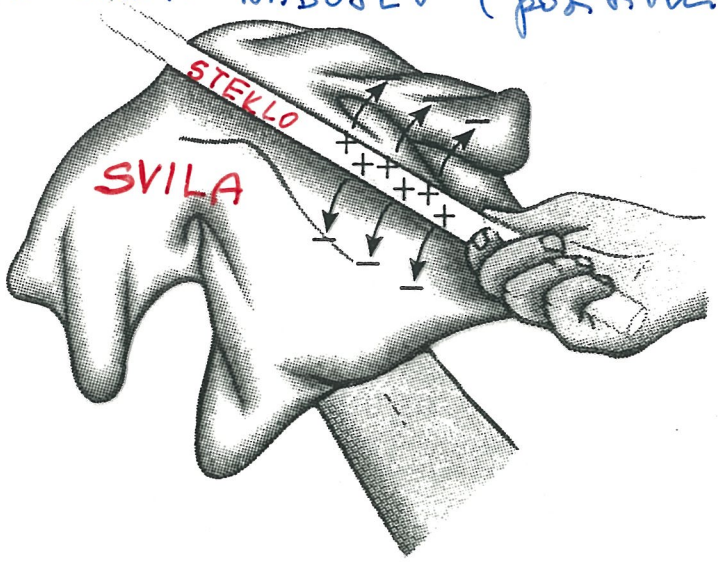
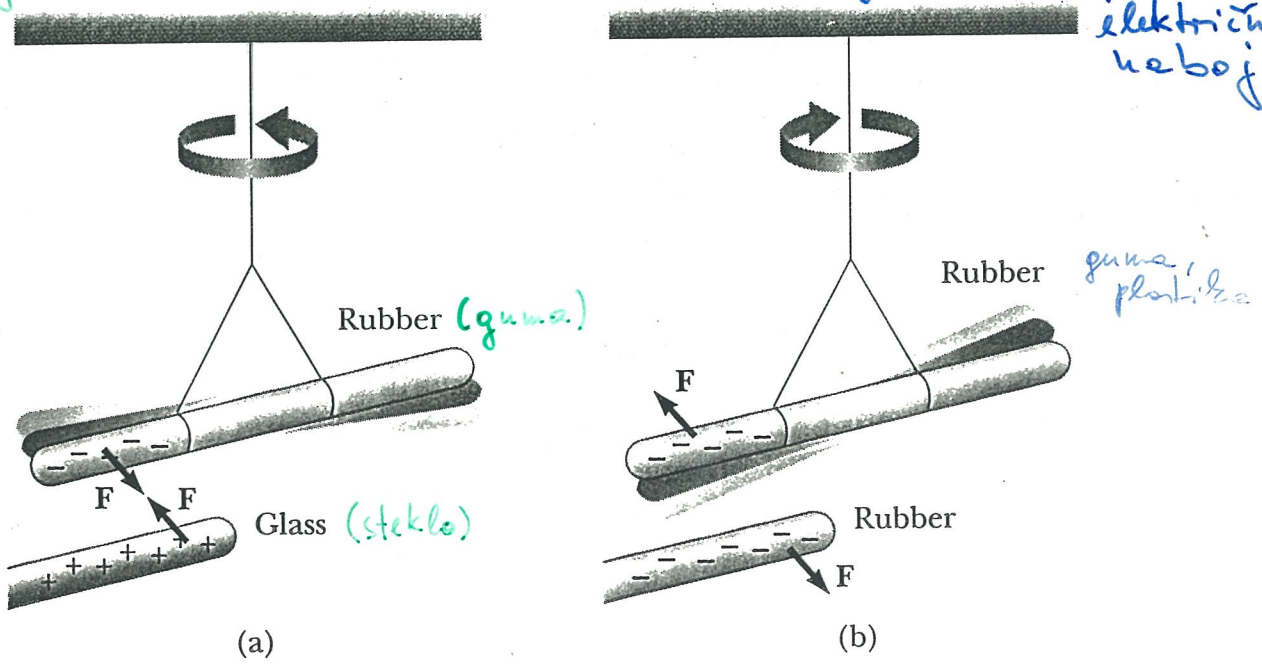
- ELEKTRIČNI NABOJ SE OHRANJA
- OBSTAJAJO DVE VRSTI NABOJEV (pozitivni in negativni)



When a glass rod is rubbed with silk, electrons are transferred from the glass to the silk. Because of conservation of charge, each electron adds negative charge to the silk, and an equal positive charge is left behind on the rod.

