Lecture 2

Read Hund's rule (Ashcroft & Mermin : pg. 650 - 652)

Lande's g factor :

$$g = 1 + \frac{J(J+1) + S(S+1) - L(L+1)}{2J(J+1)} = \frac{3}{2} + \frac{1}{2}\left[\frac{S(S+1) - L(L+1)}{J(J+1)}\right]$$

HW: Use eq. (31.50) to calculate for effective Bohr magneton number for all elements in the periodic table

E.G : $Ce \rightarrow 4f^1$ $\quad \underset{+3}{\downarrow} \quad \underset{+2}{-} \quad \underset{+1}{-} \quad \underset{0}{-} \quad \underset{-1}{-} \quad \underset{-2}{-} \quad \underset{-3}{-}$

$$S = \frac{1}{2}, L = 3, J = \frac{5}{2}$$

$$g = \frac{3}{2} + \frac{1}{2}\left(\frac{\frac{1}{2}\left(\frac{3}{2}\right) + 3(3+1)}{\frac{5}{2}\left(\frac{7}{2}\right)}\right) = \frac{6}{7}$$

$$p = \frac{6}{7}\left[\frac{5}{2}\left(\frac{7}{2}\right)\right]^{1/2} = \frac{6}{7} \cdot \frac{\sqrt{35}}{2} \approx \frac{36}{14} \approx 2.57$$