ERRATA CORRIGE

M. Sbragaglia, 22 February 2014

- “Schwartz Lemma” must be replaced with ”Schwarz Lemma” (6 occurrences throughout the book)
- Pag. 7: the correct functional (a factor λ was missing and is necessary to set a unitary normalization) reads:

$$Q_\lambda(\phi) = \langle \phi | \hat{H} - \lambda \mathbb{1} | \phi \rangle - \lambda = (E - \lambda N) - \lambda.$$

- Pag. 22: $\langle \psi_k^0 | \to \langle \psi_k^{(0)} |$
- Pag. 23, 4 lines before the ending: $H(S, V, N) \to H(S, P, N)$
- Pag. 31, 280: ’Transfered’ → ’transferred’ (spelling error)
- Pag. 72: i is missing in the fourth equation:

$$|\psi_1(t)\rangle = \frac{e^{-iE_A t} |\psi_A\rangle + e^{-iE_B t} |\psi_B\rangle}{\sqrt{2}}.$$

- Pag. 78, in the first integral: $\frac{x^2}{2x_\eta} \to \frac{x^2}{2x_\eta^2}$
- Pag. 146: $j = 0, 1, ..., k$ (the sum goes from 0 and not from 1)
- Pag. 150: a potential is missing in the last formulae, $\hat{\boldsymbol{r}} \cdot \boldsymbol{\nabla} \to \hat{\boldsymbol{r}} \cdot \boldsymbol{\nabla} \hat{V}$; $\boldsymbol{r} \cdot \boldsymbol{\nabla} \to \boldsymbol{r} \cdot \boldsymbol{\nabla} V$
- Pag. 154: $\psi_{0,0,0}(r, \theta, \phi) = \left(1 + \frac{\lambda}{4}\right) ... \to \psi_{0,0,0}(r, \theta, \phi) \approx \left(1 + \frac{\lambda}{4}\right) ...$
- Pag. 173, in the formula for the second order correction: $\delta \hat{H} \to \hat{H}'$
- Pag. 180, a factor h^3 is missing from the formula before the final result for the partition function:

$$Q_1(T) = \frac{4\pi}{3h^3} \int e^{-\beta \frac{p^2}{2m}} d^3 p \int_0^{R^3} e^{-\beta \alpha x} dx = \frac{4\pi}{3} \lambda^{-3} \int_0^{R^3} e^{-\beta \alpha x} dx$$

- Pag. 212: The first two lines have to be rephrased as:

$$\frac{n}{n_0} = 4 e^{-\beta \epsilon}.$$

  In the limit of high temperatures ($\beta \ll 1$), we get $\frac{n}{n_0} \approx 4$,
- Pag. 225: the last formula has a missing NkT

$$F(T, V, N) = E - TS = \frac{3NkT}{2} - \frac{5NkT}{2} - NkT \ln \left[\left(\frac{mkT}{2\pi\hbar^2} \right)^{\frac{3}{2}} \frac{V}{N} \right] = NkT \left\{ \ln \left[\left(\frac{2\pi\hbar^2}{mkT} \right)^{\frac{3}{2}} \frac{N}{V} \right] - 1 \right\}.$$

- pag. 261, The expression ’with μ_B Bohr magneton’ is replaced by ’with μ_B the Bohr magneton’
- pag. 252 Problem **7.20**. The rights hand side of the last equation needs to be changed:

$$\left\langle x_i \left(\frac{\partial H}{\partial x_j} \right) \right\rangle = \frac{\int x_i \left(\frac{\partial H}{\partial x_j} \right) e^{-\frac{H}{kT}} d^N p \, d^N q}{\int e^{-\frac{H}{kT}} d^N p \, d^N q} = \frac{-kT \int x_i e^{-\frac{H}{kT}} \Big|_{(x_j)_1}^{(x_j)_2} dp_1 dp_2 ... dx_{j-1} dx_{j+1} .... dq_{N-1} dq_N + kT \int \left(\frac{\partial x_i}{\partial x_j} \right) e^{-\frac{H}{kT}} d^N p}{\int e^{-\frac{H}{kT}} d^N p \, d^N q}$$

  where the derivative with respect to x_j is done by keeping fixed all the other variables. In the above expression...
- pag. 365, last line of the text of problem **12.2** ’is conserved’ is better replaced with ’are conserved’

- pag. 367, The right hand side of the third formula is: $T^{-1}C_P(\Delta T)^2$
- pag. 369, The expression in the second line 'Then, ...' is better replaced with 'Hence, ...'
- Pag. 383, in the end of the page: $A_1 = e^{-\langle N \rangle} \rightarrow A_1 = e^{-\langle n_\epsilon \rangle}$
- pag. 341, towards the end, the correct formula is

$$I \approx \mu f(\mu) - \frac{\mu^2 f'(\mu)}{2} + \frac{1}{6}\mu^3 f''(\mu) + \frac{2f'(\mu)}{\beta^2}\int_0^{+\infty} \frac{x}{e^x+1}dx$$

- pag. 342, a factor 1/2 is missing from the mean energy

$$\lim_{T\to 0} U \approx \frac{mA}{\pi\hbar^2}\left[\frac{\mu^2}{2} + \frac{k^2T^2\pi^2}{6}\right]$$

- pag 344, in the last formula, one has to replace N with $\langle N \rangle$