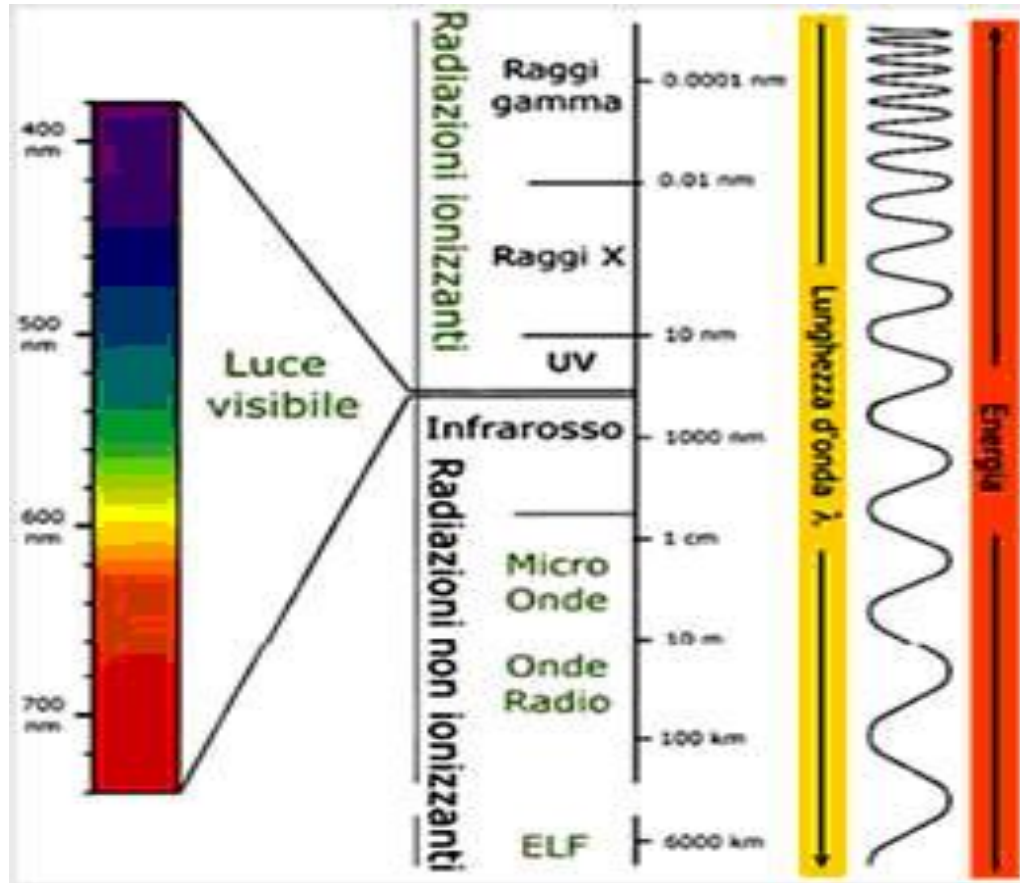


# Onde elettromagnetiche

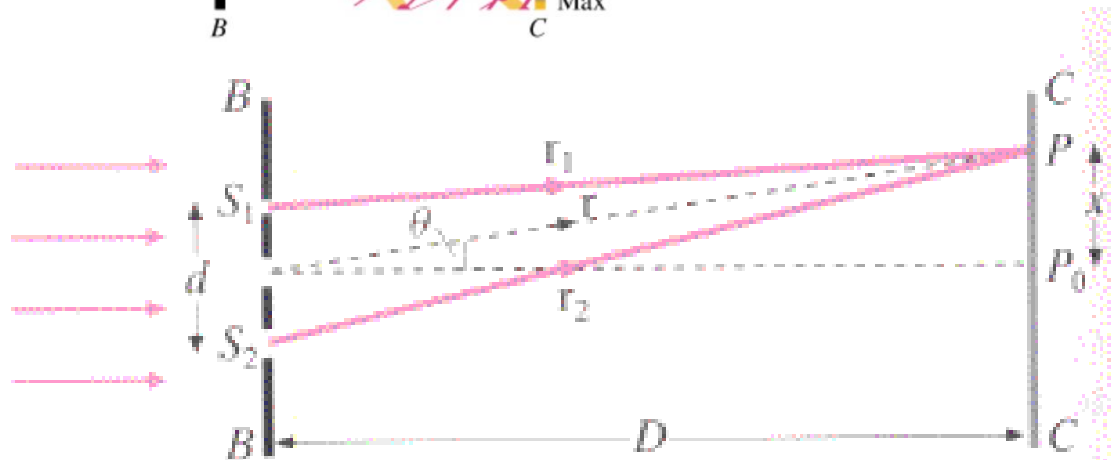
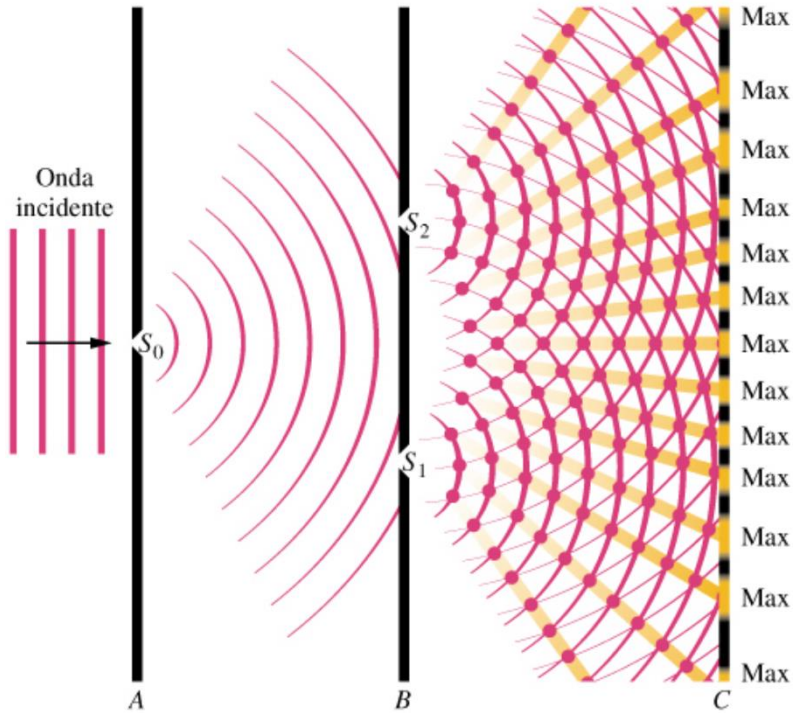
- Spettro elettromagnetico
- Interferenza
- Diffrazione

