19 September 2023

THE PAINLEVÉ HANDBOOK, Second edition, 2020

ERRATA, CORRIGENDA to the version published in November 2020

1. – Gallica has changed its links. New url's for all Gallica references are
   https://gallica.bnf.fr/ark:/12148/bpt6k7348q (Halphen vol I)
   https://gallica.bnf.fr/ark:/12148/bpt6k73491 (Halphen vol II)
   https://gallica.bnf.fr/ark:/12148/bpt6k7350h (Halphen vol III)
   https://gallica.bnf.fr/ark:/12148/bpt6k99571w?rk=21459;2 (Briot et Bouquet)
   https://gallica.bnf.fr/ark:/12148/bpt6k38984v (Appell)
   https://gallica.bnf.fr/ark:/12148/bpt6k433697z/f214.image (Bonnet 1)
   https://gallica.bnf.fr/ark:/12148/bpt6k433698b/f5.image (Bonnet 2)
   https://gallica.bnf.fr/ark:/12148/bpt6k110147r (Legendre)
2. – Change `http://historical.library.cornell.edu/math` (3 volumes of Painlevé).
   to
   `https://catalog.hathitrust.org/Record/002129540/Cite`
3. – Page iv, line 5, change "Cachan" to "Gif-sur-Yvette".
4. – Page 90, Table 3.3, line "Homoclinic double pulse", change "4P1 4P1" to "4P1 5P1".
5. – Page 95, line -4, delete "one of". Indeed, $\omega_1 = \Omega_1 - \Omega_2$, $\omega_2 = \Omega_1 + \Omega_2$, with (ω_1, ω_2) the half-periods of (g_2, g_3) and (Ω_1, Ω_2) the half-periods of (G_2, G_3).
6. – Pages 96 and 97, everywhere, change "a_2" to "m_0", defined page 86 Eq. (3.164).
7. – Page 109, Ref [4] change "Math" to "Mod".
8. – Page 110, Ref [28] has appeared,
   [28] R. Conte, M. Musette, Tuen Wai Ng and Chengfa Wu, New solutions to the complex Ginzburg-Landau equations, Physical review E **106:4** (2022) L042201.
   https://doi.org/10.1103/PhysRevE.106.L042201
   https://arXiv.org/abs/2208.14945
9. – Page 110, Ref [29] has appeared,
   [29] R. Conte, M. Musette, Tuen Wai Ng and Chengfa Wu, All meromorphic traveling waves of cubic and quintic complex Ginzburg-Landau equations, Physics letters A **481** (2023) 129024 (15 pp).
   https://doi.org/10.1016/j.physleta.2023.129024
   http://arXiv.org/abs/2307.04220

10. – Page 168, line after (5.200), change "Kornaev" to "Korneev".

11. – Page 193, Ref [4], change "Kornaev" to "Korneev".

12. – Page 194, Ref [24] has appeared,

    [24] R. Conte, Explicit breather solution of the nonlinear Schrödinger equation, Teoreticheskaya i Matematicheskaya Fizika **209:1** (2021) 46–58. Theor. math. phys. **209:1** (2021) 1357–1366. https://doi.org/10.4213/tmf10095 RU

    https://doi.org/10.1134/S0040577921100032 EN

    http://arxiv.org/abs/2104.06205

13. – Page 294, formula (B.20), delete the second x^2, the equation should be

$$\text{Bessel}: \; x^2\frac{\mathrm{d}^2\psi}{\mathrm{d}x^2} + x\frac{\mathrm{d}\psi}{\mathrm{d}x} + (x^2-\nu^2)\psi = 0,$$

14. – Page 296, formula (B.28), first line, change the second term $+\frac{\theta_\infty^2}{4(z-x)}$ to $+\frac{\theta_\infty^2(z-x)}{4}$.

    Page 297, formula (B.29), second line, change

$$+2\frac{u(u-1)(u-x)}{x^2(x-1)^2}\frac{\partial V_{\mathrm{VI}}(u)}{\partial u},$$

    to

$$+2\frac{u(u-1)(u-x)}{x^2(x-1)^2}\left(\frac{3}{4}+\frac{x(x-1)}{4(u-x)^2}+\frac{\partial V_{\mathrm{VI}}(u)}{\partial u}\right),$$

    .

15. – Page 307, formula (B.56). Lines 2 and 3, remove the minus sign in front of 1/2. Lines 4 and 5, remove the equal sign in front of 1/2.

16. – Page 322, formula (B.114), first line, change "d^2" to "$-d^2/2$".

17. – Page 315, Table B.5, entries numbers 17 and 16, change "((" to "(".

18. – Page 326, formula (B.130), one sign is wrong, replace lines 3 and 4 by

$$\begin{aligned}&+\frac{-\theta_\infty^2+\theta_0^2-\theta_1^2+(\theta_x-1)^2+4\theta_0(\theta_x-1)}{8a_{\mathrm{M}}x}\\&+\frac{-\theta_\infty^2+\theta_1^2-\theta_0^2+(\theta_x-1)^2+4\theta_1(\theta_x-1)}{8a_{\mathrm{M}}(x-1)},\end{aligned}$$

19. – Page 334, first paragraph, delete "is a first order ODE twelfth degree for $u(x)$, which".

20. – Page 336, Eq. (B.165), after $\frac{\mathrm{d}\psi}{\mathrm{d}t}$, insert "+".

21. – Page 344, replace last line by "Notation is $(2\alpha, -2\beta, \gamma, -2\delta) = (\theta_\infty^2, \theta_0^2, -d\theta_1, d^2)$.".

22. – Pages 345–346, replace the whole Table B.10 and its legend by the one in the page

    `https://fr.wikipedia.org/wiki/%C3%89quations_de_Painlev%C3%A9`

23. – Page 346, change the three lines "for the tetrahedron ... (B.195)" to

    for the tetrahedron [52,113,14] (genus zero, four branches, degree four)

$$3u^4 - 4(x+1)u^3 + 6xu^2 - x^2 = 0,$$
$$\theta = (3a, a, a, a),\ a \text{ arbitrary.} \qquad \text{(B.195)}$$

24. – Page 346, formula (B.196), change "$x =$" to "$u = -$", "$u =$" to "$x =$", "$(2,2,2,4)/7$" to "$(3,2,2,2)/7$".

25. – Page 359, line 9, remove "*copolar*".

26. – Page 361, change the first line of formula (C.28) to

$$g_2 = 3d^2,\ g_3 = -d^3,\ \wp(x) = -d + \frac{3d}{2}\coth^2\sqrt{\frac{3d}{2}}x, \qquad (1)$$

27. – Page 382, Ref 135, change "gase" to "gas".