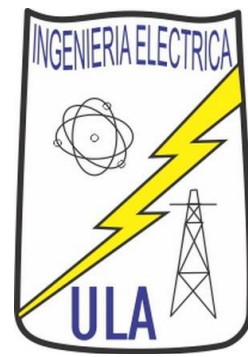


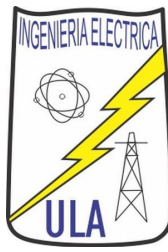


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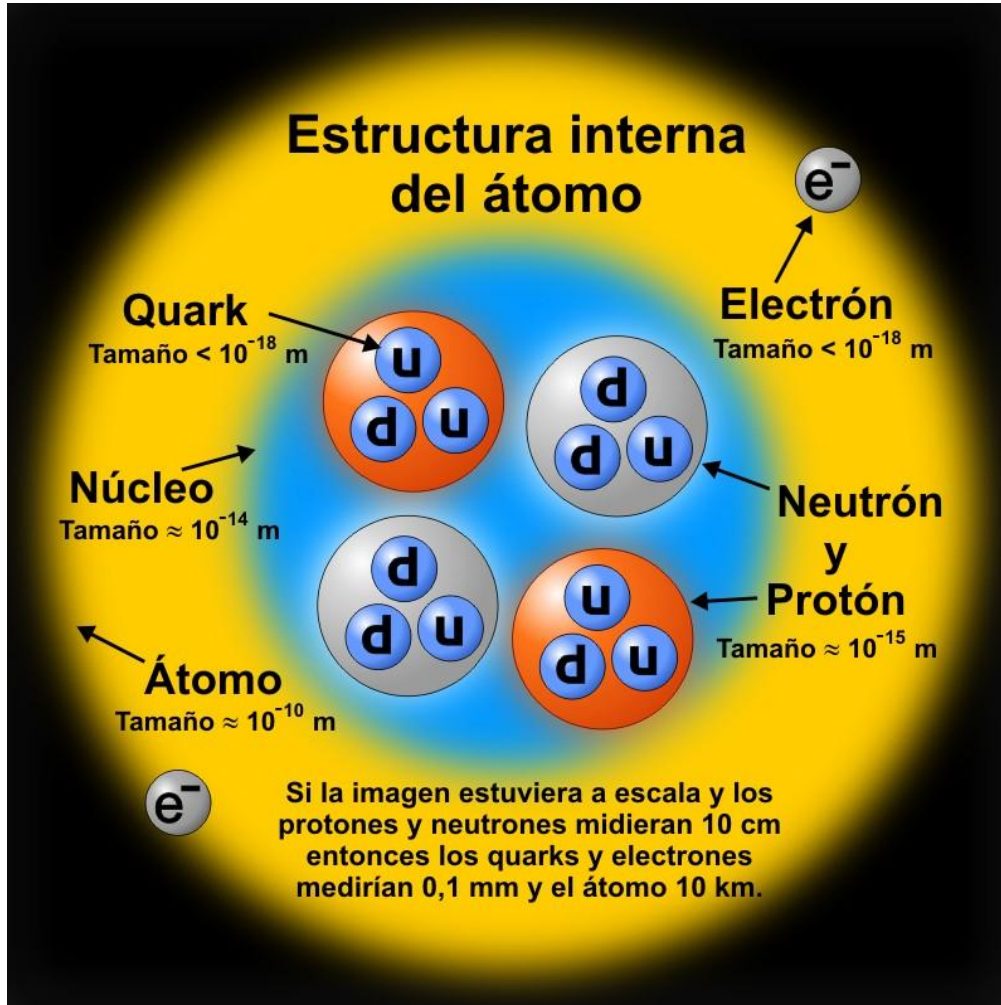


# Información adicional (Conceptos Básicos y Elementos del Circuito)

Prof. Gerardo Ceballos

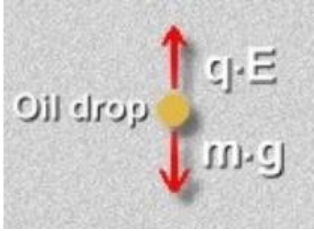
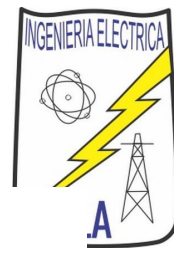


