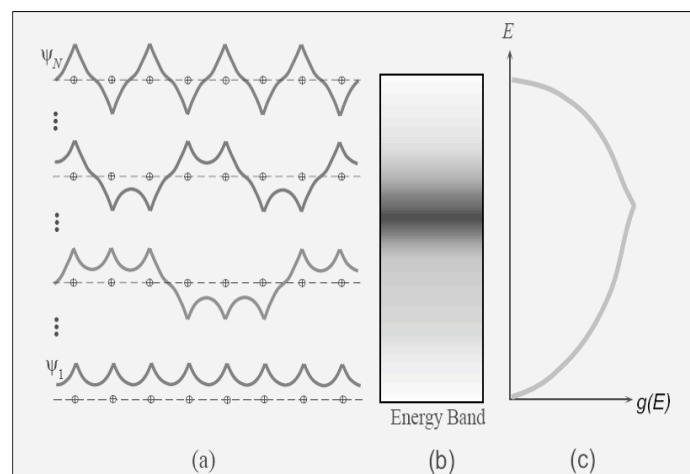
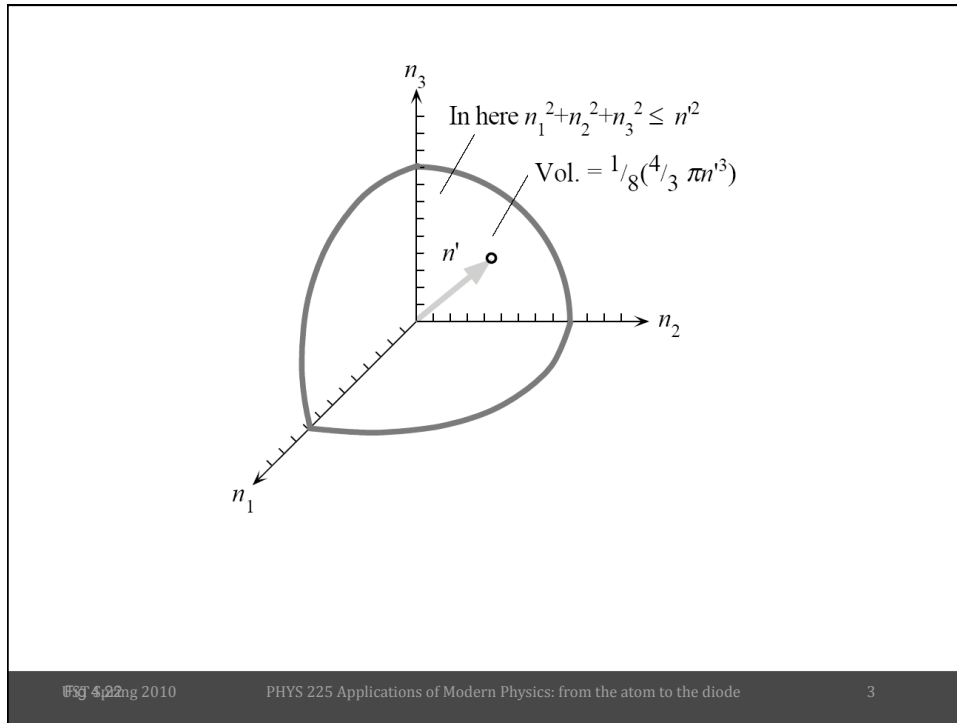


4.5 Density of states





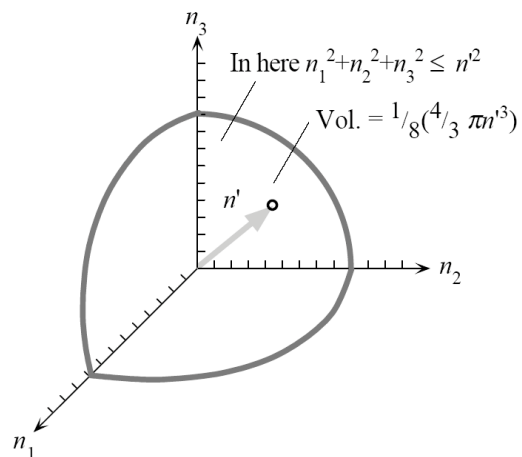
How many allowed states have energies less than E' ? i.e., how many electrons could you put in the 3D box to fill all states up to E' ?

