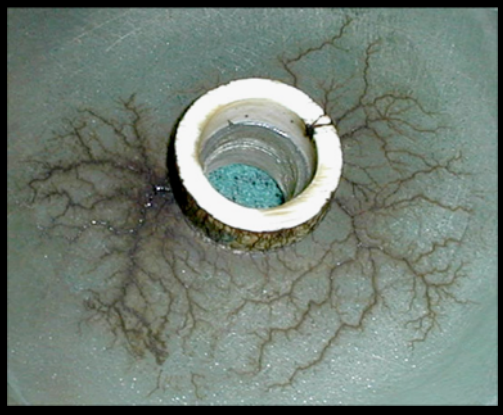
Departamento de Física
.UBAexactas

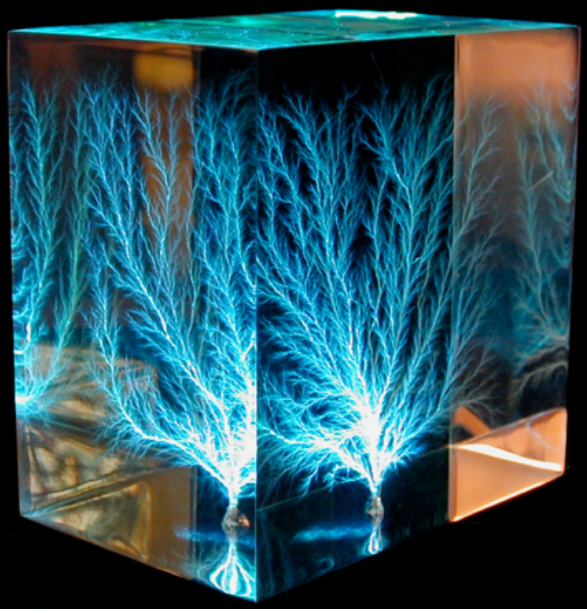
Física 3
V-2022
Parte 18'

