

Topology, Geometry and Gauge Fields: Interactions
Second Edition

ERRATA

It has come to my attention that the internal page references in the book have somehow gotten hopelessly fouled up. I have no explanation for how this came about, but I will attempt to rectify it here and, at the same time, correct as many typos and outright errors as I can find. Contributions to the list are most welcome and can be sent to

gregorynaber@gmail.com.

My apologies for the mess.

Chapter 1: Geometrical Background

Page 1, Line 8: “Haus-dorff” should be “Hausdorff”.

Page 24, Line 16: “page 27” should be “page 23”.

Page 24, Line 18: “page 5” should be “page 4”.

Page 24, Line -7: “page 28” should be “page 23”.

Page 25, Line 2: “page 6” should be “page 5”.

Page 25, Line 7: “page 5” should be “page 4”.

Page 25, Line 17: \mathcal{P} should be \mathcal{P}_1 .

Page 25, Line -4: “page 28” should be “page 23”.

Page 26, Line 4: “page 30” should be “page 23”.

Page 27, Line 5: “page 31” should be “page 25”.

Page 27, Line 19: “page 5” should be “page 4”.

Page 28, Line 6: “page 28” should be “page 23”.

Page 28, Line -13: A new paragraph should begin with “Thus, for example, ...”.

Page 29, Line 7: “page 287” should be “pages 287 and 289”.

Page 29, Line -7: “page 32” should be “pages 26-27”.

Page 31, Line -14: “page 29” should be “page 24”.

Page 31, Line -4: “page 30” should be “page 25”.

Page 32, Line 17: “page 30” should be “page 25”.

Page 32, Line -4: “page 9” should be “page 8”.

Page 33, Line 6: “page 31” should be “page 25”.

Page 34, Line 15: “page 37” should be “page 30”.

Page 35, Line 4: “page 13” should be “page 10”.

Page 35, Line -2: “page 38” should be “page 31”.

Page 35, Line -1: “page 19” should be “page 16”.

Page 37, Line 3: “page 39” should be “page 25”.

Page 38, Line 3: “page 42” should be “page 34”.

Page 40, Line 15: “page 24” should be “page 19”.

Page 40, Line -13: “page 44” should be “page 35”.

Chapter 2: Physical Motivation

Page 49, Line 8: “page 4” should be “page 3”.

Page 52, Line -9: “page 56” should be “page 48”.

Page 54, Line 10: Change “... the Poincaré Lemma (Theorem 4.4.2)” to “Theorem 4.1.1 (3)”.

Page 62, Line -15: “page 52” should be “page 39”.

Page 63, Line 1: “page 59” should be “page 36”.

Page 63, Line -5: “page 62” should be “page 53”.

Page 65, Line 6: “page 63” should be “page 53”.

Page 65, Line 19: Change “object” to “state”.

Page 66, Line 10: “page 63” should be “page 53”.

Page 66, Line 13: “page 63” should be “page 54”.

Page 66, Line -19: Change “object” to “state”.

Page 70, Line 2: “page 58” should be “page 49”.

Page 73, Line -6: “page 83” should be “page 70”.

Page 76, Line -7: “pages 86-87” should be “pages 73-74”.

Page 76, Line -1: “page 86” should be “page 73”.

Page 79, Line 15: “pages 85-86” should be “pages 72-73”.

Page 85, Line 8: “page 82” should be “page 69”.

Page 85, Line 16: “pages 86-93” should be “pages 73-79”.

Page 86, Line -2: Change “covering group” to “covering map”.

Page 87, Line 1: “page 88” should be “page 74”.

Page 91, Line 8: “page 96” should be “page 81”.

Page 93, Line 6: “pages 85-86” should be “pages 73-79”.

Page 93, Line 7: “page 100” should be “page 84”.

Page 94, Line 1: “pages 106-107” should be “pages 90-92”.

Page 94, Line 7: “page 107” should be “page 90”.

Page 94, Line 17: “page 109” should be “page 92”.

Page 95, Line 9: “pages 76-80” should be “pages 64-69”.

Page 98, Line -4: “page 96” should be “page 81”.

Page 99, Line -12: “pages 49-50” should be “pages 41-42”.