A) n'^2

B) $\frac{1}{8} \left(\frac{4}{3} \pi n'^3 \right)$

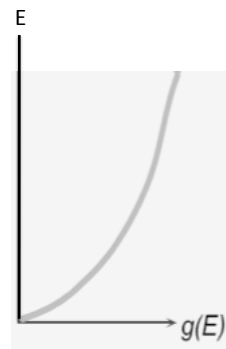
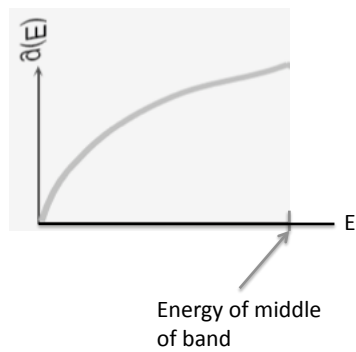
C) $2 \times \frac{1}{8} \left(\frac{4}{3} \pi n'^3 \right)$

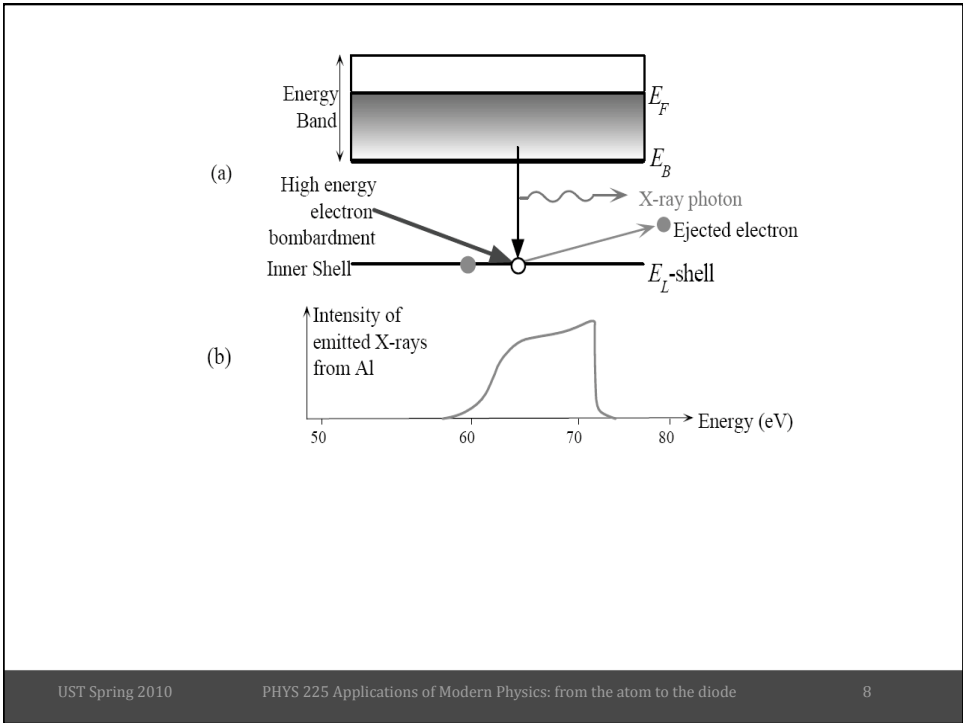
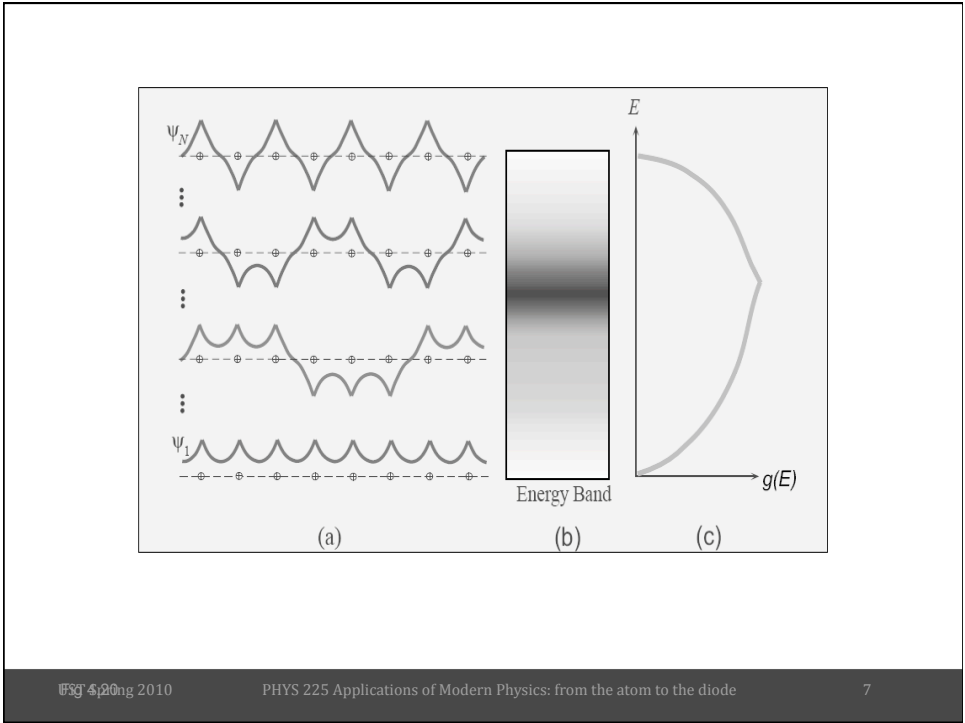
D) ∞

