List of Errors and Typos in Light and Matter

(as of July 29, 2012)

Only the items in blue and green need to be modified in books reprinted in February 2007.

Only the items in green need to be modified in books reprinted after 2010.

Preface, p. xv, second column: change “Professor Mike Widom” to “Professor Mike Wilson”.

Chapter 1, p. 20, column 1, line 8 from the bottom: change “The derivation of the law for the radiation intensity of such bodies was derived by Max Planck in 1900” to “The law for the radiation intensity of such bodies was derived by Max Planck in 1900”.

Chapter 1, p. 29, Eq. (1.44) change the bottom line to:

$$\left\{ \boldsymbol{\nabla} \times \boldsymbol{\nabla} \times \mathbf{E} + \frac{\mu/\mu_0}{c^2}\frac{\partial^2}{\partial t^2}\mathbf{E} = -\frac{\mu/\mu_0}{\varepsilon_0 c^2}\frac{\partial^2}{\partial t^2}\mathbf{P} \right\}$$

Chapter 1, p. 30, column 1, line 1, change “Eq. (1.39)” to “Eq. (1.44)”.

Chapter 1, p. 31, Eqs. (1.55) and (1.56). The LHSs of these two equations should be exchanged. I.e., (1.55) should have $\frac{\partial}{\partial z}E$ and (1.56) should have $\frac{\partial}{\partial t}E$.

Chapter 1, p. 32, third line after Eq. (1.66), change “for $F(z,t)$” to “for $E(z,t)$”.

Chapter 1, p. 34, column 2, the bottom line: change “$E(\omega) = \ldots$” to “$E(0,\omega) = \ldots$”.

Chapter 1, p. 35, last line in the paragraph following Eq. (1.94), change “the epxression in Eq. (1.93) . . . ” to “the epxression in Eq. (1.94) . . . ”.

Chapter 1, p. 36, column 1, Problem 1.21, in the final expression for $E(z,t)$, replace $/\sigma^2$ by $/(2\sigma^2)$.

Chapter 1, p. 44, column 2, Problem 1.28: change “Figure 2.14” to “Figure 2.17” (twice).

Chapter 1, p. 49, column 2, second line after Eq. (1.154): change "Eq. (1.152)" to "Eq. (1.154)".

Chapter 1, p. 50, Figure 1.7: A π was removed from the equations for z_0 and θ. The corrected equations are, $z_0 = \pi w_0^2/\lambda$, and $\theta = \lambda/(\pi w_0)$. Moreover, the width at the Rayleigh range is $\sqrt{2}w_0$ (not $\bar{A}2w_0$).

Chapter 1, Fig. 1.8 on p. 51 and associated text: What is called right and left circularly polarized light in the figure and associated text is actually right and left handed helicity, and correspond to left and right circular polarization respectively.

Chapter 1, p. 53, column 1, second line after Eq. (1.182): change "between the **i** and **i**" to "'between the **i** and **j**".

Chapter 1, pp. 55-57, the square parentheses in Eqs. (1.190), (1.191), (1.192), (1.200), (1.201), and (1.204) should be round parenthesis.

Chapter 1, p. 60, Eq. (1.225) should read as follows:

$$I(x, y, z) = I(0)\frac{k^2 L_x L_y}{16\pi^2 z^2}\left(\frac{\sin(kL_x x/2z)}{(kL_x x/2z)}\right)^2\left(\frac{\sin^2(kL_y y/2z)}{(kL_y y/2z)^2}\right)^2 .$$

Chapter 1, p. 61, Figure 1.12: switch (a) and (b) figures.

Chapter 1, p. 66, column 2, in Sec. 1.2.10 add a new first paragraph that reads: "Let us consider the interference in the intensity of the light on a screen a distance d behind an opaque wall with two narrow slits cut into it obtained when a monochromatic plane wave light field with angular frequency ω impinges upon the opaque wall. Such an experiment was first carried out by Thomas Young in 1801. The pattern that results on the screen is an interference pattern."

Chapter 1, p. 68, Problem 1.40, column 2, lines 4-5, change the answer to $I(x, y, d) = 2I_0[1 + \cos(2\pi\theta x/\lambda)]$, and on the last line of the problem, change $u(r)$ to $U(\mathbf{r})$.

