Errata for
An Introduction to Clouds - From the Mircoscale to Climate

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We are highly interested in continuously improve our book. In case you spot anything unclear or wrong, please do not hesitate to contact Ulrike Lohmann:
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xv	Acknowledgment	We are very sorry for Anna Possner, who unfortunately is by mistake missing in the acknowledgment.
xx	r_{Earth}	The correct value of the Earth radius should read $r_{Earth} = 6.371 \cdot 10^6$ m.
xxii	Chemical potential μ	The units should correctly read [J mol^{-1}].
Charts	Wind barbs	For the tephigrams containing wind barbs (e.g. Fig. 10.16) the wind arrows are displaced/off set downwards to the depicted soundings by a constant value.
19	Tab. 1.3	The typical updraft velocity for St, Sc clouds should read 0.1 cm s^{-1}.
33	Eq. (2.6)	There is a minus sign missing here and the equation should read: $dW = \vec{F}ds = -Fds = -pAds = -pdV$.
34	Eq. (2.14)	This equation holds true at constant volume ($dV = 0$), where q in eq. (2.8) may be replaced by the change in internal energy (du). The entire paragraph around Eq. (2.14) should be corrected as follows: "In general, neither the pressure nor the volume are constant, and there are contributions to both the internal energy and to the work exerted by the system. When adding a total amount of heat, dq, to a system the amount that goes into the internal energy is given by: $du = c_v dT$ (2.14). The remainder of the added heat goes into the work term, in order for the total energy of the system to be conserved. We can then rewrite the first law of thermodynamics by replacing dw and du with eqs. (2.7) and (2.14) and obtain: $dq = c_v dT + pd\alpha$ (2.15)."
51	eq. (2.72)	The are brackets missing on the right hand side. The whole term needs to be devided by M_w, in order to get correct L_v values in J kg^{-1}. $$L_v = (56579 - 42.212T + \exp(0.1149(281.6 - T))) \frac{1}{M_w}$$
51	below eq. (2.72)	... with L_v in J kg^{-1} ... **not** in J kg^{-1} K^{-1}

51	eq. (2.74)	The are brackets missing on the right hand side. The whole term needs to be devided by M_w, in order to get correct L_s values in $\mathrm{J\,kg^{-1}}$. $L_s = \left(46782.5 + 35.8925T - 0.07414T^2 + 541.5\exp\left\{-\left(\frac{T}{123.75}\right)\right\}^2\right)\frac{1}{M_w}$.
63	Exercise 1 (b)	It should read: $dW = -pdV$
63	Exercise 1 (c)	It should read: $dW = pdV$
86	Fig. 3.7	The arrows (vectors) of the Coriolis force should be of the same length at a given latitude. I.e. the 4th and 6th dotted arrow from the left hand side should be of the same length as the 1st dotted arrow from the left hand side.
99	CH 4.2.2. bottom page (c)	Instead of reaching the **LCL** by forced mechanical lifting as discussed above, an air parcel can also reach the **LCL** if it has sufficient positive buoyancy. The **LCL** reached in ...
106	4.2.4.2	... It can be obtained by following the moist adiabat (i.e. constant θ_w!) down to the surface starting from the minimum value of θ_w (not θ_e) found...
119	Fig. 5.2	Soot TEM should cover both Aitken and accumulation mode, as depicted in Fig. 5.18.
121	eq. $\tilde{\sigma} = ...$	add number to eq.
130	Fig. 5.7	The discription in the upper left part of the figure should read "Cluster formation".
159	Above eq. 6.5	Change to: "...in the new bulk phase, (ii)..."
159	Below eq. 6.5	Change to: "...difference from THE outside increases..."
184	Exercise 2 (b)	Clarification: Assuming a bubble of pure water vapor, the equilibrium vapor pressure is given as $p_b = e_{s,w}(T)K$, where $K < 1$. Determine whether the bubble could exist under equilibrium conditions.
224	Fig. 8.4(a)	Nu_{dep} should have no superscript "CD", as no liquid water phase is assumed to be involved in the deposition nucleation process.
235	Fig. 8.12	Caption should read: Observed **ice crystal** number concentration...
249	5c)	There are commas missing here: In an environment of high supercooling, large INP concentration, and low updraft velocities, very ...
255	eq. (9.5)	The number of c_N is missing; it should read $c_N = 0.038\,\mathrm{cm^{-4}(mm\,h^{-1})^{0.87}}$.
262	Fig. 9.6	Fig. caption should read: Examples of atmospheric processes or phenomena that occur...
269	Fig. 9.12	0 °C isotherm at t_3 should be tilted upwards inside cloud as for e.g. at t_4 and not flat due to latent heat release.
271	Fig. 9.14 (a)	Half circles at surface warm front should be facing the other direction, i.e. out of the warm sector.
282	Table 9.3	The number concentration of hydrometeors should read: $n_N(r_h)$.
287	Fig. 10.2	The wind barbs are vertically displaced and should only start with the sounding, i.e. the profiles of T_{env} and T_d.
306	Fig. 10.16	The wind barbs are vertically displaced and should only start with the sounding, i.e. the profiles of T_{env} and T_d.

321	Exercise 4 (b)	In the formula of the buoyancy it should read F_B for the buoyancy force, not T_B.
327	eq. (11.7)	The 4 in front of the root seems slightly shifted towards the root. It should read $\sqrt[4]{...}$.
327	T_s	The value of T_s below eq. (11.7) should read: $T_s = 289$ K (see p. 325)
329	bottom	"...is absorbed by other air molecules...". This statment is imprecise and only applies to greenhouse gases, but not to non-absorbing molecules such as N_2 or O_2.
330	line 2	"the cloud greenhouse effect is *mostly* important for..."
330	line 17	"... re-emitted by *greenhouse gases, clouds and absorbing aerosol particles* and will not..."
330	line 18	"... presence of low-level clouds is *almost* not noticable..."
334	Exercise 3	The numbering of the sub-exercises should read (a), (b), (c), (d).
336	Section 12.1.1	the reference to Section 5.2 should be deleted: "...of radiation, as discussed in Section 5.2."
339	BC AOD value	"Black carbon also contributes to ERFari. Despite its small AOD, of only **0.004**, BC..." The AOD value indicated for BC should read 0.004 and not 0.04.
347	Exercise 4 (c)	The buoyancy should read: $F_B = g(T - T_{env})/T_{env}$.
367	Exercise 5 (a)	The units of the cloud liquid water content M_l need to read $0.3\,\mathrm{kg\,kg^{-1}}$.
367	Exercise 5/6	Exercise 5 should be labeled Exercise 6.

Table 1: Errata found within the textbook.

Figure	**Correction/Comment**
ULRIKE_LOHMANN_fig.2.17.jpg	Fig. 2.17 of Web Resources: The Saturated adiabats are missing in this figure. Note that the figure is correct as in the printed version of the book.