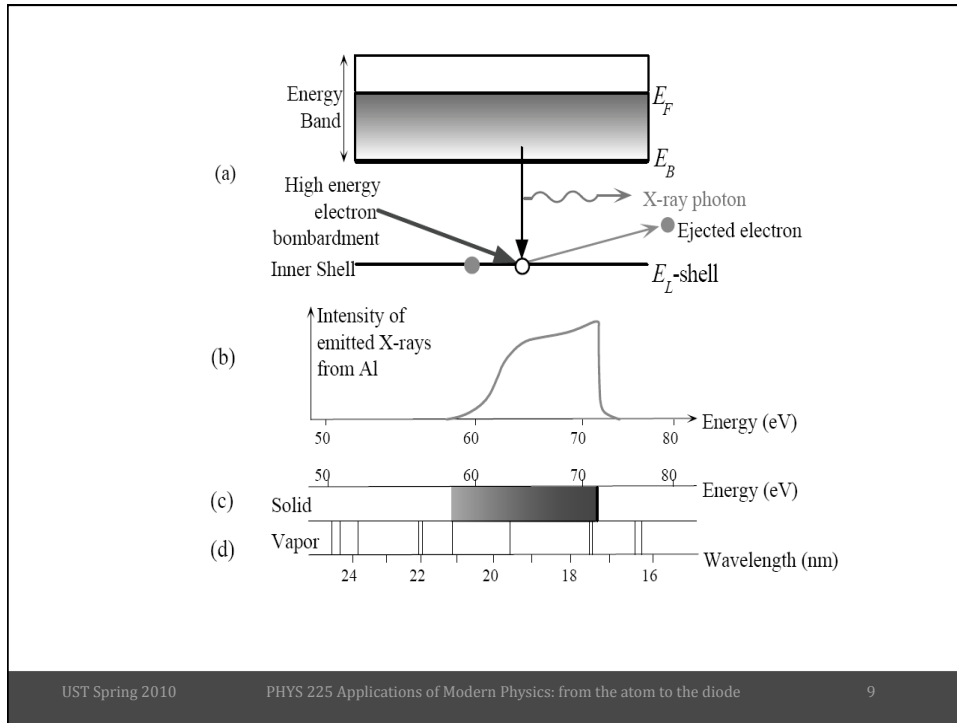


Density of States

$$g(E) = \left(8\pi 2^{1/2}\right) \left(\frac{m_e}{h^2}\right)^{3/2} E^{1/2}$$







At $T=0$, how many states contain electrons?
 (Assume $E=0$ is the bottom of the band)

A) $\frac{d[g(E)]}{dE}$

B) $\int_0^{\infty} g(E)dE$

C) $\int_0^{E_F} g(E)dE$

D) ?????

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D) ?????

What is $f(E)$ at $T=0$?

A) 0

B) $e^{-E/kT}$

C) 1 if $E < E_F$, 0 otherwise

D) ?????

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