

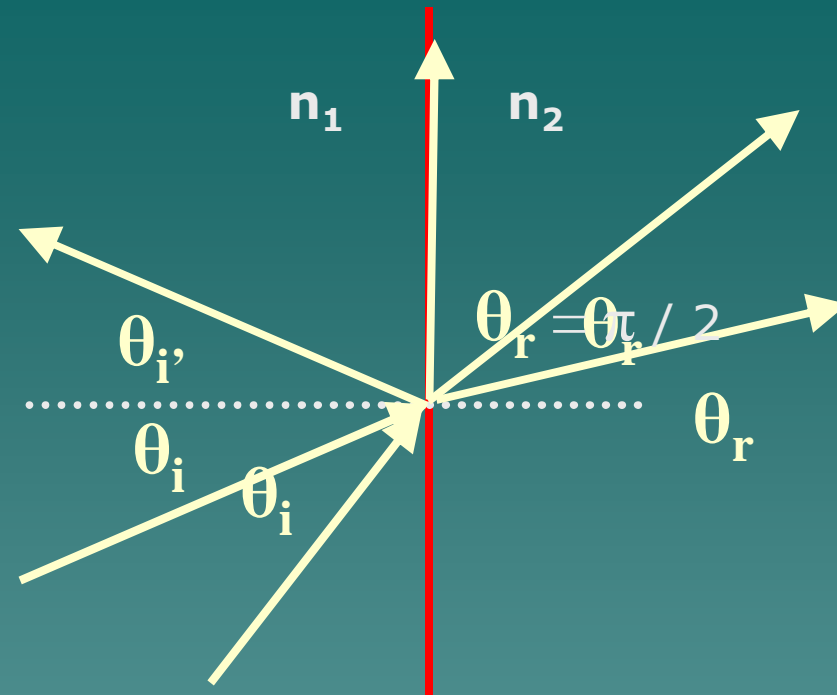
OTTICA GEOMETRICA

The image features a solid teal background. At the bottom, there is a silhouette of a mountain range in a slightly darker shade of teal. The title "OTTICA GEOMETRICA" is centered in the upper half of the image in a bold, red, sans-serif font.

Snell

$$\theta_i = \theta_i'$$

$$n_1 \sin\theta_i = n_2 \sin\theta_r$$

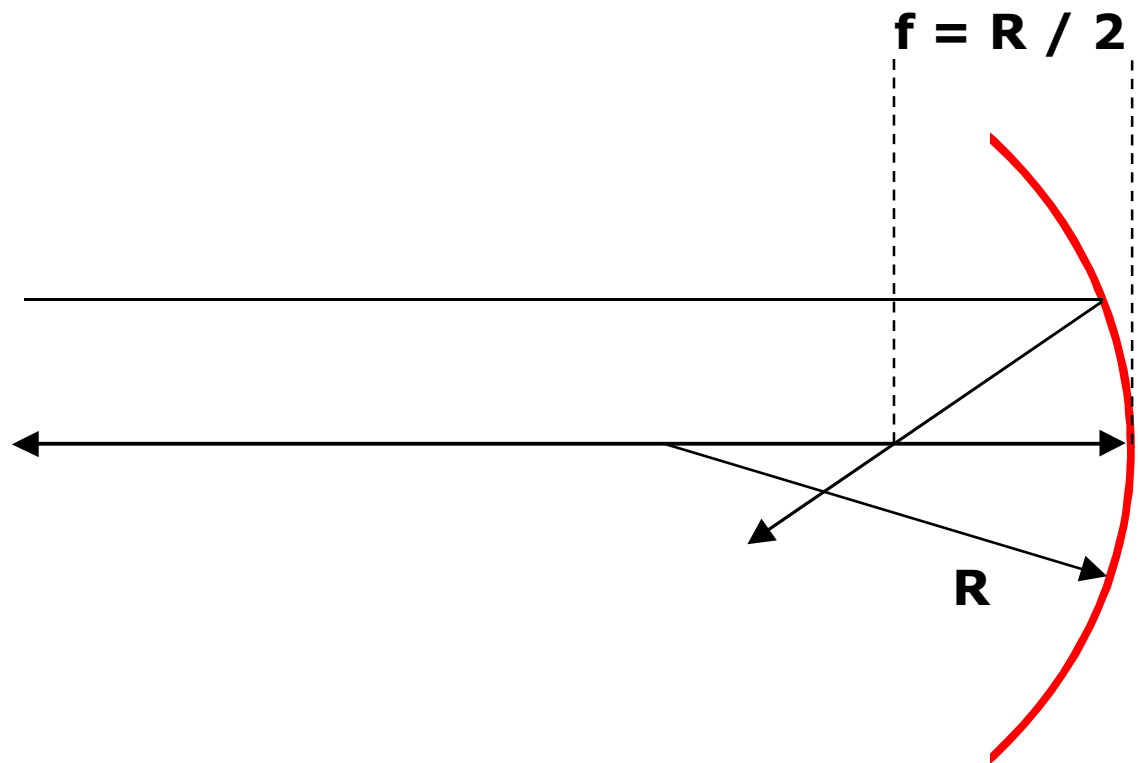


Indichiamo con $n_{12} = n_1 / n_2$ e supponiamo $n_{12} > 1$
 Quando $\sin\theta_i = 1 / n_{12} \Rightarrow \sin\theta_r = 1$ e $\theta_r = \pi / 2$
 Per valori maggiori di θ_i non si può avere onda rifratta.