# Estructura del átomo



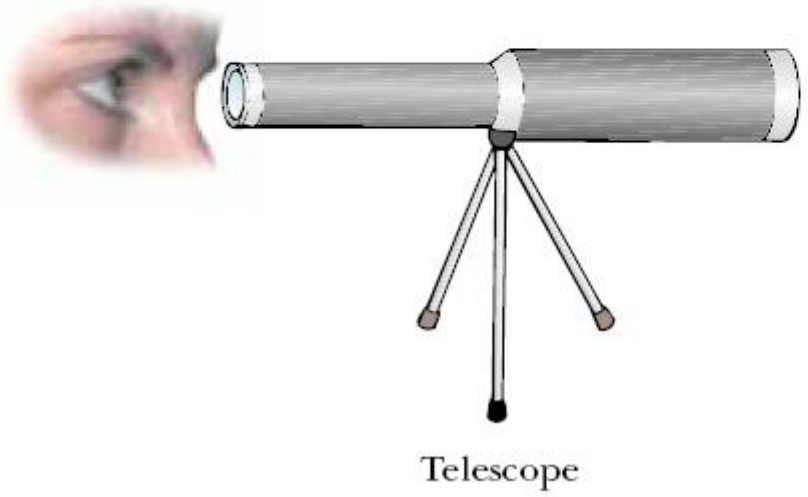
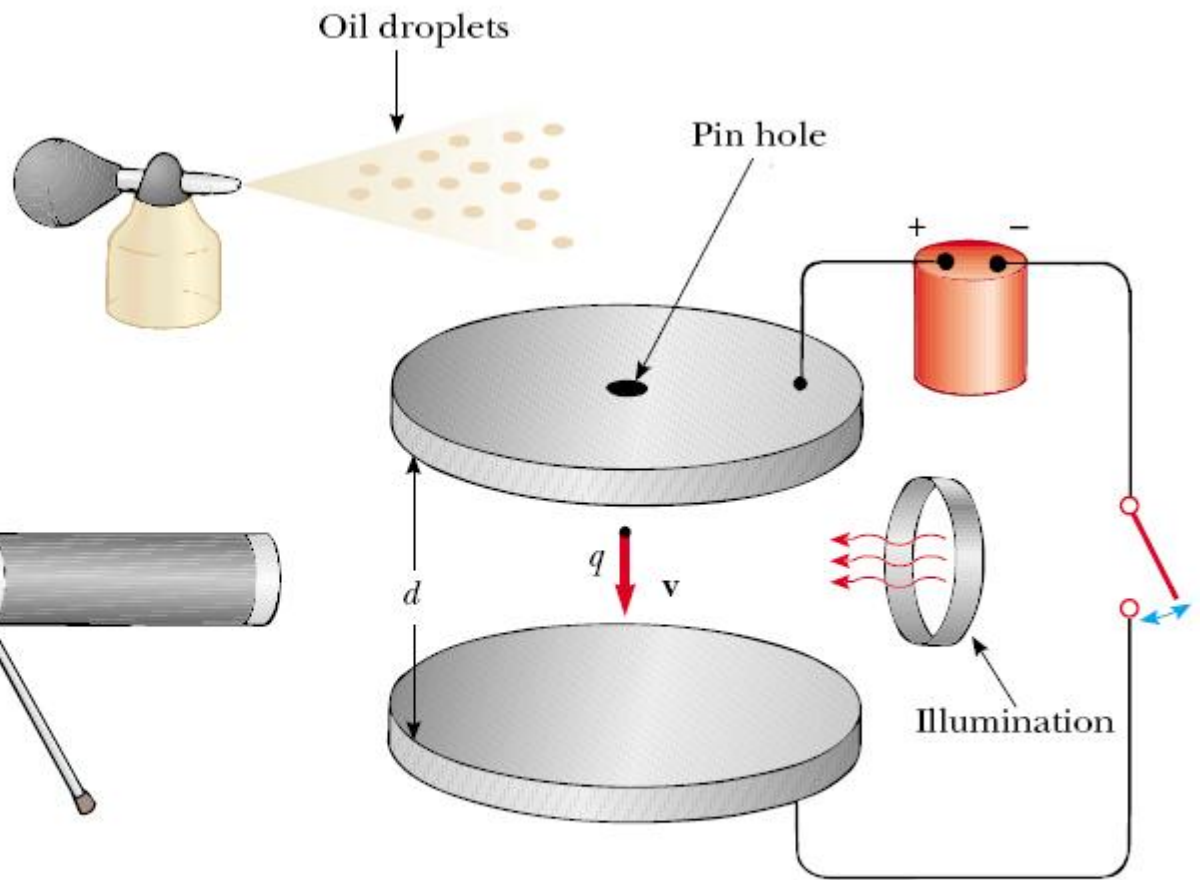


