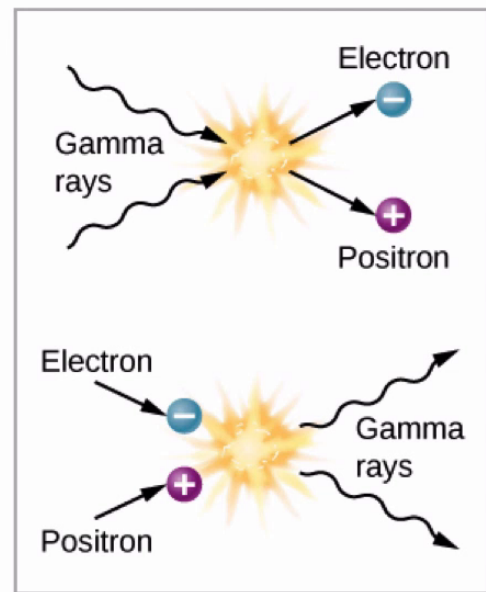
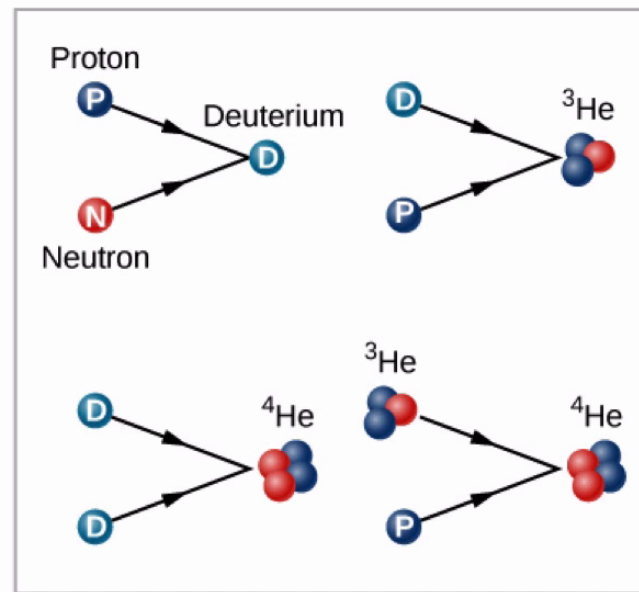


The Cosmic Microwave Background

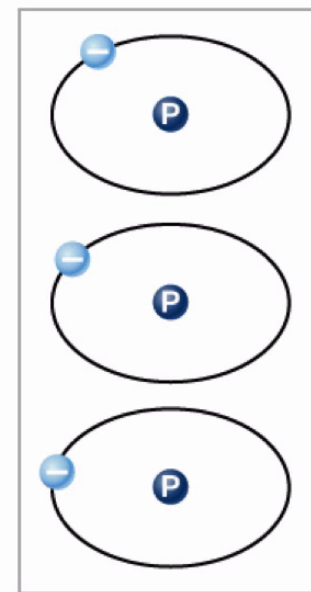
- 1** A few hundred thousand years after the big bang, free electrons combined with nuclei to make atoms. This epoch marked the transition from opaque to transparent.



(a)

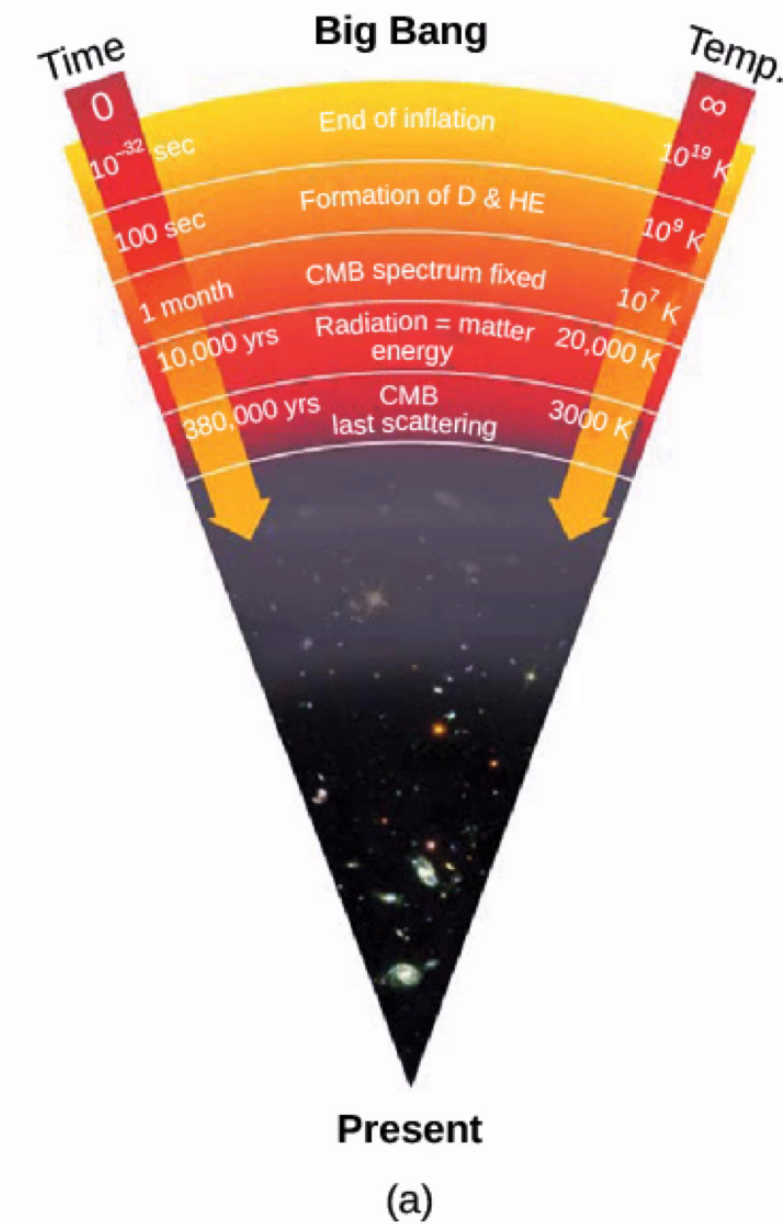


(b)

