

Departamento de Física
.UBAexactas



Física 3
V-2022
Parte 01

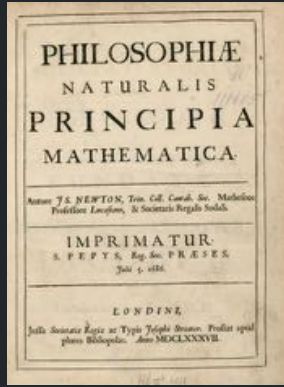


Movimiento de los planetas en el cielo



Caída de los cuerpos en la tierra

Isaac Newton # Unificación



3 Leyes +

$$F = G \frac{m_1 m_2}{r^2}$$



Electrostática



Magnetismo



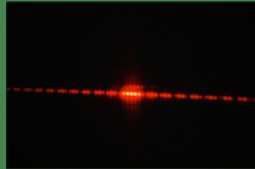
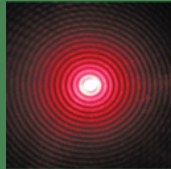
Electricidad



Electromagnetismo



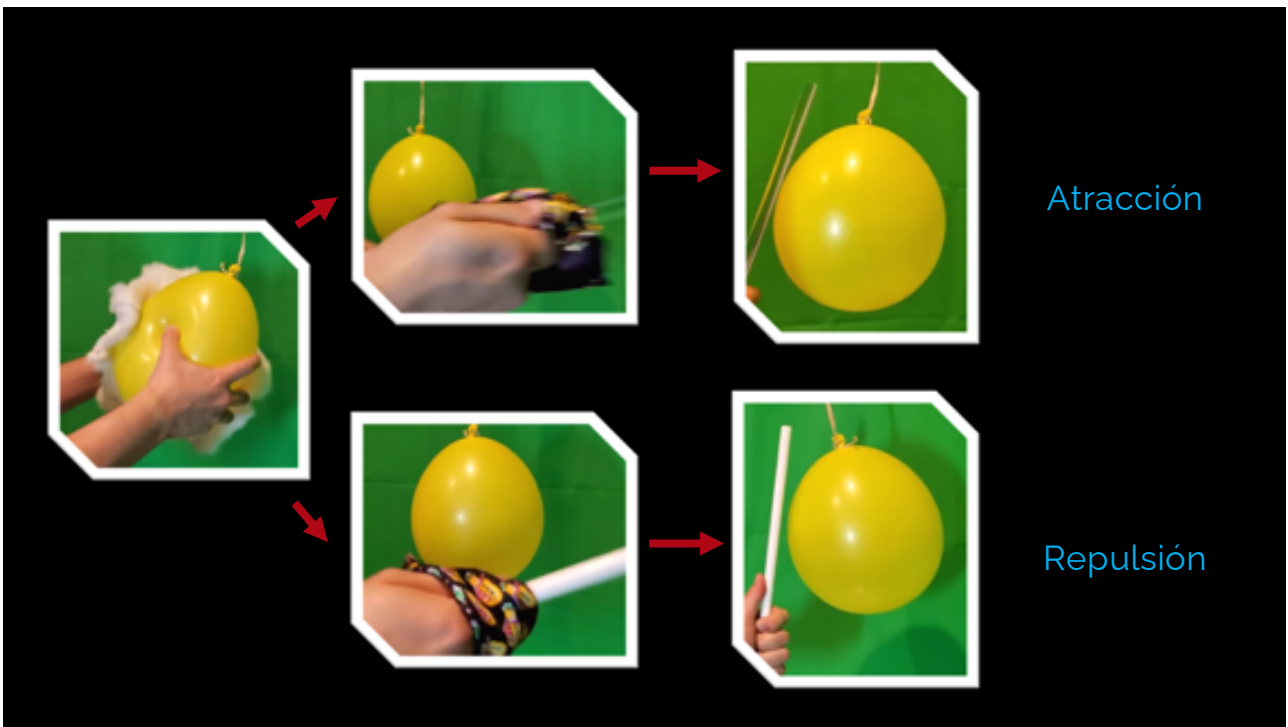
Pero hay más ...