Page 101, Line -5: “page 117” should be “page 99”.

Page 103, Line 16: “page 117” should be “page 99”.

Page 107, Line 21: “pages 132-133” should be “pages 112-113”.

Page 107, Line -15: “pages 10 and 12” should be “pages 8 and 10”.

Page 107, Line -15: “pages 9 and 12” should be “pages 7 and 10”.

Page 107, Line -14: “pages 11 and 12” should be “pages 9 and 10”.

Page 107, Line -9: Change “when-ever” to “whenever”.

Page 112, Line 9: “page 130” should be “page 110”.

Page 113, Line 16: “page 88” should be “page 74”.

Page 113, Line 20: “page 27” should be “page 22”.

Page 113, Line 21: “page 27” should be “page 22”.

Page 114, Line 17: “page 130” should be “page 110”.

Page 116, Line 11: “pages 40-42” should be “pages 33-34”.

Page 113, Line -14: “page 34” should be “page 28”.

Page 129, Line 11: “page 68” should be “page 37”.

Page 130, Line 5: “page 134” should be “page 114”.

Page 131, Line 12: “page 133” should be “page 113”.

Page 135, Line 4: “page 144” should be “page 114”.

Page 135, Line -5: “pages 132-133” should be “page 113”.

Page 135, Line -4: “pages 132-133” should be “page 113”.

Page 136, Line 10: “pages 63-64 and 68” should be “page 55”.

Page 137, Line -5: Change “pro-foundly” to “profoundly”.

Chapter 3: Frame Bundles and Spacetimes

Page 148, Line 12: “page 34” should be “page 28”.

Page 148, Line 21: “page 34” should be “page 28”.

Page 159, Line -16: Space after “with”.

Page 167, Line -17: “pages 92-93” should be “pages 77-78”.

Page 167, Line -12: “pages 101-103” should be “pages 85-86”.

Page 167, Line -3: “pages 113-115” should be “pages 96-98”.

Page 171, Line -17: “pages 114-115” should be “pages 96-97”.

Page 173, Lines -13-(-9):

The final two sentences in Exercise 3.5.2 are poorly expressed. Replace them with the following (see Figure 1). Select the point $o_+(p)$ on the worldline of the spatial origin ($\rho = 0$) at which the past null cone contains p . This past null cone contains the “incoming” light ray from p to $o_+(p)$. Then $v(p)$ is the arrival time $t(o_+(p))$ of this ray at the spatial origin. Next select the point $o_-(p)$ on the worldline of the spatial origin at which the future null cone contains p and the “outgoing” light ray from $o_-(p)$ to p . Then $w(p)$ is the departure time $t(o_-(p))$ of this light ray from the spatial origin.

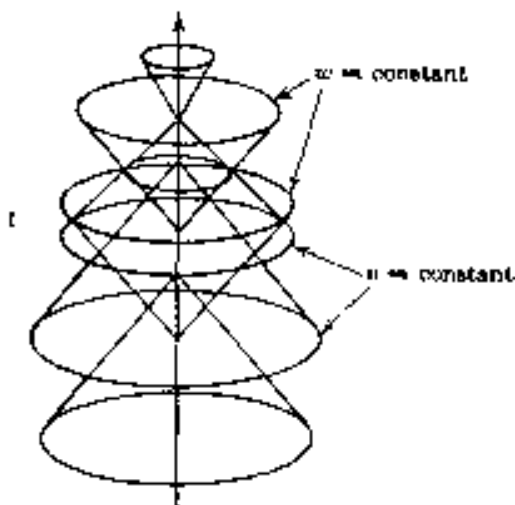


FIGURE 1. Null Coordinates

Chapter 4: Differential Forms and Integration

Page 202, Line -7: “page 15” should be “page 12”.

Page 202, Line -1: “simple” should be “simply”.

Page 204, Line 9: “innerproduct” should be “inner product”.

Page 206, Line -9: Delete the colon : after v_i .

Page 209, Line 15: “page 4” should be “page 3”.

Page 209, Line -9: By virtue of some miraculous cancellation of errors the reference to “page 4” is actually correct (the first one I have found in 209 pages). Bravo!

