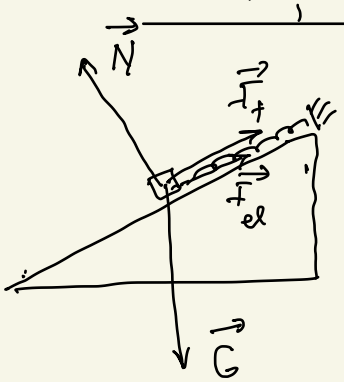
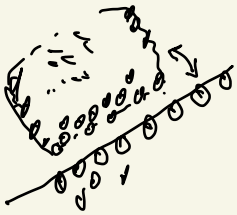
INTERACȚIUNI FUNDAMENTALE ÎN NATURĂ

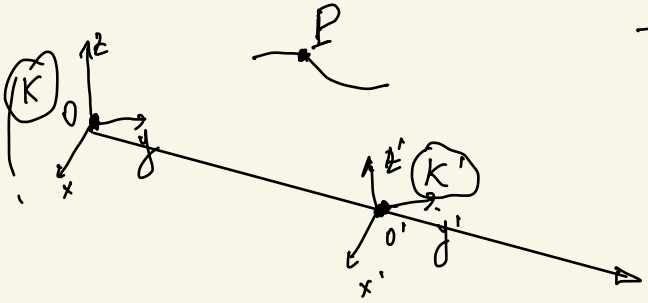


4 interacț. fundamentale

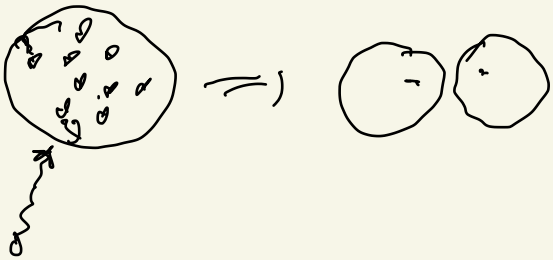
- interacțiunea gravitațională ←
- interacțiunea electromagnetică
- interacțiunea tare (nucleară) ←
- interacțiunea slabă ←



$$|\vec{F}_G| = G\frac{Mm}{r^2} \qquad G = 6{,}67 \cdot 10^{-11}\ \frac{m^2 N}{kg^2}$$



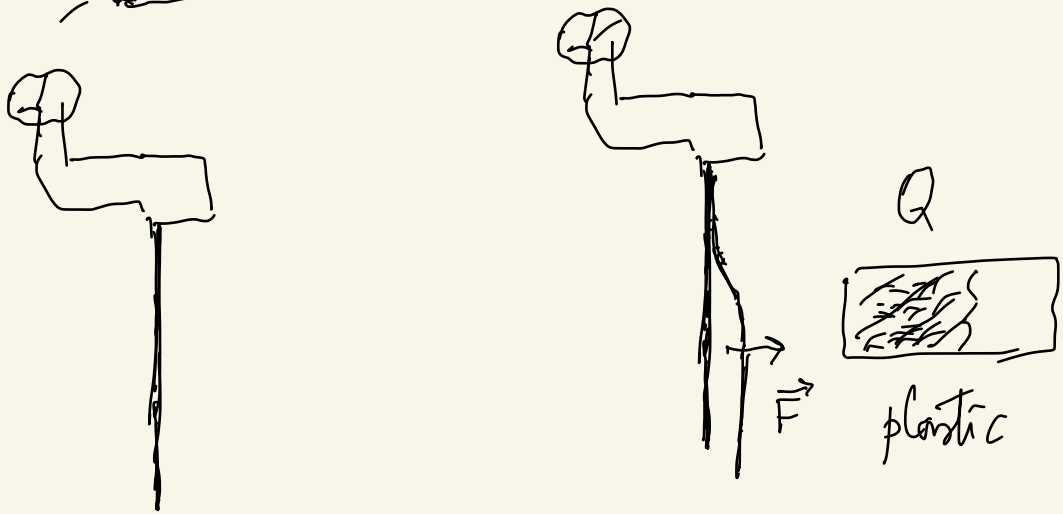
$$\vec{v}_{P-K} = \vec{v}_{P-K'} + \vec{v}_{K'-P}$$



1939
Lise Meitner

INTERACTIUNEA ELECTROMAGNETICĂ.

