Errata: Elements of Phase Transitions and Critical Phenomena

6 April 2011

Important corrections

Overall: In the first print, the symbol " $\neq$ " is misprinted as " / =". Corrected in the second print.

p. 49 In eqs. (2.121), (2.122) and the last line, b is to be replaced by $2b$.

p. 50: In eqs. (2.123), (2.125), and (2.128), b is to be replaced by $2b$.

p. 133: In eq. (6.22), the second term on the first line. The arguments of $\phi_j(z, \bar{z})$ should be replaced as $\phi_j(f, \bar{f})$.

p. 156: The footnote is to be deleted.

p. 162: Replace eq. (7.31) by the following expression and statements:

$$\begin{aligned}
\left\langle \big(\phi(r) - \phi(0)\big)^2 \right\rangle &\approx \frac{T}{J} \int \frac{2 - \mathrm{e}^{\mathrm{i}\boldsymbol{q}\cdot\boldsymbol{r}} - \mathrm{e}^{-\mathrm{i}\boldsymbol{q}\cdot\boldsymbol{r}}}{q^2} \frac{\mathrm{d}\boldsymbol{q}}{(2\pi)^2} \\
&= \frac{T}{(2\pi)^2 J} \int_0^{a^{-1}} \frac{\mathrm{d}q}{q} \int_0^{2\pi} (2 - \mathrm{e}^{\mathrm{i}qr\cos\theta} - \mathrm{e}^{-\mathrm{i}qr\cos\theta}) \mathrm{d}\theta \\
&= \frac{T}{(2\pi)^2 J} \int_0^{a^{-1}} \frac{\mathrm{d}q}{q} (4\pi - 4\pi J_0(qr)) \\
&= \frac{T}{\pi J} \int_0^{a^{-1}} \frac{\mathrm{d}q}{q} (1 - J_0(qr)) = \frac{T}{\pi J} \int_0^{r/a} \frac{\mathrm{d}y}{y} (1 - J_0(y)) \\
&= \frac{T}{\pi J} \left(\int_0^1 \frac{1 - J_0(y)}{y} \mathrm{d}y + \int_1^{r/a} \frac{\mathrm{d}y}{y} - \int_1^{r/a} \frac{J_0(y)}{y} \mathrm{d}y \right)
\end{aligned}$$

where $J_0(qr)$ is the Bessel function. The first term of the last line is independent of r, the second term is $\log(r/a)$, and the third term approaches a constant in the limit $r \to \infty$. Therefore, for $r \to \infty$, the first and third terms can be neglected in comparison with the second term, and the above equation reduces to

$$\left\langle \big(\phi(r) - \phi(0)\big)^2 \right\rangle \approx \frac{T}{\pi J} \log\Big(\frac{r}{a}\Big) \tag{7.31}$$

p. 183: In the footnote, the whole expression $J\cos\Delta\theta - J\cos 0$ should be multiplied by -1.

Minor typos

p. 30: Just below eq. (2.34), $i = 1, 2, \cdots N$ and $j(\neq i) = 1, 2, \cdots N$ should read $i = 1, 2, \cdots, N$ and $j(\neq i) = 1, 2, \cdots, N$. (Commas are inserted.)

p. 157: In eq. (7.7), $\mathrm{e}^{-\mathrm{i}\boldsymbol{q}_1\cdot\boldsymbol{r}}$ and $\mathrm{e}^{-\mathrm{i}\boldsymbol{q}_2\cdot\boldsymbol{r}}$ should be $\mathrm{e}^{\mathrm{i}\boldsymbol{q}_1\cdot\boldsymbol{r}}$ and $\mathrm{e}^{\mathrm{i}\boldsymbol{q}_2\cdot\boldsymbol{r}}$.

p. 157: In eq. (7.9), $\mathrm{e}^{-\mathrm{i}\boldsymbol{q}\cdot\boldsymbol{r}}$ should be $\mathrm{e}^{\mathrm{i}\boldsymbol{q}\cdot\boldsymbol{r}}$.

p. 157: Just above eq. (7.10), $\mathrm{e}^{-\mathrm{i}\boldsymbol{q}\cdot\boldsymbol{r}} \approx 1$ should be $\mathrm{e}^{\mathrm{i}\boldsymbol{q}\cdot\boldsymbol{r}} \approx 1$.

p. 185: In eq. (8.20), all $\mathrm{d}\boldsymbol{q}$ are to be replaced by $\dfrac{\mathrm{d}\boldsymbol{q}}{(2\pi)^d}$.

p. 210: In eq. (9.36), $\lambda+$ " should read λ_+ .

p. 212: In eq. (9.45), $(S_{N_1})^2 + (S_{N_2})^2 + \cdots (S_{N_n})^2 - 1$ should read $(S_{N_1})^2 + (S_{N_2})^2 + \cdots + (S_{N_n})^2 - 1$.

p. 226: In eq. (9.104), $\pm\frac{2\pi}{L}$, , should read $\pm\frac{2\pi}{L}$,.

p. 274: Just below eq. (A.36), e^{ixk} should be e^{ikx}.