Chapter 1, p. 68, Problem 1.40, column 2, lines 4-5, change answer to $I(x, y, d) = 2I_0[1 + \cos(2\pi\theta x/\lambda)]$, and on the last line of the problem, change $u(r)$ to $U(\mathbf{r})$.

Chapter 1, p. 80, Eq. (1.346), the right hand side of the equation in Gaussian units should read $-\frac{4\pi}{c^2}\partial_t \mathbf{J}$, and four lines below this, replace "and using $\boldsymbol{\nabla}\cdot\mathbf{E}=0$" with "and using $\boldsymbol{\nabla}\cdot\mathbf{E}=4\pi\rho$".

Chapter 1, p. 80, second column, fourth line above Eq. (1.348), change "and $\boldsymbol{\nabla}\cdot\mathbf{E}=0$ in a manner" to "and $\boldsymbol{\nabla}\cdot\mathbf{B}=0$ in a manner".

Chapter 1, p. 82, Eq. (1.362) and (1.363) are poorly broken across two lines.

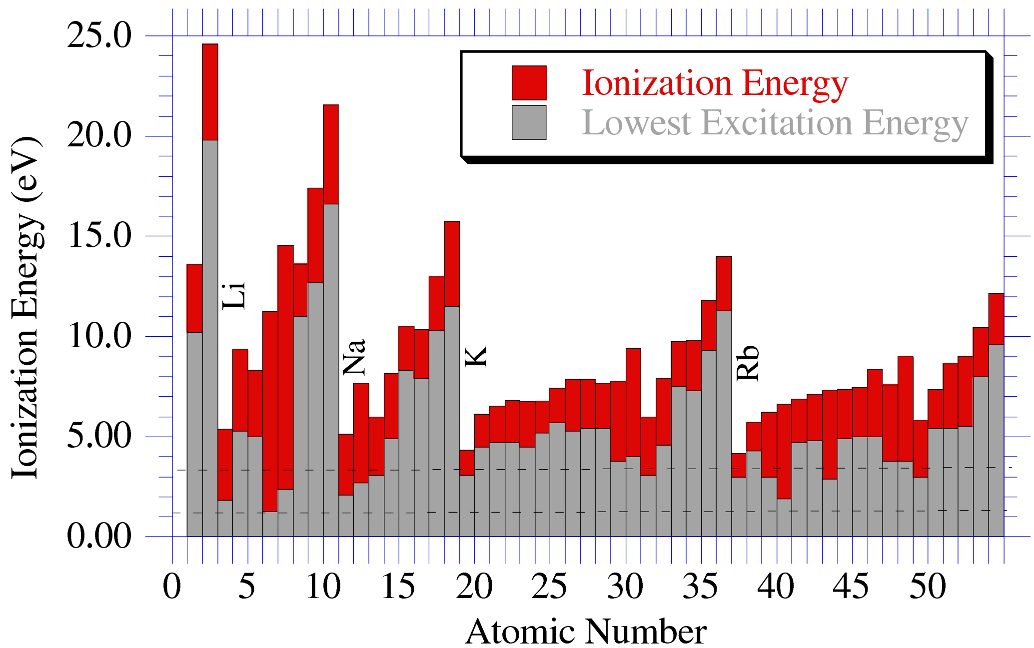


Figure 1: [Replacement for Fig. 2.3 on p. 93.] The lowest electronic excitation energy and the ionization energy of the first 54 atoms in the periodic table. The visible region of the spectrum is indicated by the dashed lines.

Chapter 2, p. 93, Fig. 2.3 and Fig. 2.3 in the color plate section: The figure should be replaced by Fig. 1 below.

Chapter 2, p. 98, column 2, Eq. (2.23) add a minus sign to the exponent so the equation reads, $I(z) = I(0)\exp(-\sigma_{\rm ab} n_T z)$.

Chapter 2, p. 98, column 2, Eq. (2.23) add a minus sign to the exponent so

the equation reads, $I(z) = I(0)\exp(-\sigma_{\rm ab} n_T z)$.

Chapter 2, p. 103, Fig. 2.6, on the left, replace "$n''^2 = \varepsilon^{-}$" with "$n'^2 = \varepsilon'$" and "$n^{-2} = \varepsilon$" with "$n^2 = \varepsilon$", and on the right, replace "$n''^2 = \varepsilon'$" with "$n'^2 = \varepsilon'$".

