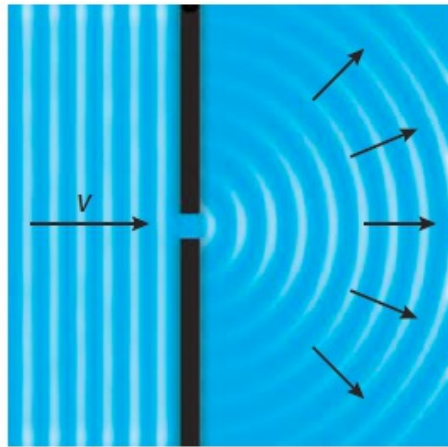
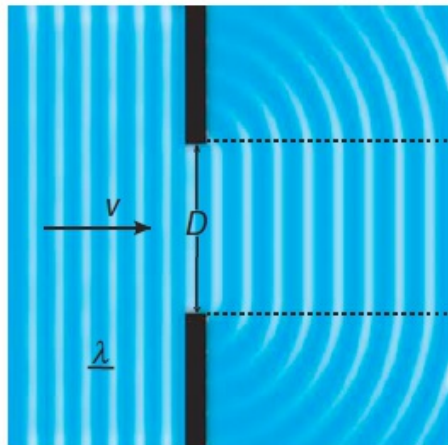


Interferens

Bøying



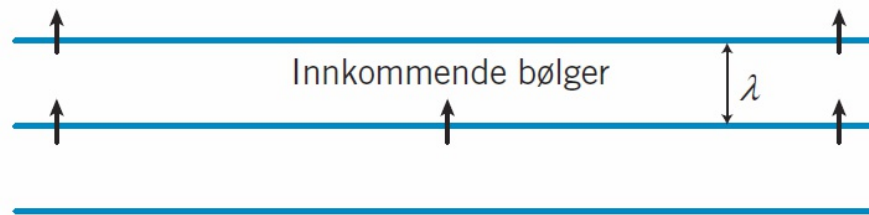
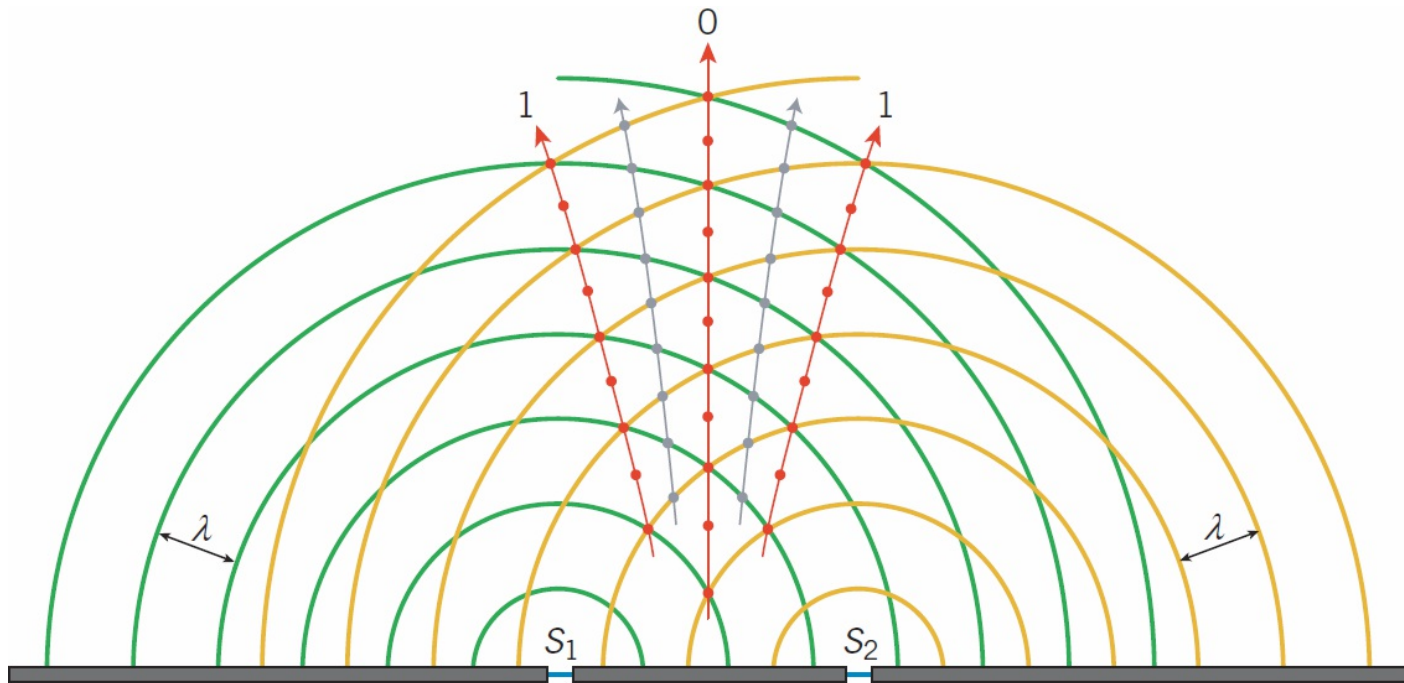
$$D < \lambda$$