Page 216, Line 4: “page 10” should be “page 8” and “page 12” should be “page 10”.

Page 225, Line -11: “page 36” should be “page 30”.

Page 225, Line -6: “pseu-dotensorial” should be “pseudotensorial”.

Page 248, Line -11: “page 252” should be “page 218”.

Chapter 5: de Rham Cohomology

Page 264, Line 15: “ $\Lambda^{k-1}(U \times \mathbb{R})$ ” should be “ $\Lambda^{k-1}(U \times \mathbb{R})$ ”.

Page 267, Line 9: “page 308” should be “page 266”.

Page 281, Line 9: “page 317” should be “page 273”.

Page 282, Line -13: “theo- ries” should be “theories”.

Chapter 6: Characteristic Classes

Page 306, Line -4: “page 302” should be “page 261”.

Page 328, Line 3: “page 377” should be “page 326”.

Page 332, Line -9: I don’t know what “[2pt]” means so you should probably delete it.

Page 340, Line 2: “page 391” should be “page 337”.

Page 340, Line 10: “page 32” should be “page 26”.

Appendix: Seiberg-Witten Gauge Theory

Page 359, Line 11: “Feynmann” should be “Feynman”.

Page 364, Line 4: “an inner product” should be “and an inner product”.

Symbols

Page 408, Line 1: $\mathbf{V}(f) = \mathbf{V}f$, 6

Page 408, Line -12: $\exp(A) = e^A$, 15

Page 408, Line -11: σ , right action, 21

Page 409, Line -13: $\langle \alpha, \beta \rangle$, inner product on forms, 108

Page 410, Line 4: $o(k, n - k)$, 156

Page 410, Line 5: $so(k, n - k)$, 156

Page 410, Line 14: $\mathcal{T}^k(E)$, multilinear maps on E , 180

Page 410, Line 17: $\text{Alt}(A)$, 182

Page 411, Line 3: $\Lambda^*(X)$, cochain *complex* of forms on X

Page 411, Line -6: $\hat{\mathcal{A}} \times_{\hat{\mathfrak{g}}} \Lambda_+^2(M, \text{ad}P)$, vector bundle of Donaldson theory, 355

Page 412, Line 9: $\Delta_{\mathbb{C}}$, complex spin representation, 370

Page 412, Line 10: $\text{Spin}^c(4)$, complex spin group of \mathbb{R}^4 , 371

Page 412, Line 12: $\hat{\Delta}_{\mathbb{C}}$, 373

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Page 413, Line 12: “spin 0-electrodynamics” should be under “action functional”

Page 413, Line 12: “page 60” should be “page 63”

Page 413, Line -13: Delete the entry “Betti numbers”

Page 413, Line 17: C^∞ -map, 1

Page 414, Line 10: Delete the second “of a”.

Page 414, Line 15: covariant derivative, 380.

Page 414, Line 15: Dirac Equation, 83, 381

Page 414, Line -16: Donaldson μ -map, 354-355

Page 414, Line -15: Donaldson Series, 399

Page 414, Line -8: electric charge, 55, 56

Page 415, Line 18: exterior k -bundle, 206

Page 415, Line 24: 1st Chern class, 304, 325

Page 415, Line 25: 1st Chern number, 328

Page 415, Line -17-(-16): forms,205,206 vector-valued, 211

Page 415, Line -5: oriented, time oriented, orthonormal, 171

Page 416, Line 17: vector-valued, 199

Page 416, Line 16: magnetic monopole, 104

Page 416, Line 17: Dirac magnetic monopole, 58-60

Page 417, Line -18: left-invariant, 15

Page 417, Line -15: rank, 8, 9,180, 199

Page 418, Line 2: *a priori*

Page 418, Line 5: compactness of the moduli space, 397

Page 418, Line 8: equations, 381, 394

Page 418, Line 10: invariant, 397, 398

Page 418, Line -16: smooth map, 1

Page 418, Line 4: spinor field, 99, 381

Page 418, Line 6: spinor representation, 87, 88

Page 418, Line 7: spinor structure, 97, 171, 344

Page 418, Line 17: Stokes' Theorem, 252, 257

Page 419, Line 13: Witten's TQFT, 359, 361