Ruptura dieléctrica

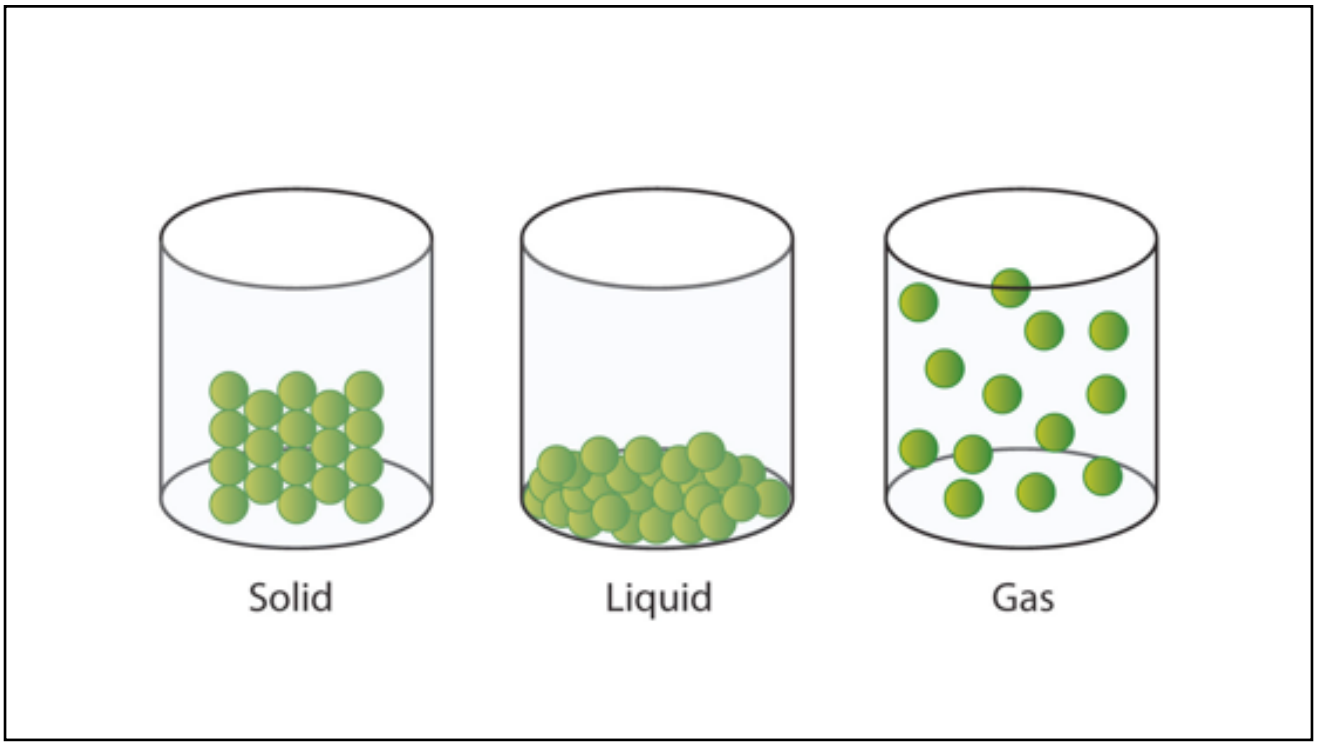


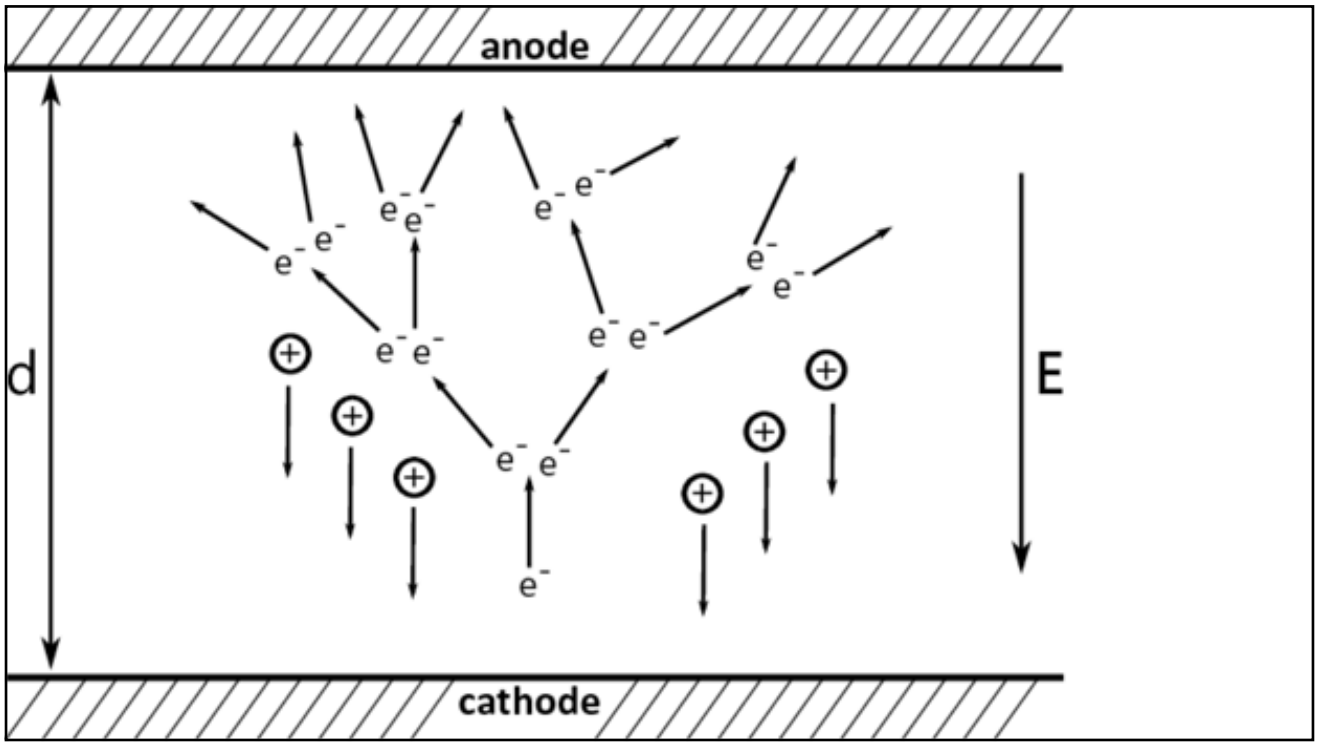
Ruptura dieléctrica

Ruptura dieléctrica



Ruptura dieléctrica

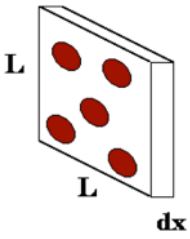




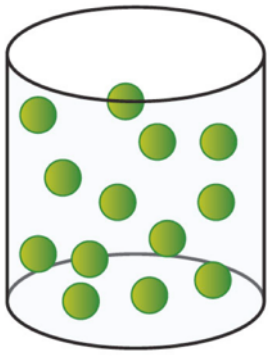
¿Cuánta **distancia** recorre (en promedio)
un electrón antes de chocar?

$$P\,V = N\,k\,T$$

$$\frac{1}{n} = \frac{V}{N} = \frac{k\,T}{P}$$



$$\ell = \frac{1}{n\,\sigma}$$



Gas

(hay muchas aproximaciones en el camino)

¿Cuánta **energía** hace falta
para ionizar un gas?