# Spettro elettromagnetico

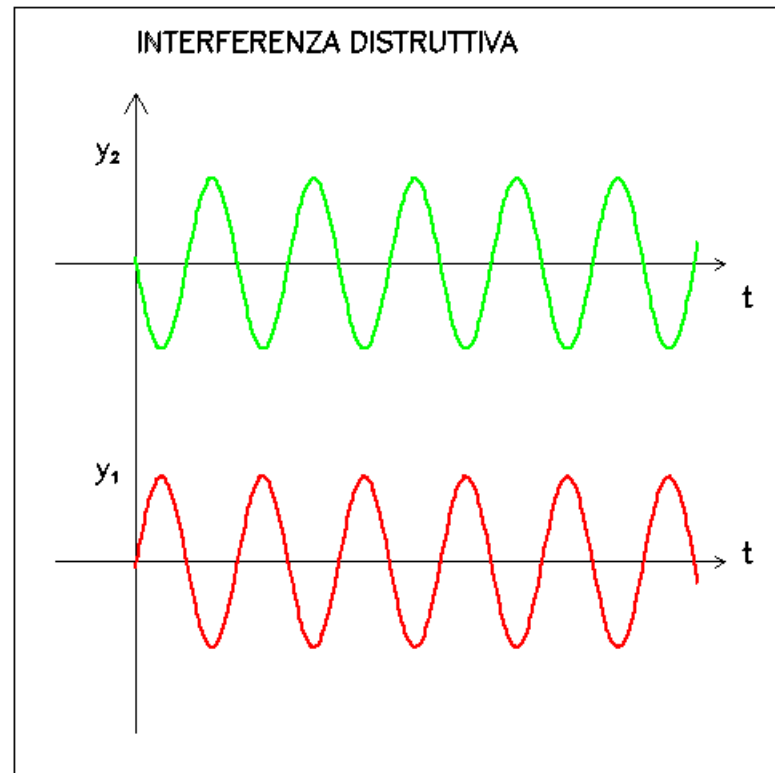
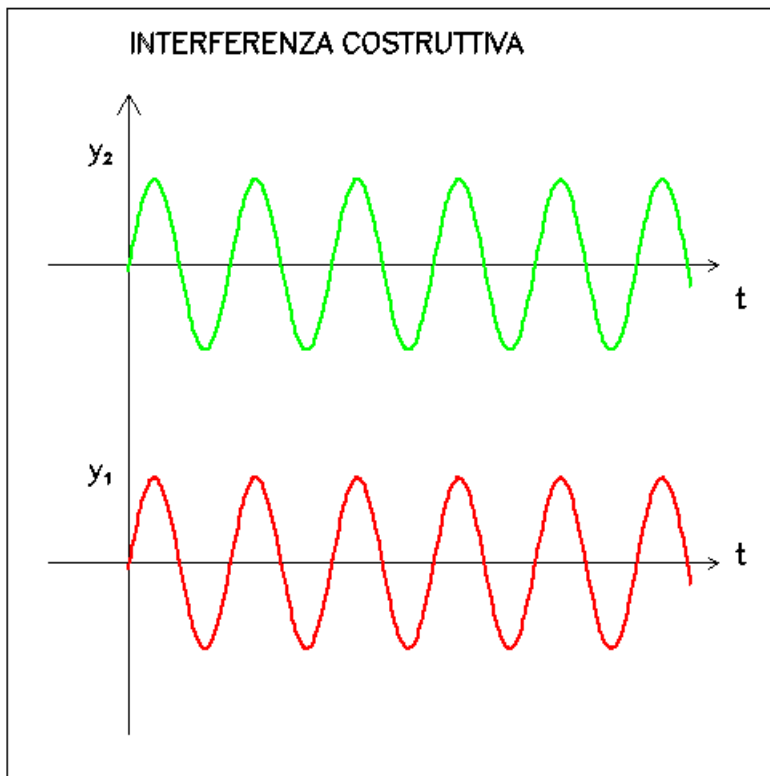