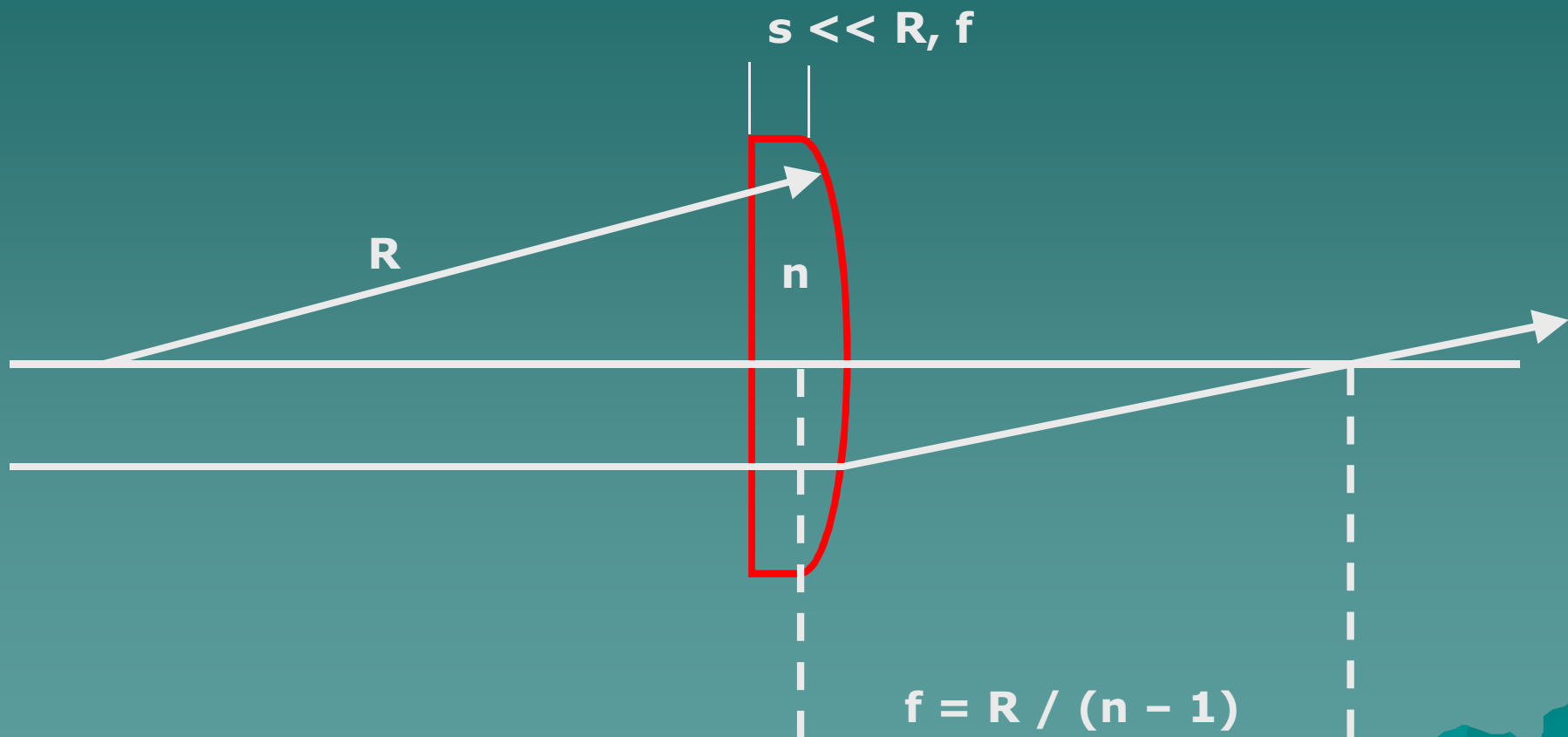
RIFLESSIONE TOTALE

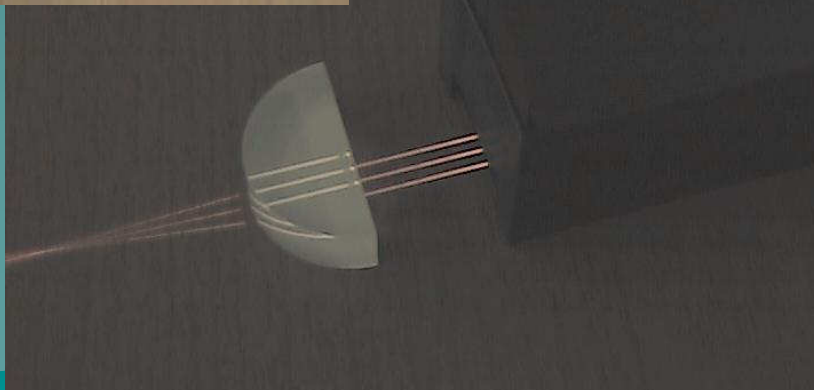
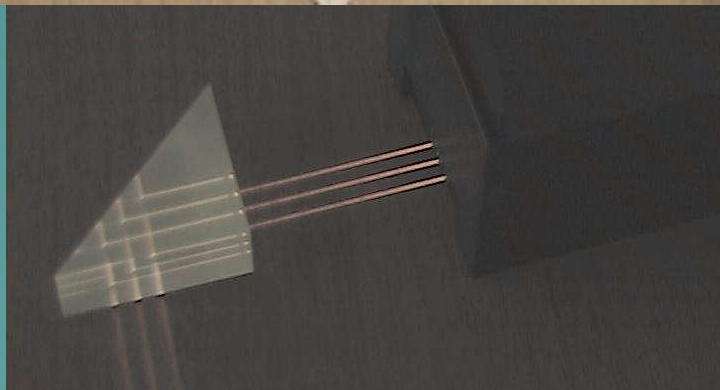
Il corrispondente angolo di incidenza si chiama angolo limite: $\sin\theta_l = 1 / n_{12}$