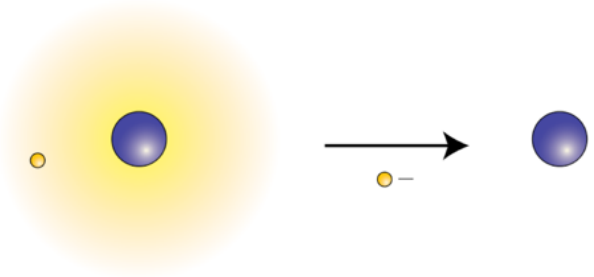
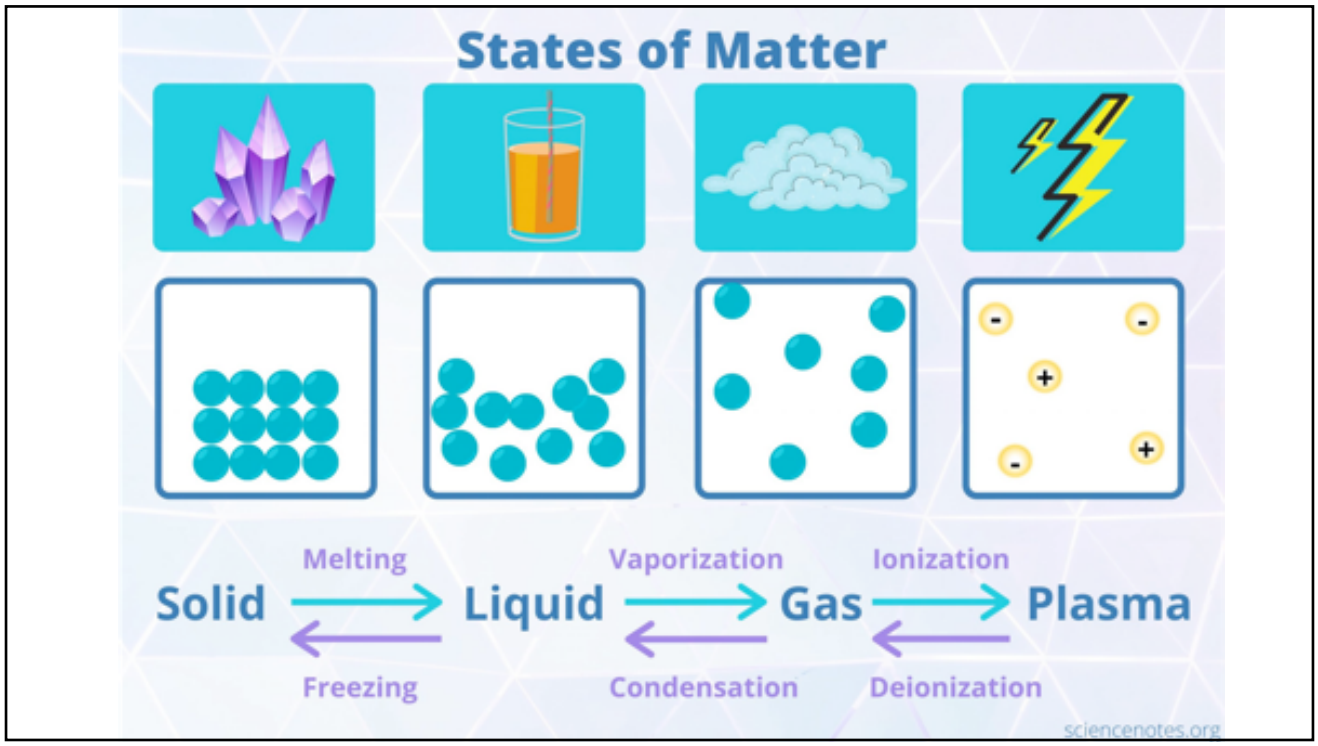
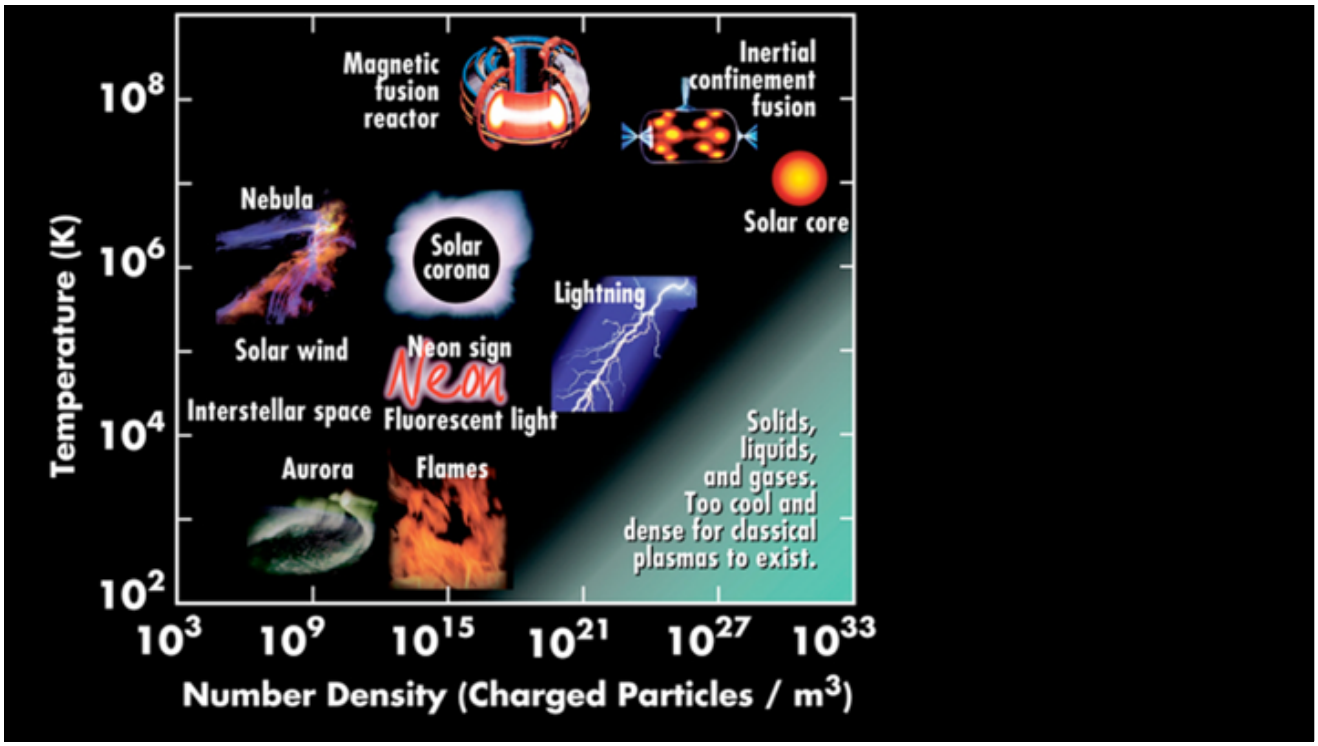


