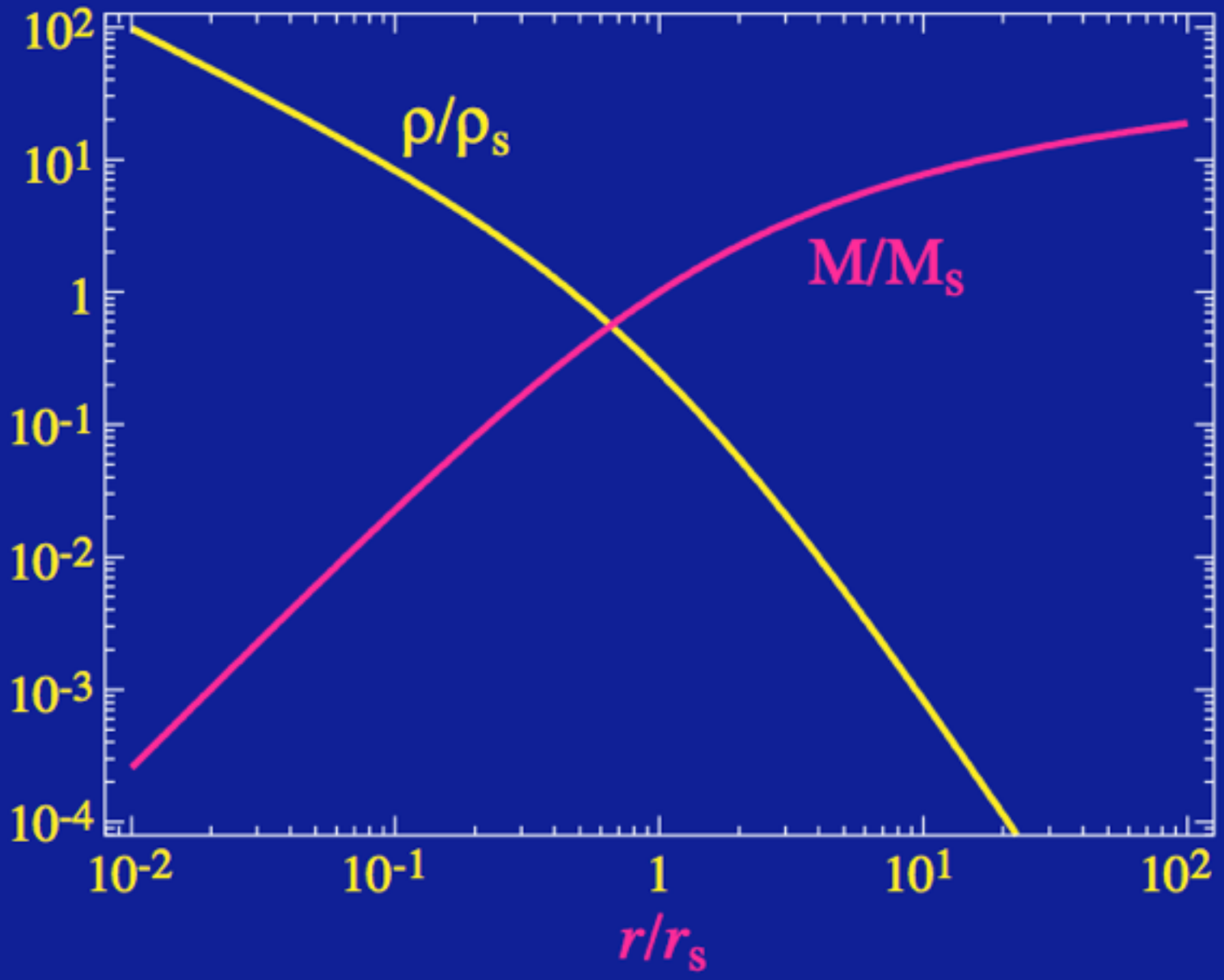
