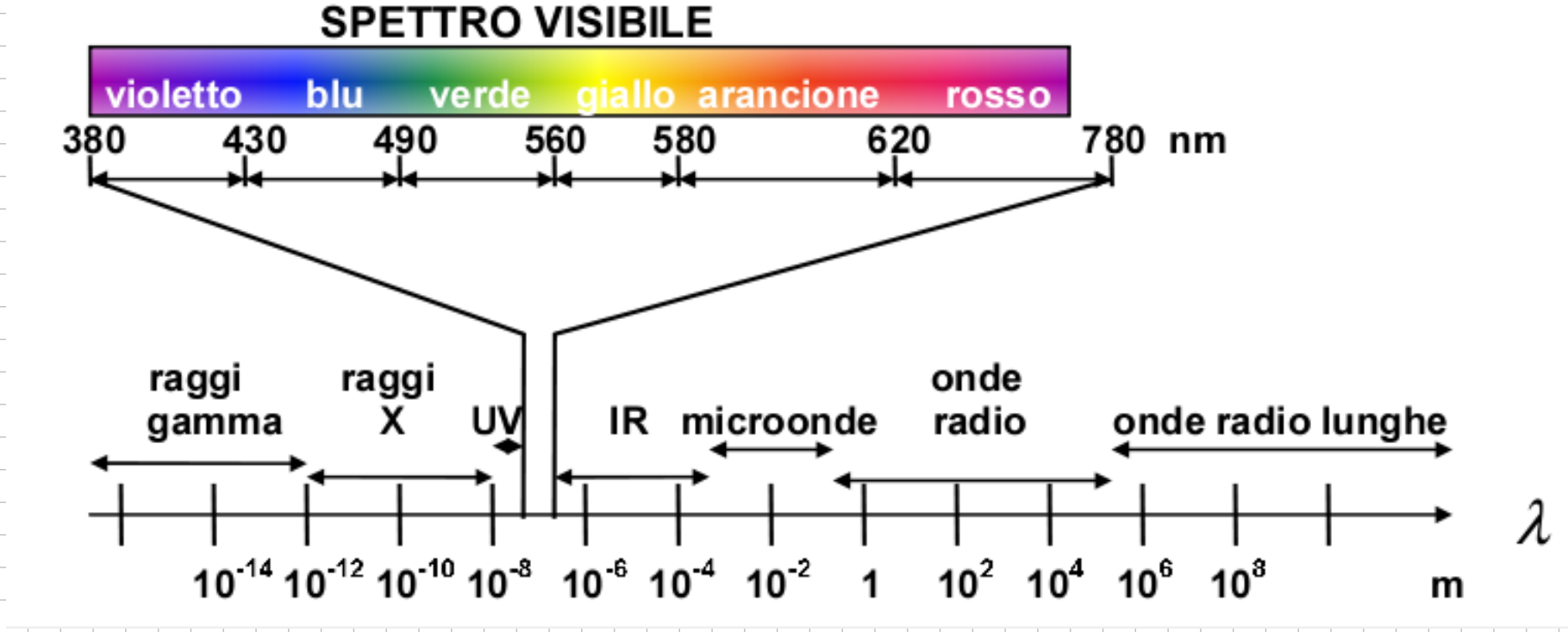
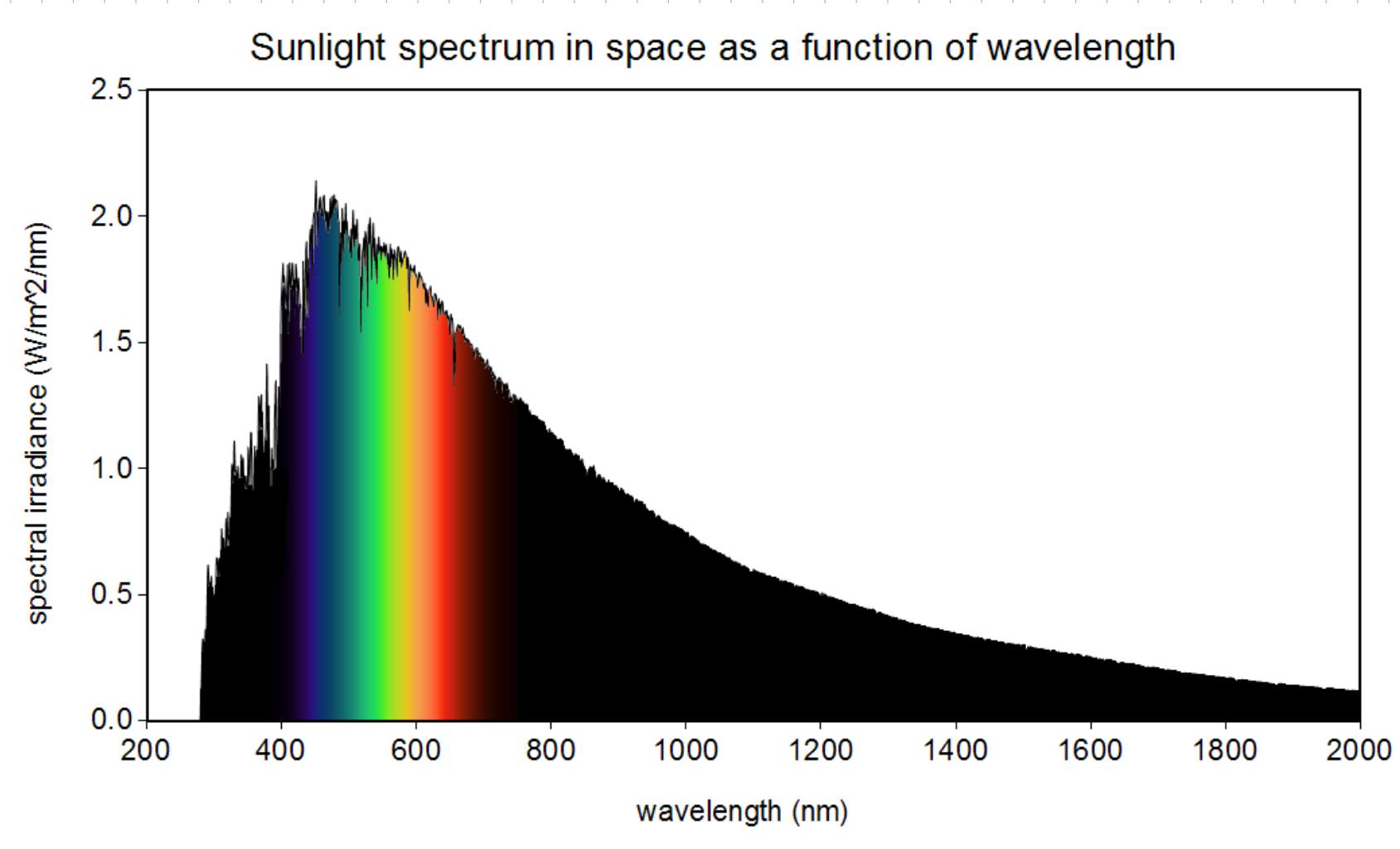
