$$M \quad = \quad \rho\, V \quad = \quad \rho(\frac{4}{3})\pi R^3$$

$$L \quad \propto \quad M \quad \propto \quad R^3$$

$$L^{1/3} \quad \propto \quad R$$

$$\frac{v^2}{R} \quad = \quad \frac{GM}{R^2} \quad = \quad \frac{G\,(\frac{4}{3})\pi\rho R^3}{R^2}$$

$$v \quad \propto \quad R$$

$$v \quad \propto \quad L^{1/3}$$

$$\Delta(\log v) \quad = \quad \frac{1}{3}\,\Delta(\log L)$$