Errata for **Conduction and Radiation** (November 2012)

1. Page 6: Footnote 2. The word <u>drawn</u> appears twice.

2. Page 25: First line, read:
   Here, h (in units of W/m^2K) is a parameter that defines the extent...

3. Page 56, first expression for B_{mn}, numerator, read sin$n\pi x$ as sin$m\pi x$.

4. Page 56, expression for A_{mn}, replace negative sign by the positive.

5. Page 56, second expression for B_{mn}, read sin$n\pi x$ as sin$m\pi x$ in the numerator as well as the denominator. Further, in the denominator, read sin$m\pi x$ as $\sin^2 m\pi x$. Hence

$$B_{mn} = \frac{\int_0^1 \int_0^1 \sin m\pi x \sin n\pi y dx dy}{\int_0^1 \int_0^1 \sin^2 m\pi x \sin^2 n\pi y dx dy}$$

6. Page 27: Figure 1.5 (b) Bi $\rightarrow 0$

7. Page 95: Figure 4.6 the plot of the error function starts from 0 and asymptotically reaches unity for $\eta > 2$.

8. page 171, read femtosecond as 10^{-15}.

9. Page 204, last line, 'are' appears twice.

10. Page 210, last line, definition of σ, factor 12 should be 15.

11. Page 211, Table 10.1, value of K, read 10^{-34} as 10^{-23}.

12. Page 214, Figure 10.4(a), read Φ as ϕ.

13. Page 224, read Equation 11.5 as

$$\alpha'_\lambda(\lambda, \theta, \phi, T) = \frac{d^3 Q_{\lambda,a}(\lambda, \theta, \phi, T)}{i'_{\lambda,i}(\lambda, \theta, \phi) dA \cos\theta d\omega d\lambda}$$

14. Page 229, middle of the page, read equation as

$$\alpha(T_A) = 0.9F_{0-17,340} + 0.1(1 - F_{0-17,340}) = 0.883$$

15. Page 236, first paragraph, read 'see Remark 6' as 'see Section 9.2'.

16. Page 253, last line read:
    The above result is valid for positive values of $h - R$, namely $h = \sqrt{R_2^2 - r^2} > R$.

17. Page 254, point 12, read equations as

$$F_{1a} = \frac{1}{2\pi}\tan^{-1}\frac{a}{c}$$

$$F_{1b} = \frac{1}{2\pi}\tan^{-1}\frac{b}{c}$$

$$F_{12} = (F_{1b} - F_{1a})$$

$$F_{21} = \frac{R}{(b-a)}\left(\tan^{-1}\frac{b}{c} - \tan^{-1}\frac{a}{c}\right)$$

18. Page 267, Figure 13.2 the arrow for Q_2 should be inward.

19. Page 269, first line, read $J_k = \epsilon_k e_{bk} + \rho_k G_k$.

20. Page 272, the equations read as follows

$$\begin{aligned}
Q_{12} &= -\frac{J_2 - J_1}{\frac{1}{A_1 F_{12}}} \\
Q_{23} &= -\frac{J_3 - J_2}{\frac{1}{A_2 F_{23}}} \\
Q_{31} &= -\frac{J_1 - J_3}{\frac{1}{A_3 F_{31}}} = -Q_{13}
\end{aligned}$$

21. Page 273, Figure 13.5 the arrowhead for Q_2 should be inward.

22. Page 286 Figure 14.1 read: $T_2(y)$ at the top surface.

23. Page 305, read the para before **Problems** as
For T_1=1000 K and $q_{1,2} = q_{2,2} = 0$, the only solution permitted by the above system of equations is $T_2 = 1000$ K and $q_{1,1} = q_{2,1} = q_1 = 0$. This result can be shown to be independent of the surface properties.

