Answer on Question #66790, Physics / Astronomy | Astrophysics

Explain how we estimate the effective surface temperature of the Sun.

Solution:

Sun emits light. We believe that the Sun is absolutely black body.

Wien's displacement law:

$\lambda_{max} = \frac{b}{T}$ (1),

where λ_{max} is peaks at the wavelength, T is the absolute temperature in kelvins, b is a Wien's displacement constant ($b=2.897\times10^{-3}$ m×K)

The human eye is most sensitive for peaks at the wavelength: $\lambda_{max}=555\times10^{-9}$ m

Of (1) $\Rightarrow$ $T = \frac{b}{\lambda_{max}}$ (2)

Of (2) $\Rightarrow$ T=5300 K

Answer:

5300 K