



This diagram delineates the mass-radius relation for a self-gravitating cloud whose cooling and dynamical timescales are equal (assuming cooling only to the process included in Figure 1). A cloud of given mass and radius was initially very large would deflate quasi-statically (because $\tau_{\text{cool}} \approx \tau_{\text{dyn}}$) until it crossed the initial line; it would then collapse in free fall and fragment into stars. This simple argument (which can readily be modified for non-spherical geometry, a non-baryonic component of mass, etc.) suggests why, irrespective of the cosmological details, no galaxies form with baryonic masses $> 10^{12} M_{\odot}$ and radii $> 10^5 \text{ pc}$. Above $10^{12} M_{\odot}$, a system must be compressed to a density $> 10^{-1} \text{ cm}^{-3}$ before going into free-fall; but below this mass, the required density is no more than 10^{-4} cm^{-3} . For the details we need to know more about the initial fluctuations, and