Benjamin Franklin (1706–1790) definiral POZITIVNI in NEGATIVNI električni naboj



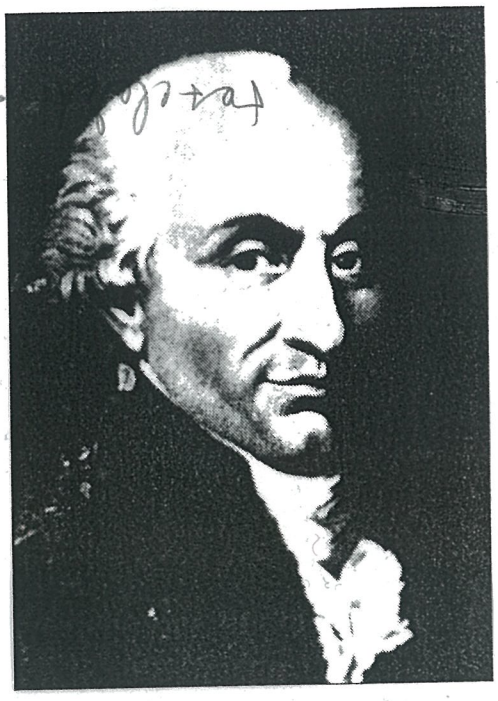
(a) A negatively charged rubber rod, suspended by a thread, is attracted to a positively charged glass rod. (b) A negatively charged rubber rod is repelled by another negatively charged rubber rod.

enota: 1 As ≡ 1 C (coulomb)

Charles Coulomb, the great French physicist after whom the unit of electric charge called the *coulomb* was named, was born in Angoulême in 1736. He was educated at the École du Génie in Mézieres, graduating in 1761 as a military engineer with a rank of First Lieutenant. Coulomb served in the West Indies for nine years, where he supervised the building of fortifications in Martinique.

In 1774, Coulomb became a correspondent to the Paris Academy of Science. There he shared the Academy's first prize for his paper on magnetic compasses and also received first prize for his classic work on friction, a study that was unsurpassed for 150 years. During the next 25 years, he presented 25 papers to the Academy on electricity, magnetism, torsion, and applications to the torsion balance, as well as several hundred committee reports on engineering and civil projects.

Coulomb took full advantage of the various positions he held during his lifetime. For example, his experience as an engineer led him to investigate the strengths of materials and determine the forces that affect objects on beams, thereby contributing to the field of structural mechanics. He also contributed to the field of ergonom-