# Interferenza

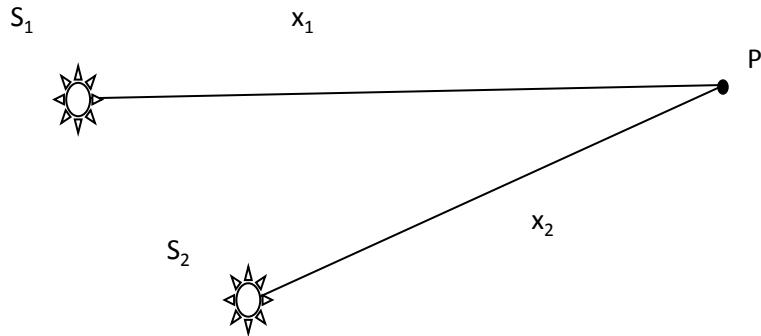
## Principio di Huygens-Fresnel



# Interferenza



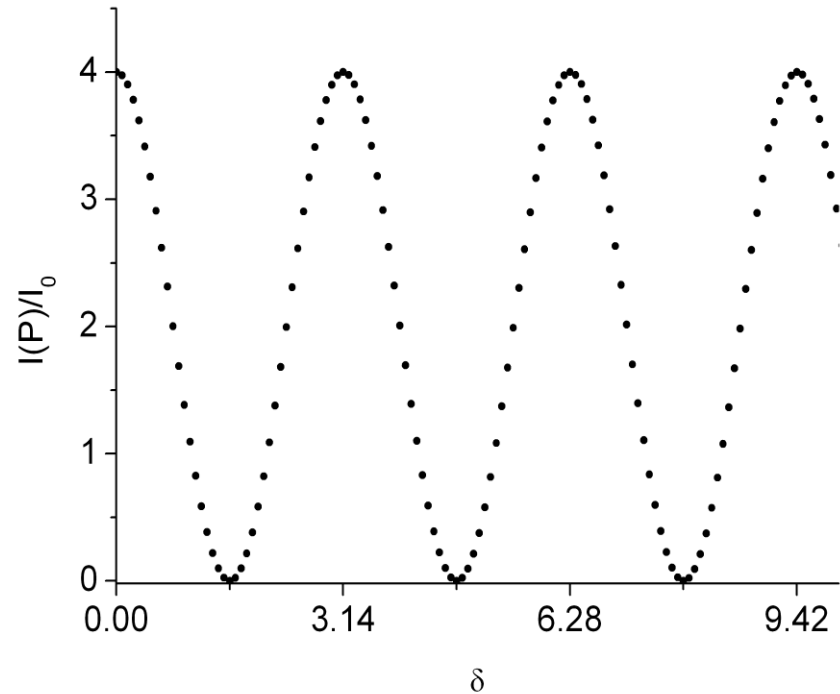
# Interferenza da 2 fenditure



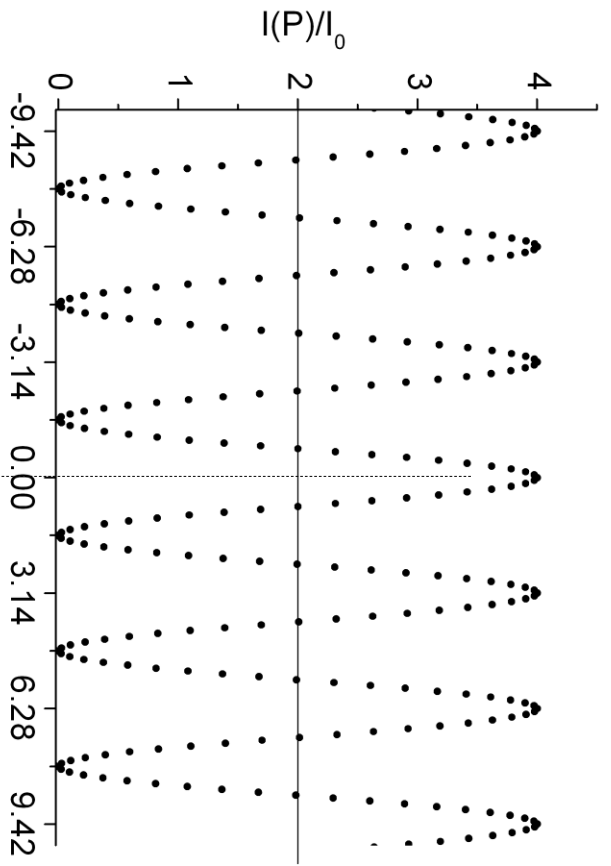
