The resolving power of microscope depends upon:

1. Wavelength of light used:
   $\boldsymbol{Resolving\ power} \propto \frac{1}{\lambda}$. Resolving power can be increased by using UV radiation.
2. Refractive index of medium between object and the objective:
   $\boldsymbol{Resolving\ power} \propto \boldsymbol{\mu}$. Resolving power can be increased by using Oil immersion objective.

2. $\boldsymbol{Resolving\ Power\ of\ telescope} = \frac{\boldsymbol{D}}{\boldsymbol{1.22\ \lambda}}$ $\quad \boldsymbol{\lambda = wavelength\ of\ light\ used}$, $\boldsymbol{D = diameter\ of\ objective\ of\ telescope}$

In telescope, $Angular\ separation\ \theta\ or\ d\theta = \frac{1.22\ \lambda}{D}$ [also called as Limit of Resolution]

Angular separation: The minimum angle between two distant objects whose images can be just resolved.

- *Resolving power of telescope is mathematically equal to the reciprocal of angular separation.*

1. What is the limit of resolution of a telescope whose objective has a diameter of 100 inch. Assume that the wavelength of light used is 6000A°. [Ans: $2.9 \times 10^{-7} rad$]
2. Estimate the smallest possible value of angular separation (*limit of resolution*) and resolving power of a normal human eye by using following data: diameter of pupil=2mm, wavelength of light=5000A°. [Ans: $2.9 \times 10^{-4} rad = 1'$; 7751.93]

3. Rayleigh criterion for limit of resolution:

Statement: "Two images are just resolvable when the center of the diffraction pattern of one is directly over the first minimum of the diffraction pattern of the other."

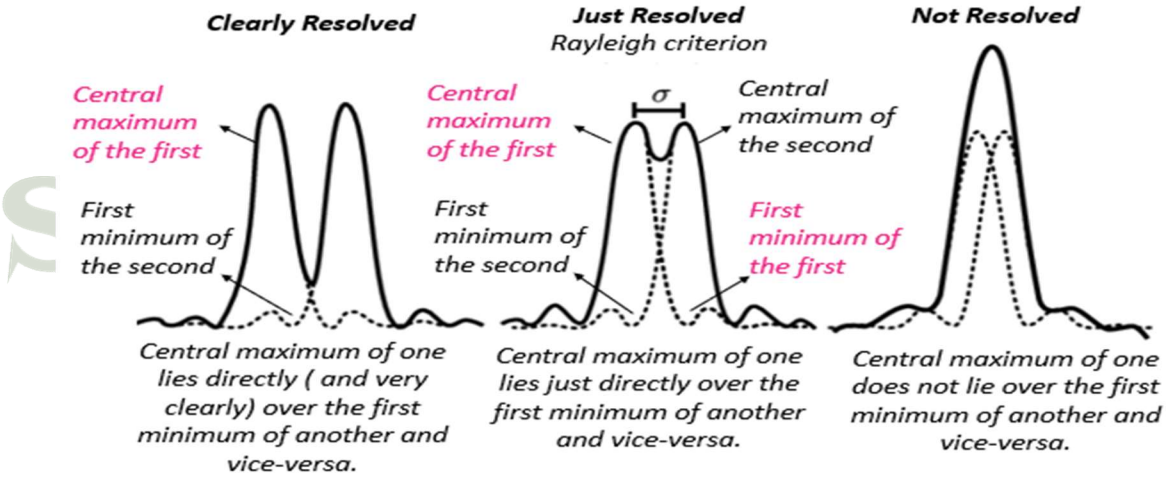

Figure: Rayleigh criterion for resolution of two nearby point objects.