TABLE 26.1 Dielectric Constants and Dielectric Strengths of Various Materials at Room Temperature

Material	Dielectric Constant κ	Dielectric Strength[a] (V/m)
Air (dry)	1.000 59	3×10^6
Bakelite	4.9	24×10^6
Fused quartz	3.78	8×10^6
Neoprene rubber	6.7	12×10^6
Nylon	3.4	14×10^6
Paper	3.7	16×10^6
Polystyrene	2.56	24×10^6
Polyvinyl chloride	3.4	40×10^6
Porcelain	6	12×10^6
Pyrex glass	5.6	14×10^6
Silicone oil	2.5	15×10^6
Strontium titanate	233	8×10^6
Teflon	2.1	60×10^6
Vacuum	1.000 00	—
Water	80	—

[a] The dielectric strength equals the maximum electric field that can exist in a dielectric without electrical breakdown. Note that these values depend strongly on the presence of impurities and flaws in the materials.


States of Matter
Melting
Vaporization
Ionization
Solid
Liquid
Gas
Plasma
Freezing
Condensation
Deionization
sciencenotes.org


Magnetic fusion reactor
Inertial confinement fusion
Solar core
Nebula
Solar corona
Lightning
Solar wind
Neon sign
Neon
Interstellar space
Fluorescent light
Aurora
Flames
Solids, liquids, and gases. Too cool and dense for classical plasmas to exist.
Temperature (K)
10^8
10^6
10^4
10^2
10^3 10^9 10^{15} 10^{21} 10^{27} 10^{33}
Number Density (Charged Particles / m^3)

Electricidad en la atmósfera
The Feynman Lectures on Physics. Volumen 2. Capítulo 9