Specchi



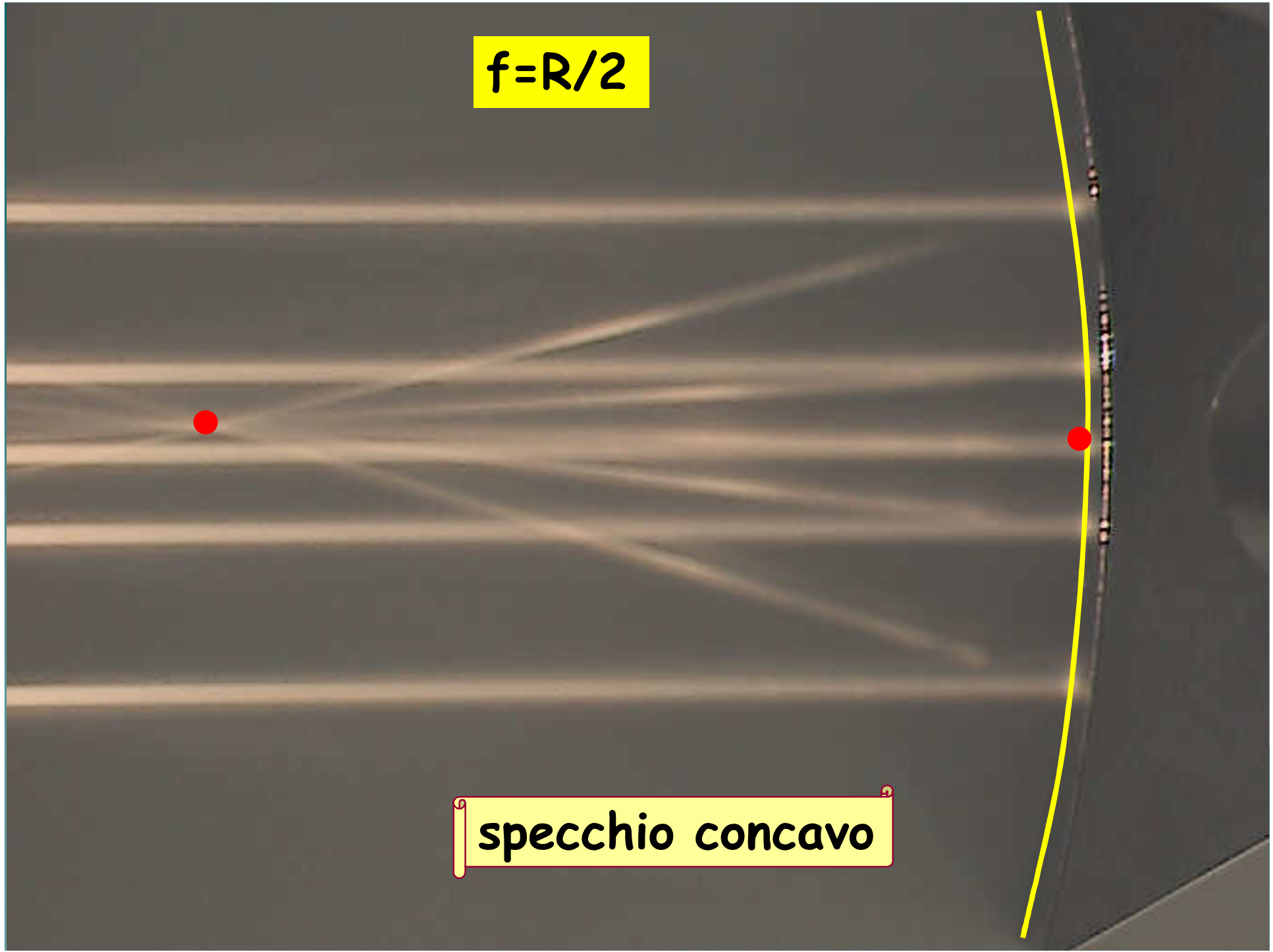
Lenti sottili in aria





$$f = R/2$$

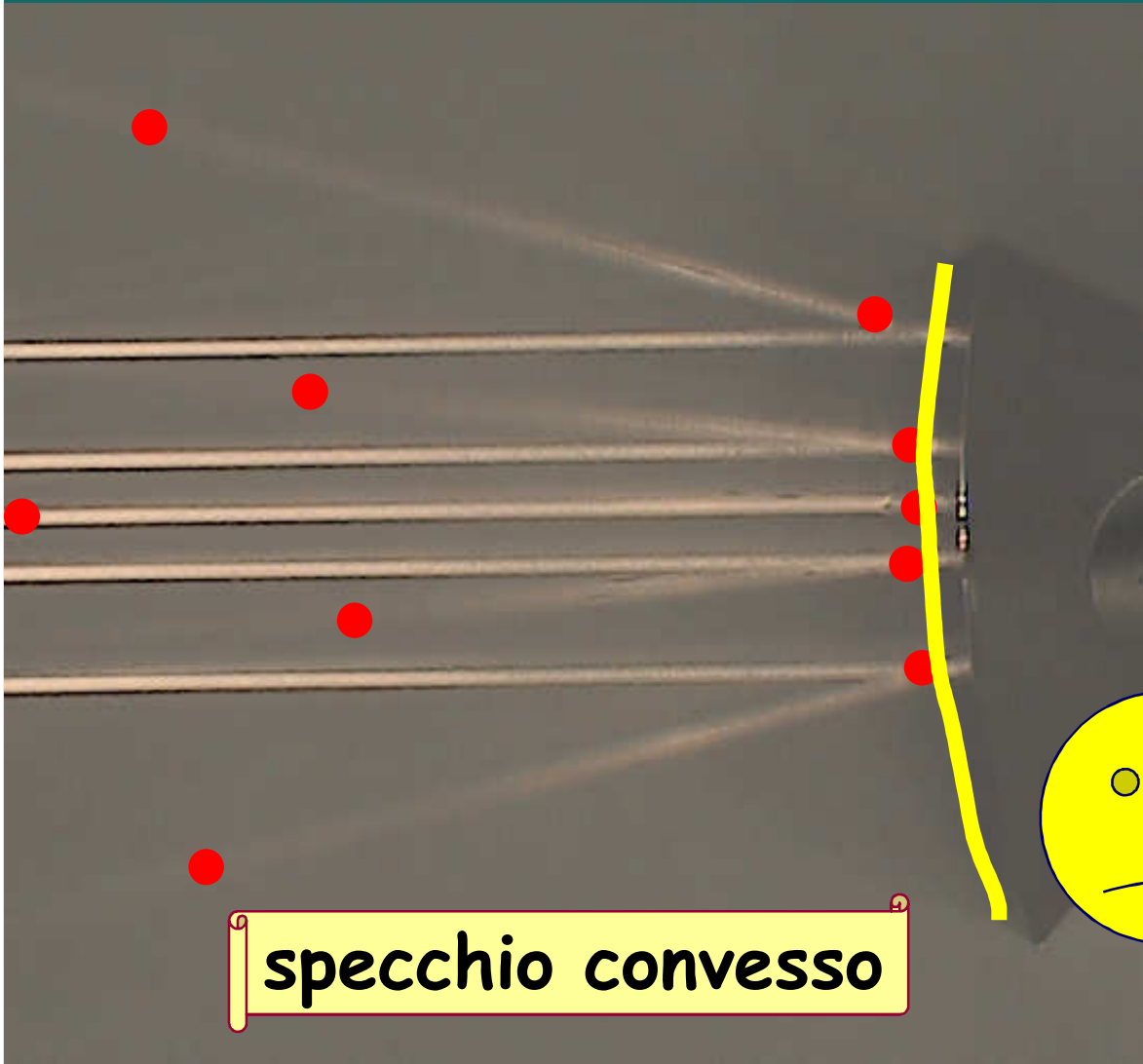
specchio concavo



$$f = R/2$$