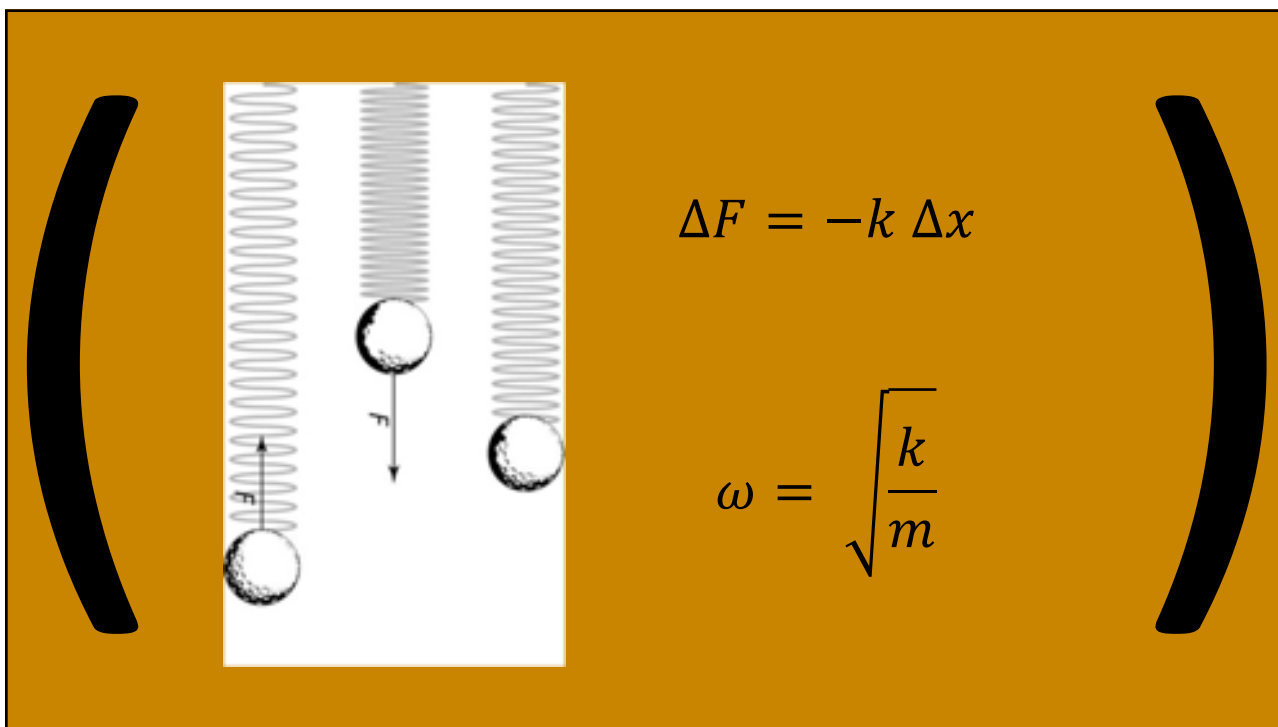


Caso 1 # Varilla de vidrio

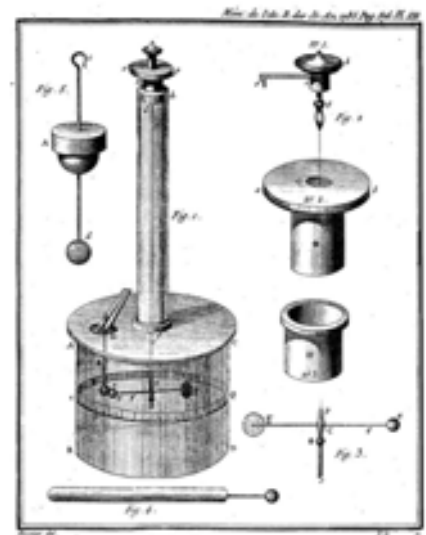


Caso 2 # Varilla de teflón





Balanza de Torsión



Ley de interacciones electrostáticas (ley de Coulomb)

Módulo de la fuerza

$$F = \kappa \frac{|q_1||q_2|}{r_{1,2}^2}$$

$$\kappa \sim 8.988 \times 10^9 \text{ N} \cdot \text{m}^2 \cdot \text{C}^{-2}$$

Ley de interacciones electrostáticas (ley de Coulomb)

Módulo de la fuerza

$$F = \kappa \frac{|q_1||q_2|}{r_{1,2}^2}$$

Fuerza (como vector)