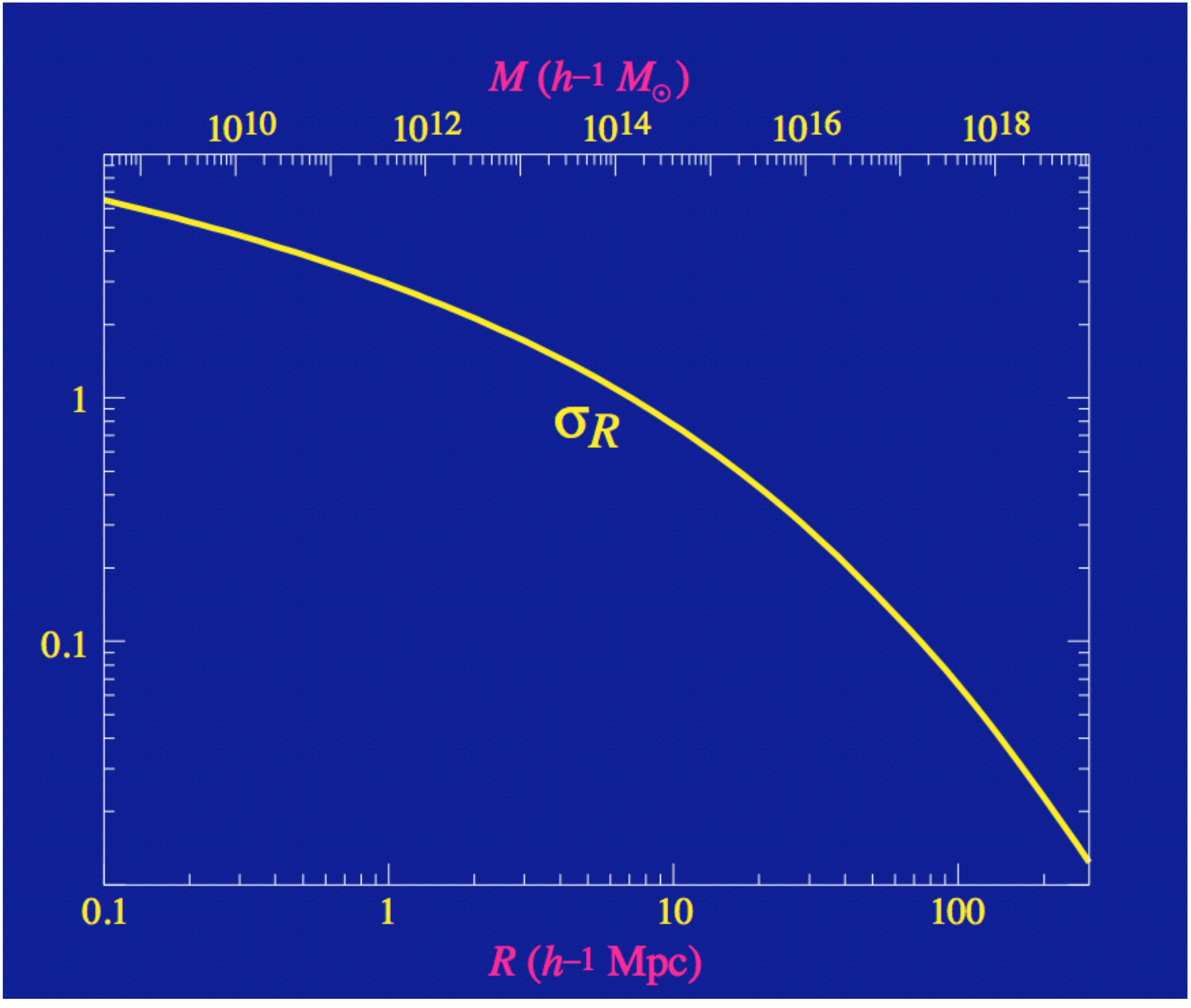
NFW Halo