specchio concavo

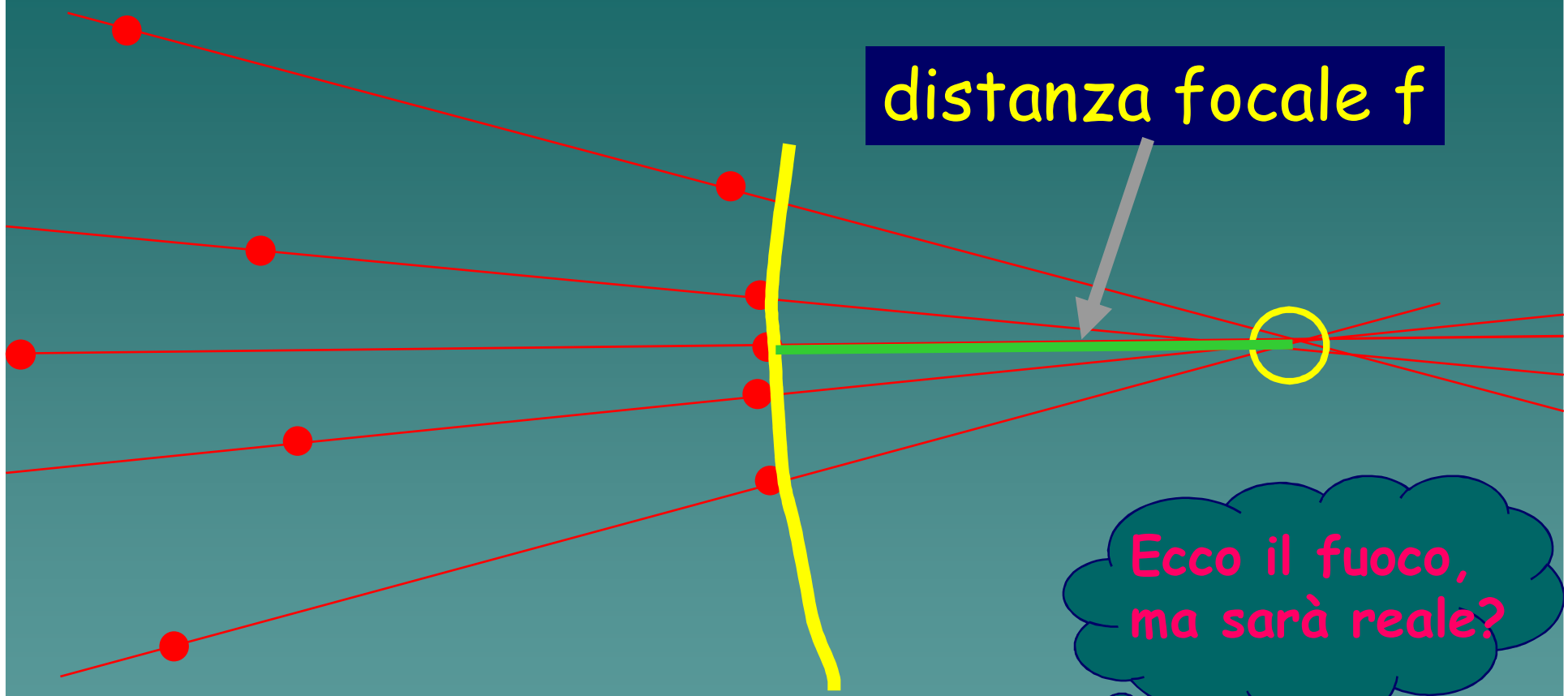


specchio convesso



Chissà dov'è
finito
il fuoco ...

distanza focale f



Ecco il fuoco,
ma sarà reale?