$$D > \lambda$$

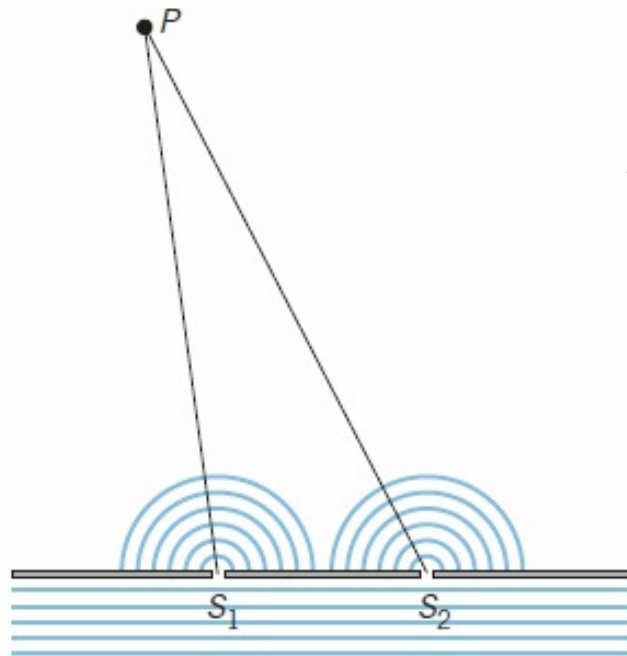
Overlagring





http://www.youtube.com/watch?v=J_xd9hUZ2AY&feature

=related



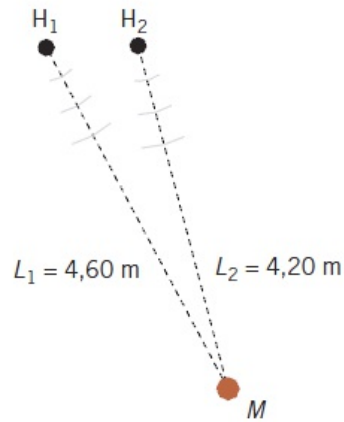
Konstruktiv interferens dersom

$$S_1P - S_2P = n\lambda \quad n = 0, \pm 1, \pm 2, \dots$$

Destruktiv interferens dersom

$$S_1P - S_2P = \left(n + \frac{1}{2}\right)\lambda$$

EKSEMPEL 9.2



Vi sender lydbølger som svinger i takt fra to høyttalere, begge med frekvensen 425 Hz, mot en student som er i punktet M . Studenten har der avstandene 4,20 m og 4,60 m til de to høyttalerne. Lydfarten i luft er 340 m/s. Vis at studenten hører et lydminimum i M .