- Density profile well-described by (Navarro, Frenk & White 1997)

$$\rho(r) = \frac{\rho_s}{(r/r_s)(1 + r/r_s)^2}$$




M (h–1 M⊙)
10^10
10^12
10^14
10^16
10^18
1
0.1
σR
0.1
1
10
100
R (h–1 Mpc)

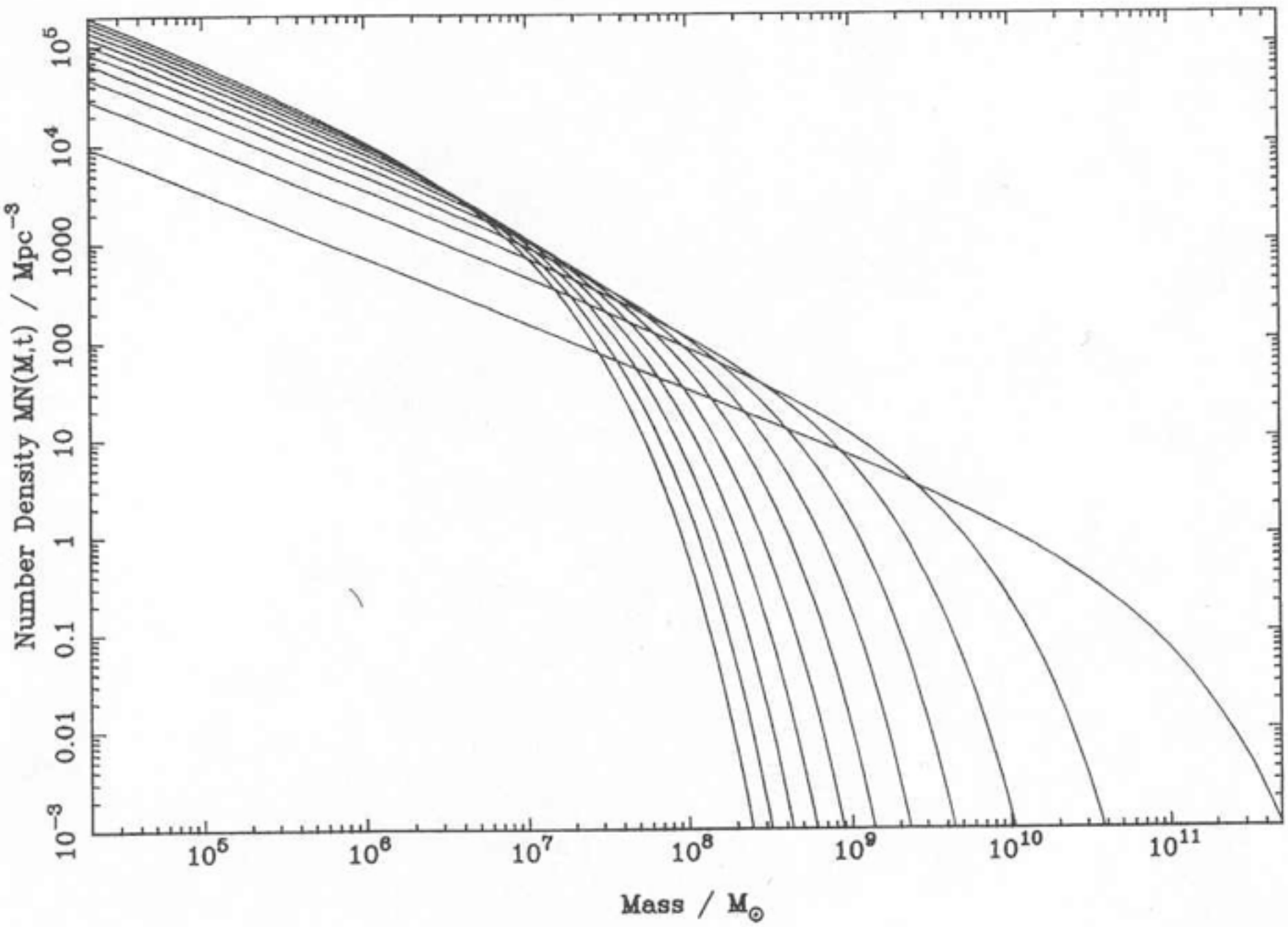
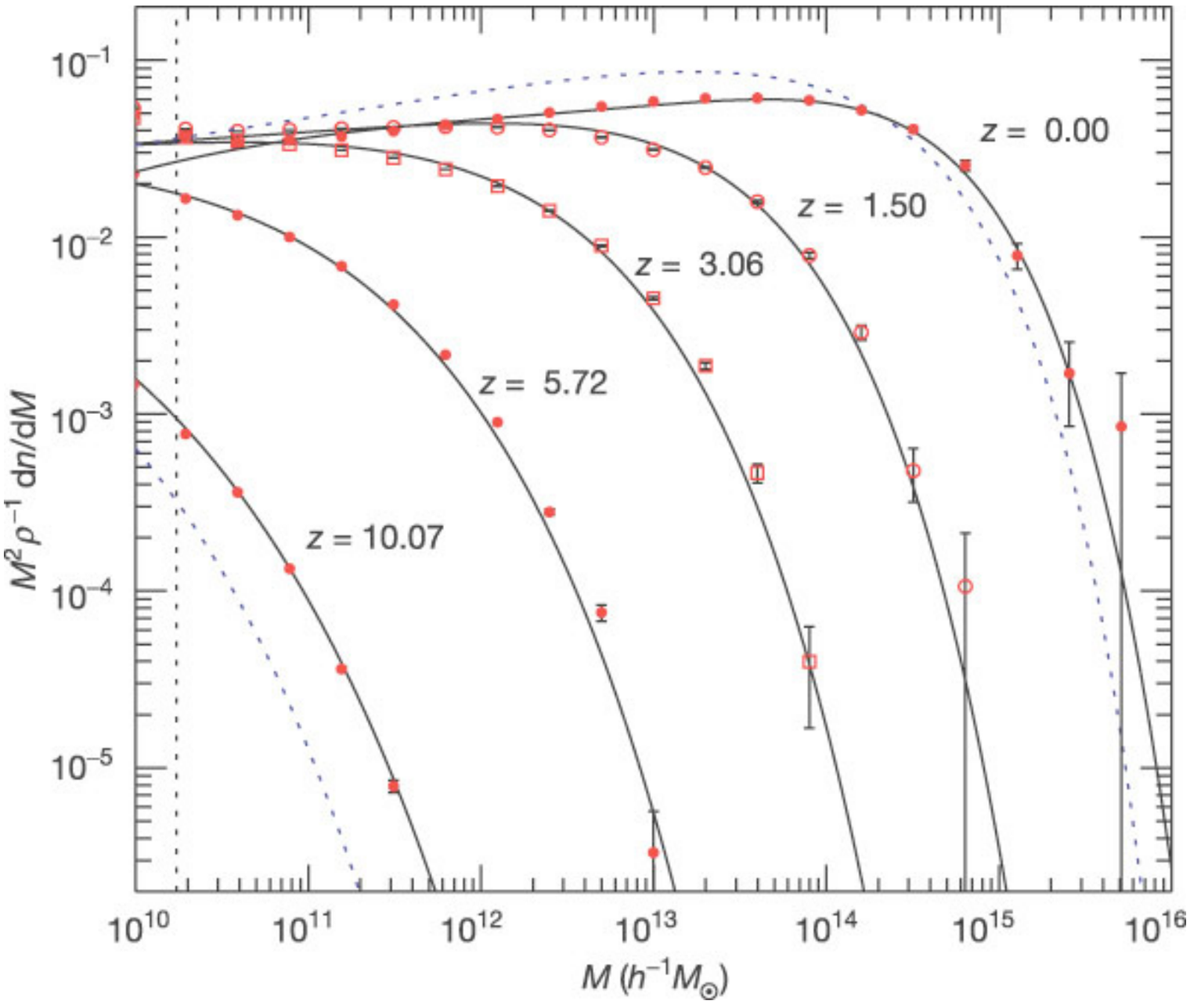
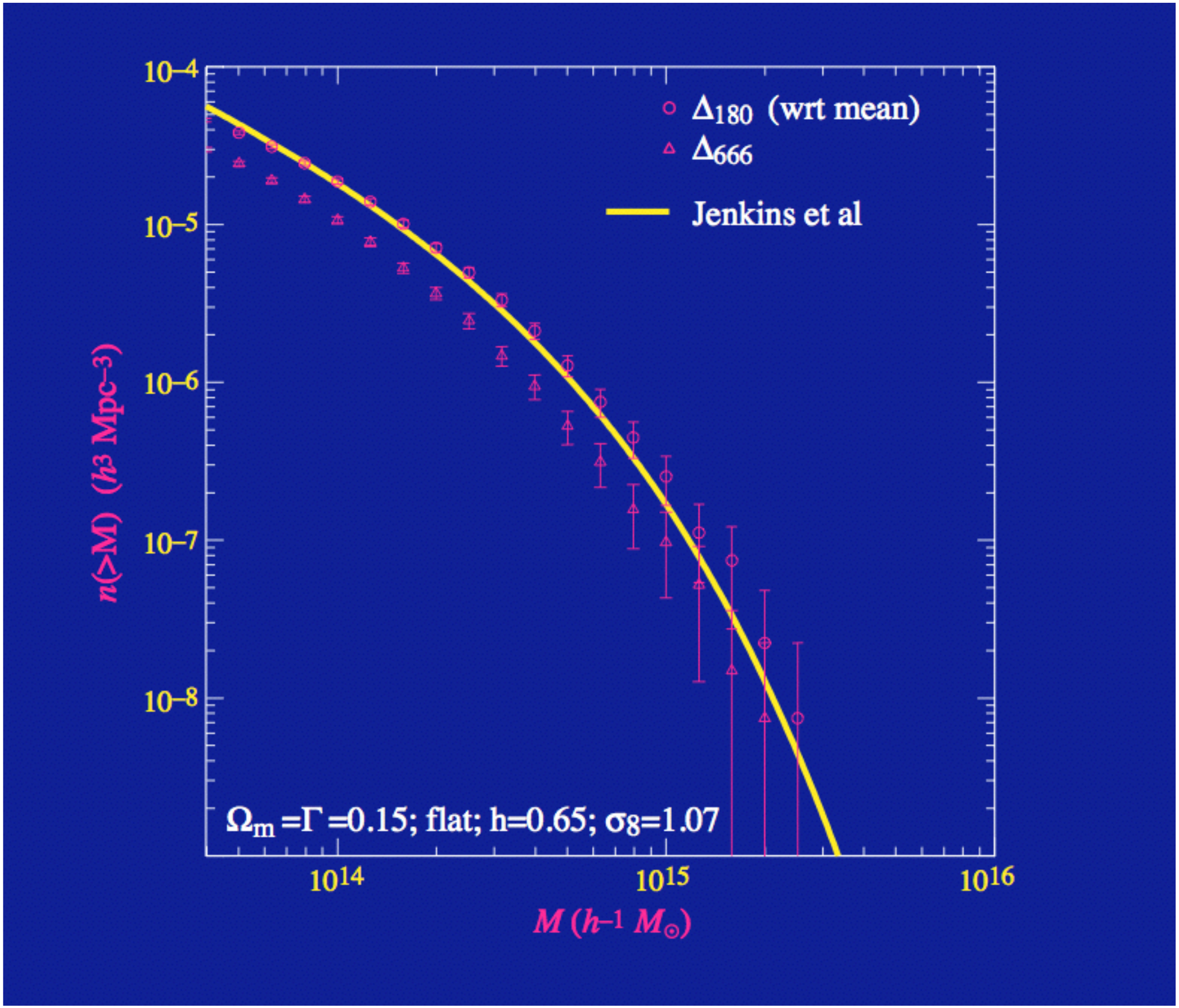