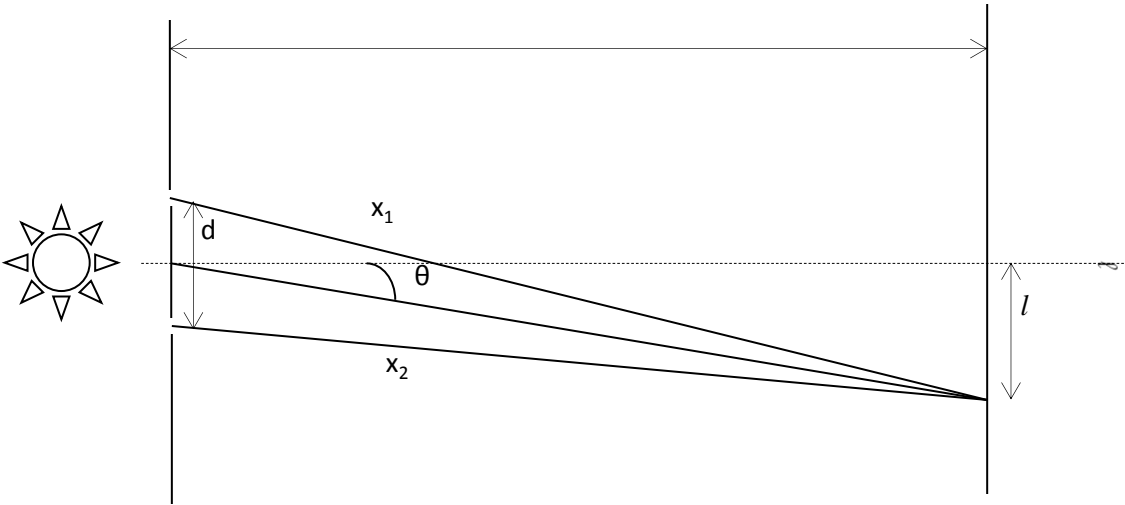
$$E_1(x, t) = E_{01} \cos(kx_1 - \omega t + \varphi_1)$$

$$E_2(x, t) = E_{02} \cos(kx_2 - \omega t + \varphi_2)$$

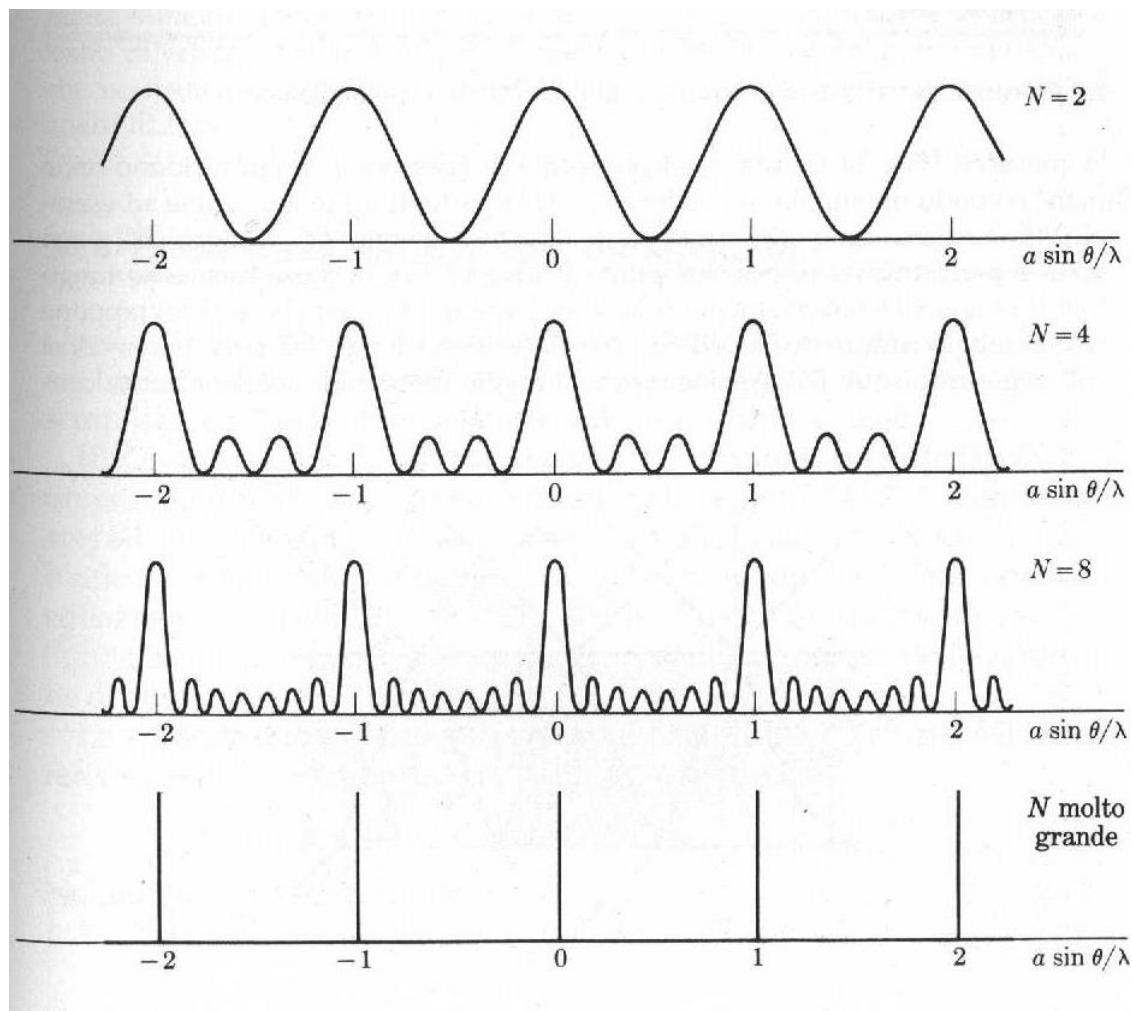
$$\delta = [k(x_2 - x_1) - (\varphi_2 - \varphi_1)]$$



