

PHYS 152

Lecture 02

Ch 24 Gauss's Law

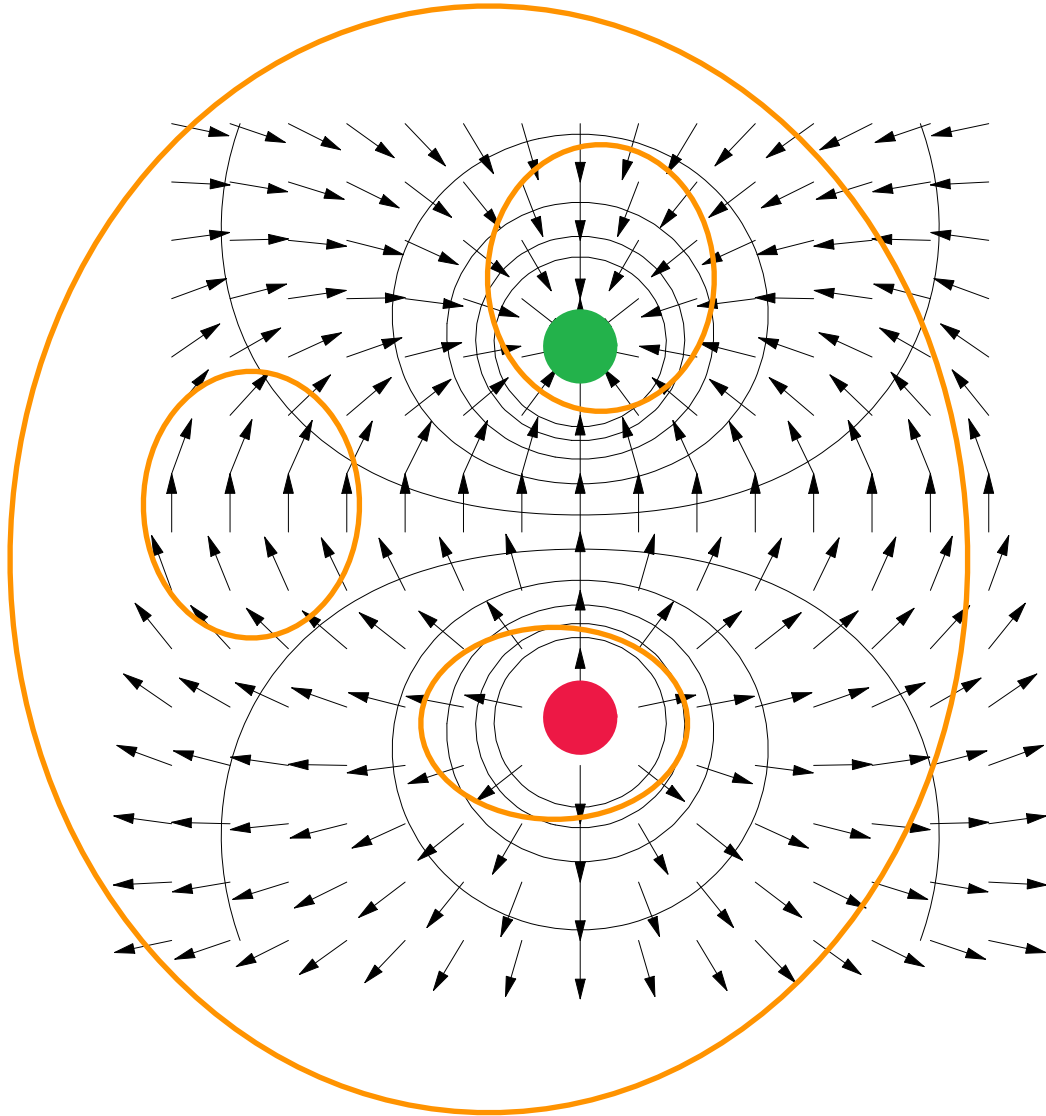
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Gauss' Law

$$\oint \vec{E} \cdot d\vec{A} = \frac{1}{\epsilon_0} q_{enc}$$

The Gauss' law relates the net flux of an electric field through a closed surface to the net charge that is enclosed by that surface

Gaussian Surfaces



Depending on where your Gaussian surfaces are, the total enclosed charge value can also be changed

Summary of the day

Point charge $E = \frac{1}{4\pi\epsilon_0} \frac{q}{r^2}$

Cylindrical rod $E = \frac{\lambda}{2\pi\epsilon_0 r}$

Conducting Surface $E = \frac{\sigma}{\epsilon_0}$

Nonconducting Sheet $E = \frac{\sigma}{2\epsilon_0}$

Note the changes in r dependence for various cases