Fig. 16.4. Illustrating the variation of the form of the Press-Schechter mass function as a function of cosmic time (Courtesy of Dr. Andrew Blain).


10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
$M^2\rho^{-1}\,dn/dM$
$z = 0.00$
$z = 1.50$
$z = 3.06$
$z = 5.72$
$z = 10.07$
10^{10}
10^{11}
10^{12}
10^{13}
10^{14}
10^{15}
10^{16}
$M\ (h^{-1}M_\odot)$


10–4
10–5
10–6
10–7
10–8
n(>M) (h3 Mpc–3)
Δ180 (wrt mean)
Δ666
Jenkins et al
Ωm =Γ =0.15; flat; h=0.65; σ8=1.07
10^14
10^15
10^16
M (h–1 M⊙)

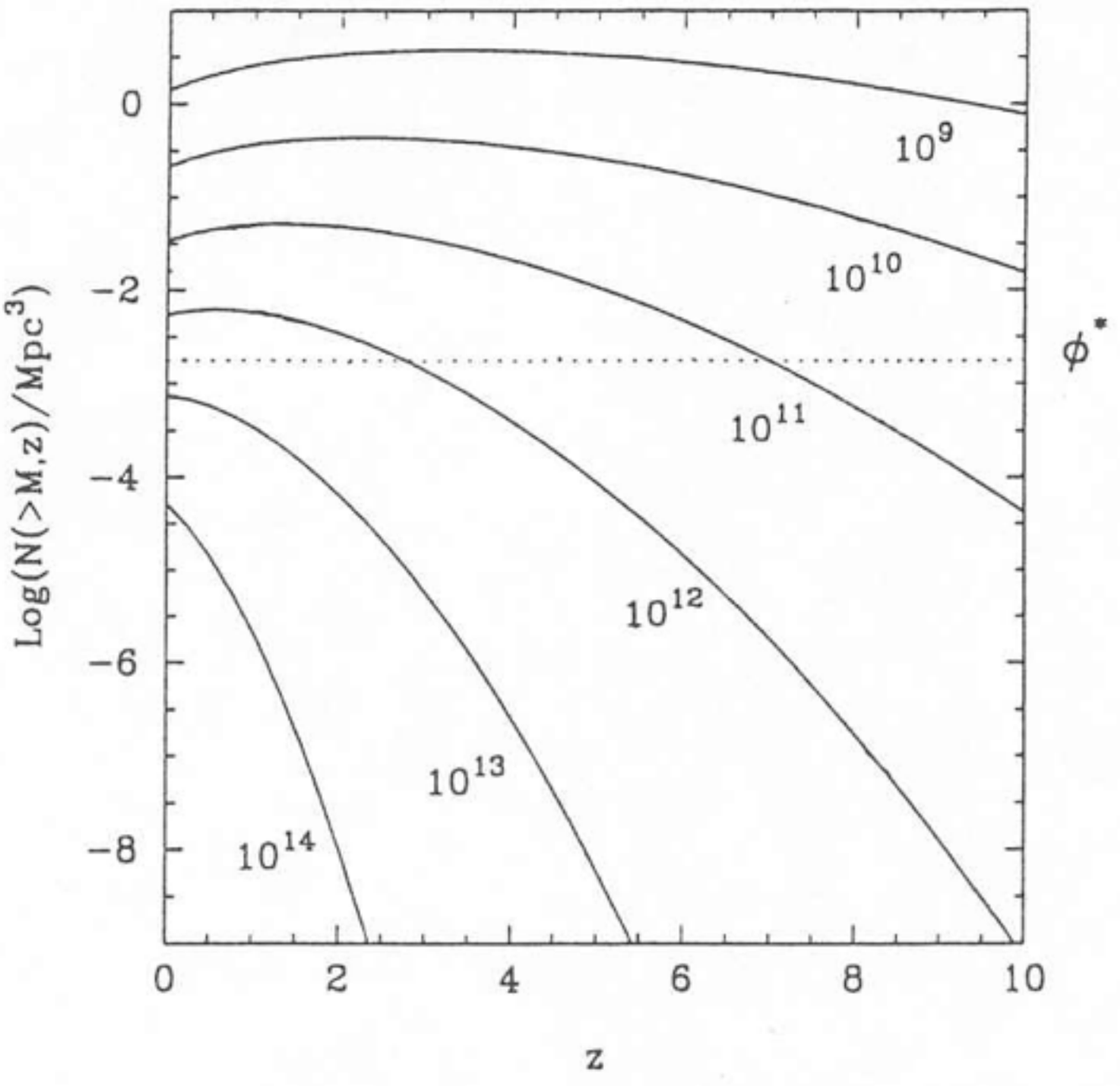
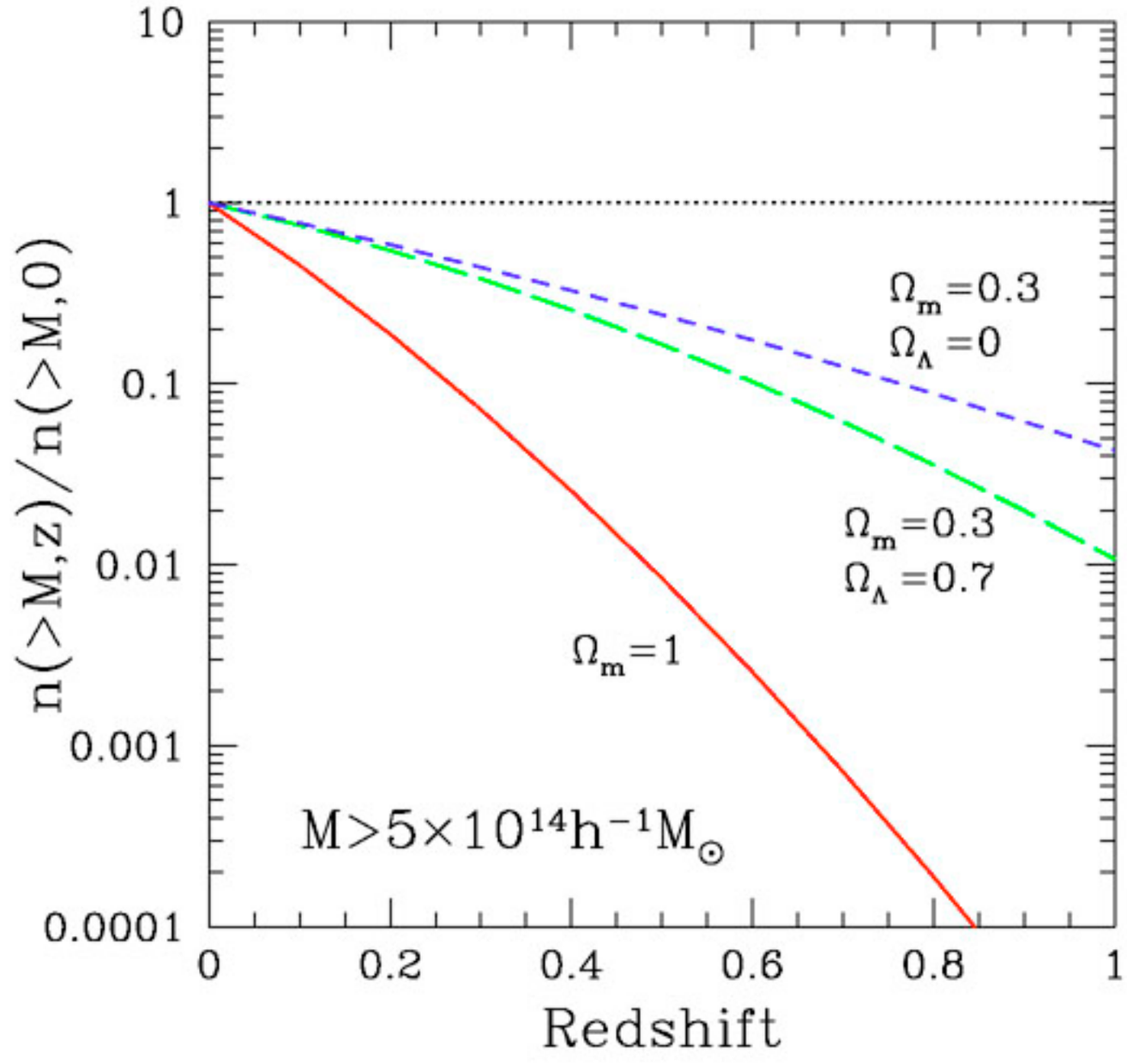
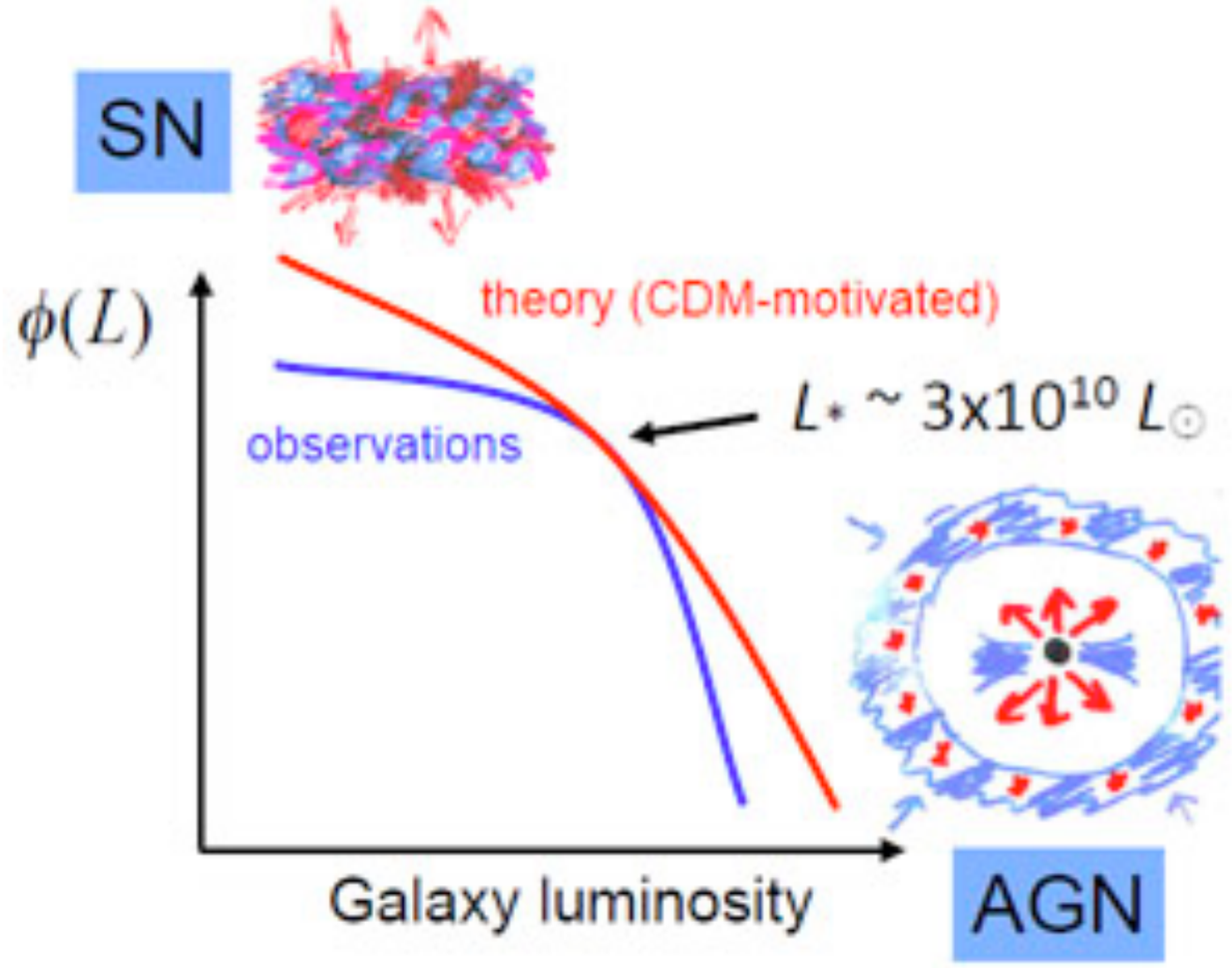