# Experimento de Millikan

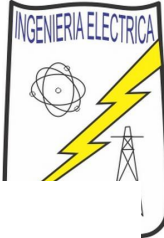


$$q \cdot E = m \cdot g$$

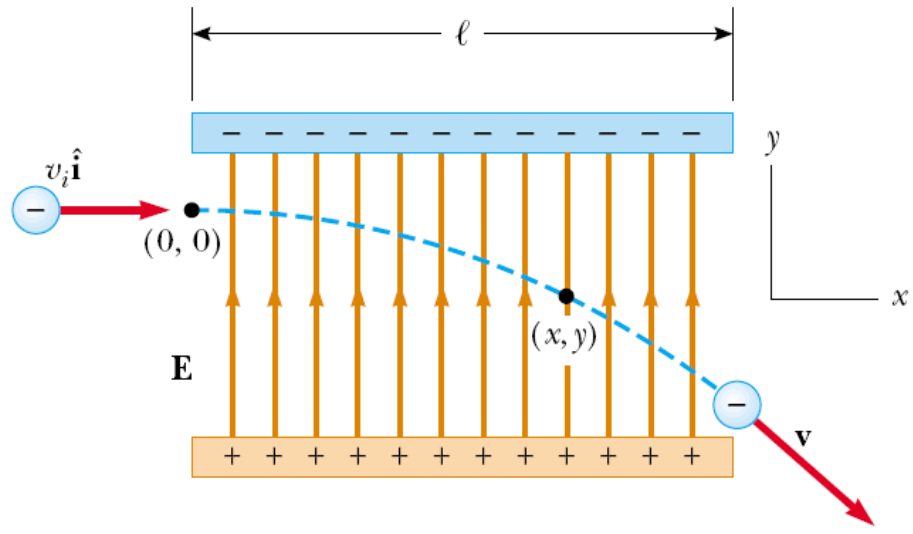
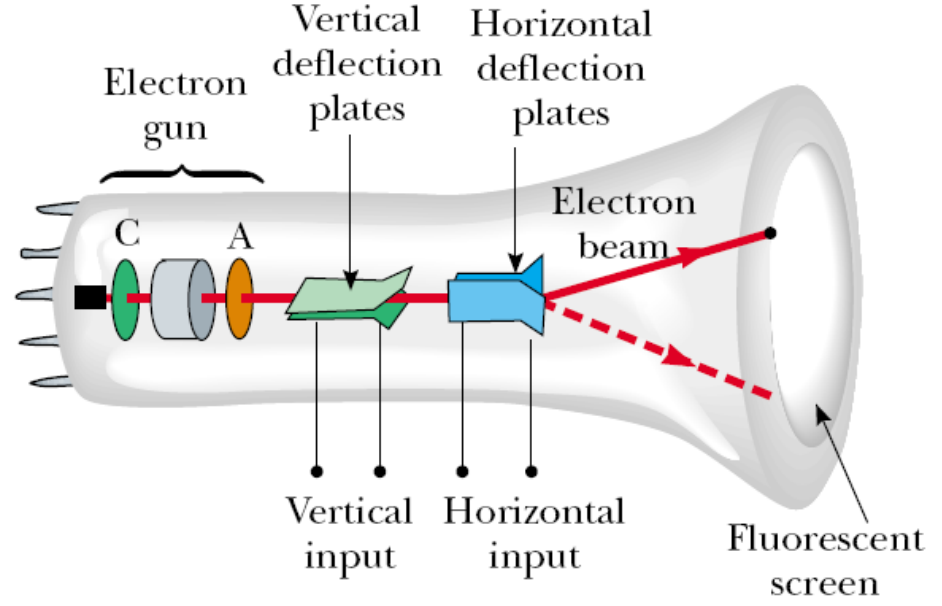
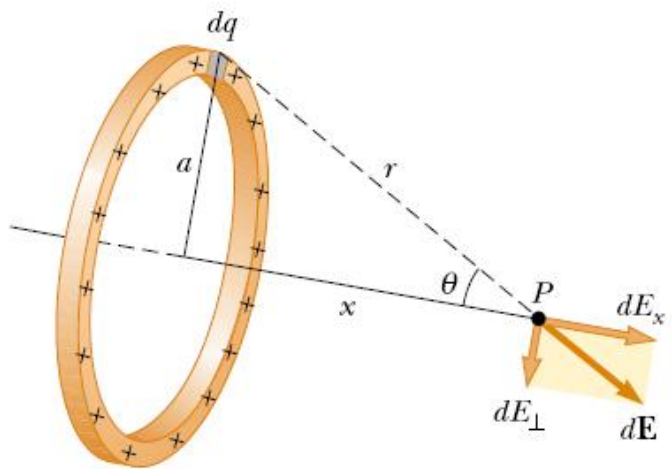
$$q = \frac{m \cdot g}{E}$$



