

CHAPTER OVERVIEW

16: Electric Charges and Fields

Learning Objectives

- Understand the definition of an electric charge.
- Understand the difference between an insulator and a conductor.
- Understand different mechanisms for charging objects.
- Understand Coulomb's model for the electric force.
- Understand the definition of an electric field.
- Understand how to calculate the electric field from a continuous distribution of charge.
- Understand how to model an electric dipole.

In this and subsequent chapters, we start to look at the theories that describe electric and magnetic phenomena. Within the framework for dynamics that was developed by Newton, we will introduce the theories of electromagnetism which describe the electric force, the magnetic force, and how these two interact. This first chapter introduces the description of the electric force, analogously to how we introduced Newton's Universal Theory of Gravity to describe the gravitational force.

prelude

If you rub a balloon against a carpet and bring it near your head, your hair will stand up and try to touch the balloon.

- A. The electric charge of the balloon is opposite of that on your hair.
- B. Your hair has no net electric charge, this is an example of charge separation and induction.

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[16.2: The Coulomb force](#)

[16.3: The Electric Field](#)

[16.4: The Electric Dipole](#)

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