Chapter 2, p. 110, two lines above Eq. (2.78): change "$\omega - \omega_0 = i\,\partial/\partial_t$" to "$\omega - \omega_0 = i\,\partial/\partial t$".

Chapter 2, p. 111, Figure 2.11: the lower tick-mark along the ordinate labeled "Group velocity dispersion" marked 5×10^{-26} should be marked 0.

Chapter 2, p. 120, Table 2.5: move ruby from the orthorhombic to the trigonal crystal system. It is therefore unixial.

Chapter 2, p. 145, Figure 2.11: the lower tick-mark along the ordinate labeled "Group velocity dispersion" marked 5×10^{-26} should be marked 0.

Chapter 2, p. 148, one line before Problem 2.27, replace "(see Problem 1.22)" with "(see Problem 1.23)".

Chapter 2, p. 151, Eq. (2.209): Change "$D_i - \ldots$" to "$D_i = \ldots$".

Chapter 2, Eq. (2.228): change "$\Delta u + \ldots$ " to "$\Delta u = \ldots$".

Chapter 2, p. 106, the equation *following* Eq. (2.65) should read: $\tilde{\epsilon}(t-\tau) = \ldots$, i.e., the tilde should appear over the epsilon on the left hand side of the equation.

Chapter 2, p. 164, second column, last line of answer to problem 2.29: Change "see Figure 2.44" to "see Figure 2.41".

Chapter 2, p. 172, third line after Eq. (2.292), replace n_+ and n_- by n_+^2 and n_-^2 respectively.

Chapter 3, p. 179, second column, Problem 3.2: Change "$\frac{d\mathbf{u}}{dt} = \omega_c \mathbf{u} \times \hat{\mathbf{z}} + F_z \hat{\mathbf{z}}$" to "$\frac{d\mathbf{u}}{dt} = \omega_c \mathbf{u} \times \hat{\mathbf{z}} + (F_z/m)\hat{\mathbf{z}}$".

Chapter 3, p. 183, second column, line 2: Change "Zeros coincide with the integer plateaus and small dips to the odd-denominator fraction in the longitudinal resistance" to "Zeros in the longitudinal resistance coincide with the integer plateaus of the Hall resistance, and small dips in the longitudinal resistance coincide with odd-denominator fractions in the expression for the Hall resistance".

Chapter 3, p. 190, Eq. (3.54), replace "$\langle\omega\rangle$" with "$\langle\omega'\rangle$".

Chapter 3, p. 197, Eq. (3.95): Change "$\epsilon_c = \epsilon_r + \epsilon_i + \epsilon_r + \ldots$" to "$\epsilon_c = \epsilon_r + \epsilon_i = \epsilon_r + \ldots$".

Chapter 3, p. 200, one line above Eq. (3.109), replace "Eq. (2.104)" with "Eq. (3.108)".

Chapter 3, p. 201, Eq. (3.113), replace "$Np(z,t)$" with "$Np(z,t) =$".

Chapter 3, p. 201, replace "Eq. (3.109)" with "Eq. (3.108)".

Chapter 3, p. 203, Eq. (3.123), replace '$(1 \pm \xi i)$" with "$(1 \pm \xi_i)$".

Chapter 3, p. 205, first column, line 7, replace "The light detected by the detector situated along . . . " with "The detector situated along . . . ".

Chapter 3, p. 205, several changes to Fig. 3.8(a) were made during processing. Below is the corrected figure.

Chapter 3, p. 211, Eq. (3.169), replace "$c^{-2}r^2\mathbf{u}[\ldots]$" with "$c^{-2}r^2\mathbf{u}\times[\ldots]$".

Chapter 3, p. 211, Eq. (3.171), replace "$(\mathbf{u}-\boldsymbol{\beta})d\mathbf{v}/d\tau$" with "$(\mathbf{u}-\boldsymbol{\beta})\times d\mathbf{v}/d\tau$".

Chapter 3, p. 227, Eq. (3.277): The brackets $\{\ldots\}$ should be on a new line and should contain $\{P_{\text{abs}} = \ldots\}$.

Chapter 3, p. 227, Eq. (3.278): The brackets $\{\ldots\}$ should contain $\{\mathbf{F} = \ldots\}$.