Charles Coulomb

1736 – 1806

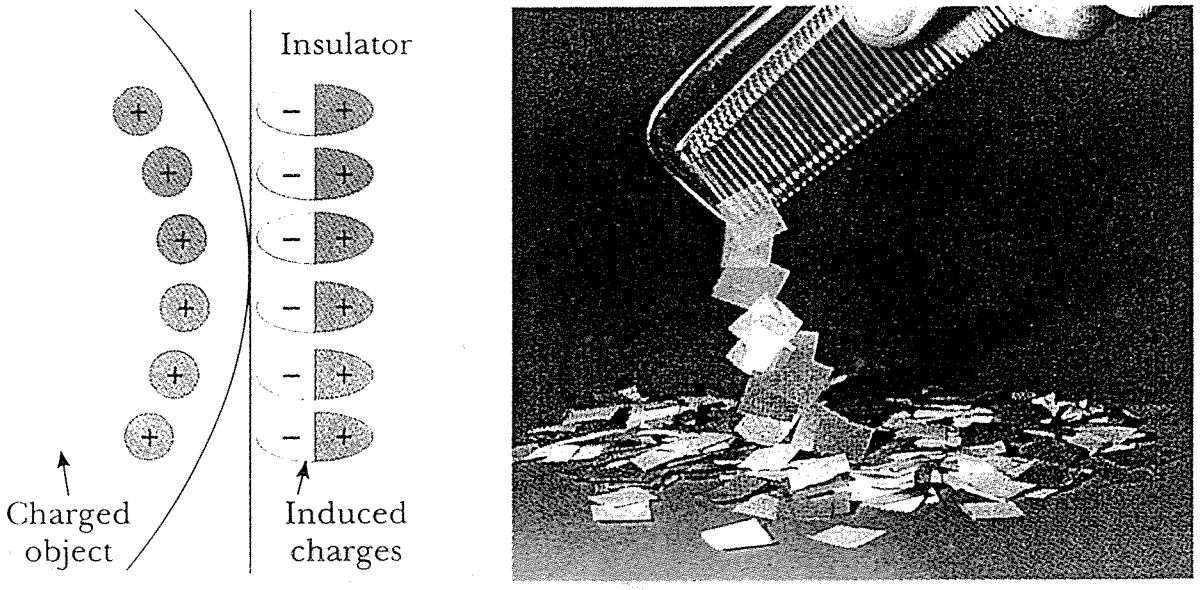
COULOMBOV ZAKON

$$F = K \cdot \frac{e_1 \cdot e_2}{r^2}$$

K ≡ Coulombova konstanta ≈ $8 \cdot 10^9$ $N \cdot m^2/(As)^2$

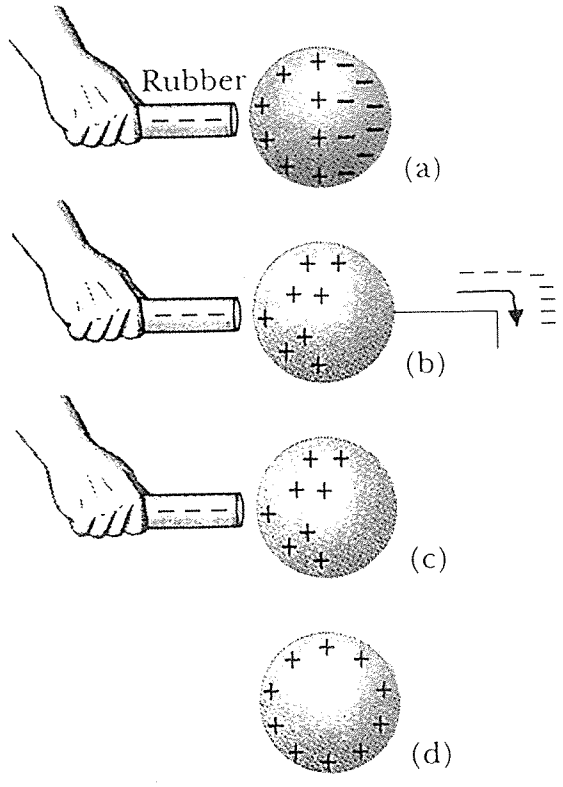
$$K = \frac{1}{4\pi\varepsilon_0}$$

ε_0 ≡ influenčna konstanta ≈ $8.9 \cdot 10^{-12}$ As/Vm



(a) (b)

(a) The charged object induces charges on the surface of an insulator. (b) A charged comb attracts bits of paper because charges are displaced in the paper. The paper is neutral but polarized. *(© 1968 Fundamental Photographs)*



Charging a metallic object by induction. (a) The charge on a neutral metallic sphere is redistributed when a charged rubber rod is placed near the sphere. (b) The sphere is grounded, and some of the electrons leave. (c) The ground connection is removed, and the sphere has a net nonuniform positive charge. (d) When the rubber rod is removed, the excess positive charge becomes uniformly distributed over the surface of the sphere.

