Errata

Chapter 4 -

- Page 48, Eeq.(419) should read :

$$\boxed{\frac{F}{A}=\frac{e^{-ik_3 d}}{\left[\cos k_2 d - i\frac{k_1^2+k_2^2}{2k_1k_2}\sin k_2 d\right]}} \quad ,$$

not :

$$\frac{F}{A}=\frac{e^{-ik_3 d}}{\left[\cos k_2 d - i\frac{k_1^2+k^2}{2k_1k_2}\sin k_2 d\right]} \quad .$$

- Page 55, line 7 should read:

$$\boxed{\hat{H}\hat{P}\sum_n C_n \Psi_{E_n}(x)=\sum_n (-1)^{n+1} C_n E_n \Psi_{E_n}(x)=\hat{P}\hat{H}\sum_n C_n \Psi_{E_n}(x)} \quad ,$$

not :

$$\hat{H}\hat{P}\sum_n C_n \Psi_{E_n}(x)=\pm\sum_n C_n E_n \Psi_{E_n}(x)=\hat{P}\hat{H}\sum_n C_n \Psi_{E_n}(x) \quad .$$

- Page 60, Problem 4.1, line 4 should read:

for $\boxed{\beta= 4 \text{ and } 10.....}$ ….. ,

not :

for $\beta = 2$ and 6 ..... .

- **Page 61, Problem 4.4, equation should read:**

$\boxed{\Psi(x) = ...}$,

not :

$V(x) = \ldots\ldots\ldots$.

- **Page 62, Problem 4.6 (c), should read:**

$\boxed{\ldots \text{ for the lowest two bound states} \ldots..}$,

not :

for the lowest three bound states ….. .

Chapter 5 -

- **Page 84, line 12 should read:**

$$\boxed{\Delta n = \sqrt{< \alpha \mid (\hat{a}^{+}\hat{a}^{-})^{2} \mid \alpha > - (< \alpha \mid \hat{a}^{+}\hat{a}^{-} \mid \alpha >)^{2}} = \mid \alpha \mid = (\overline{n})^{\frac{1}{2}}} \quad ,$$

not $\Delta n = \sqrt{< \alpha \mid (\hat{a}^{+}\hat{a})^{2} \mid \alpha > - (< \alpha \mid \hat{a}^{+}\hat{a} \mid \alpha >)^{2}} = \mid \alpha \mid = (\overline{n})^{\frac{1}{2}}$.

- **Page 82, third line from the bottom should read:**

$$= |<0|\alpha>|^2 \sum_n \frac{|\alpha|^{2n}}{n!} = |<0|\alpha>|^2 e^{|\alpha|^2} \quad ,$$

not :

$$= |<0|\alpha>|^2 \sum_n \frac{\alpha^{2n}}{n!} = |<0|\alpha>|^2 e^{|\alpha|^2} \quad .$$

Chapter 6 –

- Equation (6.3) should read :

$$\left\{ -\frac{\hbar^2}{2m}\left[\frac{1}{r^2}\frac{\partial}{\partial r}\left(r^2 \frac{\partial}{\partial r}\right) + \frac{1}{r^2 \sin\theta}\frac{\partial}{\partial \theta}\left(\sin\theta \frac{\partial}{\partial \theta}\right) + \frac{1}{r^2 \sin^2\theta}\frac{\partial^2}{\partial \phi^2}\right] - \frac{e^2}{r}\right\} \Psi_E(r,\theta,\phi)$$

$$= E\Psi_E(r,\theta,\phi),$$

not :

$$\left\{ -\frac{\hbar^2}{2m}\left[\frac{1}{r^2}\frac{\partial}{\partial r}\left(r^2 \frac{\partial}{\partial r}\right) + \frac{1}{r^2 \sin^2\theta}\frac{\partial}{\partial \theta}\left(\sin\theta \frac{\partial}{\partial \theta}\right) + \frac{1}{r^2 \sin^2\theta}\frac{\partial^2}{\partial \phi^2}\right] - \frac{e^2}{r}\right\} \Psi_E(r,\theta,\phi)$$

$$= E\Psi_E(r,\theta,\phi) \quad .$$

- Equation (6.36) should read:

$$\left\{ -\frac{\hbar^2}{2m}\left[\frac{1}{r^2}\frac{\partial}{\partial r}\left(r^2 \frac{\partial}{\partial r}\right) - \frac{\ell(\ell+1)}{r^2}\right] - \frac{e^2}{r}\right\} R_{E\ell}(r) = E_\ell R_{E\ell}(r),$$

not :

$$\left\{-\frac{\hbar^2}{2m}\left[\frac{1}{r^2}\frac{\partial}{\partial r}\left(r^2\frac{\partial}{\partial r}\right)\frac{\partial}{\partial r}-\frac{\ell(\ell+1)}{r^2}\right]-\frac{e^2}{r}\right\}R_{E\ell}(r)=E_\ell R_{E\ell}(r) \quad .$$

- Page 91, Eq.(6.31) should read :

$$\boxed{<\ell m_\ell \mid \hat{L}_\pm \mid \ell' m_\ell' >=[(\ell \mp m_\ell')(\ell \pm m_\ell' +1)]^{\frac{1}{2}}\hbar\delta_{\ell\ell'}.\delta_{m_\ell,(m_\ell'\pm 1)}} \quad ,$$