Chapter 4, p. 238, Eq. (4.11): the second and third lines of the equation should read "$= \frac{q}{2mc}\mathbf{L}$" and "$\{\boldsymbol{\mu} = \frac{q}{2m}\mathbf{L}\}$" respectively.

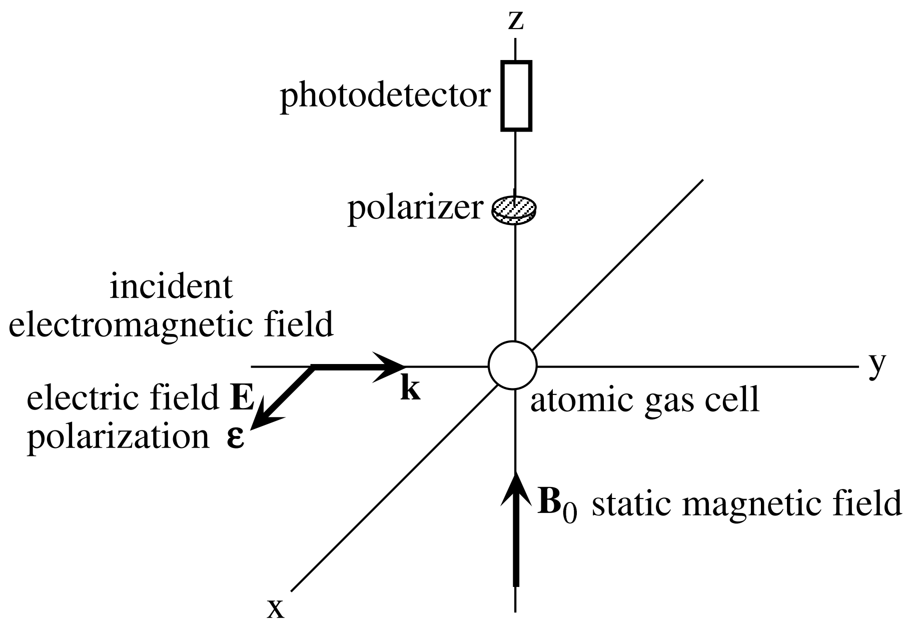


Figure 2: Replacement for Fig. 3.8(a).

Chapter 4, p. 241, last line of the second column: multiply the right hand side of the equation by "(-1)".

Chapter 4, p. 273-275: Figures 4.14 and 4.15 should be interchanged. The captions remain unchanged but the figures should be switched.

Chapter 4, p. 267, last line in column 1, replace "$[\mathbf{E} + (4\pi/3)\mathbf{M}$" with "$[\mathbf{H} + (4\pi/3)\mathbf{M}$".

Chapter 4, p. 268, column 2, third line after Problem 4.9, delete $E(t')$ from the integrand.

Chapter 4, p. 269, Fig. 4.12 caption, change 38 to 3.8 and 378 to 37.8.

Chapter 6, p. 331-333. Eq. (6.17), the equation should read as follows:

$$\begin{aligned}\mathbf{B}_N(\mathbf{r}) &= \left[\frac{\mu_0}{4\pi}\right] \boldsymbol{\nabla} \times \{\boldsymbol{\mu}_N \times (-\boldsymbol{\nabla} r^{-1})\} \\ &= \left[\frac{\mu_0}{4\pi}\right] \boldsymbol{\nabla} \times \{\boldsymbol{\mu}_N \times \mathbf{r}/r^3\} \\ &= \left[\frac{\mu_0}{4\pi}\right] \left\{\boldsymbol{\mu}_N \frac{8\pi}{3}\delta(\mathbf{r}) + \frac{3\mathbf{r}(\mathbf{r}\cdot\boldsymbol{\mu}_N) - r^2\boldsymbol{\mu}_N}{r^5}\right\} .\end{aligned}$$

