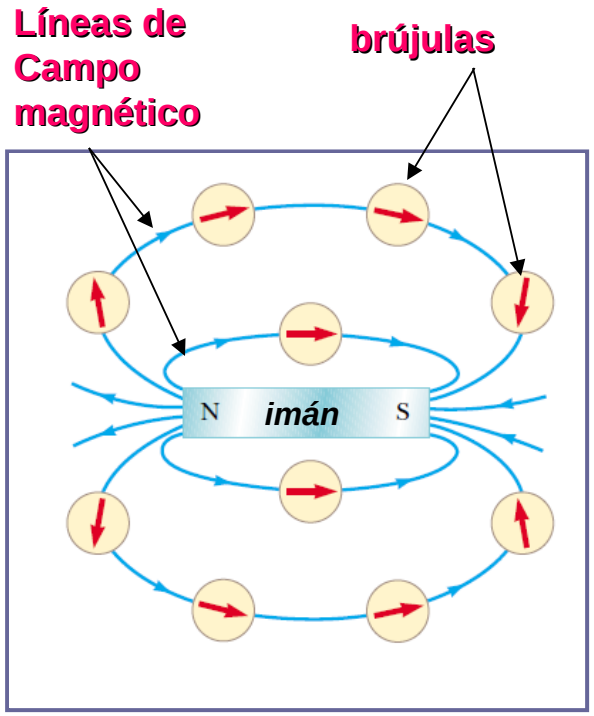
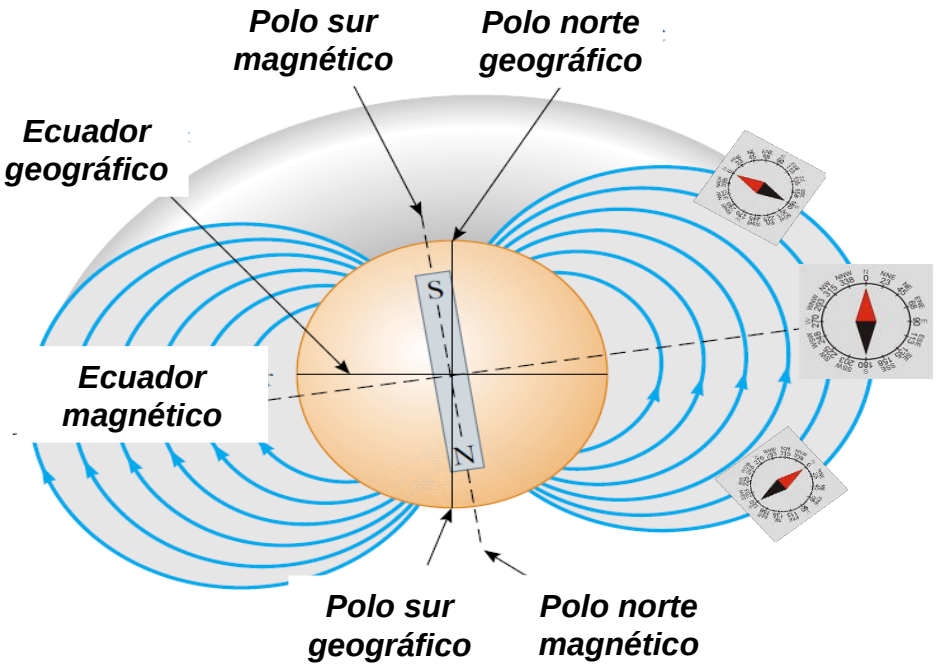
Magnetismo