$f = R/2 ?$

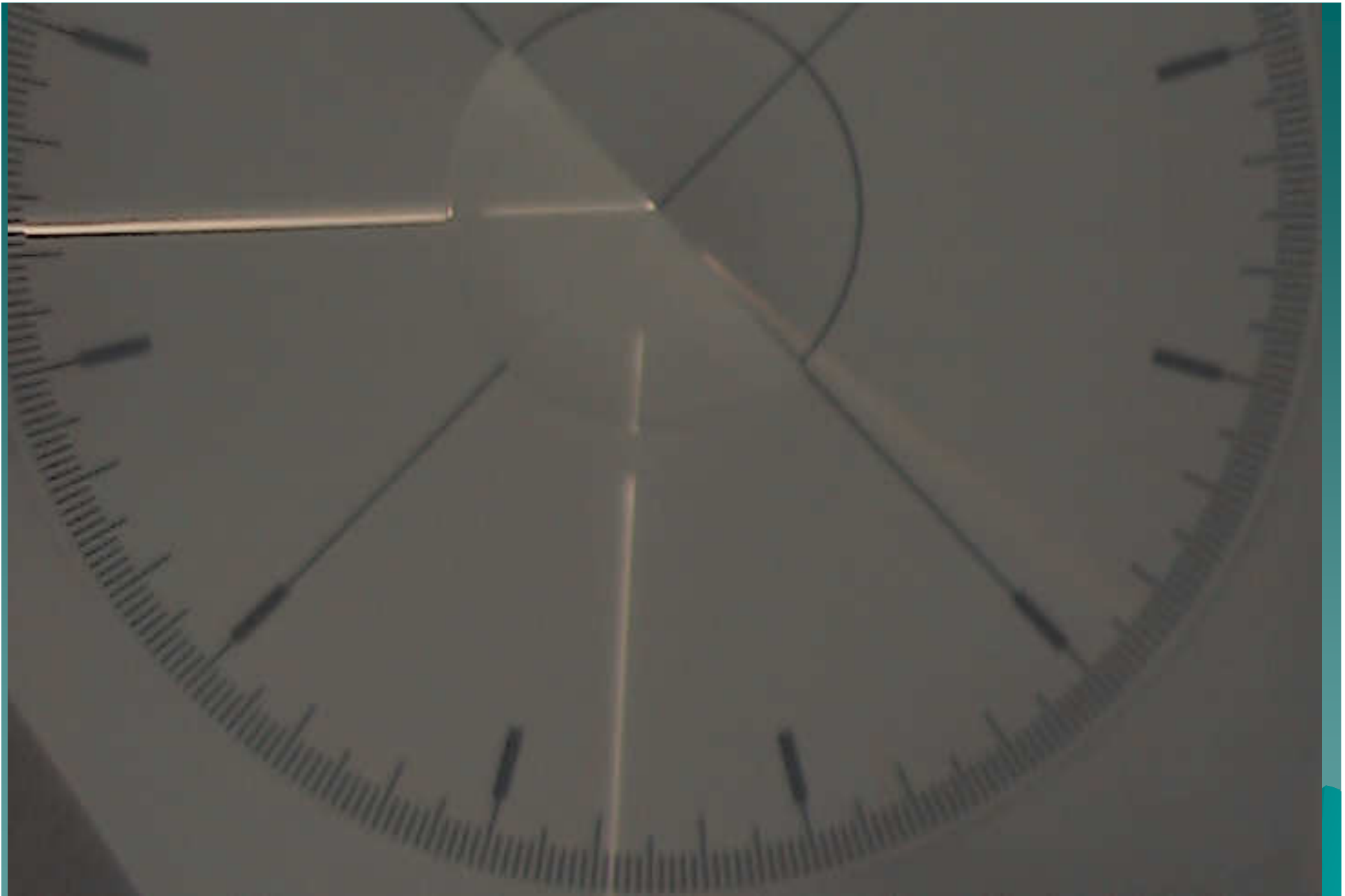
Rifrazione e angolo limite

il raggio deve passare per il centro del goniometro

il diottro deve essere allineato con il centro del goniometro





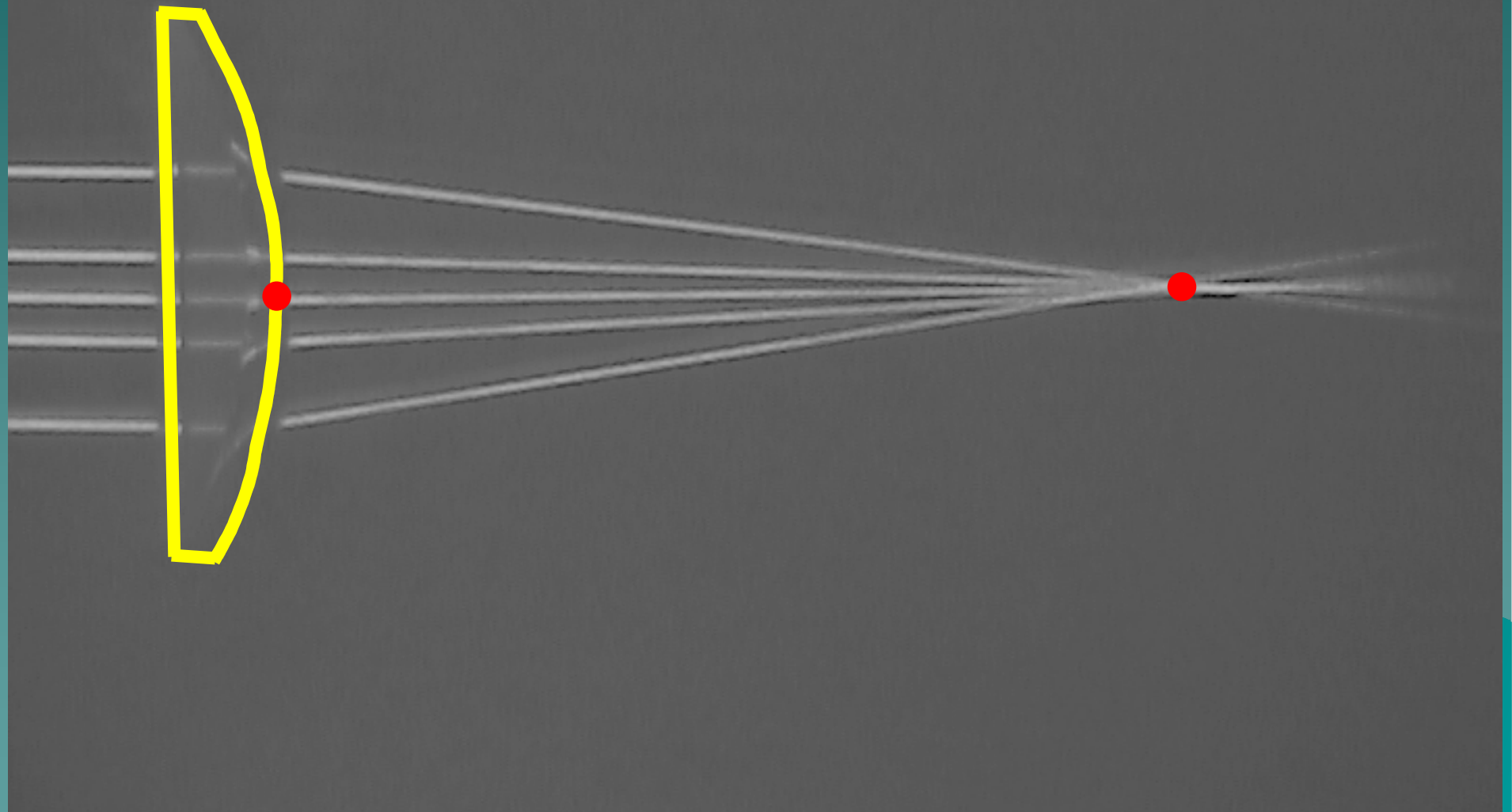


$$1/n_{12} = \sin \theta_1$$

È sparito il raggio rifratto ... che fine ha fatto la sua energia ?