In Eqs. (6.19), (6.20), (6.21), (6.23), (6.25), (6.26): Add a factor of $(-2/3)$ to the delta function term in these equations. I.e., in (6.19), the term $-\boldsymbol{\mu}_N 4\pi\delta(\mathbf{r})$, should be replaced by $\boldsymbol{\mu}_N(4\pi/3)\delta(\mathbf{r})$, in (6.20), $-g_s\mathbf{s}\cdot\boldsymbol{\mu}_N 4\pi\delta(\mathbf{r})$ should be replaced by $g_s\mathbf{s}\cdot\boldsymbol{\mu}_N(4\pi/3)\delta(\mathbf{r})$, in (6.21), $-g_s\mathbf{s}\cdot\mathbf{j}_N 4\pi\delta(\mathbf{r})$ should be replaced by $g_s\mathbf{s}\cdot\mathbf{j}_N(4\pi/3)\delta(\mathbf{r})$, in (6.23), $-g_s\mathbf{s}\cdot\mathbf{j}_N 4\pi\delta(\mathbf{r})$ should be replaced by $g_s\mathbf{s}\cdot\mathbf{j}_N(4\pi/3)\delta(\mathbf{r})$ and $-g_s\mathbf{s}\cdot\mathbf{j}_N 4\pi|\psi(0)|^2$ should be replaced by $g_s\mathbf{s}\cdot\mathbf{j}_N(4\pi/3)|\psi(0)|^2$, in (6.25) and (6.26), $-g_s\mathbf{s}\cdot\mathbf{j}_N 4\pi|\psi(0)|^2$ should be replaced by $g_s\mathbf{s}\cdot\mathbf{j}_N(4\pi/3)|\psi(0)|^2$.

Chapter 6, p. 338, Table 6.3: The ground state of nitrogen is ${}^4S^o_{3/2}$.

Chapter 6, p. 344, second column, line 1: change the sentence beginning "This allows us to write the local density ...." to
"Defining the local Fermi momentum $p_F(\mathbf{r})$ at a given coordinate point $\mathbf{r}$ to be such that $\frac{p^2(\mathbf{r})}{2m} + V(\mathbf{r}) = E_F$, where E_F the Fermi energy defined as the highest occupied quantum state in the system, and taking the momentum distribution to be spherically symmetric at point $\mathbf{r}$, we find the local density of particles at $\mathbf{r}$ to be

$$n(\mathbf{r}) = \frac{2}{(2\pi\hbar)^3}\int d\mathbf{p} = \frac{2}{(2\pi\hbar)^3}\,4\pi\int^{p_F(\mathbf{r})} dp\,p^2 ,$$

such that $\int d\mathbf{r}\,n(\mathbf{r}) = N$."

Chapter 6, p. 346, second column, line 9 in *Fine structure of multielectron atoms*: change "2p 3p ${}^1S_1$ singlet states" to "2p 3p ${}^1S_0$ singlet states".

Chapter 6, p. 346, second column, line 9 from the bottom: change "must" to "most".

Chapter 6, pp. 342-343 corrections are marked here in red (mostly complex conjugates):

$$H_{0i} = \int dV\, \chi^*_i H_0(\mathbf{r})\chi_i \,, \qquad (6.41)$$

$$J_{ij} = J_{ji} = e^2 \int dV_1 dV_2\, \chi^*_i(\mathbf{r}_1)\chi^*_j(\mathbf{r}_2)\, |\mathbf{r}_1\text{-}\mathbf{r}_2|^{-1}\, \chi_i(\mathbf{r}_1)\chi_j(\mathbf{r}_2) \,, \qquad (6.42)$$

$$K_{ij} = K_{ji} = e^2 \int dV_1 dV_2\, \chi^*_i(\mathbf{r}_1)\chi^*_j(\mathbf{r}_2)\, |\mathbf{r}_1\text{-}\mathbf{r}_2|^{-1}\, \chi_j(\mathbf{r}_1)\chi_i(\mathbf{r}_2) \,. \qquad (6.43)$$

$$J_i(\mathbf{r}_k)\chi(\mathbf{r}_k) = e^2 \left[\int dV_1\, \chi^*_i(\mathbf{r}_1)\, |\mathbf{r}_k\text{-}\mathbf{r}_1|^{-1}\, \chi_i(\mathbf{r}_1)\right]\chi(\mathbf{r}_k) \,, \qquad (6.44)$$

$$K_i(\mathbf{r}_k)\chi(\mathbf{r}_k) = e^2 \left[\int dV_1\, \chi^*_i(\mathbf{r}_1)\, |\mathbf{r}_k\text{-}\mathbf{r}_1|^{-1}\, \chi(\mathbf{r}_1)\right]\chi_i(\mathbf{r}_k) \,. \qquad (6.45)$$

