Errata and Addenda for the 2018 revision of
"Four-Manifolds, Geometries and Knots"

15 October 2018

Chapter 2:

page 27, line 7: the "Euler characteristic formula" is $\chi(X) = \Sigma(-1)^i \beta_i^{(2)}(X)$, of course.

page 34, line 15: This sentence could be expanded out as follows:

If X and Y are PD_n-complexes and Y is non-orientable then a map $f : X \to Y$ such that $f^*w_1(Y) = w_1(X)$ only determines a homomorphism from $H_n(X;\mathbb{Z}^{w_1(X)})$ to $H_n(Y;\mathbb{Z}^{w_1(Y)})$ *up to sign*, as one must choose a lift $f^+ : X^+ \to Y^+$. A similar issue arises with other non-constant local coefficient systems. (See [Ta08] for a thorough discussion of the subtleties here. This oversight has no serious consequences for the present work.)

page 36, Theorem 2.11: the relevant action used here is the natural right action on $Ext^1_{\mathbb{Z}[\pi]}(\mathbb{Z}, \mathbb{Z}[\pi])$, NOT the action via conjugation considered in Chapter III.§8 of [Br].

page 44, middle: the identification of $k_1(X)$ with an iterated extension class deserves comment, as I have not found a published proof, although I suspect one may be found in the work of Eilenberg, Mac Lane and J.H.C. Whitehead of the late 1940s. We may construct a $K(\pi, 1)$ by adjoining cells of dimension ≥ 3 to X. An application of the Homotopy Addition Theorem (see §7.5 of [Sp]) to the standard 3-cocycle representing the primary obstruction to retracting $K(\pi, 1)$ onto X shows that it is the composite of the projection of the 2-cycles Z_2 onto $H_2(X;\mathbb{Z}[\pi])$ with the inverse of the Hurewicz isomorphism, and so represents the class of the extension.

If P is aspherical no additive natural transformation takes $k_1(P) = 0$ to $[P]$.

Chapter 11:

§11.2: The groups $P''_{48.3^{k-1}a} \times Z/dZ$ were overlooked here! This oversight has yet to be corrected. It has no consequences for other chapters. In particular, these groups cannot be knot commutator subgroups, as they have abelianization $Z/2dZ$.

Chapter 15:

page 299: "$g \in \pi^+$" should be "$w_1(X)(g) = 1$", as the notation π^+ has not been defined.

page 306, line -4: "15.14" should be "15.12".

Chapter 18:

page 364, line -4: "Chapter 12" should be "Chapters 8, 12 and 13".

Bibliography: The following list includes the items cited from the arXiv in the 2018 revision (but not yet published elsewheres) and new references. The details shall be updated when possible.

References

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(This does not seem to have been published.)

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