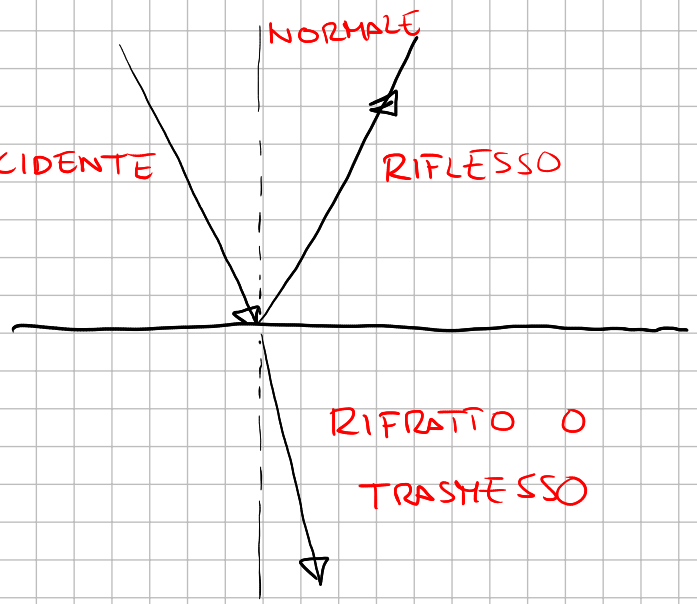
SPETTRO DELLE ONDE