Repaso





$$\mathbf{F}_B = q\mathbf{v} \times \mathbf{B}$$

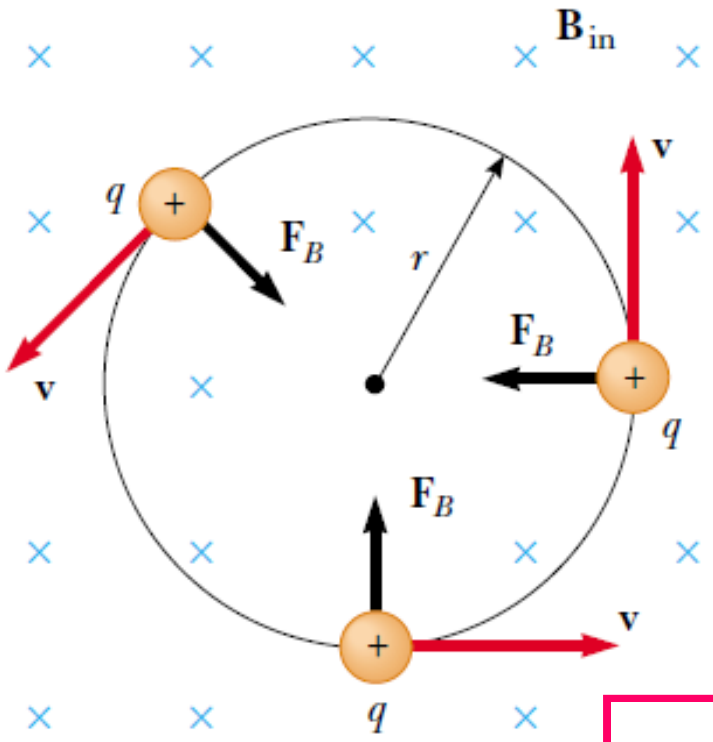
Unidades y magnitudes

$$1\ \mathrm{T} = 1\ \frac{\mathrm{N}}{\mathrm{A \cdot m}}$$

$$1\ \mathrm{T} = 10^4\ \mathrm{G}$$

Some Approximate Magnetic Field Magnitudes	
Source of Field	**Field Magnitude (T)**
Strong superconducting laboratory magnet	30
Strong conventional laboratory magnet	2
Medical MRI unit	1.5
Bar magnet	10^{-2}
Surface of the Sun	10^{-2}
Surface of the Earth	0.5×10^{-4}
Inside human brain (due to nerve impulses)	10^{-13}