Fig. 16.5 The evolution of the comoving number density of dark matter haloes with masses greater than M as a function of redshift for a standard Cold Dark Matter model with $\Omega_0 = 1$. The curves have been derived using the Press-Schechter form of evolution of the mass spectrum which is a good fit to the results of N-body simulations. The dotted line labelled ϕ^* shows the present number density of L^* galaxies. (after Efstathiou 1995).


10
1
0.1
0.01
0.001
0.0001
0
0.2
0.4
0.6
0.8
1
n(>M,z)/n(>M,0)
Redshift
Ωm=0.3
ΩΛ=0
Ωm=0.3
ΩΛ=0.7
Ωm=1
M>5×10¹⁴h⁻¹M⊙


SN
$\phi(L)$
theory (CDM-motivated)
$L_* \sim 3\text{x}10^{10}\, L_\odot$
observations
Galaxy luminosity
AGN

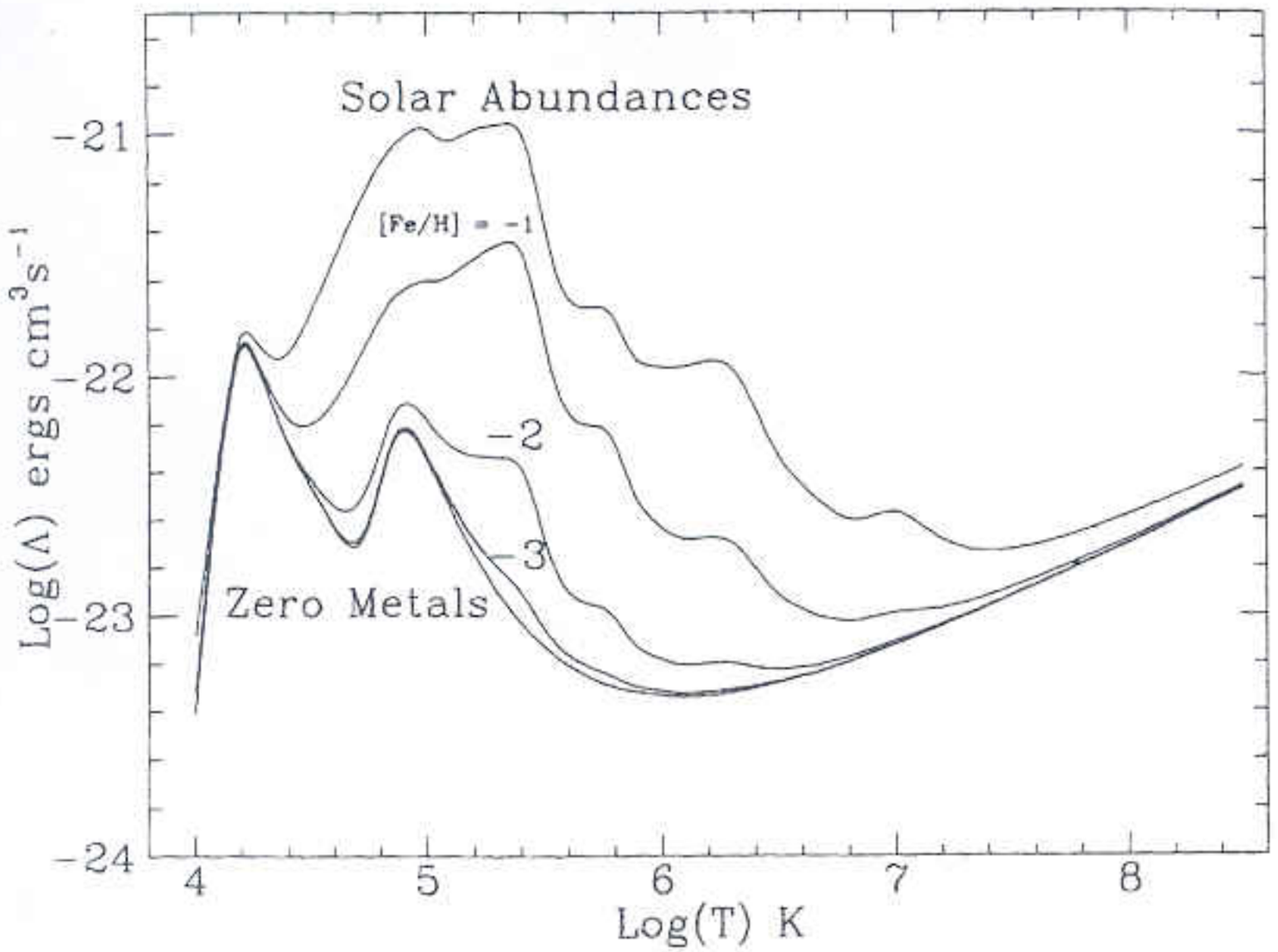
