

# Kap 21 Elektrisk ladning og elektrisk felt

Coulombs lov

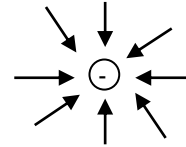
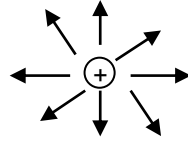
$$F = \frac{1}{4\pi\epsilon_0} \frac{Qq}{r^2}$$

Elektrisk felt

$$E = \frac{F}{q} = \frac{1}{4\pi\epsilon_0} \frac{Q}{r^2}$$

$$\vec{E} = \frac{\vec{F}}{q}$$

Elektrisk kraft mellom punktformede / kuleformede ladninger



Permeabilitet for vakuum

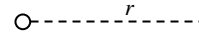
$$\epsilon_0 = 8.854 \cdot 10^{-12} \frac{C^2}{Nm^2}$$

Konstanten i Coulombs lov

$$k = \frac{1}{4\pi\epsilon_0} = 8.988 \cdot 10^9 \frac{Nm^2}{C^2}$$

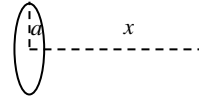
Punktladning

$$E = \frac{1}{4\pi\epsilon_0} \frac{Q}{r^2}$$



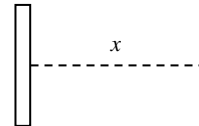
Ringladning

$$E = \frac{Qx}{4\pi\epsilon_0(x^2 + a^2)^{3/2}}$$



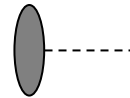
Lang uniformt ladet stav

$$E = \frac{\lambda}{2\pi\epsilon_0 x}$$



Stor uniformt ladet skive

$$E = \frac{\sigma}{2\epsilon_0}$$



Kraftmoment for en elektrisk dipol

$$\vec{\tau} = \vec{p} \times \vec{E}$$

$$p = qd$$

Potensiell energi i dipol

$$U = -\vec{p} \cdot \vec{E}$$