24. Page 322 Figure 17.1 read: $T = T_b$ at the left plane.

25. Page 335, Equation 18.15 read

$$\frac{dI_\lambda(\hat{\Omega})}{ds} = -\kappa_\lambda I_\lambda - \zeta_\lambda I_\lambda + \kappa_\lambda I_{\lambda b} + \frac{\zeta_\lambda}{4\pi}\int_{4\pi} I_\lambda(\hat{\Omega}_i)\Phi_\lambda(\hat{\Omega}_i, \hat{\Omega})d\hat{\Omega}_i \quad (1)$$

26. Page 335, Equation 18.16 read

$$\frac{dI_\lambda}{d\tau_\lambda} = -I_\lambda + (1-\omega_\lambda)I_{\lambda b} + \frac{\omega_\lambda}{4\pi}\int_{4\pi} I_\lambda(\hat{\Omega}_i)\Phi_\lambda(\hat{\Omega}_i, \hat{\Omega})d\hat{\Omega}_i \quad (2)$$

27. Page 335, read equation defining source function as

$$S_\lambda = (1-\omega_\lambda) I_{\lambda b} + \frac{\omega_\lambda}{4\pi} I_\lambda(\hat{\Omega}_i)\Phi_\lambda(\hat{\Omega}_i, \hat{\Omega}) d\hat{\Omega}_i$$

28. Page 340, expression below equation 18.26 read

$$\hat{\mathbf{s}} \cdot \nabla I_\lambda = \frac{dI}{ds}$$

29. Page 340, Equation 18.29 read

$$\nabla\cdot\mathbf{q}_\lambda = \int_{4\pi} \kappa_\lambda I_{\lambda b} d\Omega - \int_{4\pi} \beta_\lambda I_\lambda(\hat{\Omega}) d\Omega + \int_{4\pi} \frac{\zeta_\lambda}{4\pi} \int_{4\pi} I_\lambda(\hat{\Omega}_i)\Phi_\lambda(\hat{\Omega}_i \cdot \hat{\Omega}) d\hat{\Omega}_i d\Omega \tag{3}$$

30. Page 340, Equation 18.30 read

$$\nabla\cdot\mathbf{q}_\lambda = 4\pi\kappa_\lambda I_{\lambda b} - \int_{4\pi} \beta_\lambda I_\lambda(\hat{\Omega}) d\Omega + \frac{\zeta_\lambda}{4\pi} \int_{4\pi} I_\lambda(\hat{\Omega}) \int_{4\pi} \Phi_\lambda(\hat{\Omega}_i \cdot \hat{\Omega}) d\Omega d\hat{\Omega}_i \tag{4}$$

31. Page 340, expression below equation 18.30 read

$$\int_{4\pi} \Phi_\lambda(\hat{\Omega}_i \cdot \hat{\Omega}) d\Omega = 1$$

32. Page 341, Equation 18.33 read

$$\nabla\cdot\mathbf{q} = \int_0^\infty \kappa_\lambda \left(4\pi I_{\lambda b} - G_\lambda\right) d\lambda \tag{5}$$

33. Page 341, Equation 18.34 read

$$\nabla\cdot\mathbf{q} = \kappa \left(4\pi\sigma n^2 T^4 - G\right) \tag{6}$$

34. Page 341, Equation 18.36 read

$$I_b = n^2\sigma T^4 = \frac{G}{4\pi} = \frac{\int_{4\pi} I(\mathbf{r},\hat{\Omega}) d\hat{\Omega}}{4\pi} \tag{7}$$

35. Page 359: Equations 19.19 and 19.20 read:

$$G(\tau_z) = 2\pi\left[I_{b1}E_2(\tau_z) + I_{b2}E_2(\tau_L - \tau_z)\right] + 2\pi\left[\int_0^{\tau_z} I_b(\tau_z')E_1(\tau_z - \tau_z')d\tau_z' + \int_{\tau_z}^{\tau_L} I_b(\tau_z')E_1(\tau_z' - \tau_z)d\tau_z'\right]$$

and

$$q(\tau_z) = 2\pi\left[I_{b1}E_3(\tau_z) - I_{b2}E_3(\tau_L - \tau_z)\right] + 2\pi\left[\int_0^{\tau_z} I_b(\tau_z')E_2(\tau_z - \tau_z')d\tau_z' - \int_{\tau_z}^{\tau_L} I_b(\tau_z')E_2(\tau_z' - \tau_z)d\tau_z'\right]$$

Similar corrections apply for equations 19.23 and 19.24 in page 360, equations 19.50 and 19.51 in page 368 and equations 19.56 and 19.57 in page 370.