Løsning:

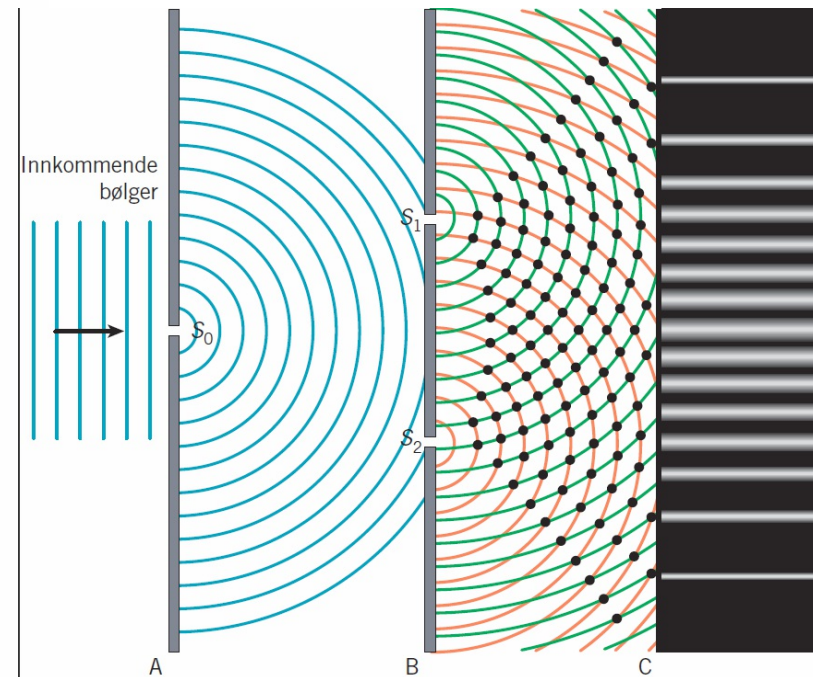
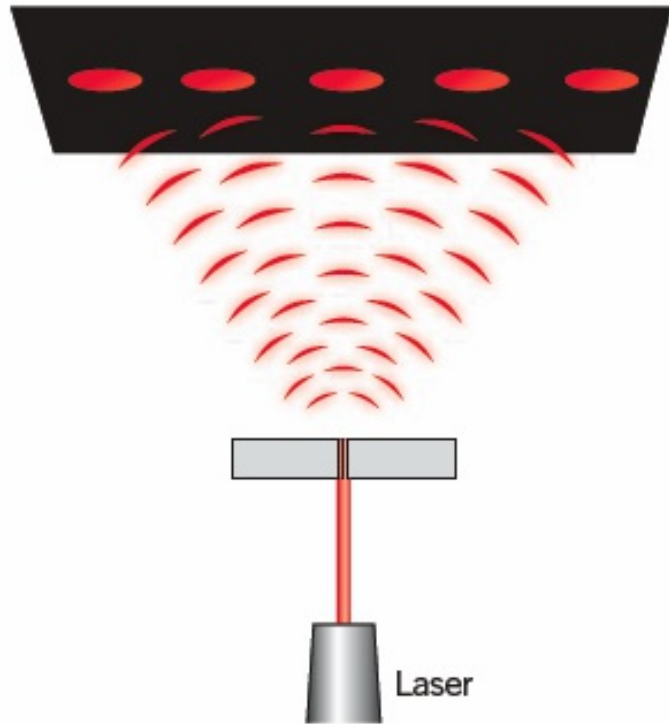
$$\Delta L = L_1 - L_2 = 4,60 \text{ m} - 4,20 \text{ m} = 0,40 \text{ m}$$

$$v = f \lambda \quad \lambda = \frac{v}{f} = \frac{340 \text{ m/s}}{425 \text{ Hz}} = 0,80 \text{ m}$$

