

# Phys 1022 Electricity and Magnetism

## Introduction to Electric Charge

Matter is made up of protons, neutrons and electrons. Protons and electrons have opposite charges.

$$Q_p = -Q_e = 1.602176565 \times 10^{-19} \text{ C} \quad (\text{unit Coulombs})$$

Some fundamental properties of charge are:

- Charge is conserved, it cannot be created or destroyed.
- Like charges repel
- Unlike charges attract
- The force exerted by one charge on another is inversely proportional to the square of the distance between them.

## Triboelectric Effect

When touching, some materials claim electrons from other materials, becoming electrically charged. An example is rubbing a balloon and sticking it to the wall:

Rubbing a balloon on your hair removes electrons from hair, negatively charging the balloon. As the balloon is brought close to the wall, the electrons in the wall are repelled, causing the surface of the wall to have a net relative positive charge, which the balloon is attracted to.

