SPECIAL CASE

$n = 3 \rightarrow M$ indep of R

$$M = 4\pi M_3 \left(\frac{K}{\pi G}\right)^{3/2}$$

WD: mass increases : $\downarrow \mu_e$?

EOS NON-REL $n = 1.5$

$\longrightarrow$ REL $n = 3$

$$P_{e,\,rel\text{-}deg} = \underbrace{\frac{hc}{8}\left(\frac{3}{\pi}\right)^{1/3}\frac{1}{(u \cdot \mu_e)^{4/3}}}_{K_2}\ \rho^{4/3}$$

$$P = K_2 \cdot \rho^{4/3}$$

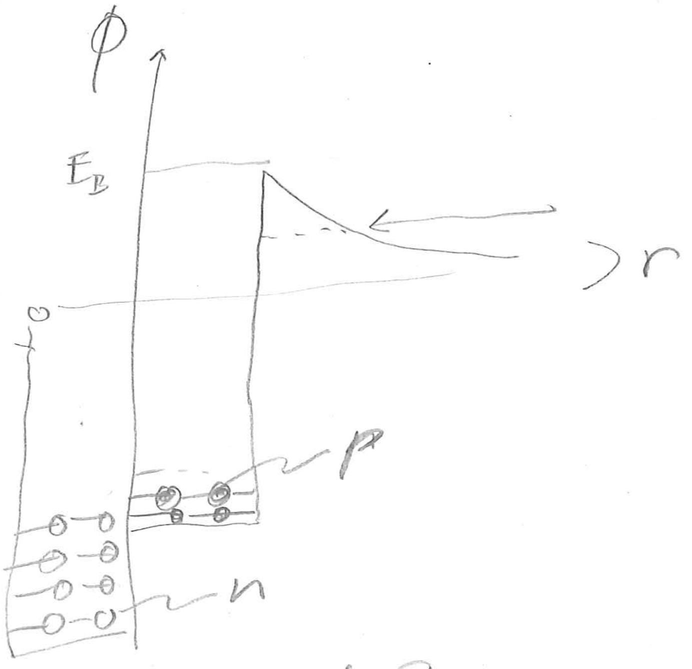
$$\rightarrow M = M_{CH} = \frac{M_3\sqrt{3/2}}{4\pi}\left(\frac{hc}{G u^{4/3}}\right)^{3/2}\mu_e^{-2}$$

$$\simeq 5.83\ \mu_e^{-2}\ M_\odot$$

Q: $\mu_e \simeq 0.5 \rightarrow M_{CH} = 1.46\ M_\odot$

Q: M_{CH} for IRON CORE ?

Thermonuclear Reactions



Q: n/p ratio?

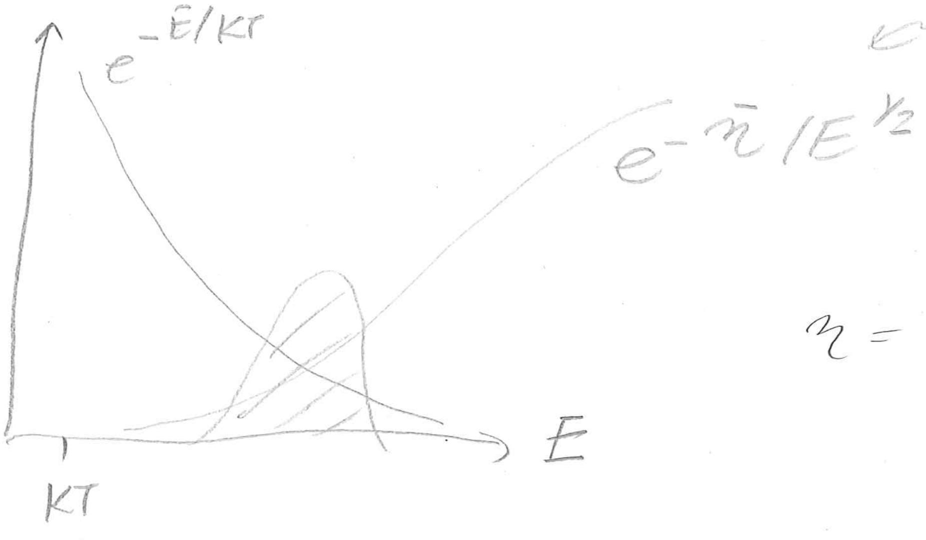
typical $E = kT \ll E_B$

Q: How can we have reactions?

- high-E TAIL OF DISTRIBUTION
- Tunneling (QM)

NOTE: SCREENING @ high ρ!

Qualitative



tunnel penetration Barrier

$$\eta = \pi \cdot \sqrt{2m}\ \frac{Z_i Z_k e^2}{\hbar}$$

→ compute reaction rate $\langle \sigma v \rangle$ from

MASS EXCESS

$$\Delta M = c^2 \cdot (m - A \cdot u)$$

UNIT OF E

neutral atom

BINDING Energy

$$A = N + Z$$

$$EB = c^2 \cdot (m - (N m_n + Z \cdot (m_p + m_e)))$$