The origin of cosmic structure
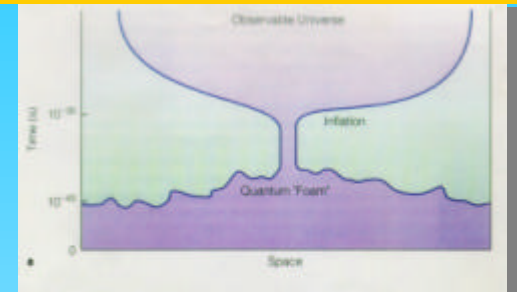
Inflation (t~10^{-35} s)

QUANTUM FLUCTUATIONS:

$$|\delta_k|^2 \propto k^n \quad n = 1$$

Gaussian amplitudes

+

Damping (nature of dark matter)

$$P(k) = Ak^n\, T^2(k,t)$$

Transfer function

$R_h(t_{eq})$

cold

Mezaros damping

P(k)

$\log(k^3|\delta_k|^2)$

n=1

hot Free streaming

$\log(k\ \mathrm{Mpc}/\Omega h^2)$
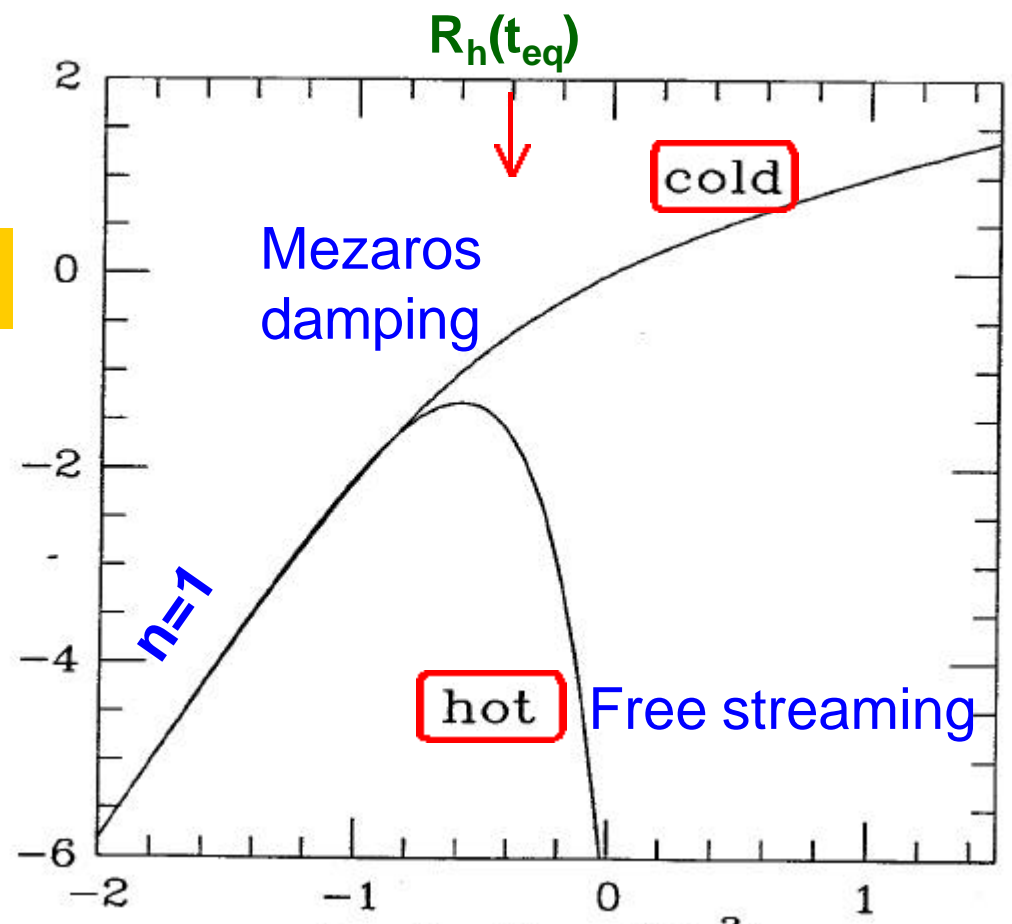
- Hot DM (eg ~30 ev neutrino)
    - Top-down formation
- Cold DM (eg ~neutralino)
    - Bottom-up (hierachical)