lente sottile convergente



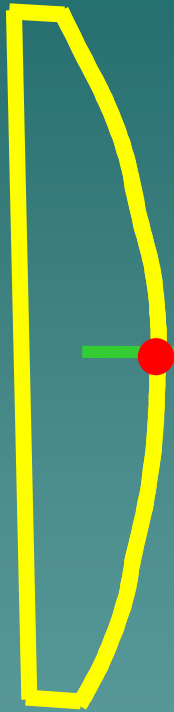
$$R_1 = \infty$$

$$R_2 = ?$$

$$R_1 = \infty$$

$$R_2 = -f(n-1) < 0$$

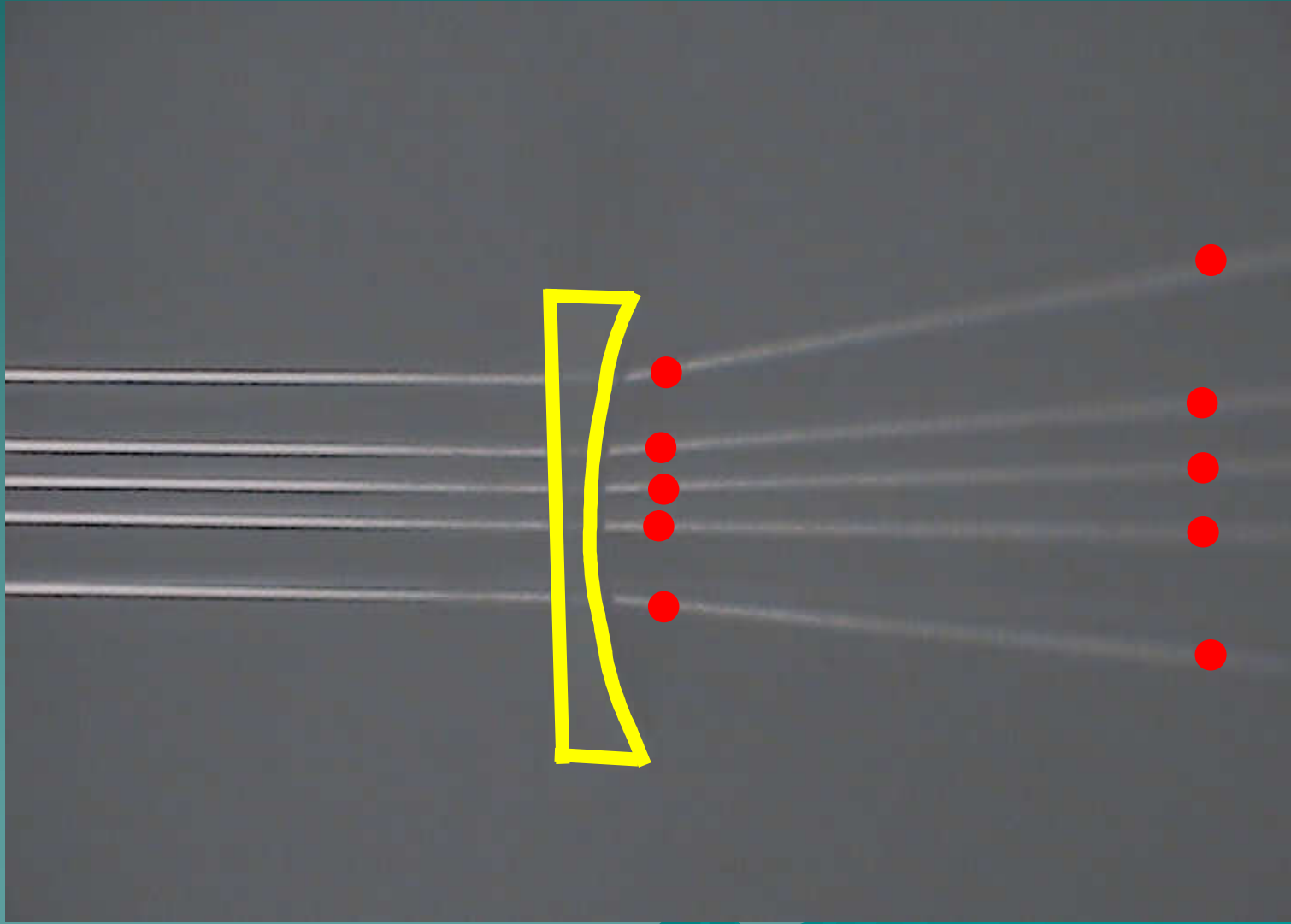
$$f > 0$$



lente sottile convergente

$$\frac{1}{f} = (n-1) \left(\frac{1}{R_1} - \frac{1}{R_2} \right) ?$$