Electrostatica



Sarcina electrică

$q, Q, q_0, Q_1, q_0, 2, 1/2 \ldots$

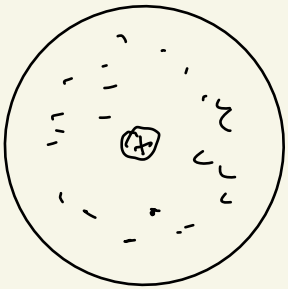
$(Q)_{SI} = C$ (Coulomb)

Charles August de Coulomb.

Proprietăți

1) Sarcina este de două feluri < pozitivă / negativă

$$\frac{m_p}{m_e} = \frac{1,67 \cdot 10^{-27}}{9,1 \cdot 10^{-31}} \simeq 1836$$



$p^+ \rightarrow e$

$e^- \rightarrow -e$

$e = 1{,}6 \cdot 10^{-19}\ C$

$R = 8{,}31 \frac{J}{mol \cdot K}$, $pV = \nu RT$

$k_B = 1{,}38 \cdot 10^{-23} \frac{J}{K}$ Boltzmann.

$c = 3 \cdot 10^8 \frac{m}{s}$.

$g = 9{,}8 \frac{m}{s^2}$

$v_{sunet} \simeq 340 \frac{m}{s}$.

$G = 6{,}67 \cdot 10^{-11}$ $\quad F = G \frac{Mm}{r^2}$

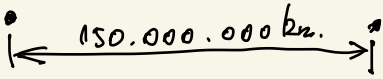
$\rho_{apa} = 10^3\ kg/m^3$

$e = 1{,}6 \cdot 10^{-19}\ C$

$\rho_{aer} = 1{,}3\ kg/m^3$, $p_0 = 1 atm$, $t_0 = 0^\circ C$

$R_P \simeq 6400\ km$.

$R_S \simeq 1.400.000\ km$.



$p_0 = 1 atm \simeq 10^5 \frac{N}{m^2}$ $\left(= 101325 \frac{N}{m^2}\right)$

2) Sarcina electrică este o mărime cuantificată

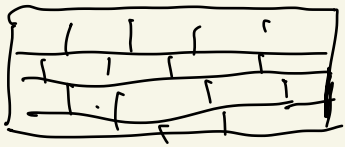
$$Q = ne, \quad n \in \mathbb{Z}$$

$e, 2e, -4e, \ldots,$ ~~$4{,}7e$~~ ×

$v \approx 600 \frac{km}{h}$

$v \in [0, 600] \frac{km}{h}$

$\sqrt{2}, \pi \frac{km}{h}$



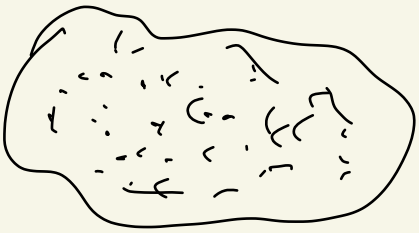
1000 cărămizi.

867

541

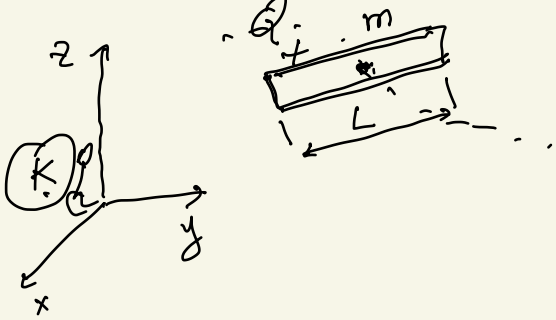
~~540,5~~

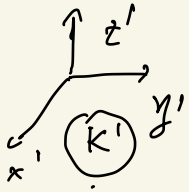
3) Sarcina totală a unui sistem izolat se conservă

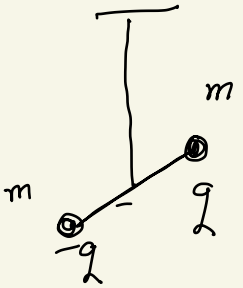


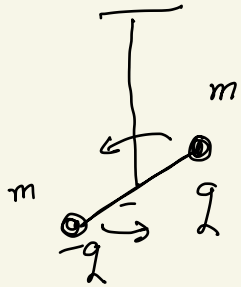
$Q_{net} = const.$

4) Sarcina electrică este o mărime relativ invariantă









m
q

m > m

q