







# DARK ENERGY SPECTROSCOPIC INSTRUMENT

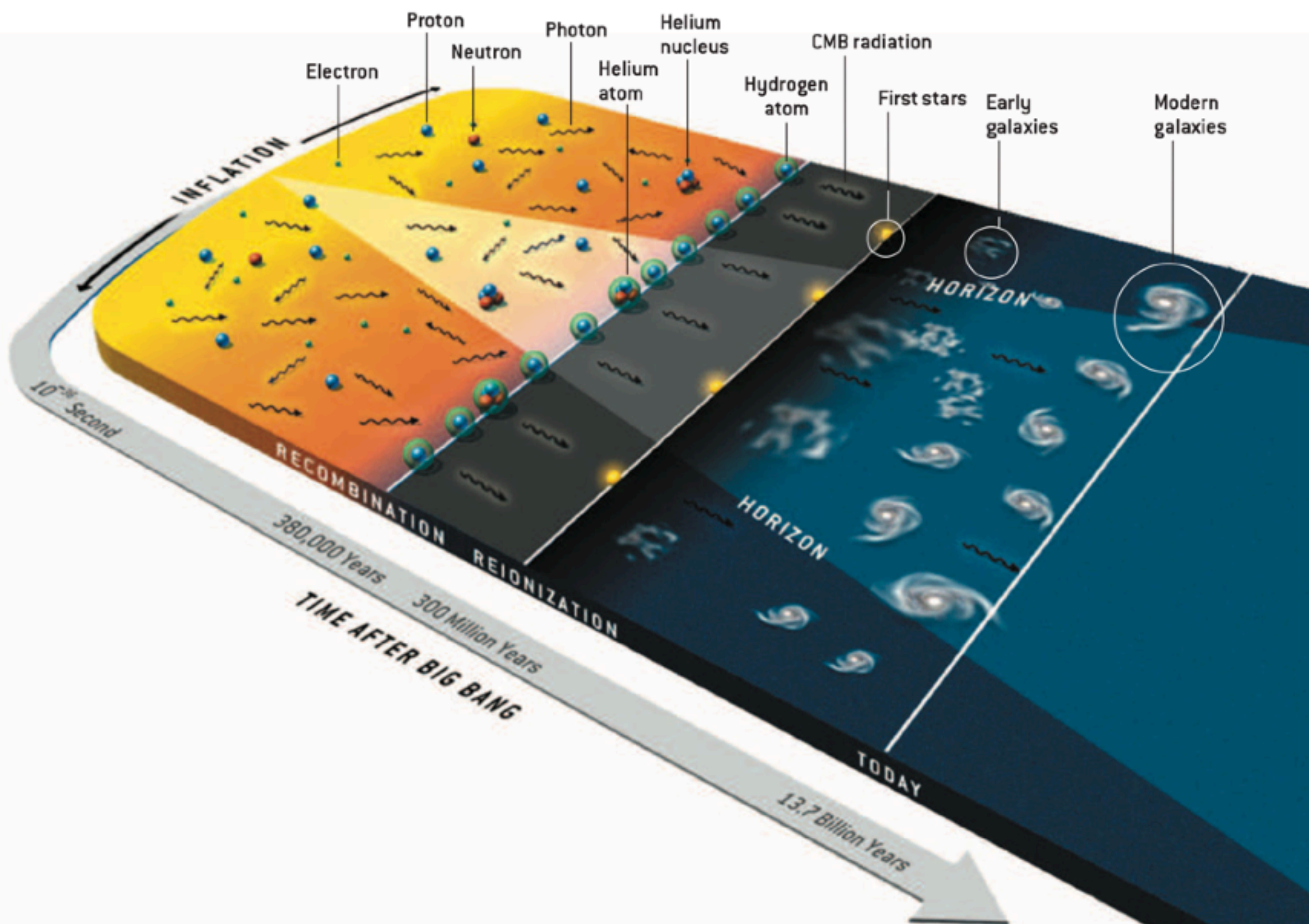
U.S. Department of Energy Office of Science