Problem 6.7: (a) Verify Eq. (6.40) for closed shell determinants.
(b) Show that the coulomb operator and exchange integrals can be obtained as one-electron integrals

$$J_{ij} = \int dV\, \chi^*_i(\mathbf{r})\, J_j(\mathbf{r})\, \chi_i(\mathbf{r}),$$

$$K_{ij} = \int dV\, \chi^*_i(\mathbf{r})\, K_j(\mathbf{r})\, \chi_i(\mathbf{r}) \,,$$

or

$J_{ij} = \int dV\, \chi^*_j(\mathbf{r})\, J_i(\mathbf{r})\, \chi_j(\mathbf{r})$, (move K_{ij} to next line)

$$K_{ij} = \int dV\, \chi^*_j(\mathbf{r})\, K_i(\mathbf{r})\, \chi_j(\mathbf{r}) \,.$$

$$\int dV\, \chi^*_i(\mathbf{r})\chi_j(\mathbf{r}) = \delta_{ij} \,, \qquad (6.47)$$

$$2\sum_{i=1}^{n} \int dV\delta\chi^*_i(\mathbf{r})H_0(\mathbf{r})\chi_i(\mathbf{r}) + \sum_{ij=1}^{n} \int dV\{\delta\chi^*_i(\mathbf{r})[2J_j(\mathbf{r})\text{-}K_j(\mathbf{r})]\chi_i(\mathbf{r}) + \delta\chi^*_j[2J_i\text{-}K_i]\chi_j\} = 0 \,, \qquad (6.50)$$

$$\int dV\, \delta\chi^*_i(\mathbf{r})\chi_j(\mathbf{r}) = 0 \,, \qquad (6.51)$$

Chapter 6, p. 347, the second and third lines of Eq. (6.78) should read:
"$= \langle \Psi[^{2S+1}L_J] \,|\, A\, \mathbf{S} \cdot \mathbf{L} \,|\, \Psi[^{2S+1}L_J] \rangle$
$= \frac{A}{2}[J(J+1) - L(L+1) - S(S+1)]$".

Chapter 6, p. 350, first column, line 8: the right hand side of the equation for $U(R)$ should be multiplied by "(-1)".

Chapter 6, p. 353, column 2, text opposite Eq. (6.102) should read: "For example, for atoms A and B both asymptotically in ^{2}P states, S can take …". I.e, change "Σ" to "S".

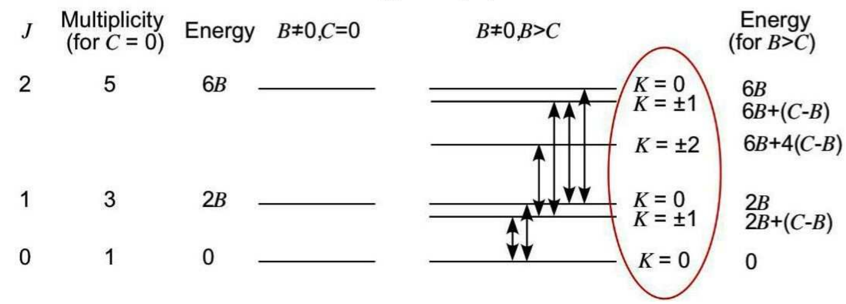
Chapter 6, p. 360, Eqs. (6.116) and (6.117), replace "$\mathbf{d_{el}}||$" with "$\mathbf{d_{el}}|$".

Chapter 6, p. 361, Table 6.5, change the example from "$^3\Pi_2 \not\leftrightarrow {}^3\Delta_3$" to "$^3\Pi_1 \not\leftrightarrow {}^3\Delta_3$".

Chapter 6, p. 364, column 2, first line after Eq. (6130), replace "$-1 \leq \xi \leq 1$" with "$-1 \leq \eta \leq 1$".

Chapter 6, p. 366, column 2, Eq. (6.142), the final expression for the overlap integral $S(R)$ should read:
$S(R) = \left[1 + \alpha R + \frac{1}{3}(\alpha R)^2\right] \exp(-\alpha R)$.
After Eq. (6.142), add the following:
"The ground state energy of the hydrogen molecular ion is given by
$E(R) = \frac{-e^2}{2a_0} + \frac{e^2}{R} + \frac{e^2}{a_0} \frac{\exp(-\alpha R)[(\alpha R)^{-1} - \alpha R] - (\alpha R)^{-1}}{1 + S(R)}$."