- not :

$$<\ell m_\ell \mid \hat{L}_\pm \mid \ell' m_\ell' >=[(\ell \mp m_\ell)(\ell \pm m_\ell +1)]^{\frac{1}{2}}\hbar\delta_{\ell\ell'}.\delta_{m_\ell,(m_\ell'\pm 1)} \quad .$$

- Page 99, equation in should read :

$$\boxed{\int_0^{2\pi}\int_0^{\pi}\left|R_{10}(r)\,Y_{00}\right|^2 r^2 dr\sin\theta d\theta d\phi=\left|R_{10}(r)\right|^2 r^2 dr},$$

not :

$$\int_0^{2\pi}\int_0^{\pi}\left|R_{10}(r)\right|^2 r^2 dr\sin\theta d\theta d\phi = 4\pi\left|R_{10}(r)\right|^2 r^2 dr ,$$

- Page 99, Equation (6.38) should read :

$$\ldots\ldots\ldots\ldots \text{ and } \boxed{\mid p_y >=\frac{i}{\sqrt{2}}(\mid p_{+1}> + \mid p_{-1}>)}. \quad (6.38) \quad ,$$

not :

…….. and $|p_y\rangle = i(|p_{+1}\rangle + |p_{-1}\rangle)$. (6.38) .

- Page 103, Eq.(6.49) should read :

$$\boxed{\langle jm_j \,|\, \hat{J}_{\pm} \,|\, j'm_j' \rangle = [(j \mp m_j')(j \pm m_j' + 1)]^{\frac{1}{2}} \hbar \delta_{jj'} \delta_{m_j,(m_j' \pm 1)}} \quad ,$$

- not :

$$\langle jm_j \,|\, \hat{J}_{\pm} \,|\, j'm_j' \rangle = [(j \mp m_j)(j \pm m_j + 1)]^{\frac{1}{2}} \hbar \delta_{jj'} \delta_{m_j,(m_j' \pm 1)} \quad .$$

- Page 109, Problem 6.8(e) should read :

$$\boxed{\Delta L_z = [\langle \Psi \,|\, \hat{L}_z^2 \,|\, \Psi \rangle - \langle \Psi \,|\, \hat{L}_z \,|\, \Psi \rangle^2]^{\frac{1}{2}}} \quad ,$$

not :

$$\Delta L_z = [\langle \Psi \,|\, \hat{L}_z \,|\, \Psi \rangle - \langle \Psi \,|\, \hat{L}_z \,|\, \Psi \rangle^2]^{\frac{1}{2}} \quad .$$

- Page 108, Problem 6.8(b) should read :

$$\boxed{\text{……measurement of } L^2 \text{ and } L_z \text{ that gives …..,}}$$

not :

…….measurement of L^2 and L_z gives ….., .

Chapter 7 –

- line 18 should read :

$$\boxed{\Psi_{a_1 a_2 \ldots a_{N-1} a_N}(\vec{r}_1, \vec{r}_2, \ldots, \vec{r}_{N-1}, \vec{r}_N) = \Psi_{a_2}(\vec{r}_1)\Psi_{a_1}(\vec{r}_2)\ldots\Psi_{a_{N-1}}(\vec{r}_{N-1})\Psi_{a_N}(\vec{r}_N)} \quad ,$$

not:

$$\Psi_{a_1 a_2 \ldots a_{N-1} a_N}(\vec{r}_1, \vec{r}_2, \ldots, \vec{r}_{N-1}, \vec{r}_N) = \Psi_{a_2}(\vec{r}_1)\Psi_{a_1}(\vec{r}_2)\ldots\Psi_{n_{N-1}\ell_{N-1}m_{\ell_{N-1}}s_{N-1}m_{s_{N-1}}}(\vec{r}_{N-1})\Psi_{n_N\ell_N m_{\ell_N} s_N m_{s_N}}(\vec{r}_N)$$

Chapter 8 –

- Equation (8.25) should read:

$$\boxed{|E_f> = |100> e^{-\frac{i}{\hbar}E_1 t} + C_{12}^{(1)} |210> e^{-\frac{i}{\hbar}E_2 t}} \quad ,$$

not :

$$|E_f> = |100> e^{-\frac{i}{\hbar}E_1 t} + C_{12}^{(1)} |210>, e^{-\frac{i}{\hbar}E_2 t} \quad .$$

Chapter 10 –

- Eq.(10.46) should read:

$$\boxed{N_C = \frac{\pi}{\sqrt{2}}\left(\frac{m_e^* k_B T}{\pi^2 \hbar^2}\right)^{3/2}} \quad , \qquad \textbf{not :} \qquad N_C = \frac{1}{\sqrt{2}}\left(\frac{m_e^* k_B T}{\pi^2 \hbar^2}\right)^{3/2} \quad .$$

- Eq.(10.47) should read :

$$\boxed{N_V = \frac{\pi}{\sqrt{2}}\left(\frac{m_h^* k_B T}{\pi^2 \hbar^2}\right)^{3/2}} \quad , \qquad \textbf{not :} \qquad N_V = \frac{1}{\sqrt{2}}\left(\frac{m_h^* k_B T}{\pi^2 \hbar^2}\right)^{3/2} \quad .$$