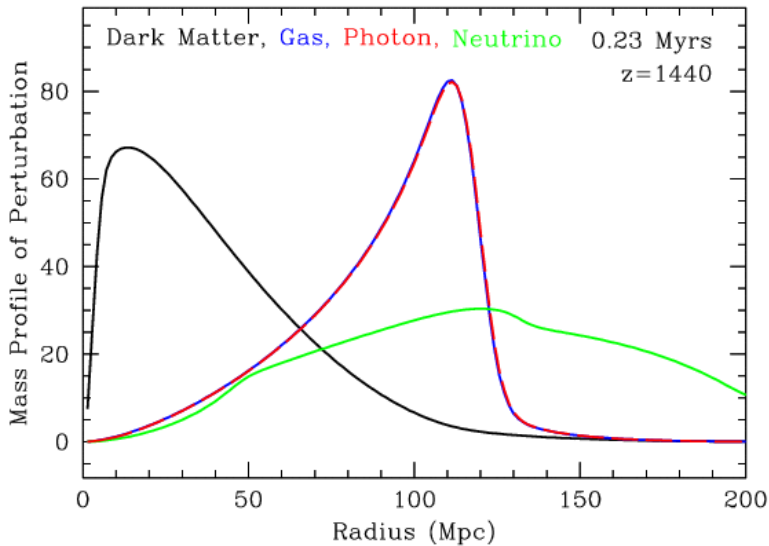


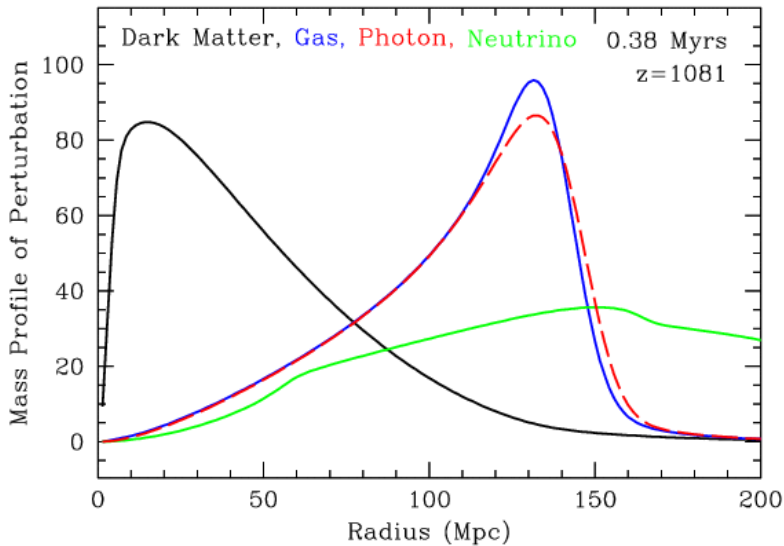


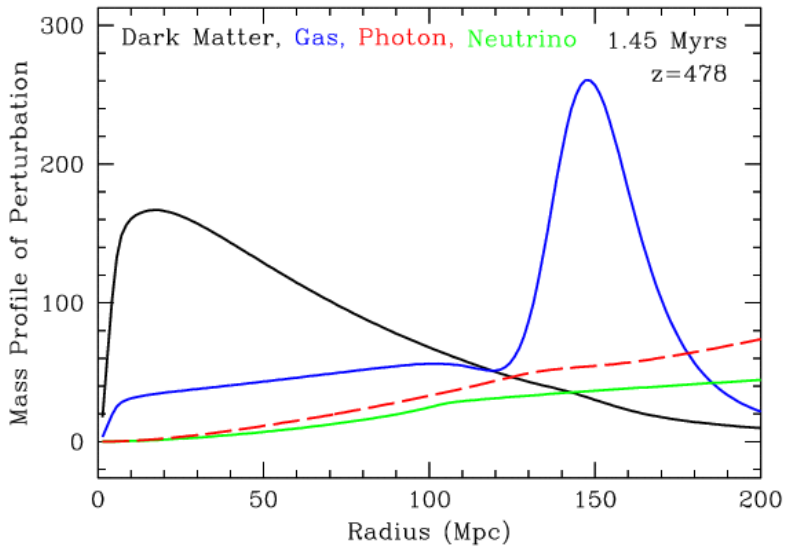


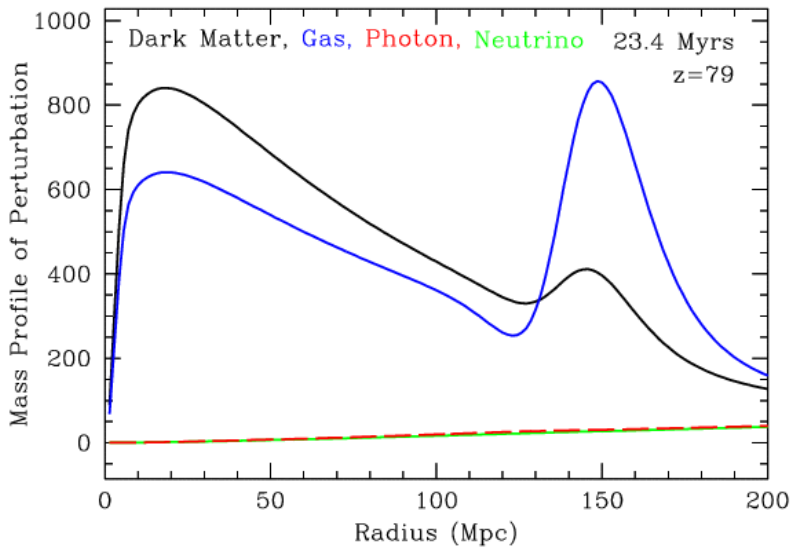


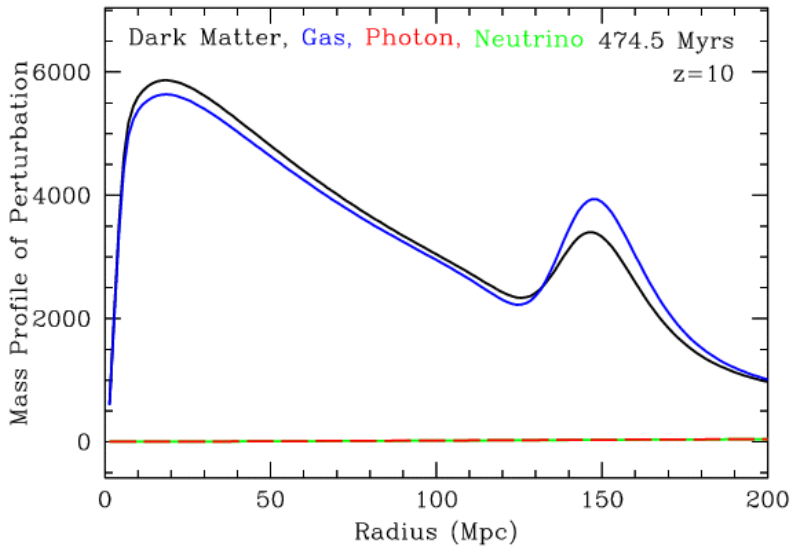


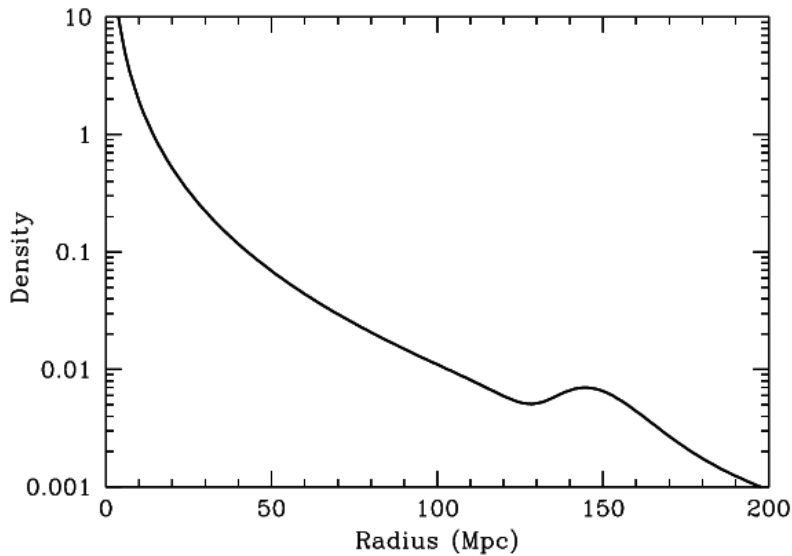