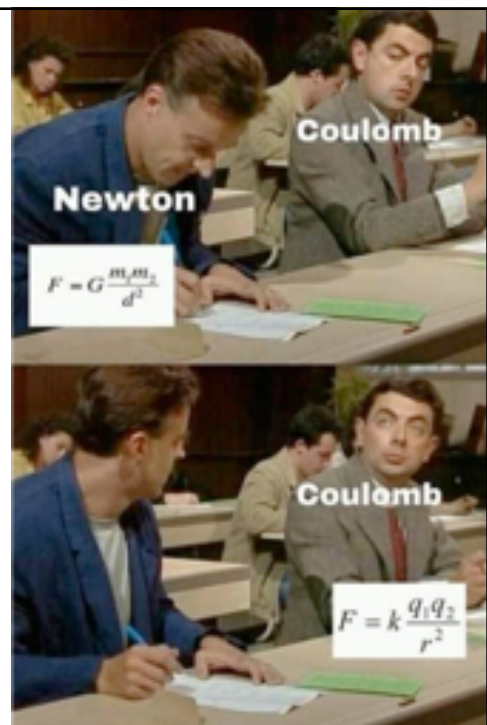
$$\vec{F}_{1,2} = \kappa q_1 q_2 \frac{\vec{r}_2 - \vec{r}_1}{|\vec{r}_2 - \vec{r}_1|^3}$$

Producida por la carga 1 sobre la carga 2

Todo lo que saben de Física 1 vale:

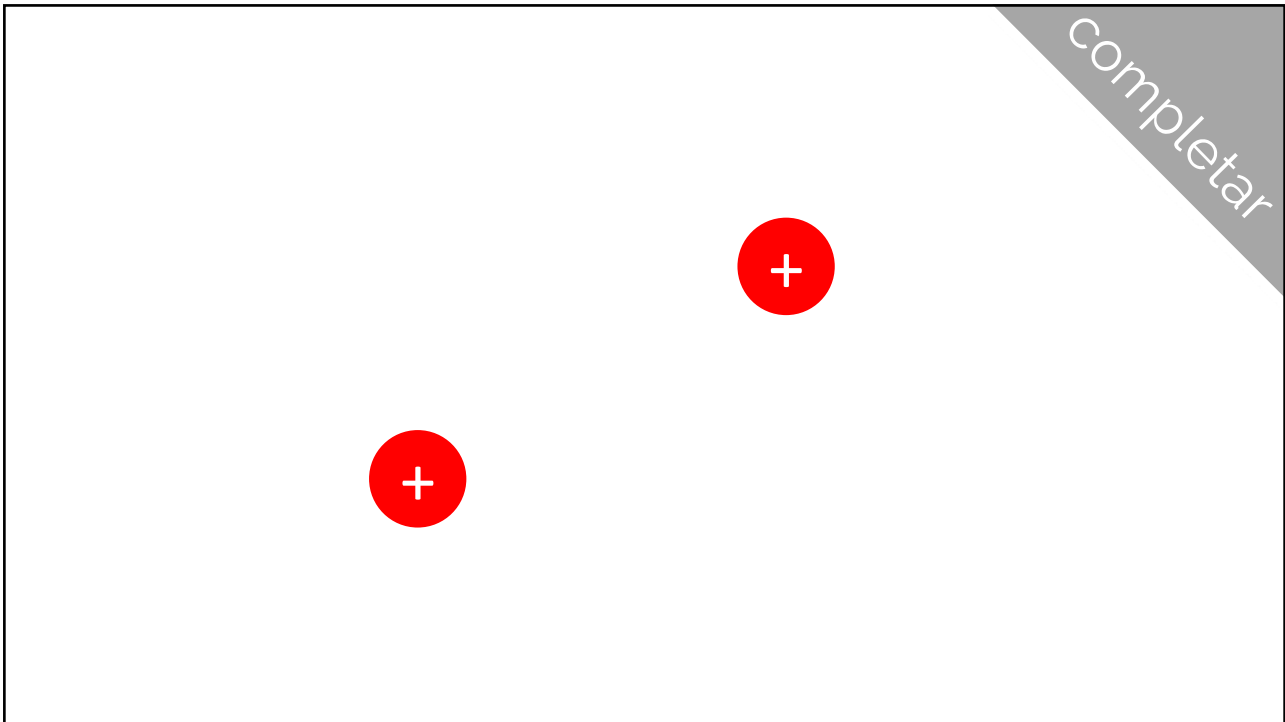
1. Depende de la inversa del cuadrado de la distancia.
2. Está en la dirección que une ambas partículas

Pero: puede ser **atractiva** o **repulsiva** dependiendo de los signos de q_1 y q_2



A diagram enclosed in a black rectangular border. A horizontal dashed line is positioned in the upper half. Above the line, there are two red circles, each containing a white plus sign (+). Below the line, there are two circles: a red circle with a white plus sign (+) on the left and a blue circle with a white minus sign (-) on the right. In the top right corner, there is a grey triangular area containing the word "completar" in white text.