SPETTRO DEL SOLE



LUCE E INDICE DI RIFRAZIONE



normale + incidente definiscono un piano d'incidenza

riflesso + rifratto giacciono su quel piano

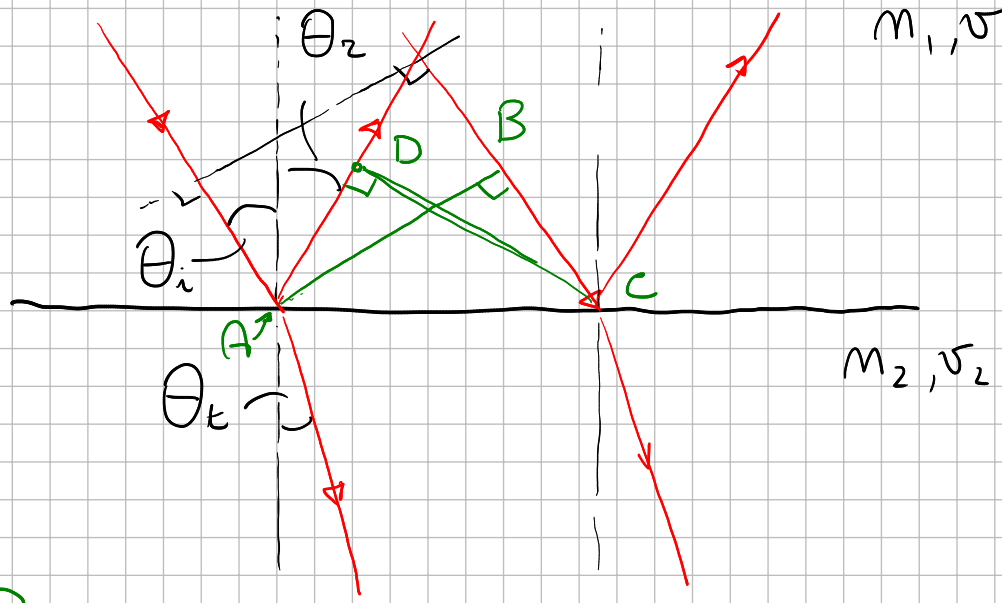
in un mezzo la luce si muove con $v < c$, $n \equiv \frac{c}{v}$ indice di RIFRAZIONE

$n \geq 1$, $n_{ARIA} \approx 1$, $n_{ACQUA} \approx 1.33$, $n_{VETRO} \approx 1.5 \div 2$

$\omega = k v \Rightarrow v = \frac{\omega}{k} = \frac{\lambda}{T} \longrightarrow$ si trova sperimentalmente che

$\lambda = \frac{\lambda_0}{n}$ (λ_0 → VUOTO) $\Rightarrow k = n k_0$ perché $\omega = \omega_0$, $\nu = \nu_0$ $\left[\nu = \frac{\omega}{2\pi}\right.$ FREQUENZA DELL'ONDA$\left.\right]$

RIFLESSIONE E RIFRAZIONE

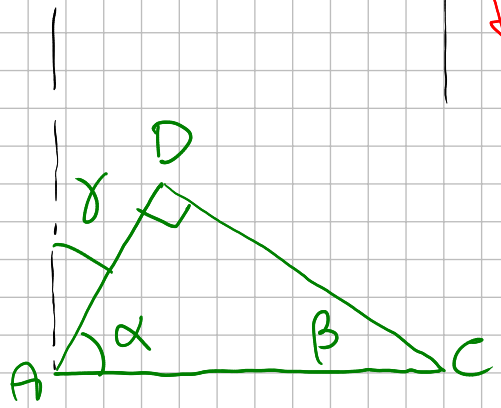


$$\overline{BC} = \overline{AD}$$

guardiamo $\widehat{ABC}$ e $\widehat{ADC}$

- hanno la stessa ipotenusa, $\overline{AC}$
- hanno un angolo retto
- hanno un cateto uguale, $\overline{BC} = \overline{AD}$