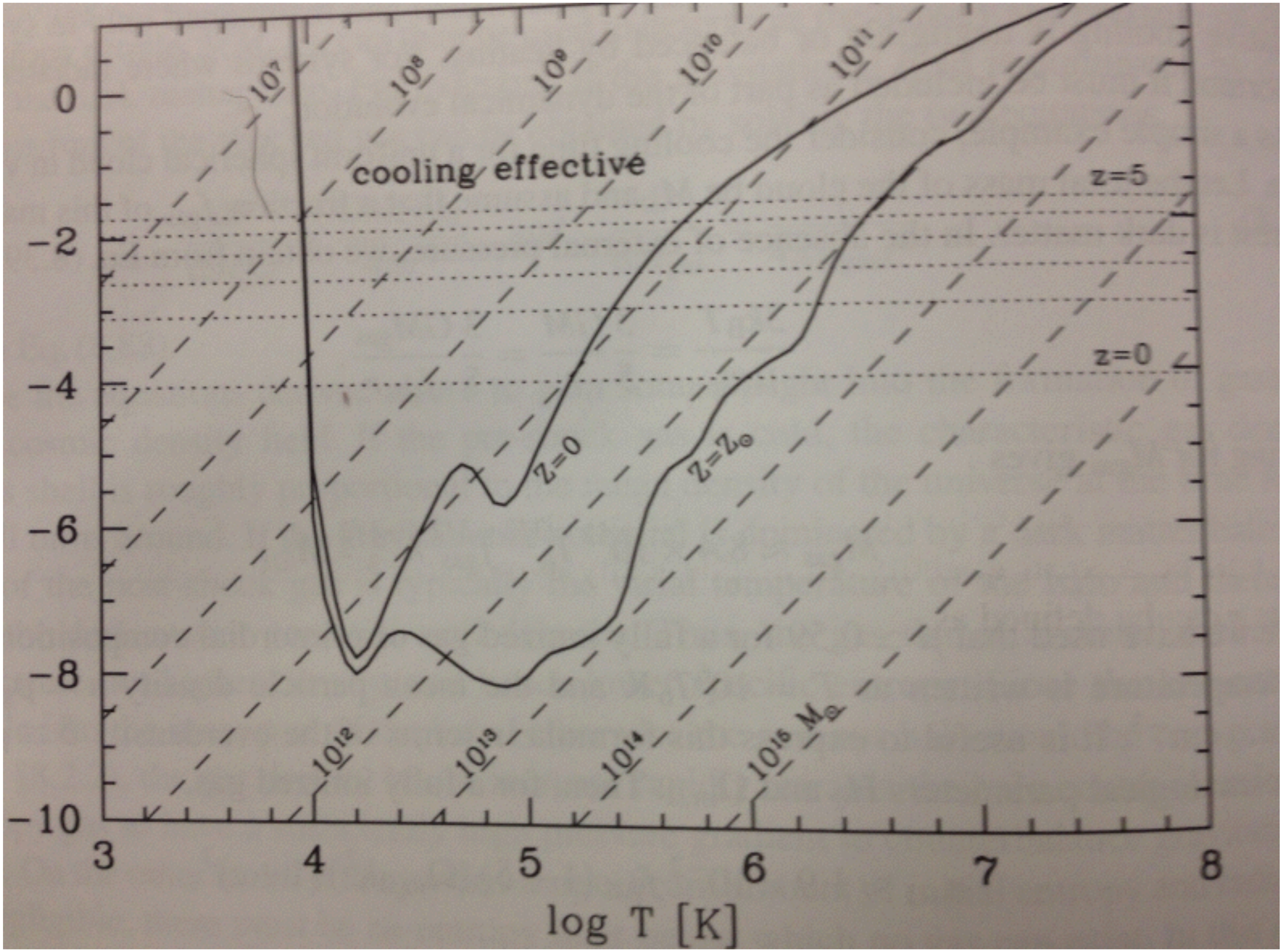


Fig. 16.2. The cooling rate per unit volume $\Lambda(T)$ of an astrophysical plasma of number density 1 nucleus cm^{-3} by radiation for different cosmic abundances of the heavy elements ranging from zero metals to the present abundance of the heavy elements as a function of temperature T (Silk and Wyse 1993, after Sutherland and Dopita 1993). In the zero metal case, the two maxima of the cooling curve are associated with the recombination of hydrogen ions and doubly ionised helium (see also Sect. 19.5 and Fig. 19.3).


cooling effective
z=5
z=0
z=0
z=z⊙
10⁷
10⁸
10⁹
10¹⁰
10¹¹
10¹²
10¹³
10¹⁴
10¹⁵ M⊙
0
−2
−4
−6
−8
−10
3
4
5
6
7
8
log T [K]

log n (cm^-3)