Corrections to the book
"A Modern Introduction to Quantum Field Theory",
by Michele Maggiore
(Last update: Apr. 16, 2023)

(These corrections are *not* included in the last published edition)

- On page xii, the statement that $\epsilon^{\mu\nu\rho\sigma}$ is anticyclic is incorrect. Since $\epsilon^{\mu\nu\rho\sigma}$ is antisymmetric under the exchange of any pair of indices, it is indeed true that $\epsilon^{1230} = -1$, since the index 0 made three jumps with respect to the reference sequence $\epsilon^{0123} = +1$. However, starting from $\epsilon^{1230} = -1$ and making three jumps for the index 1, we get $\epsilon^{2301} = +1$, so in this case a cyclic permutation of 0123 gives again +1 instead of −1.

  (Thanks to Jilal Jahangir, 28/01/2022)

- Page 67, "(See Exercise 2.4)." should be "'(See Exercise 2.6)."

  (Thanks to Suneel Gupta, 16/04/2023)

- Page 71, "We see from eq. (3.175)..." should be "We see from eq. (3.174)..."

  (Thanks to Suneel Gupta, 16/04/2023)

- On page 78, after eq. (3.225),

  "$\langle njl|1/r^3|njl\rangle = 0$ if $l = 0$"

  should be replaced by

  "$\langle njl|\mathbf{S}\cdot\mathbf{L}/r^3|njl\rangle = 0$ if $l = 0$".

  The matrix element in fact vanishes because, using eq. (3.224), the matrix element of $\mathbf{S}\cdot\mathbf{L}$ vanishes when $l = 0$ and therefore $j = s$.

- On page 100, after eq. (4.91). The field $\mathbf{A}(t, \mathbf{x})$ must actually be expanded in vector spherical harmonics (rather than is the scalar spherical harmonics Y_{LM}). The issue is quite technical, and is discussed in detail for instance in my textbook "Gravitational Waves. Vol. I", pages 145-147. For the purpose of deriving the intrinsic parity of the photon, the overall minus sign in eq. (4.91) is however all that is needed.

- On page 165, eq. (6.56), the real part of the mass is denoted once as M and once as M_R. It should be M_R everywhere.

- Page 196: in the theory described by the Lagrangian (8.3) the amplitude $f\bar{f} \to f\bar{f}$ receives a contribution not only from the s-channel diagram in Fig. 8.1, but also from a t-channel diagram, analogous to that in Fig. 6.2, but in which the upper lines correspond to f (with arrows point leftward), the lower lines to $\bar{f}$ (rightward arrows) and the intermediate line corresponds to the exchange of the ϕ field. In the low-energy limit both the s-channel and t-channel diagrams are correctly described by the single $G(\bar{\Psi}\Psi)^2$ interaction, and correspond to the two possible contractions of, say, $\bar{\Psi}(x_1)$ with any of the two $\Psi(x)$ in the expansion to first order in G of the four-point Green's function,

$$iG \int d^4x \, \langle 0|T \left\{ \bar{\Psi}(x_1)\Psi(x_2)\bar{\Psi}(x_3)\Psi(x_4)\bar{\Psi}(x)\Psi(x)\bar{\Psi}(x)\Psi(x) \right\} |0\rangle \, .$$