A diagram enclosed in a black rectangular border. A horizontal dashed line is positioned in the upper half. Above the line, there are two red circles, each containing a white plus sign (+). Below the line, there are three red circles, each containing a white plus sign (+), arranged with one on the left and two on the right. In the top right corner, there is a grey triangular area containing the word "completar" in white text.



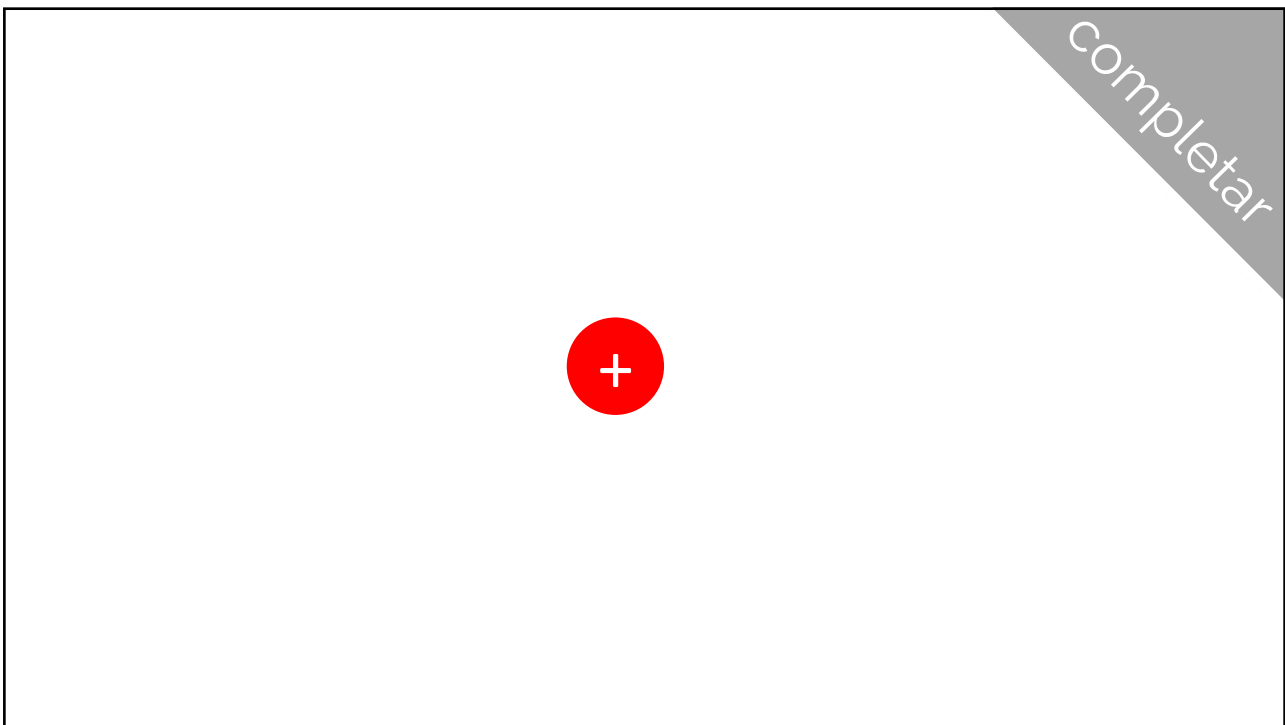
De la fuerza al campo

$$\begin{aligned}
 \vec{F}_{1,2} &= \kappa q_1 q_2 \frac{\vec{r}_2 - \vec{r}_1}{|\vec{r}_2 - \vec{r}_1|^3} \\
 &= q_2 \kappa q_1 \frac{\vec{r}}{r^3} \\
 &= q_2 \vec{E}_1(\vec{r}_2 - \vec{r}_1)
 \end{aligned}$$

Campo de la carga 1 en la posición de la carga 2

El **campo eléctrico**
de una carga **q** en el origen

$$\vec{E}(\vec{r}) = \kappa q \frac{\vec{r}}{|\vec{r}|^3}$$



completar



GeoGebra

<https://www.geogebra.org/m/kmzsngt4>