Answer on Question #54845-Physics-Electromagnetism

Maxwell equation.

Answer

The Maxwell equations are the set of four fundamental equations governing electromagnetism (i.e., the behavior of electric and magnetic fields). They were first written down in complete form by physicist James Clerk Maxwell, who added the so-called displacement current term to the final equation, although steady-state forms were known earlier.

For time-varying fields, the differential form of these equations in cgs is

$$\nabla \cdot \vec{E} = 4\pi\rho$$

$$\nabla \times \vec{E} = -\frac{1}{c}\frac{\partial \vec{B}}{\partial t}$$

$$\nabla \cdot \vec{B} = 0$$

$$\nabla \times \vec{B} = \frac{4\pi}{c}\vec{J} + \frac{1}{c}\frac{\partial \vec{E}}{\partial t}$$

where $\nabla \cdot$ is the divergence, $\nabla \times$ is the curl, $\vec{E}$ is the electric field, $\vec{B}$ is the magnetic field, ρ is the charge density, c is the speed of light, and $\vec{J}$ is the vector current density.