Movimiento de una partícula cargada en un **B** uniforme



$$\sum F = ma_c$$

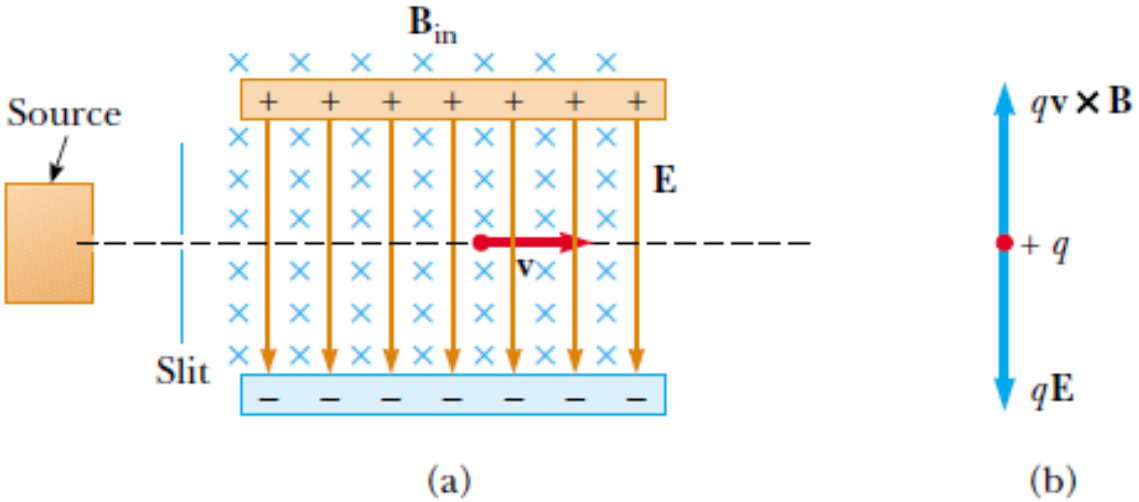
$$F_B = qvB = \frac{mv^2}{r}$$

$$r = \frac{mv}{qB}$$

$$\omega = \frac{v}{r} = \frac{qB}{m}$$

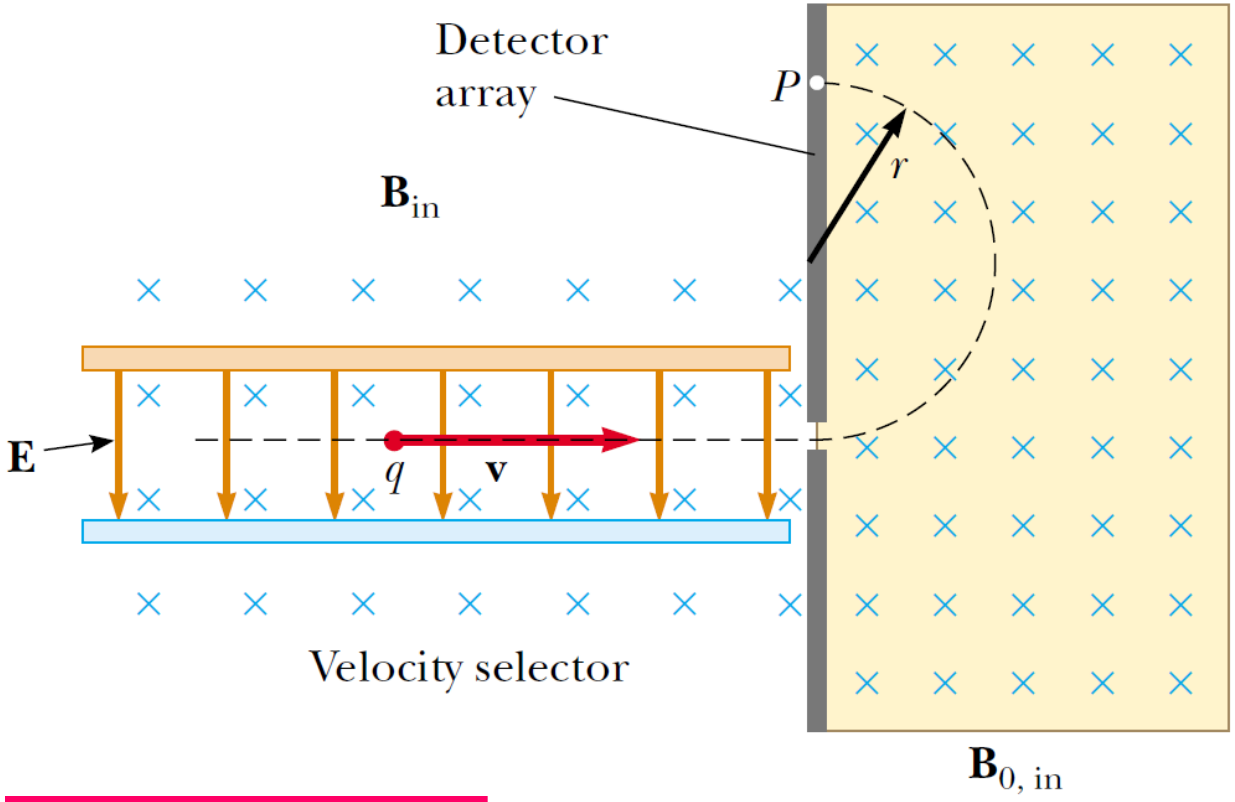
$$T = \frac{2\pi r}{v} = \frac{2\pi}{\omega} = \frac{2\pi m}{qB}$$