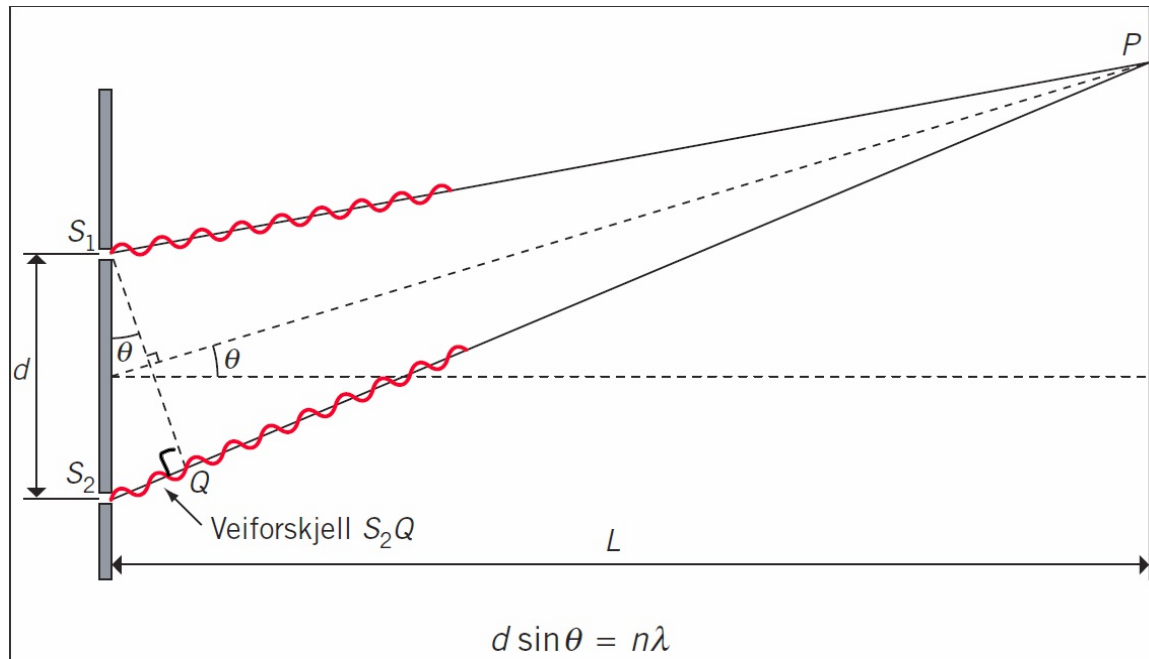
$$\Delta L = \left(n + \frac{1}{2} \right) \lambda$$

↑
0

Interferens med lys og Youngs dobbeltspalteforsøk: Beviste at lys er bølger (1803)



Interferensformelen



$$\frac{S_2Q}{d} = \sin \theta$$

Konstruktiv int.

