Errors in the text

Chapter 2

page 49, Fig. 2.21 caption – “(b) If we add an additional spatial coordinate y, a space cone can be drawn.” should read “(b) If we add an additional spatial coordinate y, a light cone can be drawn.”

page 51, Fig. 2.22 caption – “Frank’s annual signals to Mary are solid blue.” should read “Frank’s annual signals to Mary are solid black.”

page 57, Fig. 2.25 – part b) of the figure is missing.

page 59, in the paragraph below Eq. 2.46 – “The value of $dt/d\tau (= \gamma)$ is obtained from Equation (2.30), where the speed $u$ is used in the relation for $\gamma$ to represent the relative speed of the moving (Mary’s) frame and the fixed (Frank’s) frame.” should read “The value of $dt/d\tau (= \gamma)$ is obtained from Equation (2.30), where the speed $v$ is used in the relation for $\gamma$ to represent the relative speed of the moving (Mary’s) frame and the fixed (Frank’s) frame.” This can be seen in Fig. 2.25.

page 74, Summary to chapter 2 – All factors of $\frac{1}{\sqrt{1 - v^2 / c^2}}$ in Eqs. 2.47, 2.57 and 2.64 should be $\frac{1}{\sqrt{1 - u^2 / c^2}}$. These factors are correct where they first appear in the main body of the chapter.

Chapter 3

page 88, “The Discovery of Helium”, 2nd column, 2nd to last line – “Certainly the line spectra of many elements were known by 1898, ...” should read “Certainly the line spectra of many elements were known by 1868, ...”

page 110-111, Example 3.15 – the first part of the solution repeats.

Chapter 4

page 126, Eq. 4.4 – $\mathbf{F} = \frac{1}{4\pi\varepsilon_0} \frac{Z_1 Z_2 e^2}{r^2} \mathbf{e}_r$ should read $\mathbf{F} = \frac{1}{4\pi\varepsilon_0} \frac{Z_1 Z_2 e^2}{r^2} \mathbf{e}_r = Fe_r$.

page 128, Example 4.2 – The bracketed term in the expression for the fraction $f$ scattered at an angle greater than 90° is missing its denominator: 
\[ \left( \frac{(79)(2)(1.6 \times 10^{-19} \text{C})^2 (9 \times 10^{-9} \text{N} \cdot \text{m}^2 / \text{C}^2)}{\cot 45^\circ} \right)^2 \] should read
\[
\left[ \frac{(79)(2)(1.6 \times 10^{-19} \text{C})^2 (9 \times 10^{-9} \text{N} \cdot \text{m}^2 / \text{C}^2)}{(2)(7.7 \times 10^6 \text{eV})(1.6 \times 10^{-19} \text{J/eV})} \right]^2 (\cot 45^\circ)^2.
\]

Page 130, Example 4.3 – The thickness of the gold foil should be \(2.1 \times 10^{-7}\) since that is the value used in the calculation below.

Chapter 5

Page 183, problem 23 – The answer key in the back of the book is not correct. For part c, the correct answer is \(2\pi\) meters. Also, in part b, the group velocity should be -50 m/s, rather than +50 m/s.

Chapter 6

Page 197, example 6.7 – The last equation on the page should have a factor of \(\pi\) in the numerator. Since the integral turns out to be zero, this factor is not of great importance.

Page 205, example 6.10 – The first equation in the right hand column has a factor \(\sqrt{mk}\) in the denominator. This should be \(\sqrt{\kappa m}\).

Problem 6.23 – The answer in the back of the book is wrong.

Chapter 7

Page 234 – The paragraph just above Example 7.3 refers to Figure 7.4. It should refer to Figure 7.5.

Page 237, Figure 7.8 – The magnetic quantum numbers -1 and +1 should be reversed, so that it reads from top to bottom -1, 0, +1. The second to last paragraph before Example 7.5 should say that the \(m_f = -1\) state will be deflected up, the \(m_f = +1\) state will be deflected down, and the \(m_f = 0\) state will be undeflected.

Page 248, problem 32 – The reference should be to Example 7.8 instead of Example 7.6.

Chapter 8

Page 268, Figure 8.13 – The arrow from the \(m_J = -3/2\) sublevel of the \(^2P_{3/2}\) state should go down to the \(m_J = -1/2\) sublevel of the \(^2S_{1/2}\) state.