General Physics (PHY 2140)

Lecture 4

- Electrostatics
  - ✓ Electric flux and Gauss's law
  - ✓ Electrical energy
    - ✓ potential difference and electric potential
    - ✓ potential energy of charged conductors

http://www.physics.wayne.edu/~apetrov/PHY2140/

Chapters 15-16

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Lightning Review

Last lecture:

1. Properties of the electric field, field lines
2. Conductors in electrostatic equilibrium
   - ✓ Electric field is zero everywhere within the conductor.
   - ✓ Any excess charge field on an isolated conductor resides on its surface.
   - ✓ The electric field just outside a charged conductor is perpendicular to the conductor's surface.
   - ✓ On an irregular shaped conductor, the charge tends to accumulate at locations where the radius of curvature of the surface is smallest.

Review Problem: Would life be different if the electron were positively charged and the proton were negatively charged? Does the choice of signs have any bearing on physical and chemical interactions?

15.10 Electric Flux and Gauss's Law

- A convenient technique was introduced by Karl F. Gauss (1777-1855) to calculate electric fields.
- Requires symmetric charge distributions.
- Technique based on the notion of ***electrical flux***.