

## TALLER 2

JUAN BARBOSA - 201325901

1. **A white floodlight beam crosses a large volume containing a tenuous molecular gas mixture of mostly oxygen and nitrogen. Compare the relative amount of scattering occurring for the yellow (580 nm) component with that of the violet (400 nm) component.**

De Rayleigh se sabe que el scattering es proporcional a  $1/\lambda^4$ :

$$S \propto \frac{1}{\lambda^4} \quad (1)$$

Entonces el cociente entre el scattering del violeta ( $v$ ) y el amarillo ( $y$ ):

$$\frac{S_v}{S_y} = \frac{1/\lambda_v^4}{1/\lambda_y^4} = \left(\frac{\lambda_y}{\lambda_v}\right)^4 \quad (2)$$

$$S_v = S_y \left(\frac{\lambda_y}{\lambda_v}\right)^4 \approx 4.42 S_y \quad (3)$$

2. **A very narrow laserbeam is incident at an angle of  $58^\circ$  on a horizontal mirror. The reflected beam strikes a wall at a spot 5.0 m away from the point of incidence where the beam hit the mirror. How far horizontally is the wall from that point of incidence?**

El ángulo incidente debe ser igual al reflejado. Lo cual implica que existe un triángulo rectángulo con hipotenusa 5.0 m.

$$\sin(58^\circ) = \frac{d}{5.0} \quad \longrightarrow d = 5 \sin(58^\circ) \quad (4)$$