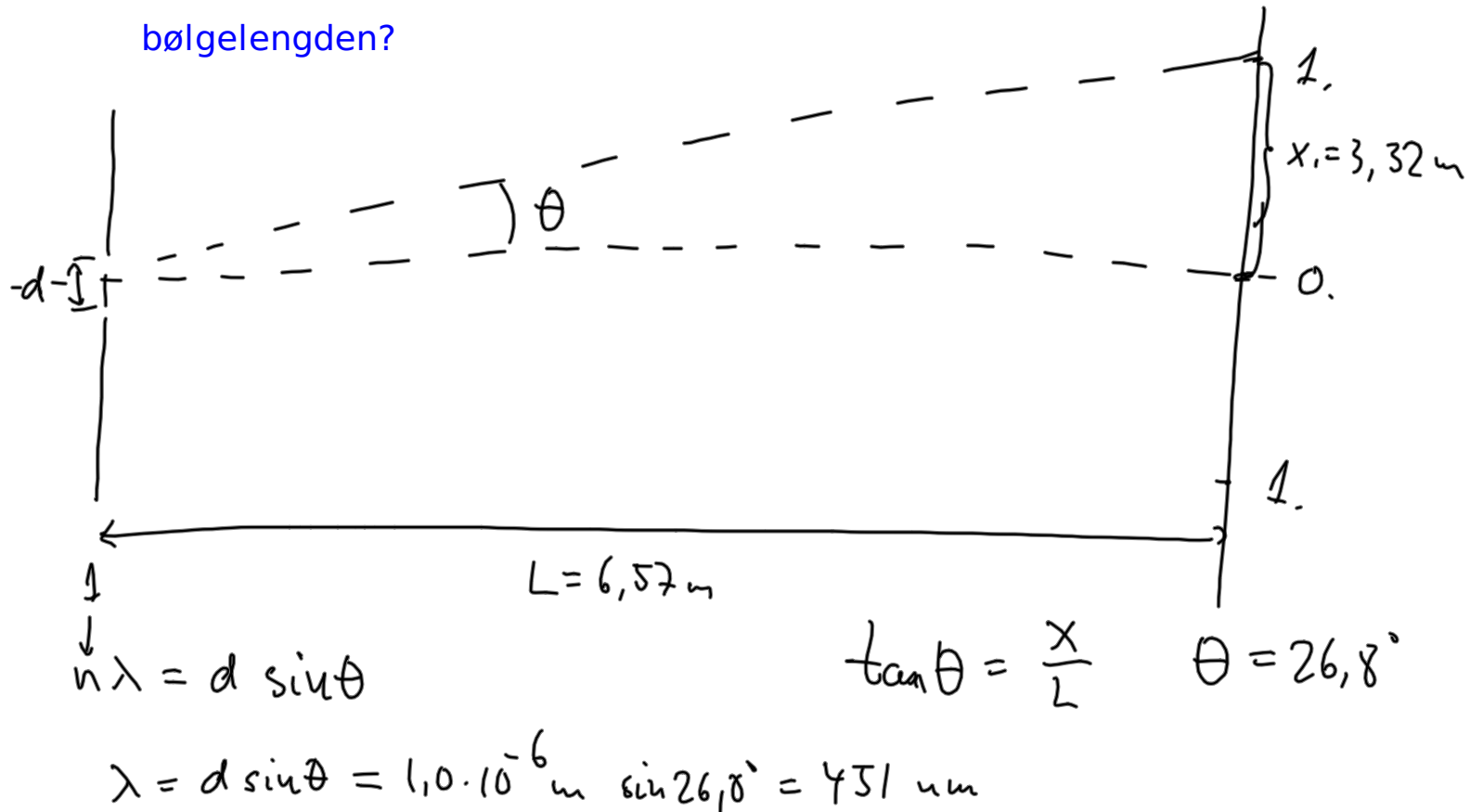
$$S_2Q = n \lambda$$

$$\frac{n \lambda}{d} = \sin \theta$$

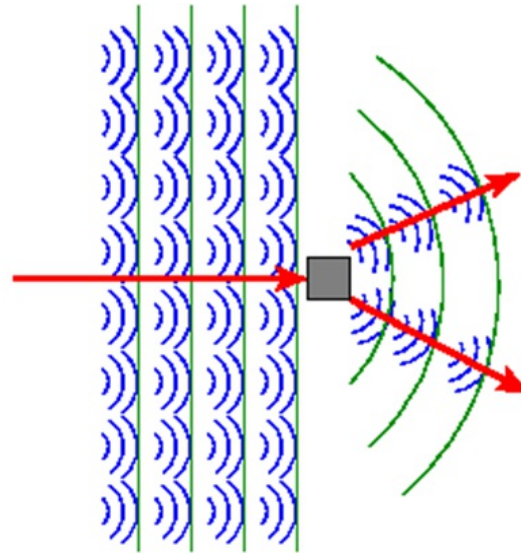
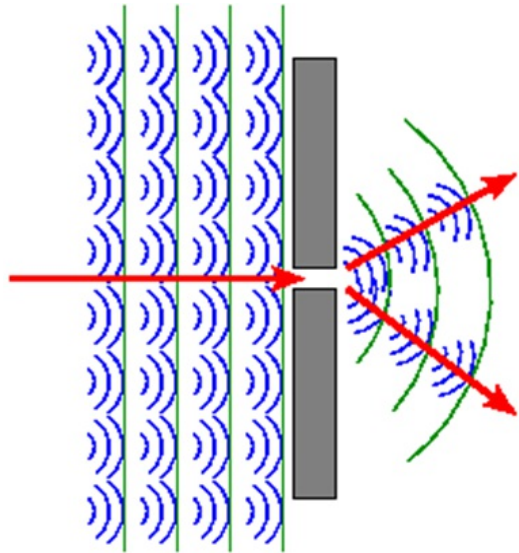
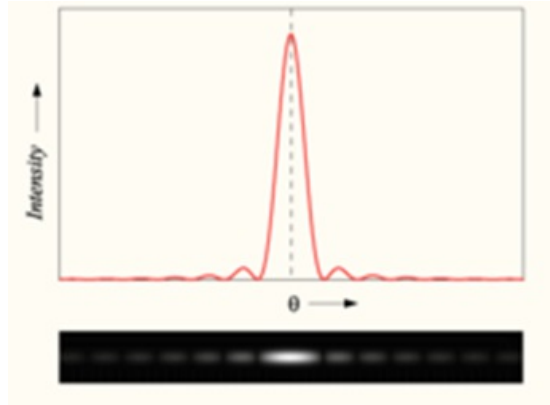
$$n \lambda = d \sin \theta$$

Eksempel: spalteavstanden er $d = 1,0 \cdot 10^{-6}$ m. På en skjærme i avstanden $L = 6,57$ m observerer vi første maksimum til siden for midten i avstanden $x = 3,32$ m fra det sentrale maksimum. Hva er bølgelengden?

bølgelengden?



