

# Corrections to: Relativity, Groups, Particles



line before (2.3.1): omit one =:

line 3 before eq. (2.9.1): read "Consider a point mass moving with instantaneous velocity ..."

line between eqs. (2.9.1) and (2.9.2): read "take differentials and insert  $d\bar{\mathbf{x}} = \bar{\mathbf{w}}dt$  to obtain for  $\mathbf{u} = d\mathbf{x}/dt$ "

In (2.10.1), matrix for  $L_v$ : omit a bar

line 2 before eq. (2.10.7): add to footnote "See also Sect. 8.4, Ex. 6."

line 3 before Exercises to Sect. 2.9: read "... was known to..."

Sect. 3.1, Ex. 2: read "... matrix group  $\mathcal{L} = \dots$ "

Sect. 4.3: add to footnote 1: "W. Kündig, Phys. Rev. *129*, 2371 (1963)."

Sect. 5.2, para. 1: replace "bot" by "but";  
smallprint paragraph: replace "and if the principle of relativity holds, then" by "then, excluding time reflections (cf. Sect. 8.5)," and "p. 84." by "p. 84; however, the last part of their argument has to be replaced by one using the results of our Ex. 1,2 in Sect. 6.4!"

line below eq. (5.2.22): read "conservation law of charge"

line 2 before eq. (5.7.2): read "Therefore the homogeneous equations ..."

eq. (5.9.19): instead of  $\mathbf{z}(s)$  read  $\mathbf{z}(s_0)$  and then insert "where  $s_0$  is defined by  $z^0(s_0) = x^0$ "

line 2 before eq. (5.9.21): read "... of the particle at time  $t = x^0$ ."

line 2 after eq. (5.9.21): in the last integral, replace  $z^0(s)$  and  $t$  in  $dt$  by  $z^0$ .

line before eq. (5.9.27): read "Poincaré"

line 2 after eq. (6.1.2): read "independent of"

Sect. 6.2: add to footnote 1: "It should also be mentioned that there is another meaning for "groupoid", becoming more popular in recent years, the present object then being called a *magma*."

In footnote 2 read "indebted" and replace "Univ. Berkeley" by "Temple Univ."

para. 2 before eq. (6.5.13): add "See P. Ehrenfest, Z. Phys. 78, 555 (1932)."

line before (7.1.9): replace  $2\pi$  by  $\pi$

Sect. 7.5c: first para., line 5: read  $j, j - 1, \dots, -j$

Sect. 7.5, Ex. 3: in the hint, replace  $t$  by  $\phi$ .

line before eq. (7.6.5): read "in contrast"

line 3 of Ex. 3 to Sect. 7.6: replace "forms" by "generates"

line 2 after eq. (7.9.7): insert "respectively," before "while"

Sect. 7.10: in para. 2, after "multiplier" insert "(alias *ray*)"

line before (7.10.1): after "postulate" add ", for some *multipliers*  $\omega(g, h) \in \mathcal{A}$ ," and delete the 2 lines after (7.10.1)

line after (7.10.3): after "subgroup" insert "isomorphic to  $\mathcal{A}$ ". In the following paragraph, after "satisfying eq. (7.10.2)" insert ", yielding a still special case of the general situation considered in the first paragraph, in that the kernel of the homomorphism  $\tilde{\mathcal{G}} \rightarrow \mathcal{G}$  is central, the present subcase  $\mathcal{A} \subset \mathbf{C}^\times$  arising from *projective realizations* of  $\mathcal{G}$  in complex projective spaces (cf. Sect. 9.2)"; before "by multiples of ..." insert "*homothetically*, i.e."; replace "multivalued" by "multiplier"; delete "which is ... section".

p. 226, para.1: read "multiplier" insread of "multivalued"

line 3 after eq. (8.2.13): after "but not unitary" insert "(if  $j = j' > 0$ )"

lines 3,4 after eq. (8.4.25): read "hermiticity" and "eq. (8.4.25)"

Sect. 8.4, Ex. 6b.: after "spacelike unit vectors" insert "spanning a spacelike 2-plane and"

New para. after eq. (8.5.5), line 2: read "formulated in exercise"

Ex. 1 to Sect. 8.5, hints: after "one deduces the relations" insert " $K(g_1 g_2) =$ "

line before eq. (9.1.21): read "a nonzero factor"

line after eq. (9.1.46): read "sum over  $\nu = \mu$ "

line before (9.1.48): insert "The representation is thus faithful."

line after eq. (9.1.53): read "eqs. (9.1.14, 53)"

Sect. 9.2, para. 2, line 8: interchange  $i, j$  after "sending ..."

para. 7: replace "counters" by "detectors"

paragraph after (9.2.6): insert "homothetically, i.e." after "gets represented", and replace "trivially" by "homothetically" in line 2 of the next para.

matrix in (9.3.6): remove transposition sign from  $a$  and add it onto 0

line 2 after eq. (9.3.7): add "(using a continuous analog to Schur's lemma; cf. Naimark (1960))"

line 2 before eq. (9.3.15): an additional pair of brackets is needed in the right-most expression:  $(\text{id } \dots)\Phi$

paragraph before eq. (9.4.10): insert "below" after "...that the definition (9.4.10)"; add "Cf. H.K. Urbantke, J. Geom. Phys. 46, 125 (2003)" to the paragraph.

line after eq. (9.4.11): read "as follows from eqs. (9.4.3,8,10)"

line 3 before eq. (9.4.31): read "(8.4.25)"

line 4 before eq. (9.4.40): read "(9.4.27)"

Sect. 9.4, Ex. 7, line 2: read "Proca equations (9.3.28)"

line before eq. (9.5.4): read "an example of an invariant scalar product is"

Fig. 10.1: replace B by  $\mathcal{D}$  in 2 places

line 2 after eq. (10.1.7): read (10.1.2) instead of (10.12)

Sect. A.4: add "or *torsor*" at the end of para.1; add "respectively" after " $g = e$ ", after "from the left or right", and after "semilinear representations".

Sect. B.1, para. 1: after "antilinear" insert "or *conjugate-linear*"

Sect. B.5, end of para.1: read "eq. (8.3.3)"