(b) Spherical and Symmetric top Fig. 16(b)



Chapter 6, p. 373, Fig. 6.16(b) showed be corrected as shown above.

Chapter 6, p. 386, Eq. (6.195): The last term on the right hand side is a 5 by 5 matrix. This matrix should not have been broken into two lines.

Chapter 6, p. 396, Eq. (6.208): Change "V_F" to "v_F".

Chapter 6, p. 405, Fig. 6.41(a): Replace f_y and f_z with d_y and d_z respectively.

Chapter 8, p. 467, next to last line in the first column: change "$\beta_{ji} = d^j[k(\omega_i)]/d\omega_j$" to "$\beta_{ji} = d^j[k(\omega_i)]/d\omega_i^j$".

Chapter 8, p. 494, column 2 Eq. (8.110): Add an i to the $\frac{\partial}{\partial z}$ term so the equation reads, $i\frac{\partial u}{\partial z} - \frac{1}{2}\frac{\partial^2 u}{\partial z^2} + |u|^2 u = 0$.

Chapter 8, p. 499, column 2 lines 1-9: Change text to read "wavevector are related by the expression $\Omega = |\mathbf{q}|v_s = 2|\mathbf{k}|v_s \sin(\theta/2) = 2n(\omega/c)v_s \sin(\theta/2)$, where v_s is the sound velocity in the medium and θ is the angle between $\mathbf{k}$ and $\mathbf{k}'$ (see Figure 2.41). The process of Stimulated Brillouin ..."

Chapter 9, p. 512, Eq. (9.38), and the sentence above it should be changed to the following.
"If the initial state is a superposition state, $\psi_{\text{in}} = \psi(-\infty) = \sum_n c_n(-\infty)u_n(-\infty)$, it evolves to $\psi(\infty) = \sum_n c_n(\infty)u_n(\infty) \exp\left(\frac{-i}{\hbar}\int_{-\infty}^{\infty} dt'\, E_n(t')\right)$."
Note the lower limit of the integral in the exponential. The lower limit of the integrals in the exponentials of equations that follow, through (9.44), should also be $-\infty$.

Chapter 9, p. 513, Eq. (9.43) should read:
$\int_{-\infty}^{t} dt' \left| \frac{\langle u_i(t')|\frac{dH(t')}{dt'}|u_n(t')\rangle}{[E_n(t')-E_i(t')]} \right| << 1$ for $n \neq i$.

Chapter 9, p. 514, two lines above Eq. (9.47): replace "Making the transformation . . . given by", by "Making the transformation $\psi(t) \equiv (\psi_1(t), \psi_2(t)) \to \Psi(t) \equiv (\Psi_1(t), \Psi_2(t))$ given by".

Chapter 9, p. 516, column 1, just after Problem 9.8, add the following:
The following example of a pure state density matrix is instructive. Given a two-level spin system (or any two-level system for that matter) in state $|\Psi\rangle = (a|\uparrow\rangle + b|\downarrow\rangle)$, the density matrix is given by

$$\begin{aligned}
\rho &= |\Psi\rangle\langle\Psi| = (a|\uparrow\rangle + b|\downarrow\rangle)\,(a^*\langle\uparrow| + b^*\langle\downarrow|) \\
&= (\,aa^*|\uparrow\rangle\langle\uparrow| + ab^*|\uparrow\rangle\langle\downarrow| + ba^*|\downarrow\rangle\langle\uparrow| + bb^*|\downarrow\rangle\langle\downarrow||\,) \\
&= \left(a\begin{pmatrix}1\\0\end{pmatrix} + b\begin{pmatrix}1\\0\end{pmatrix}\right)\left(a^*\begin{pmatrix}1 & 0\end{pmatrix} + b^*\begin{pmatrix}0 & 1\end{pmatrix}\right) \\
&= \begin{pmatrix}aa^* & ab^*\\ ba^* & bb^*\end{pmatrix} .
\end{aligned}$$

In the third line of the above equation we used the column vector notation for the kets $|\uparrow\rangle$ and $|\downarrow\rangle$, and we took their Hermitian conjugates to form the bra vectors $\langle\uparrow|$ and $\langle\downarrow|$ that are represented as row vectors. In the last line, we multiplied the row and column vectors to obtain 2×2 matrices and collected terms to form one 2×2 matrix. The diagonal elements of the density matrix are the populations in the up and down spin states, $P_\uparrow = aa^*$ and $P_\downarrow = bb^*$, and the off diagonal elements, $\rho_{\uparrow,\downarrow} = ab^*$ and $\rho_{\downarrow,\uparrow} = ba^*$, are called the coherences. They depend on the phase of the amplitudes a and b.