Active Figure 25.27 Schematic drawing of the Millikan oil-drop apparatus.



# Tubo de rayos catódicos



## Resistivities and Temperature Coefficients of Resistivity for Various Materials

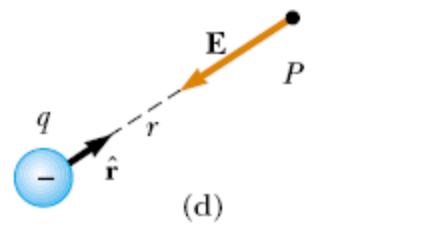
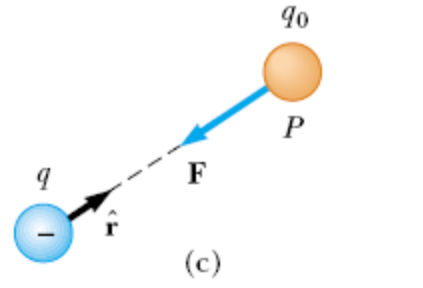
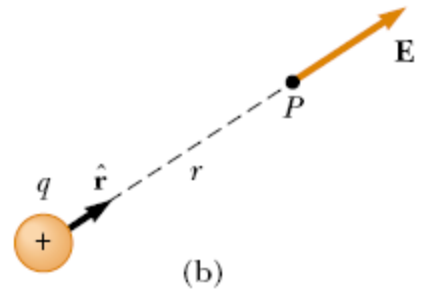
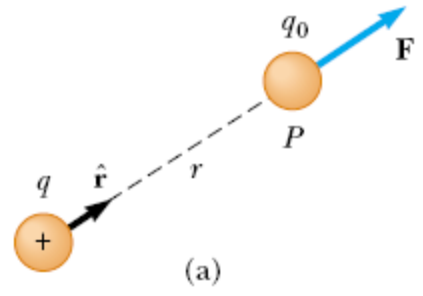
Material	Resistivity <sup>a</sup> ( $\Omega \cdot m$ )	Temperature Coefficient <sup>b</sup> $\alpha[(^{\circ}C)^{-1}]$
Silver	$1.59 \times 10^{-8}$	$3.8 \times 10^{-3}$
Copper	$1.7 \times 10^{-8}$	$3.9 \times 10^{-3}$
Gold	$2.44 \times 10^{-8}$	$3.4 \times 10^{-3}$
Aluminum	$2.82 \times 10^{-8}$	$3.9 \times 10^{-3}$
Tungsten	$5.6 \times 10^{-8}$	$4.5 \times 10^{-3}$
Iron	$10 \times 10^{-8}$	$5.0 \times 10^{-3}$
Platinum	$11 \times 10^{-8}$	$3.92 \times 10^{-3}$
Lead	$22 \times 10^{-8}$	$3.9 \times 10^{-3}$
Nichrome <sup>c</sup>	$1.50 \times 10^{-6}$	$0.4 \times 10^{-3}$
Carbon	$3.5 \times 10^{-5}$	$-0.5 \times 10^{-3}$
Germanium	0.46	$-48 \times 10^{-3}$
Silicon	640	$-75 \times 10^{-3}$
Glass	$10^{10}$ to $10^{14}$	
Hard rubber	$\sim 10^{13}$	
Sulfur	$10^{15}$	
Quartz (fused)	$75 \times 10^{16}$	