Van de Graaffov generator

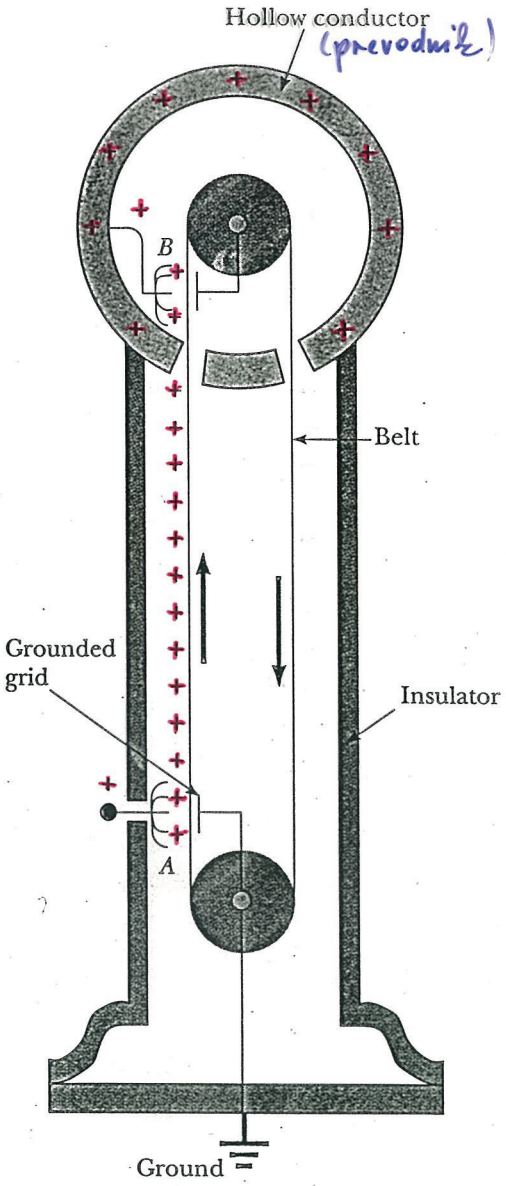


Figure 25.27 Schematic diagram of a Van de Graaff generator. Charge is transferred to the hollow conductor at the top by means of a moving belt. The charge is deposited on the belt at point *A* and transferred to the hollow conductor at point *B*.