Selector de velocidades



$$v = \frac{E}{B}$$

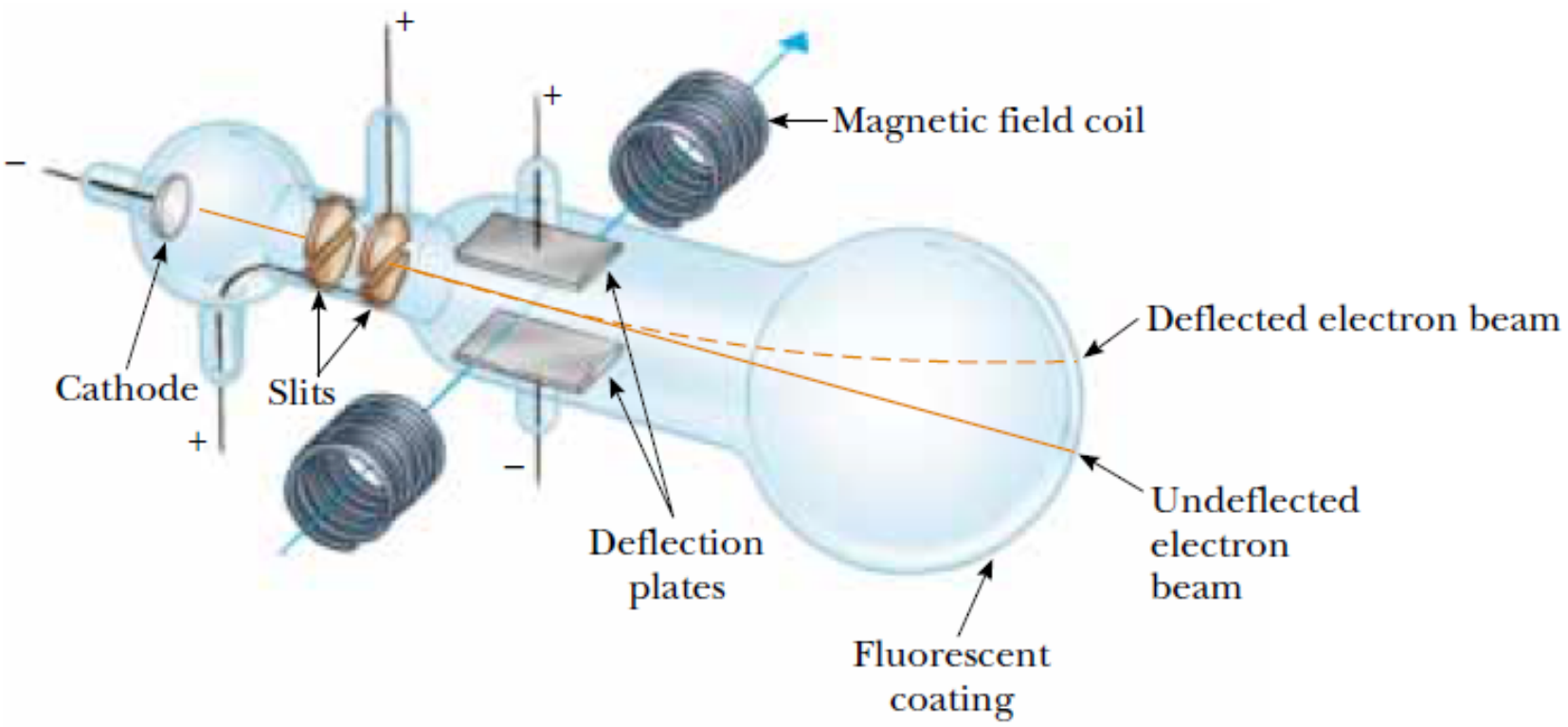
Espectrómetro de masa



$$\frac{m}{q} = \frac{rB_0}{v}$$

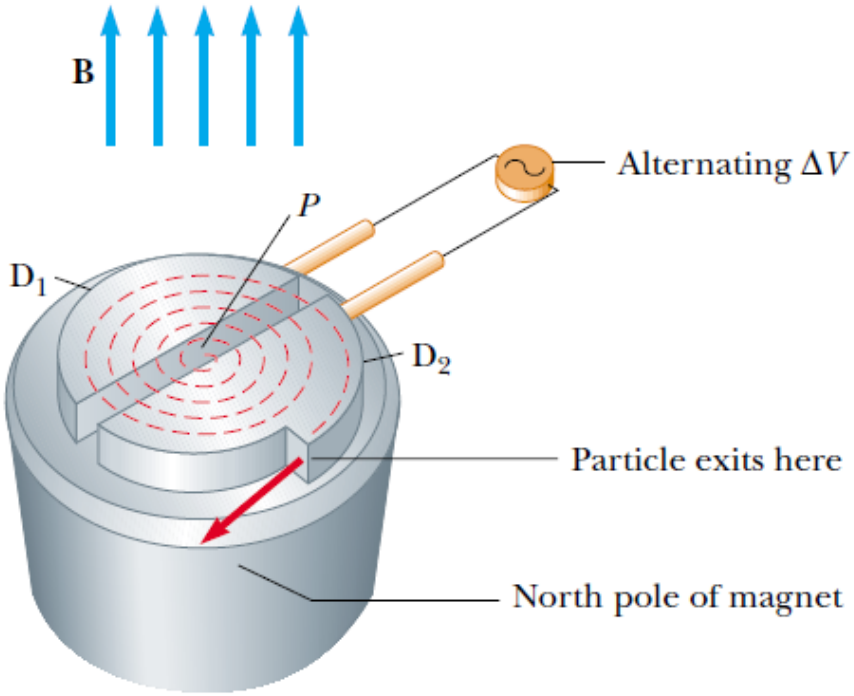
$$\frac{m}{q} = \frac{rB_0B}{E}$$

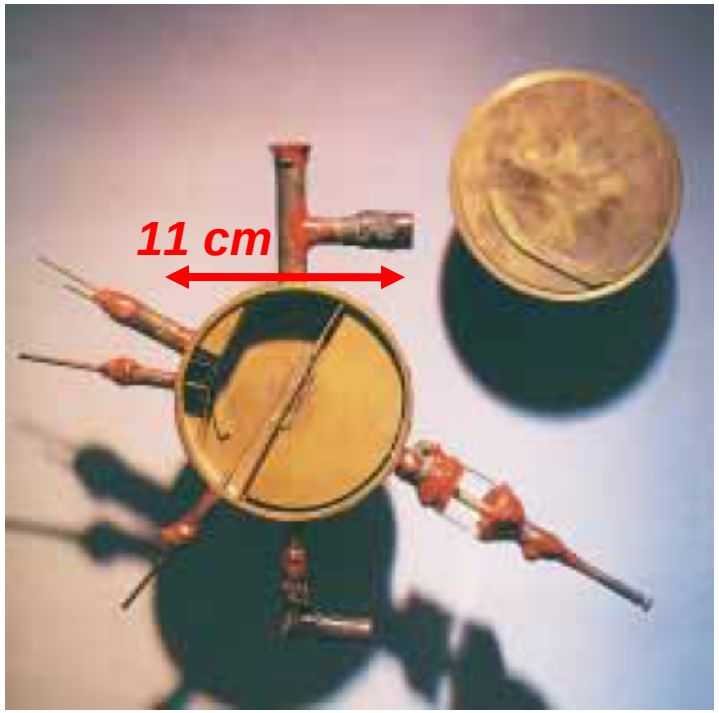
Determinación de q/m para el electrón (Thomson 1897)



