$$\mathrm{v_{esc}} = \sqrt{\frac{2GM}{R}}$$

$$\mathrm{v_{gas}} = 157\sqrt{\frac{T}{w}} \quad \text{meter/sec}$$

$$\mathrm{T} \simeq 279\sqrt{\frac{1}{d_{\mathrm{AU}}}} \quad \text{Kelvin}$$