$$I(P) = I_0 + I_0 + 2I_0 \cos \delta = 4 I_0 \cos^2 \left( \frac{\delta}{2} \right)$$

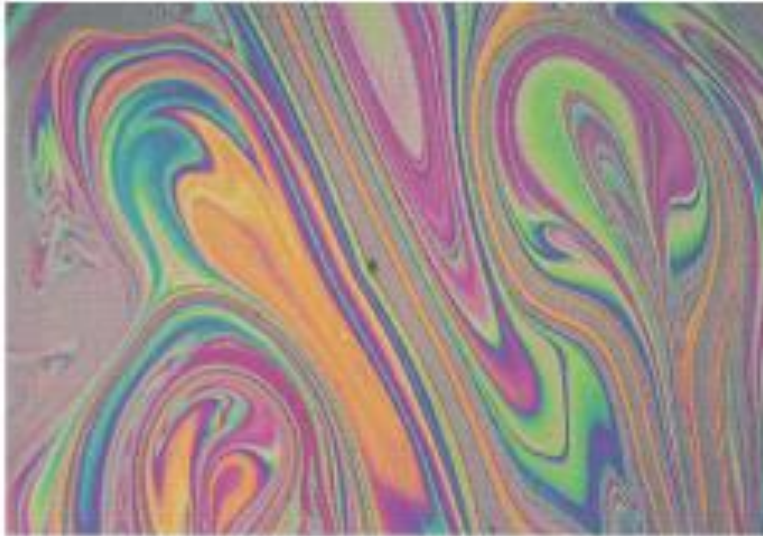


# Interferenza da N fenditure

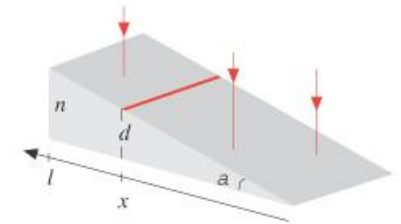
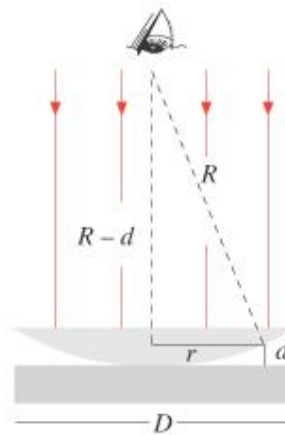


# Interferenza da film sottile

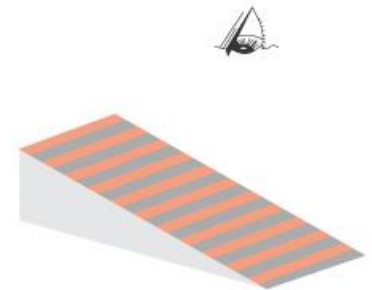
Olio/acqua



Interferenza da  
cuneo ( $\alpha < 10^{-3}$ )