DESIGN LOGICAL CONSTRAINTS - Aug 2024 X11 CNFP @ Crete, Greece, 2024

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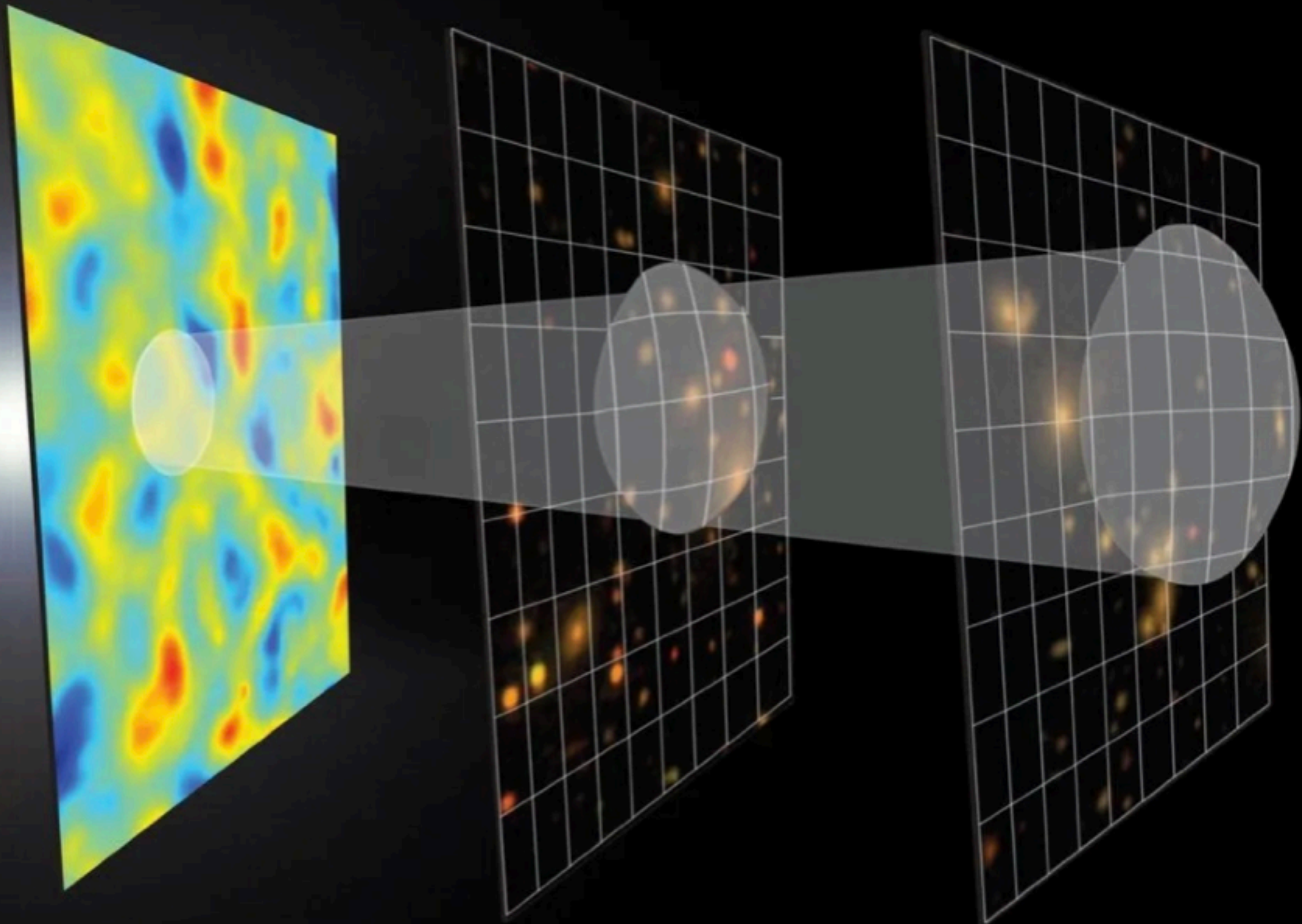


