PHYS142 Review Note

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Chapter 1

Introduction, Coulomb Law, Energy

1.1 Basics of Electromagnetism

Single unified force, our perception of a force as electric or magnetic depends on our **state of motion**.

Electric Fields created by:

- Static Electric Charges
- TIme-Varying Magnetic Fields

Magnetic Fields created by

- Moving Electric Charges (Currents)
- Time-Varying Electric Fields

Maxwell's Equation:

$$\nabla \cdot \vec{E} = \frac{\rho}{\epsilon_0}$$
$$\nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$$
$$\nabla \cdot \vec{B} = o$$
$$\nabla \times \vec{B} = \mu_0 \vec{J} + \mu_0 \epsilon_0 \frac{\partial \vec{E}}{\partial t}$$

1.2 Electrostatics:Charges At Rest