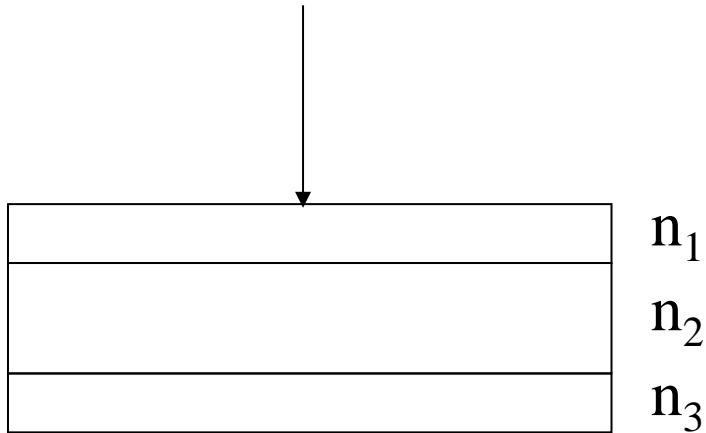


Anelli di Newton





# Film antiriflesso



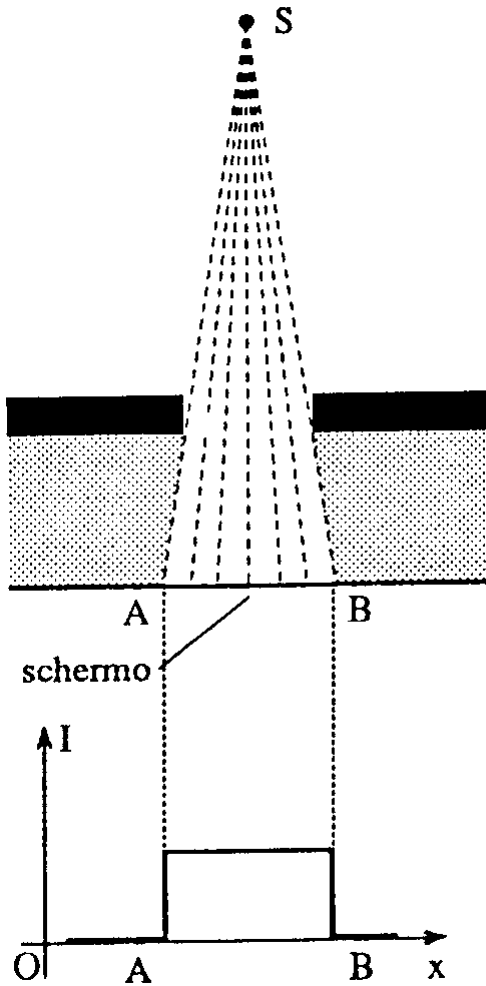
Interferenza costruttiva :

$$\frac{4\pi n_2 d}{\lambda} = 2m\pi \quad d = m \frac{\lambda}{2n_2} \quad m = 1, 2, \dots$$

Interferenza distruttiva :

$$\frac{4\pi n_2 d}{\lambda} = (2m + 1)\pi \quad d = (2m + 1) \frac{\lambda}{4n_2} \quad m = 0, 1, 2, \dots$$