lente sottile divergente



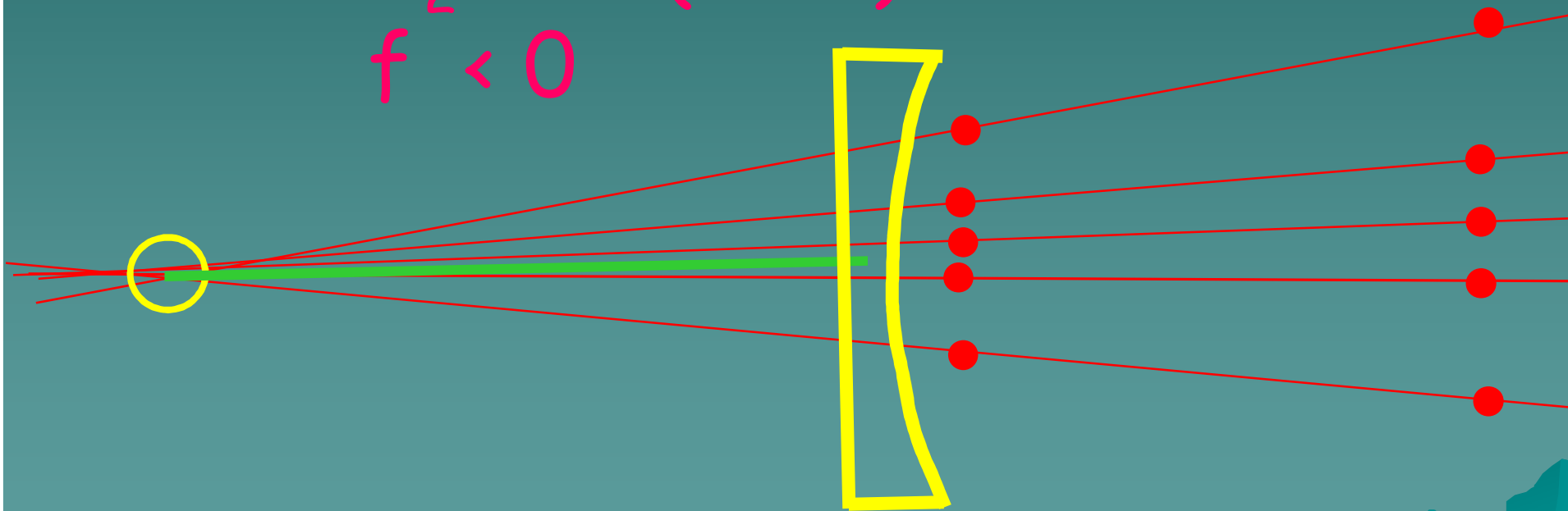
$$R_1 = \infty$$
$$R_2 = ?$$

$$\frac{1}{f} = (n - 1) \left(\frac{1}{R_1} - \frac{1}{R_2} \right) ?$$

$$R_1 = \infty$$

$$R_2 = -f (n - 1) > 0$$

$$f < 0$$



lente sottile divergente



$$\frac{1}{f} = (n - 1) \left(\frac{1}{R_1} - \frac{1}{R_2} \right) ?$$





