

**In this file I will correct important errors in equations or misleading statements about physics. I will not correct typos in the text, or syntax, or grammatical errors. However, if you have found such errors please let me know. I will collect them just in case that a second edition of the book is issued. Thanks.**

### **Chapter 16: Energy eigenstates of a diatomic molecule**

► On page 240, in Eq. 16.5 replace

$$V(r) = D_0 \left\{ 1 - \exp[\alpha(r - r_1)] \right\}^2$$

with

$$V(r) = D_0 \left\{ 1 - \exp[-\alpha(r - r_1)] \right\}^2$$

(communicated by Melissa Hines, Cornell University)

### **Chapter 17: Diatomic molecule: its spectroscopy**

► On page 282, in Eq. 17.42 replace  $P_{i \rightarrow f}^R$  with  $P_{i \rightarrow f}^P$

► On page 282, in Eq. 17.43 replace  $P_{i \rightarrow f}^P$  with  $P_{i \rightarrow f}^R$

► On page 283, in Figure 17.2 exchange the labels R and P on the vertical arrows  
(communicated by Melissa Hines, Cornell University)

### **Chapter 18: Hydrogen atom**

► Replace the printed version of Eq. 18.12 on page 301 with

$$\Phi_{n,\ell}(\rho) \equiv \sqrt{\frac{(n-\ell-1)!}{2n(n+\ell)!}} \left(\frac{2Z\rho}{n}\right)^\ell \exp\left[-\frac{Z\rho}{n}\right] L_{n-\ell-1}^{2\ell+1}\left(\frac{2Z\rho}{n}\right)$$

n	l	$\Phi[n, l][\rho]$
1	0	$\frac{e^{-\rho}}{\sqrt{2}}$
2	0	$-\frac{e^{-\rho/2}(-2+\rho)}{2\sqrt{2}}$
2	1	$\frac{e^{-\rho/2}\rho}{2\sqrt{6}}$
3	0	$\frac{e^{-\rho/3}(27-18\rho+2\rho^2)}{27\sqrt{2}}$
3	1	$-\frac{1}{27}e^{-\rho/3}(-6+\rho)\rho$
3	2	$\frac{e^{-\rho/3}\rho^2}{27\sqrt{5}}$
4	0	$-\frac{e^{-\rho/4}(-192+144\rho-24\rho^2+\rho^3)}{192\sqrt{2}}$
4	1	$\frac{e^{-\rho/4}\rho(80-20\rho+\rho^2)}{64\sqrt{30}}$
4	2	$-\frac{e^{-\rho/4}(-12+\rho)\rho^2}{192\sqrt{10}}$
4	3	$\frac{e^{-\rho/4}\rho^3}{192\sqrt{70}}$

► On p. 310, Table 18.1 is erroneous. It should be replaced with the table included here. This was calculated erroneously in WorkbookQM\_18. That Workbook is to be replaced with the

WorkbookQM\_18 corrected.nb

which is posted on this web site.

► On p. 311, in the first line, replace  $\exp[-2 Z \rho/n]$  with  $\exp[-Z \rho/n]$

### **Chapter 19: The Spin of the Electron and Its Role in Spectroscopy**

► In Figure 19.3 on page 351 had errors. The correct version is posted here as Figure19.3\_revised. (communicated by Melissa Hines, Cornell University)

### **Chapter 20: The Electronic Structure of Molecules: The H<sub>2</sub> Molecule**

► On pp. 377-378, the normalization factors should be  $\frac{1}{\sqrt{N!}}$ , not  $\frac{1}{N!}$ . For example, in Exercise 20.8, replace  $\frac{1}{2!}$  in front of the determinant with  $\frac{1}{\sqrt{2!}}$ .

The other occurrences are in the last equation above Exercise 20.8 on page 377 and in Exercise 20.9 on page 378, where  $\frac{1}{3!}$  should be replaced with  $\frac{1}{\sqrt{3!}}$ .

(communicated by Melissa Hines, Cornell University)