Conductores T  $\uparrow$  R  $\uparrow$

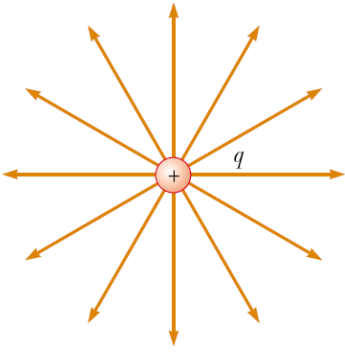
Semiconductores T  $\uparrow$  R  $\downarrow$

Aislantes T  $\uparrow$  R  $\downarrow$

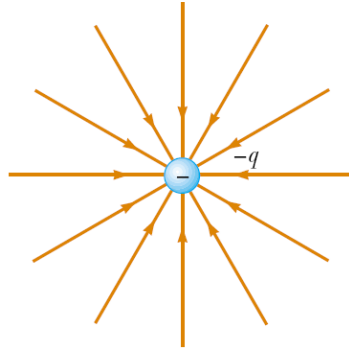
# Ca | ca



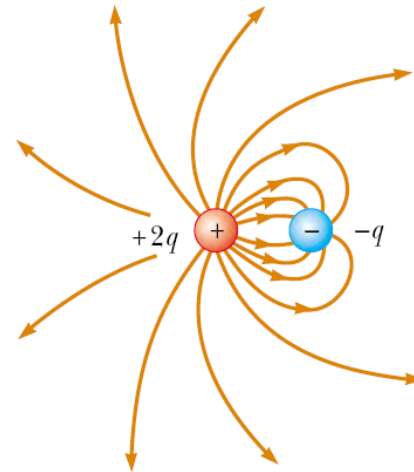
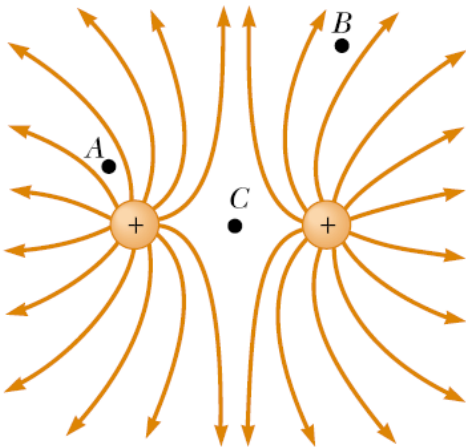
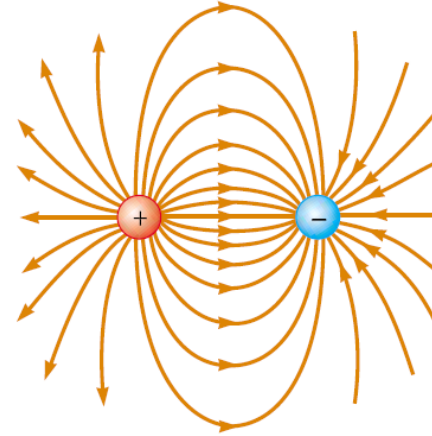
# Líneas de Campo Eléctrico



(a)



(b)





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  - Serway, Physics, 6ta ed.
  - Alexander, Sadiku, Fundamentals of Electric Circuits, 5th ed.