$$R_1 = \infty$$

$$R_2 = \infty$$

$$f = \infty$$



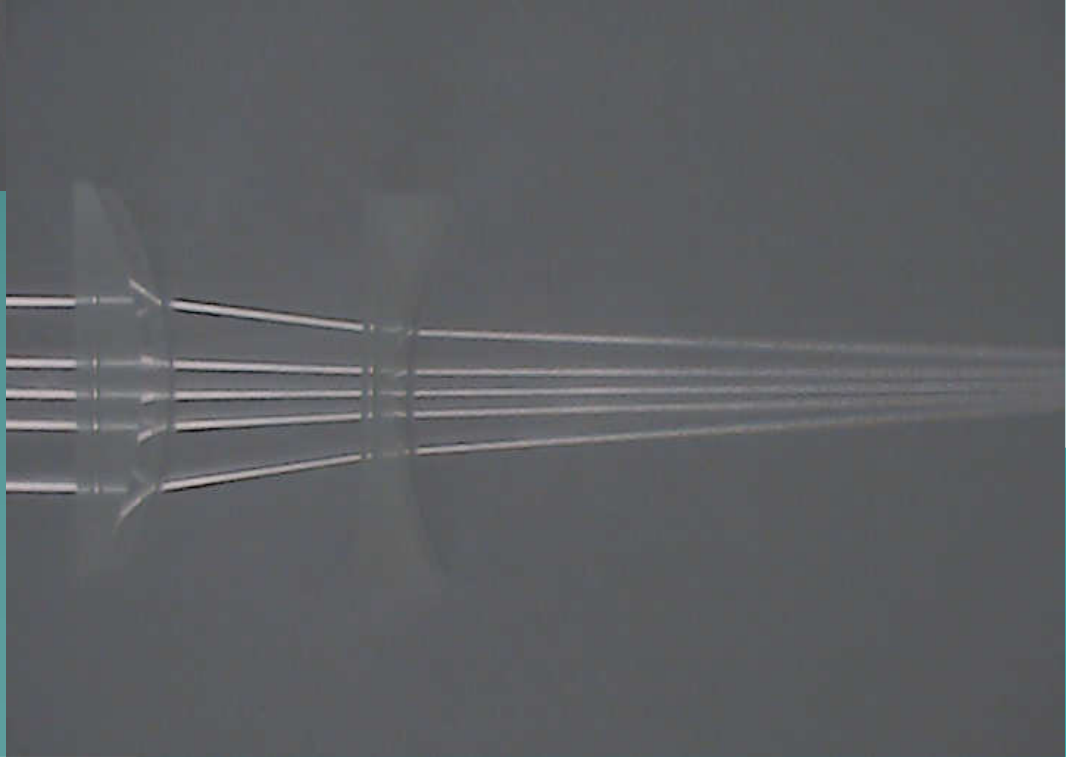
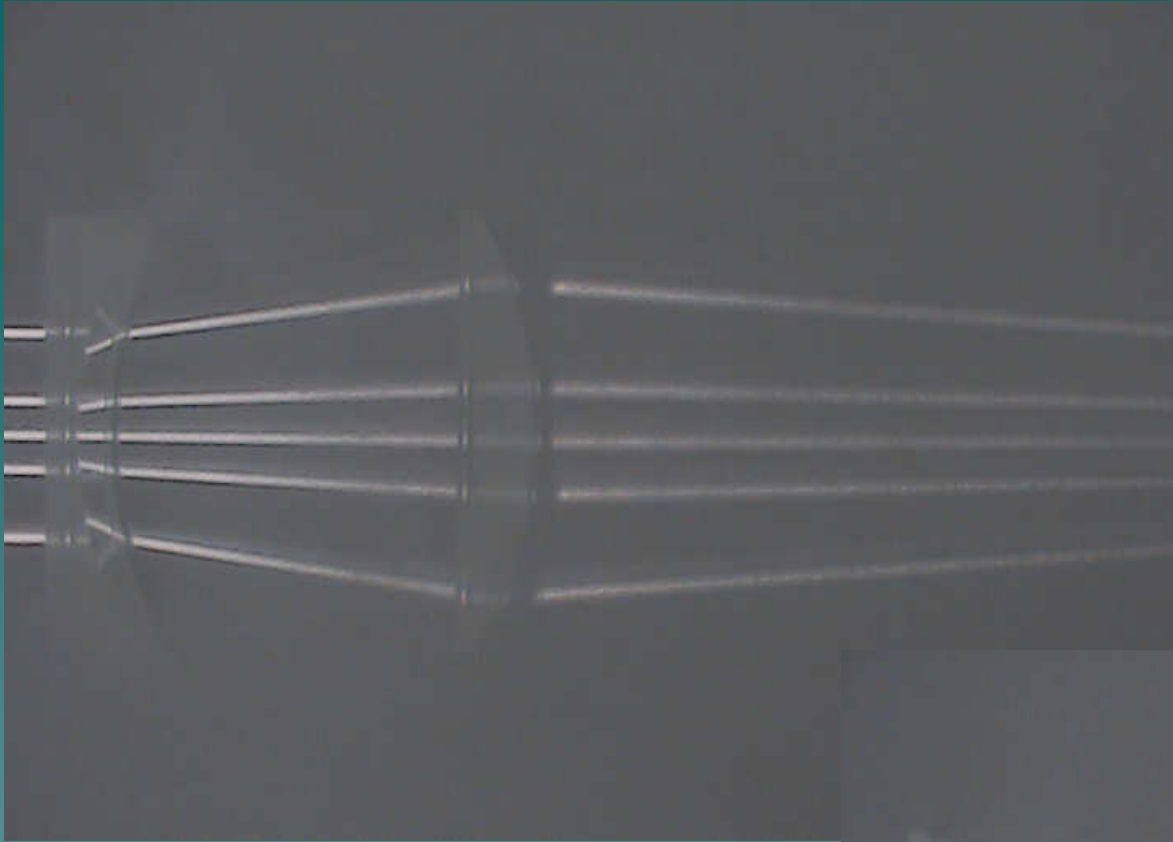
?



$$R_1 = R_2$$

$$f = \infty$$







**Cosa succede all'immagine se
si copre parte di una lente
(o di uno specchio)?**