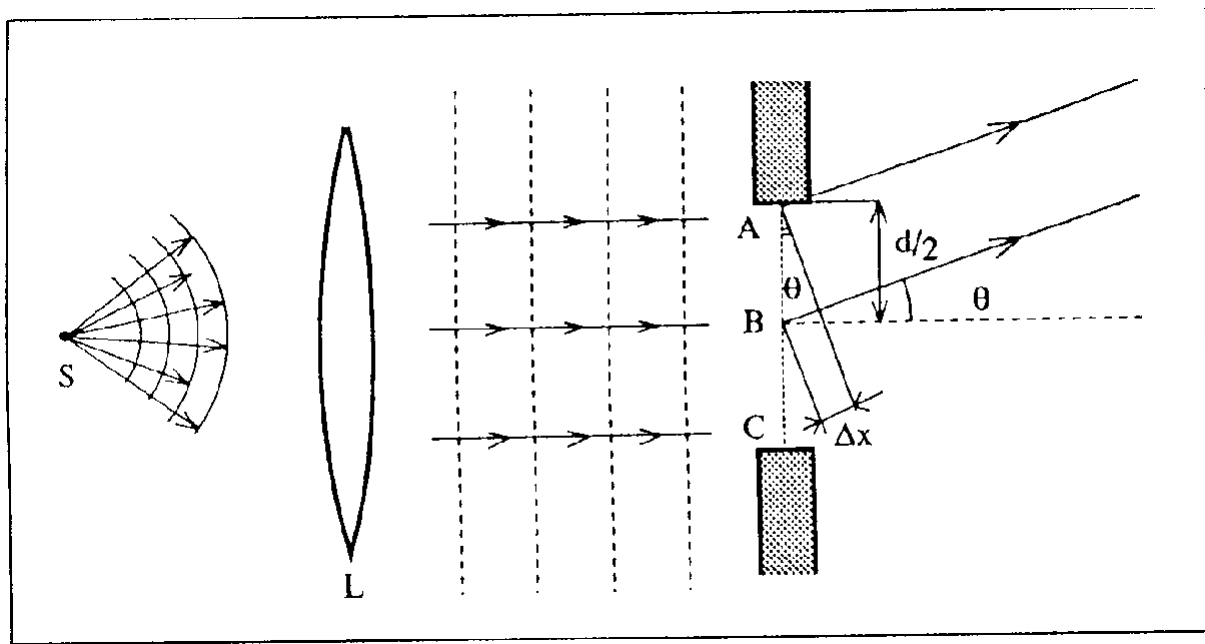
# Diffrazione

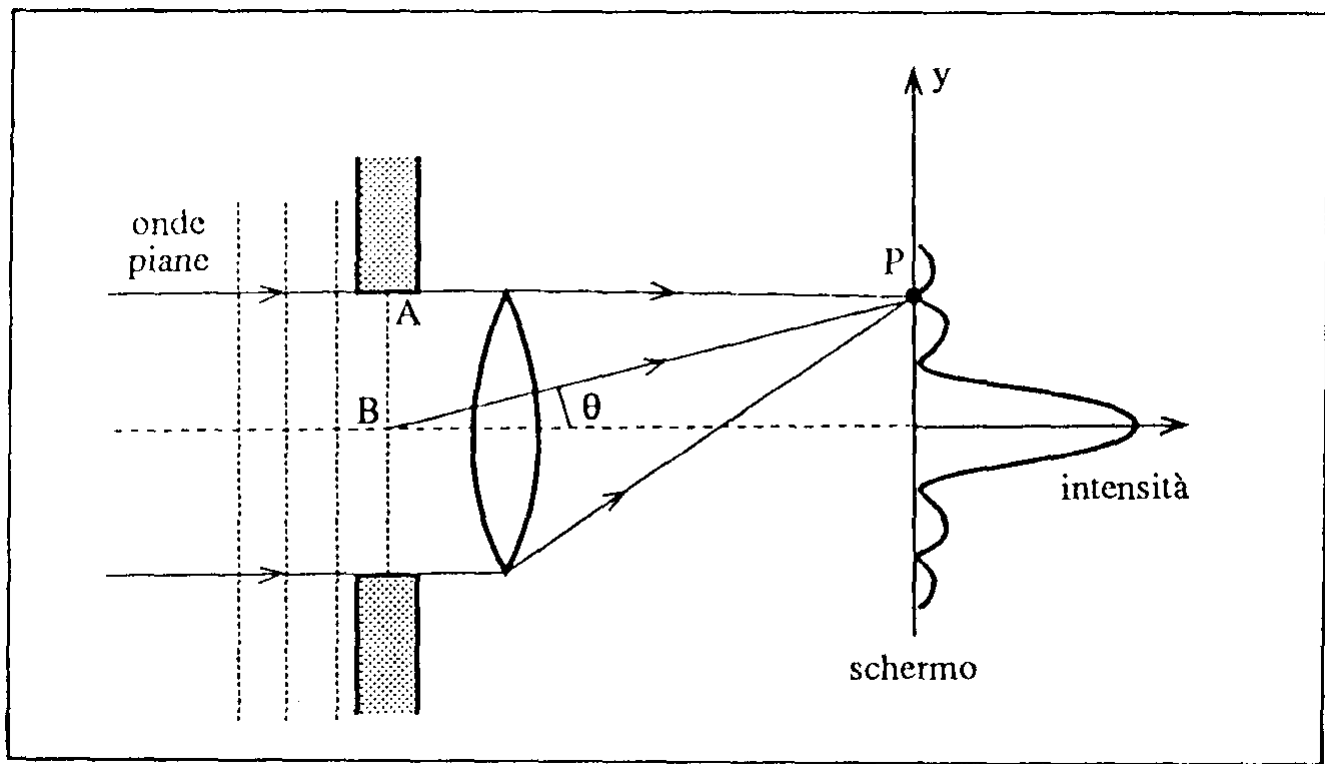


Caso di ottica geometrica:

