Maxwell's equations

Maxwell's equations are four partial differential equations (or integrodifferential equations) in which the Scottish physicist James C. Maxwell (1831–1879) unified existing knowledge about electromagnetic fields. Their immediate consequence is, among other things, that **electromagnetic waves** incl. lights **propagate at a finite speed**. The equations represent the basis of classical electromagnetic field theory, they describe very well the behavior of the electromagnetic field at the macroscopic level. At the phenomenological level, they show the interconnectedness of electric and magnetic fields, the explanation of this interconnectedness is a question of relativistic physics.

$$\nabla \cdot \mathbf{D} = \rho$$
$$\nabla \cdot \mathbf{B} = 0$$
$$\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$$
$$\nabla \times \mathbf{H} = \mathbf{J} + \frac{\partial \mathbf{D}}{\partial t}$$

Example of Maxwell's equations in differential form, E= electric field intensity H= magnetic field intensity D= electric induction ρ= free charge density J= electric current density

Links

Related links

- Electromagnetic spectrum

External links

- Maxwell-Boltzmann speed distribution