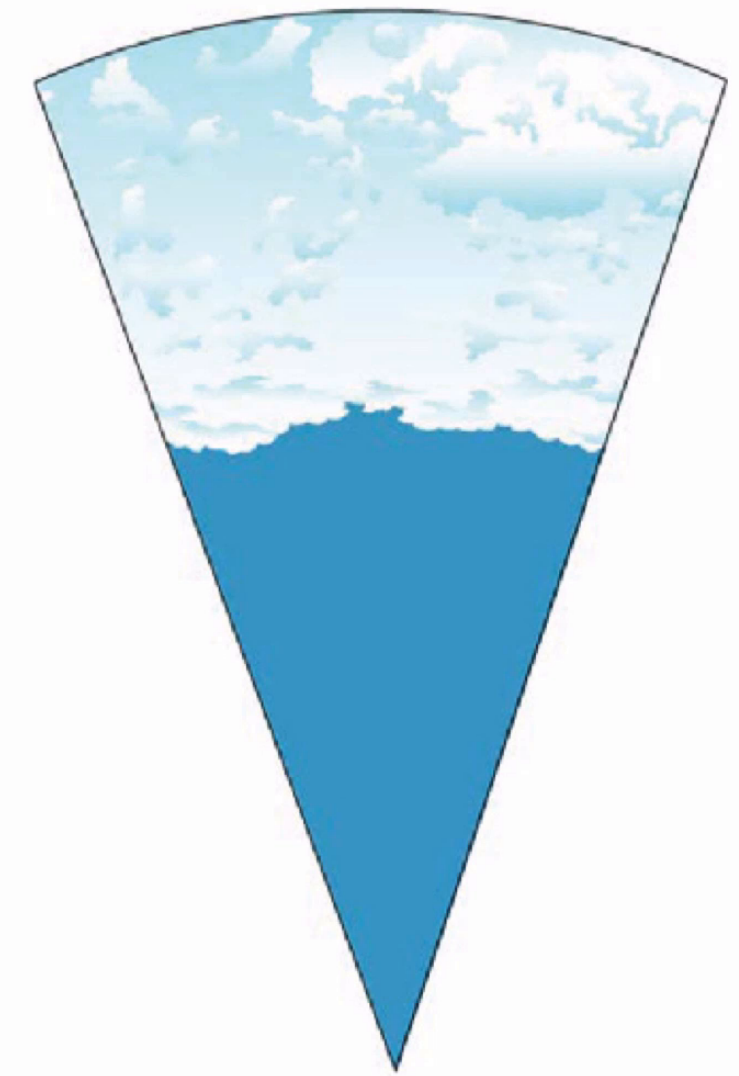


(c)

- 2** When we look out in space and back in time, we can only see as far as this epoch

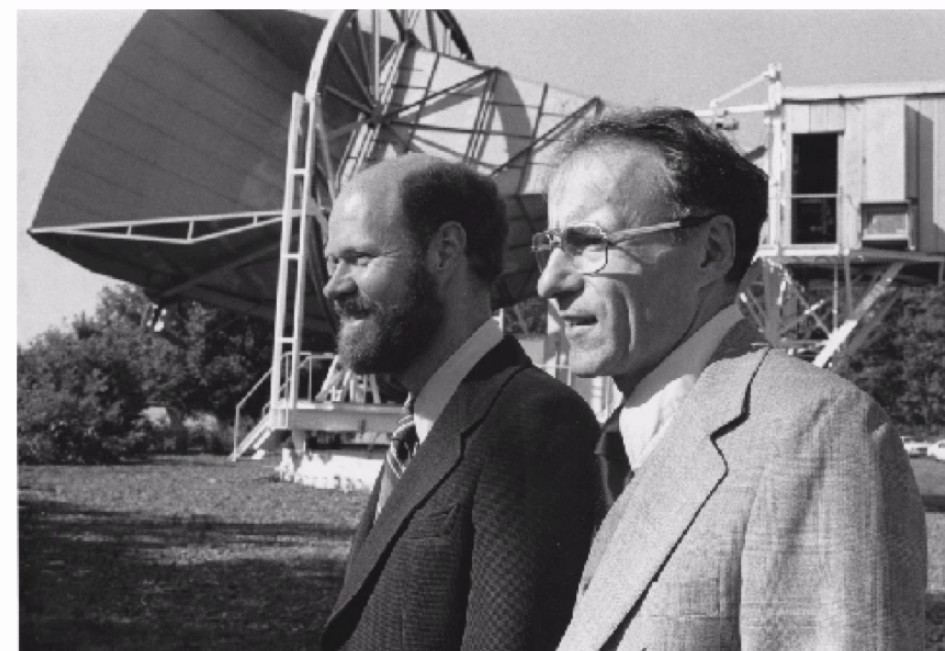


(a)



(b)

- 3** Robert Wilson and Arno Penzias detected the radiation from this epoch, as microwave background radiation coming from all directions



- 4** The temperature of the cosmic microwave background (CMB) is around 2.73 K — much colder than its initial temperature of 3,000 K