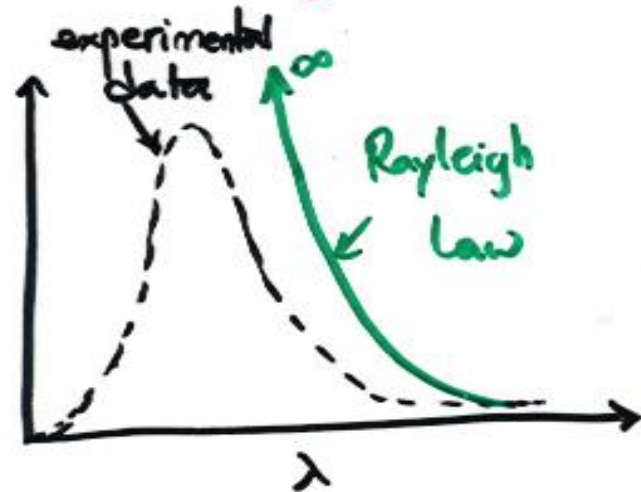


## Rayleigh - Jeans Law

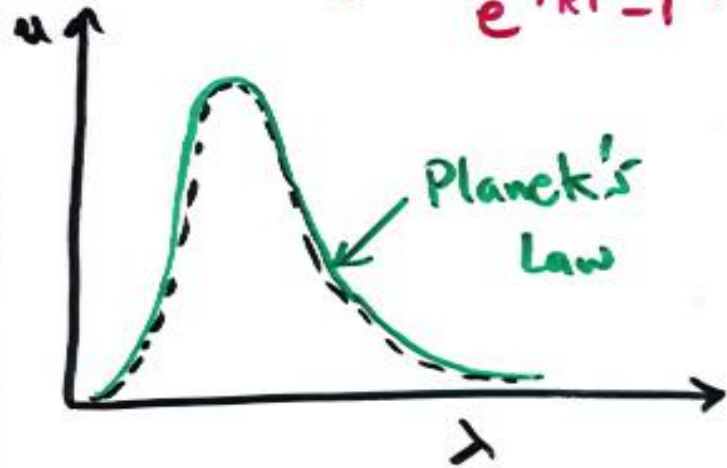
$$u(f, T) = \frac{8\pi f^2}{c^3} k_B T$$



$\lambda \rightarrow 0 \quad u \rightarrow \infty$   
ultraviolet catastrophe

## Planck's function

$$u(f, T) = \frac{8\pi f^2}{c^3} \left( \frac{hf}{e^{\frac{hf}{kT}} - 1} \right)$$



Planck's Law fit the experimental data for the blackbody

At high  $f$  ( $f \rightarrow \infty$ ) where  $\frac{hf}{kT} \gg 1$   
 $\lambda \rightarrow 0$

$$e^{\frac{hf}{kT}} - 1 \approx e^{-\frac{hf}{kT}}$$

$$\Rightarrow u(f, T) \approx \frac{8\pi f^3 h}{c^3} e^{-\frac{hf}{kT}} \quad [\text{Wien's Law}]$$