El ciclotrón

$$v = qBR/m$$



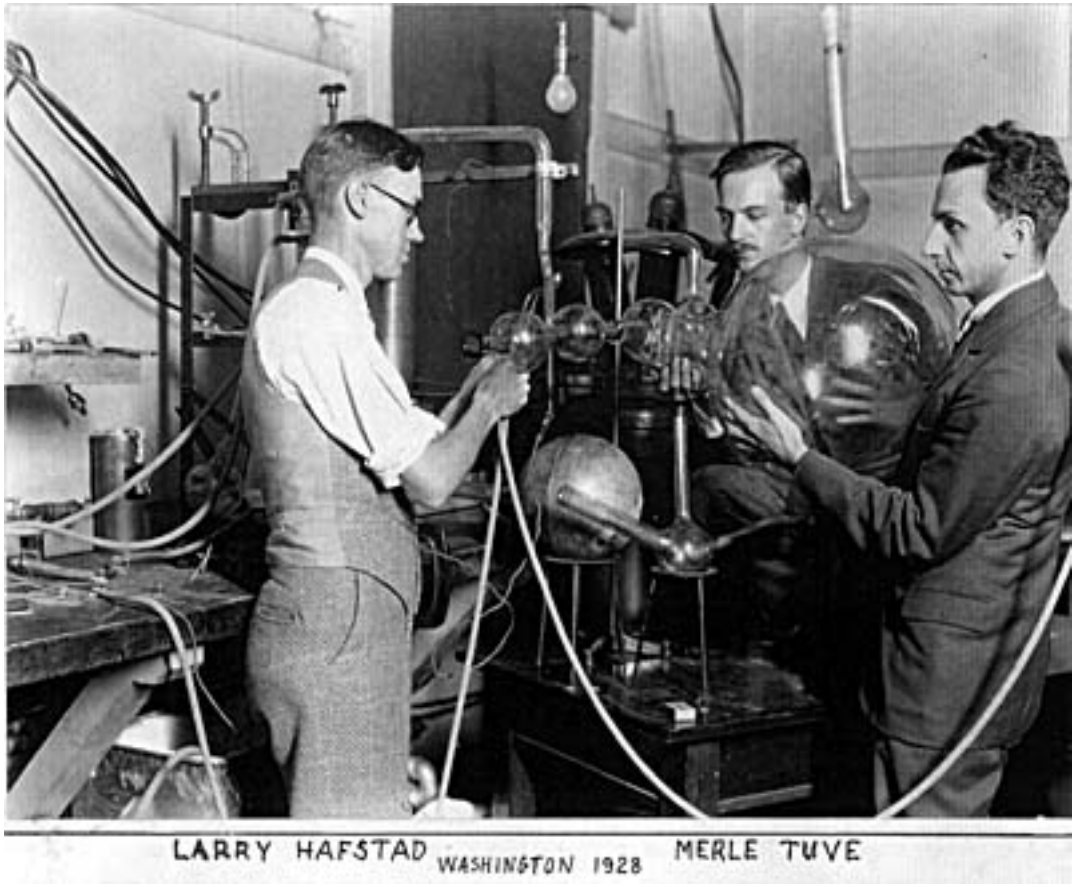


$$\frac{1}{2}mv^2 = \frac{q^2B^2R^2}{2m}$$

CUADRO I

Características del sincrociclotrón de Buenos Aires

Diámetro de las piezas polares	180 cm
Distancia entre los polos	35 cm
Altura de las "De"	20 cm
Frecuencia	10 Mc/seg
Tensión de pico	22 KV
Campo magnético	14.400 gauss
Potencia total	390 KW
Corriente de blanco máxima (deuterones)	30 μA
Presión en la cámara de aceleración	10^{-5} mm Hg



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