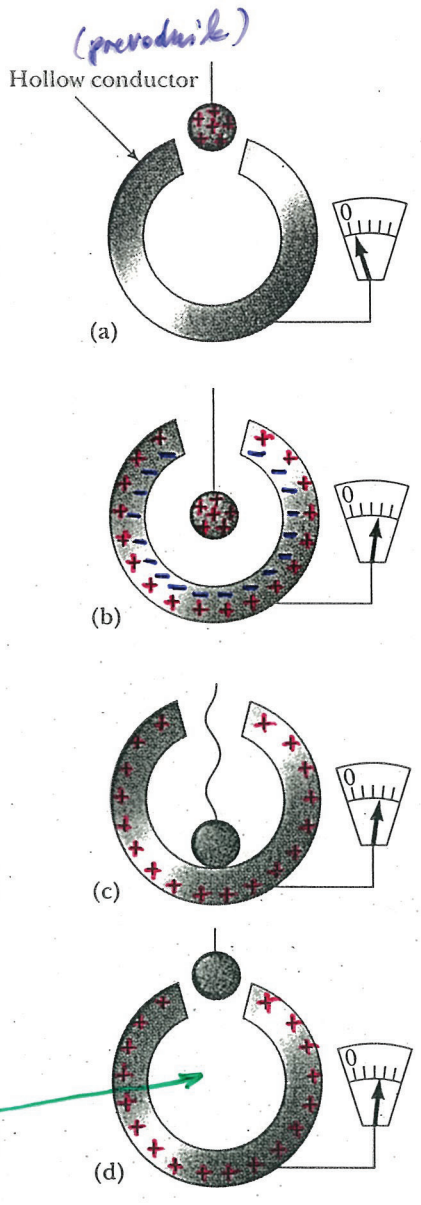
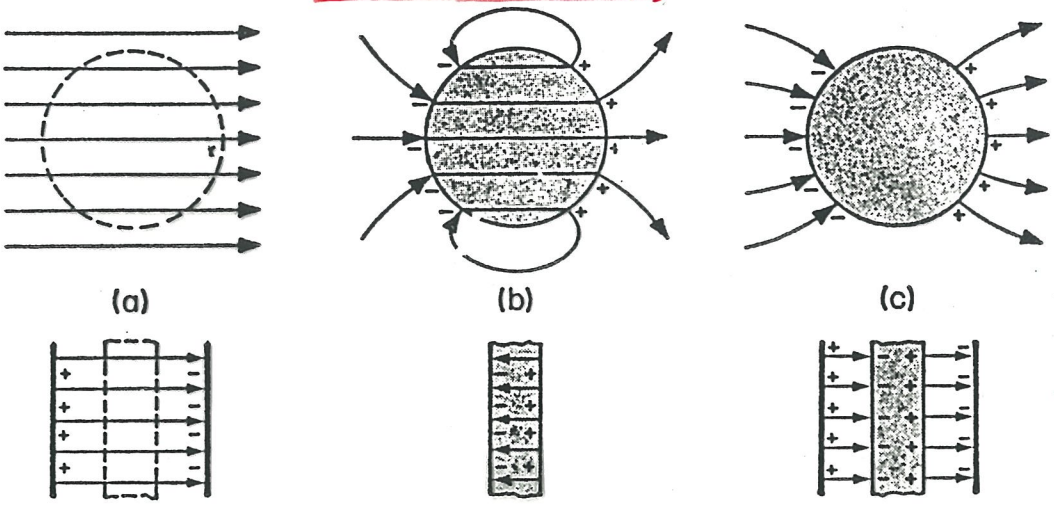


Figure 24.20 An experiment showing that any charge transferred to a conductor resides on its surface in electrostatic equilibrium. The hollow conductor is insulated from ground, and the small metal ball is supported by an insulating thread.

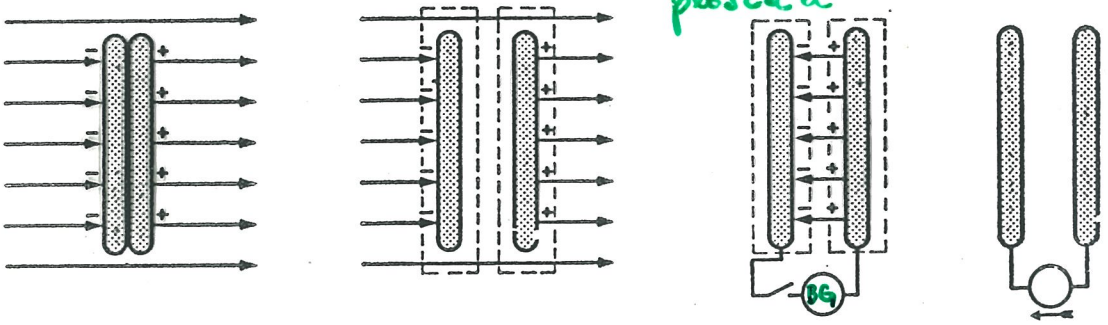
INFLUENCA



POVRŠINA PREVODNIKA POSTANE EKVIPOTENCIALNA PLOSKEV

Prvotno električno polje (a), polje naboja na površini prevodnika (b) in novo polje, ki je vsota obeh polj (c). Zgornja vrsta risb se nanaša na kovinsko kroglo, ki jo damo v homogeno električno polje, spodnja pa na kovinsko ploščo, ki jo damo v polje ploščatega kondenzatorja tako, da je vzporedna z elektrodama

- NEPOSREDNA MERITEV GOSTOTE ELEKTRIČNEGA POLJA ⟹ izmerimo influenciran naboj (e) na ploščah ⇒ izračunam $D = \frac{e}{S}$