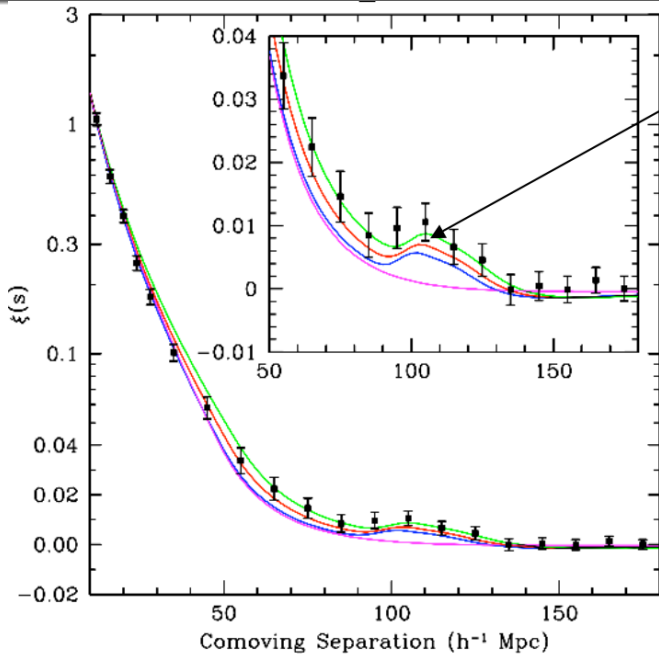




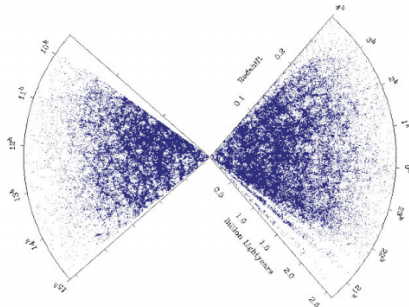








With **no DM**, today amplitude of typical fractional overdensities should be 0.01

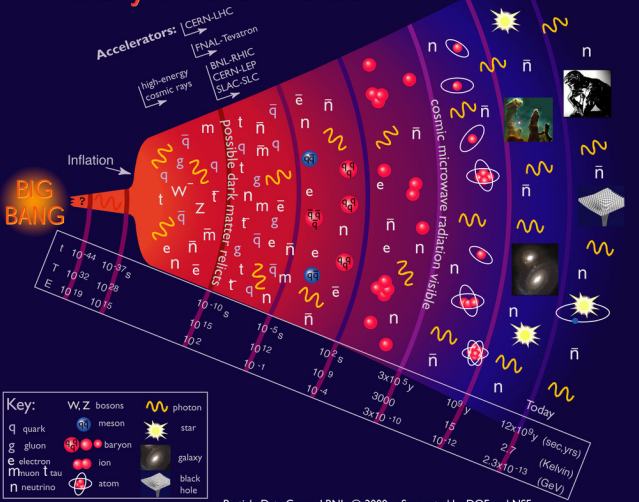


But, in galaxies and clusters
fractional overdensities ~ 100 and up

→ fluctuations that we **see** in the CMB
are not enough to give us structure today

Potential fluctuations at recombination
must have been larger than temp. fluct.

History of the Universe



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