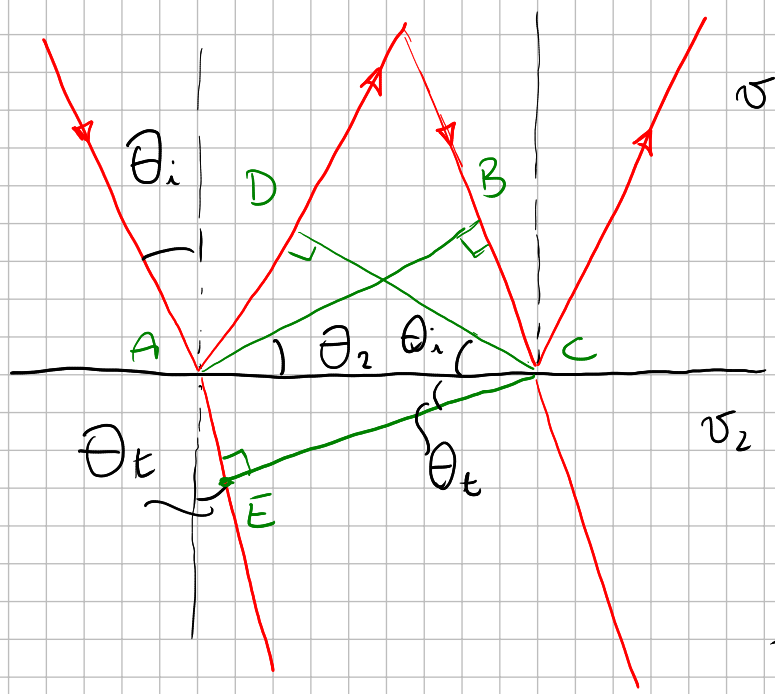
$\Rightarrow$ sono uguali $\rightarrow$ angoli uguali



$$\alpha + \beta = \frac{\pi}{2} \quad \Rightarrow \quad \beta = \frac{\pi}{2} - \alpha$$

$$\gamma + \alpha = \frac{\pi}{2} \quad \Rightarrow \quad \gamma = \frac{\pi}{2} - \alpha = \beta = \theta_2 = \theta_1$$

RIFRAZIONE



v_1

$\overline{BC} \neq \overline{AE}$ perché $v_1 \neq v_2$

$\widehat{ABC}$ e $\widehat{AEC}$ hanno $\overline{AC}$ in comune

$$\begin{cases} \overline{BC} = \overline{AC} \sin\theta_2 = v_1 \Delta t \\ \overline{AE} = \overline{AC} \sin\theta_t = v_2 \Delta t \end{cases} \Rightarrow$$

$$\overline{AC} = \frac{v_1 \Delta t}{\sin\theta_2} = \frac{v_2 \Delta t}{\sin\theta_t} \Rightarrow$$

$$\frac{v_1}{\sin\theta_2} = \frac{v_2}{\sin\theta_t}, \text{ però } n_1 = \frac{c}{v_1}, \; n_2 = \frac{c}{v_2} \Rightarrow v_1 = \frac{c}{n_1}, \; v_2 = \frac{c}{n_2} \Rightarrow$$

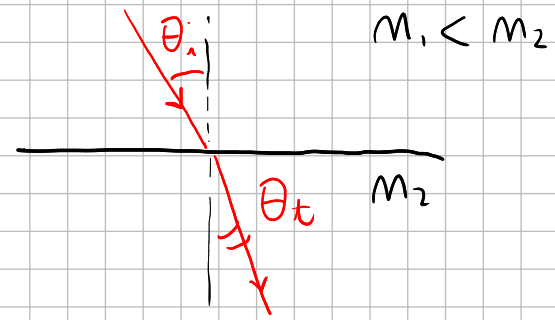
$$n_1 \sin\theta_2 = \boxed{n_1 \sin\theta_i = n_2 \sin\theta_t} \quad \text{LEGGE DI SNELL}$$

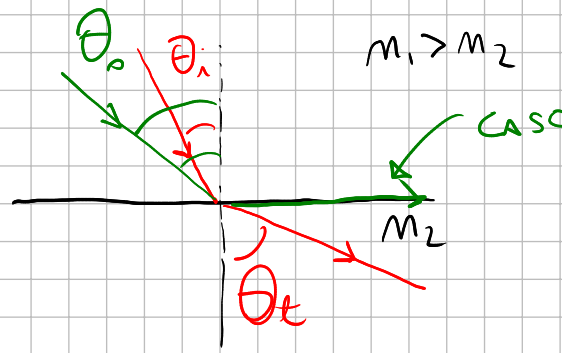
LEGGE DI SNELL

$$\sin\theta_t = \frac{n_1}{n_2}\sin\theta_i$$

$\sin\theta_t < \sin\theta_i$ se $n_2 > n_1$

$\sin\theta_t > \sin\theta_i$ se $n_1 > n_2$





$$1 = \frac{n_1}{n_2}\sin\theta_0$$

$$\Downarrow$$

$$\sin\theta_0 = \frac{n_2}{n_1}$$

DISPERSIONE DELLA LUCE