Chapter 9, p. 517, Eq. (9.60), the amplitudes should be denoted by c, not b.

Chapter 9, p. 520, Eq. (9.88), the last term on the RHS should be $-\gamma(\rho_{22} - \rho_{22} + 1)$, without the factor of /2.

Chapter 9, p. 523, third line after Eq. (9.110): replace "$\ldots - \rho_{12}(t), w(t)] = \ldots$" with "$\ldots - \rho_{12}(t)], w(t) = \ldots$".

Chapter 9, p. 525, last equality in Eq. (9.124): replace "$\eta\mu^2 T_2 \hbar$" with "$\eta\mu^2 T_2/\hbar$".

Chapter 9, p. 544, Eq. (9.241), remove the square root in $\sqrt{n}$ of the denominator of the intermediate equation, i.e., change $\sqrt{n}$ to n.

Chapter 9, p. 547, Eq. (9.251) should read: $(\Delta X_1)^2 < \frac{1}{2}|\langle X_3\rangle|$.

Chapter 9, p. 547, the 2nd and 3rd equations in the second column read:
$\langle 0|D^\dagger(\alpha)aD(\alpha)|0\rangle = \alpha = (\langle X_1\rangle_\alpha + i\langle X_2\rangle_\alpha)$
$\langle X_1\rangle_\alpha = \mathrm{Re}\,\alpha$ and $\langle X_2\rangle_\alpha = \mathrm{Im}\,\alpha$.

Chapter 10, p. 561, second column: The first sentence of the new paragraph should be changed to: "Claude Elwood Shannon invented a basic concept in digital communication, as used in computers, optical and magnetic storage media and telecommunication systems. In 1948, at Bell Labs in New Jersey, he laid the foundation for the subject of information theory."

Appendix B, p. 592, column 2, line 4 from the bottom of the page: change "Figure 2.10" to "Figure B.2".

Appendix B, p. 593, column 1, line 4: change "Figure 2.10" to "Figure 2.5".

Appendix C, p. 604, column 1, line 11: Move the sentence "Hence, the atomic unit of velocity is the speed of light divided by about 137." back by one sentence, so it precedes the sentence beginning "Moreover, the atomic unit of energy ...".

Appendix C, p. 604, column 1, 16 lines from the bottom: Change the sentence beginning "The magnetic field due to a ... " to "The magnetic field in the rest frame of an electron due to a moving proton with velocity $\mathbf{v}$ at a distance of 1 Bohr away ($\mathbf{B} = \frac{\mathbf{v}}{c} \times e\mathbf{r}/r^3$), with $\mathbf{v}$ orthogonal to $\mathbf{r}$, is given by $|B| = (v/c)(e/a_0^2)$, which is $1/137$ in atomic units of magnetic field if the velocity v is the Bohr velocity."

Appendix C, p. 604, Answer to Problem C.6(c): Change "$\frac{m_e}{\mu}\frac{e\hbar}{2m_e c}H = \frac{1}{1822}\frac{1}{2\,137.06}\frac{1}{1715.1}$" to "$\frac{m_e}{M_p}\frac{e\hbar}{2m_e c}H = \frac{1}{1822}\frac{1}{2\times 137.06}\frac{1}{1715.1}$".

Appendix C, p. 607, first line after Eq. (C.89): change "Equations (C.91) and (C.92)" to "Equations (C.88) and (C.89)". On p. 608, Problem C10, change (C.91) and (C.92) to (C.88) and (C.89).

Appendix D, p. 609, second line after Eq. (D.1): change "with kinetic energy $V(x)$, ...", to "with kinetic and potential energies T and $V(x)$, ...".

Appendix D, p. 611, last line of first column: change "to have contributions only from states outside the manifold $\{\psi_{nj}^{(0)}\}$ of zero order with eigenvalue ...", to "to have contributions only from *outside* the manifold $\{\psi_{nj}^{(0)}\}$ of zero order states with eigenvalue ...".

Index, p. 638, add: "Soliton   492-495, 574".