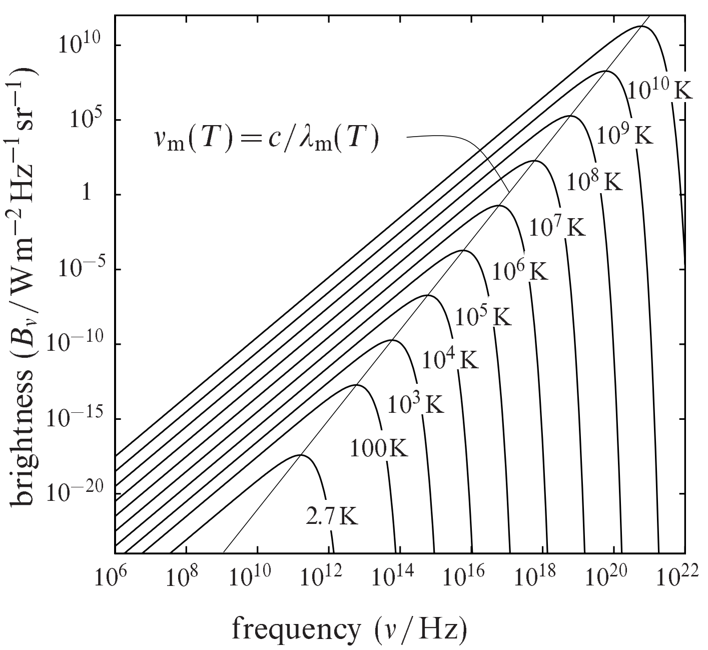
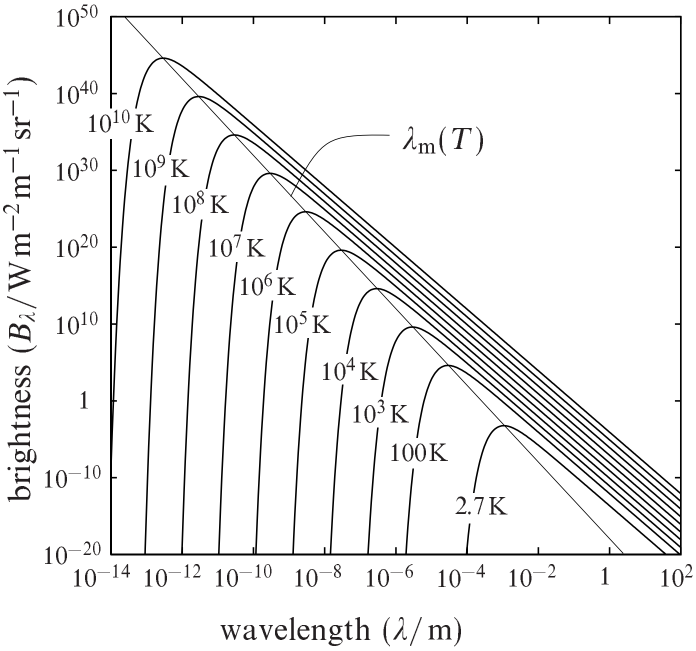
Blackbody radiation





Planck function[a]	$B_\nu(T) = \frac{2h\nu^3}{c^2}\left[\exp\left(\frac{h\nu}{kT}\right) - 1\right]^{-1}$ $B_\lambda(T) = B_\nu(T)\frac{\mathrm{d}\nu}{\mathrm{d}\lambda}$ $= \frac{2hc^2}{\lambda^5}\left[\exp\left(\frac{hc}{\lambda kT}\right) - 1\right]^{-1}$	B_ν surface brightness per unit frequency (W m^{-2} Hz^{-1} sr^{-1}) B_λ surface brightness per unit wavelength (W m^{-2} m^{-1} sr^{-1}) h Planck constant
Spectral energy density	$u_\nu(T) = \frac{4\pi}{c}B_\nu(T)$ J m^{-3} Hz^{-1} $u_\lambda(T) = \frac{4\pi}{c}B_\lambda(T)$ J m^{-3} m^{-1}	c speed of light k Boltzmann constant T temperature $u_{\nu,\lambda}$ spectral energy density
Rayleigh–Jeans law ($h\nu \ll kT$)	$B_\nu(T) = \frac{2kT}{c^2}\nu^2 = \frac{2kT}{\lambda^2}$	
Wien's law ($h\nu \gg kT$)	$B_\nu(T) = \frac{2h\nu^3}{c^2}\exp\left(\frac{-h\nu}{kT}\right)$	
Wien's displacement law	$\lambda_m T = \begin{cases} 5.1 \times 10^{-3}\,\mathrm{m\,K} & \text{for } B_\nu \\ 2.9 \times 10^{-3}\,\mathrm{m\,K} & \text{for } B_\lambda \end{cases}$	λ_m wavelength of maximum brightness
Stefan–Boltzmann law[b]	$M = \pi \int_0^\infty B_\nu(T)\,\mathrm{d}\nu$ $= \frac{2\pi^5 k^4}{15c^2h^3}T^4 = \sigma T^4$ W m^{-2}	M exitance σ Stefan–Boltzmann constant ($\simeq 5.67 \times 10^{-8}$ W m^{-2} K^{-4})
Energy density	$u(T) = \frac{4}{c}\sigma T^4$ J m^{-3}	u energy density
Greybody	$M = \epsilon\sigma T^4 = (1-A)\sigma T^4$	ϵ mean emissivity A albedo

[a] With respect to the projected area of the surface. Surface brightness is also known simply as "brightness." "Specific intensity" is used for reception.

[b] Sometimes "Stefan's law." Exitance is the total radiated energy from unit area of the body per unit time.