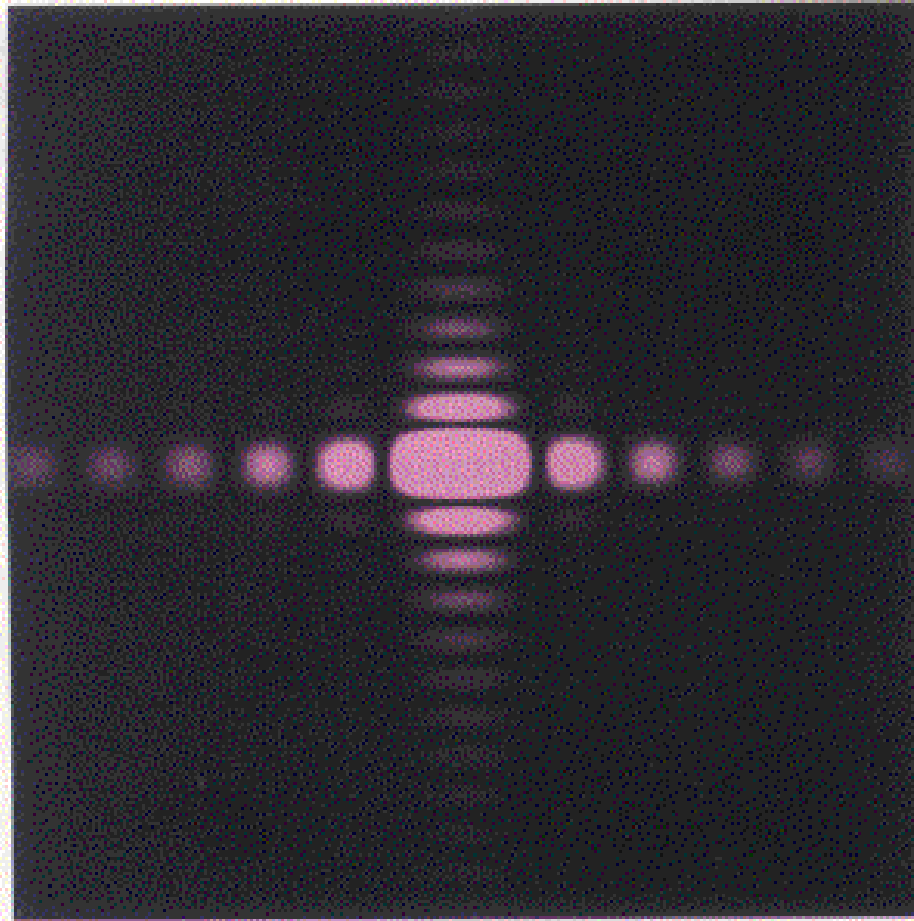
l'immagine “dietro” uno schermo ha i contorni netti

# Ostacolo con ottica “ondulatoria”





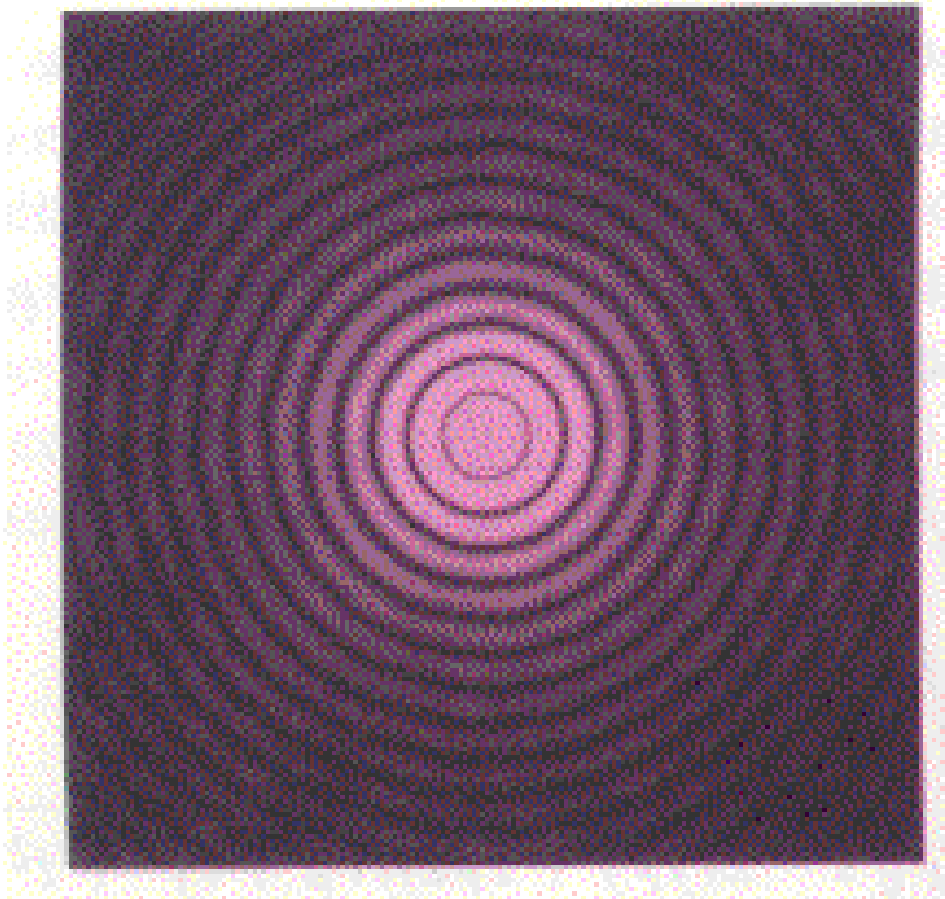
# Fenditura $b \times d$



$$\lambda \sim d$$

$$\lambda \sim b$$

# Fenditura circolare



# Interferenza (2 fenditure) + diffrazione