Poskus pri merjenju influenciranega naboja: kovinski plošči damo staknjeni v polje (jakost električnega polja je pravokotna na plošči), ju v polju razmaknemo in razmaknjeni vzamemo iz polja, nato se z njima dotaknemo priključkov balističnega galvanometra

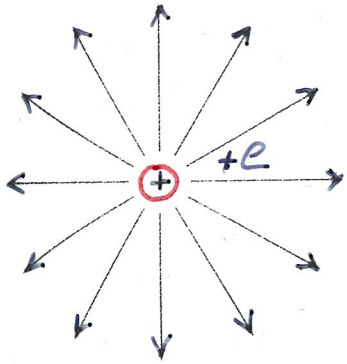
- končno električno polje je sestavljeno iz prvotnega polja in polja nabojev, ki se naberejo na površini prevodnika

- naboj, ki se nabere na površini prevodnika je INFLUENCIRANI NABOJ

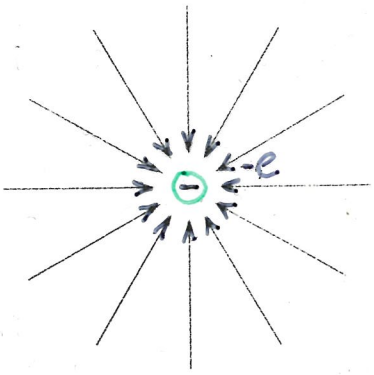
slike: J. Strnad: Fizika 2

ELEKTRIČNO POLJE

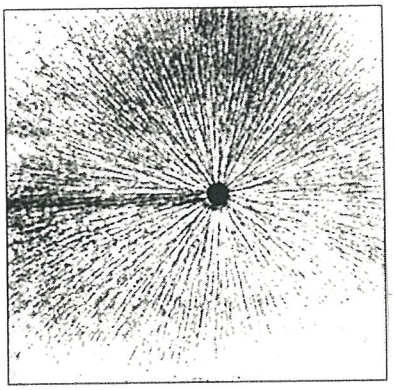
- **MONOPOL**



(a)

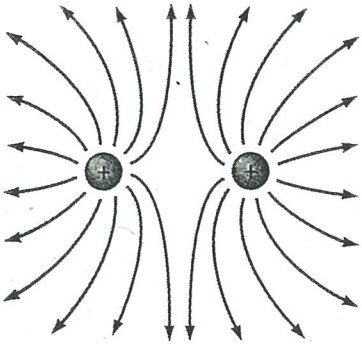


(b)

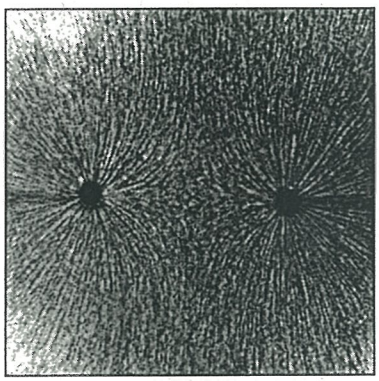


(c)

- **KVADRUPOL**



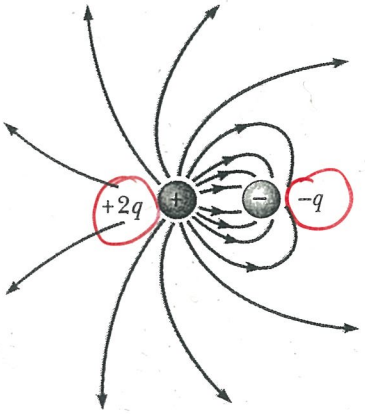
(a)



(b)

DVA ENAKA POZITIVNA NABOJA

- **DIPOL**



The electric field lines for a point charge $+2q$ and a second point charge $-q$. Note that two lines leave the charge $+2q$ for every one that terminates on $-q$.

PRAVILA:

1. silnice izvirajo v pozitivnem naboju in končajo v neg. naboju
2. Ploskovna gostota silnic je proporcionalna $\vec{E}$
3. Silnice se ne sekajo (ker smer $\vec{E}$ določena enolično)