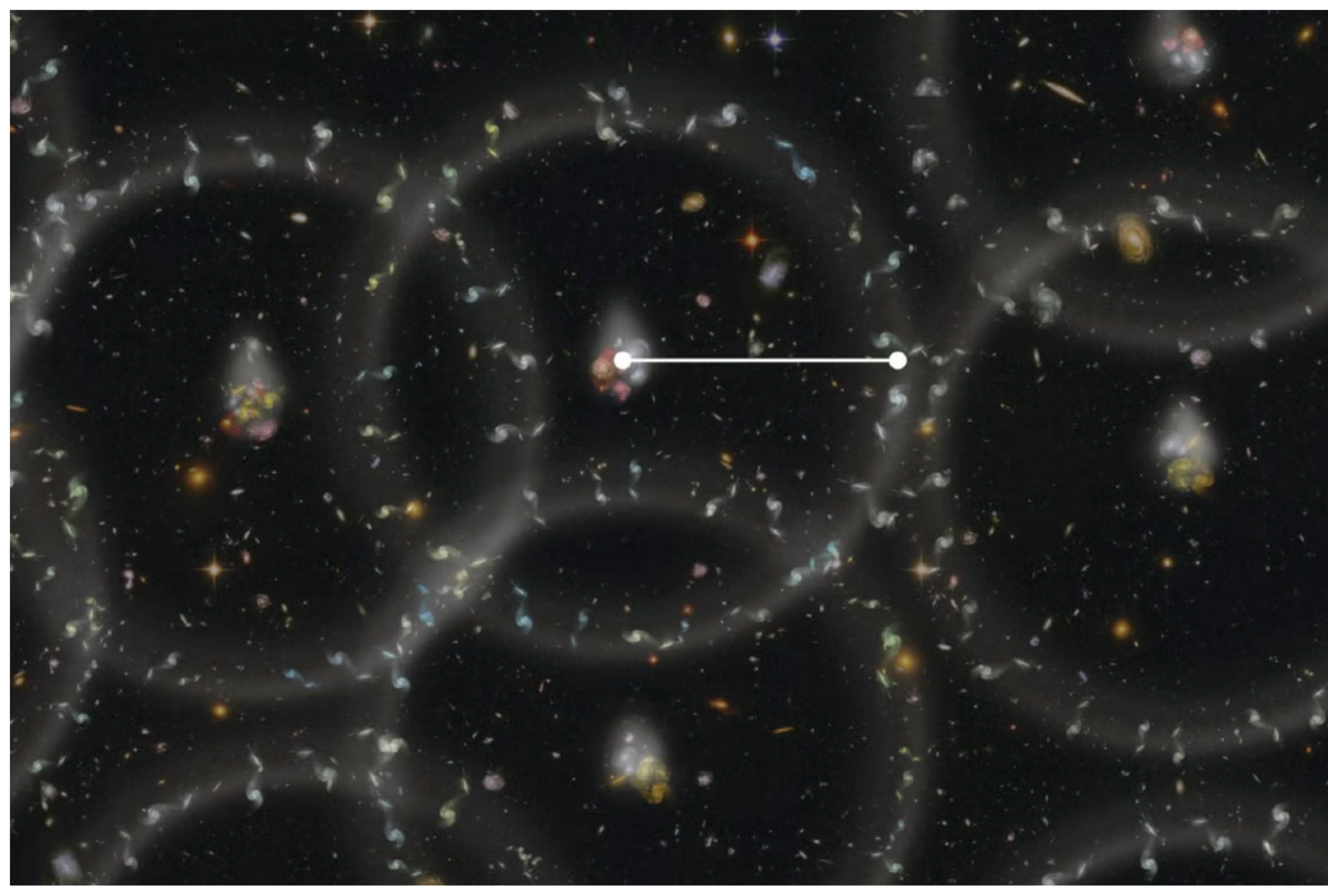










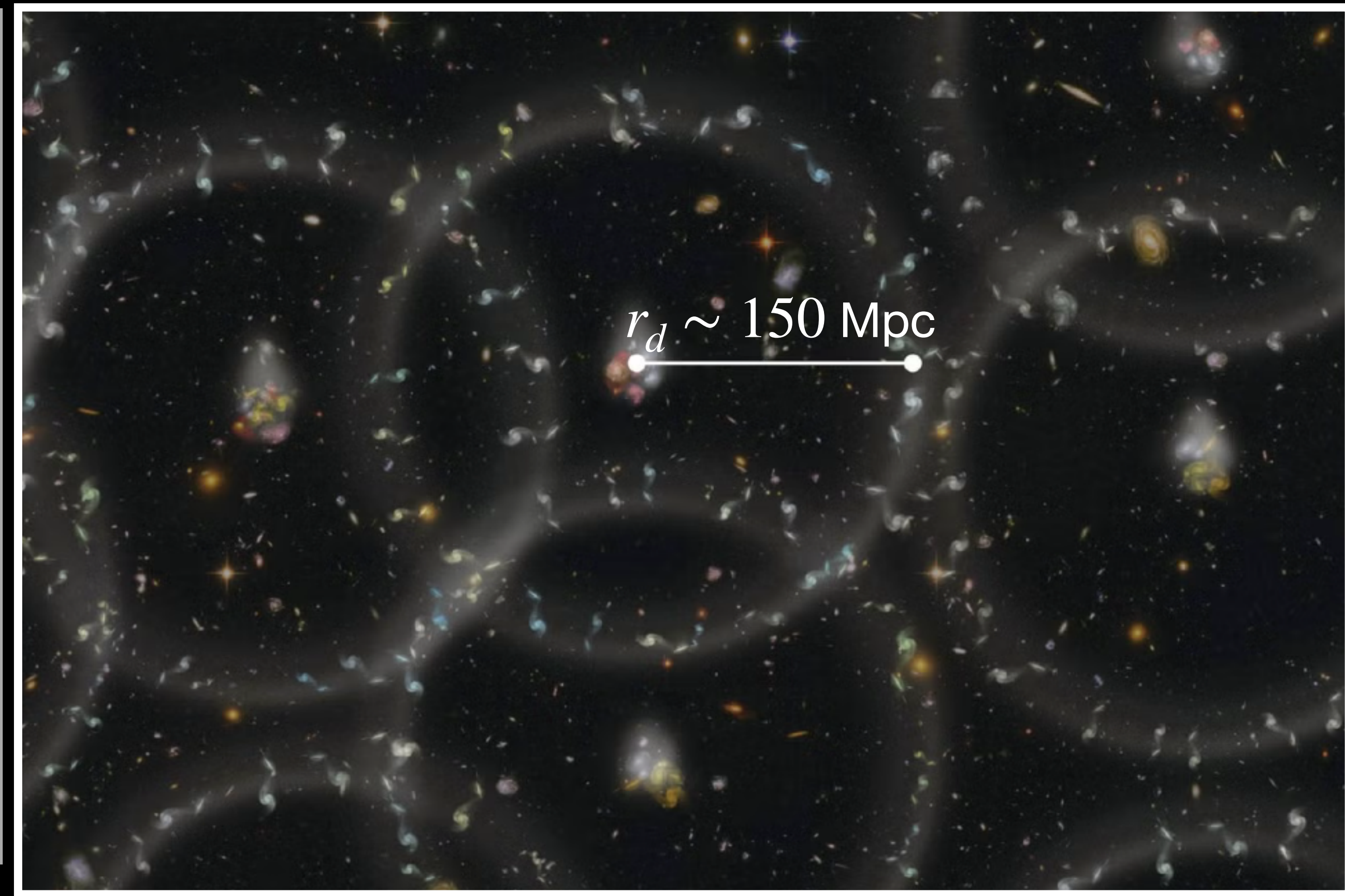
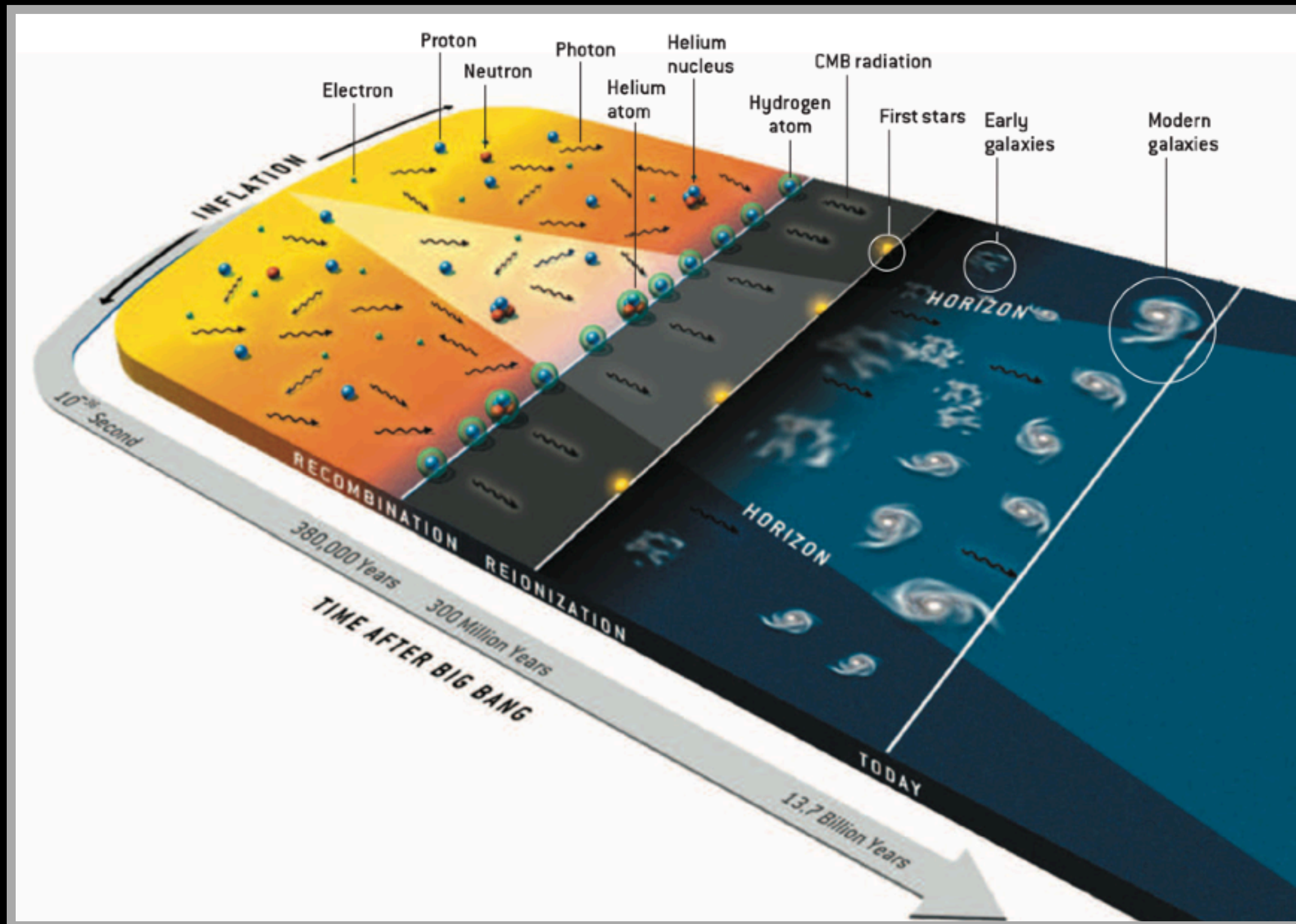






# Baryon Acoustic Oscillations (BAO)

- Gravity and pressure generated sound waves in the primordial plasma
- When baryons and photons decoupled, the sound waves stopped





# How do we learn cosmology from BAO?

- Measure angular positions, and redshifts of tracers (of the underlying matter density field, e.g., BGS, LRG, ELG, QSO, Ly $\alpha$ )
- Work out distances to the tracers.
  - ➔ If we know the characteristic scale from  $r_d$  early physics probes such as CMB or BBN, we measure absolute distances.
  - ➔ Otherwise, we measure distances in units of  $r_d$ .
- Infer cosmology