Hvor tykt hår har du egentlig? Diffraksjon i en enkelt spalte



Interferensgitter: mange spalter

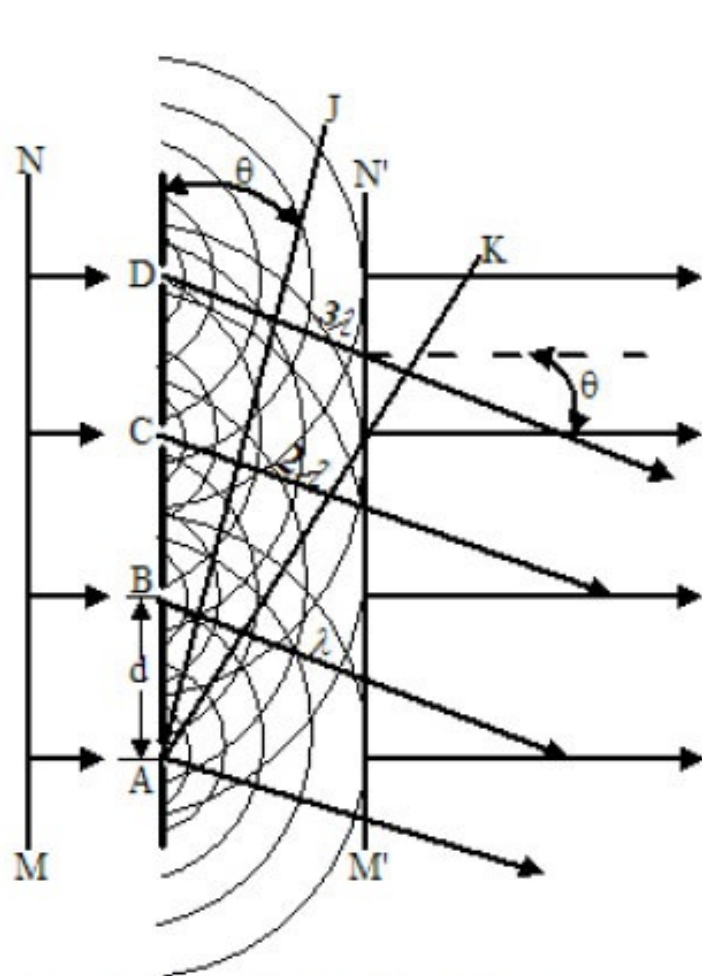
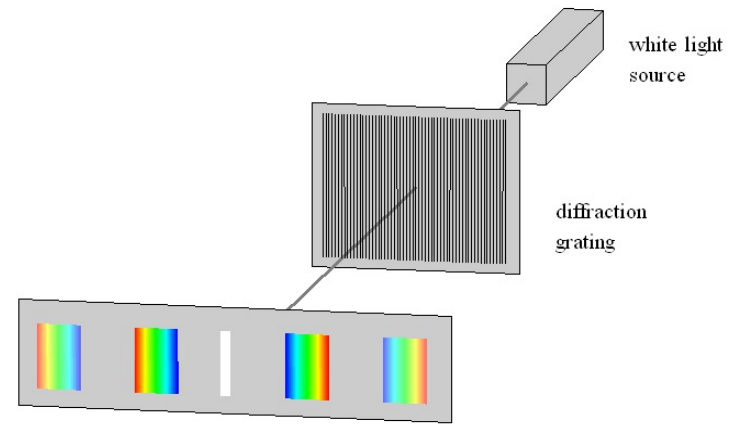


Fig. 2. Theory of the diffraction grating.



$d \sin \theta = n \lambda$ for maks
 ↑
 gitter konstant

