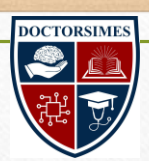


APPLIED SCIENCES

PHYSICS & CHEMISTRY

INTRODUCTION

LECTURE NO 1

ELECTROMEGNETISM

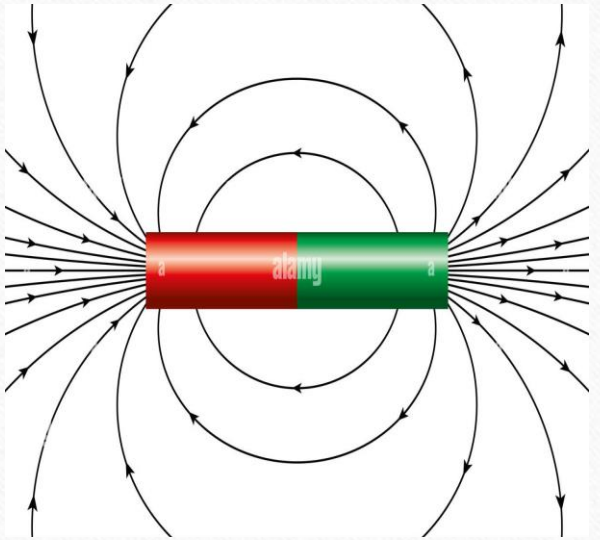
- Branch of physics that deals with the study of electric and magnetic fields, their intrections, and phenomena associated with them.

Here are some concepts related to electromagnetism:

1. Electric field (E): An electric field surrounds electric charges and exerts a force on other charges within its vicinity, its strength and direction is determined by the magnitude and distribution of electric charges

MAGNETIC FIELD (B)

- A magnetic field is a region around a magnet, a current-carrying wire, or a moving electric charge where other magnetic materials or moving charges experience a magnetic force.



ELECTROMAGNETIC FORCE

- Electromagnetic force is the force between charged particles due to their electric charges and their motion. It combines both electric and magnetic forces into one unified interaction.

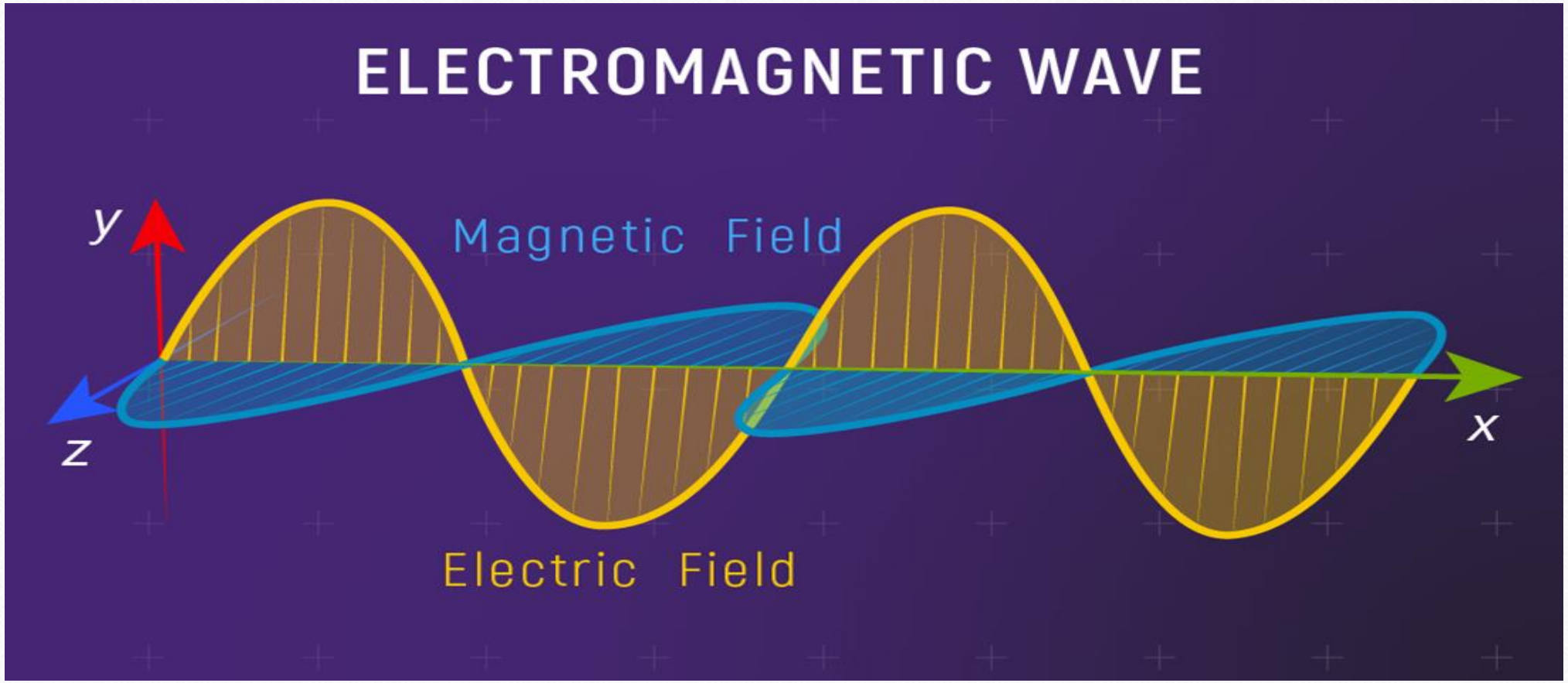
MAXWELL’S EQUATION

- Maxwell's equations are a set of four fundamental equations that describe how electric and magnetic fields are generated and interact with each other, with charges, and with currents.
- They form the foundation of classical electromagnetism, electric circuits, and light (electromagnetic waves).

MAXWELL'S EQUATION

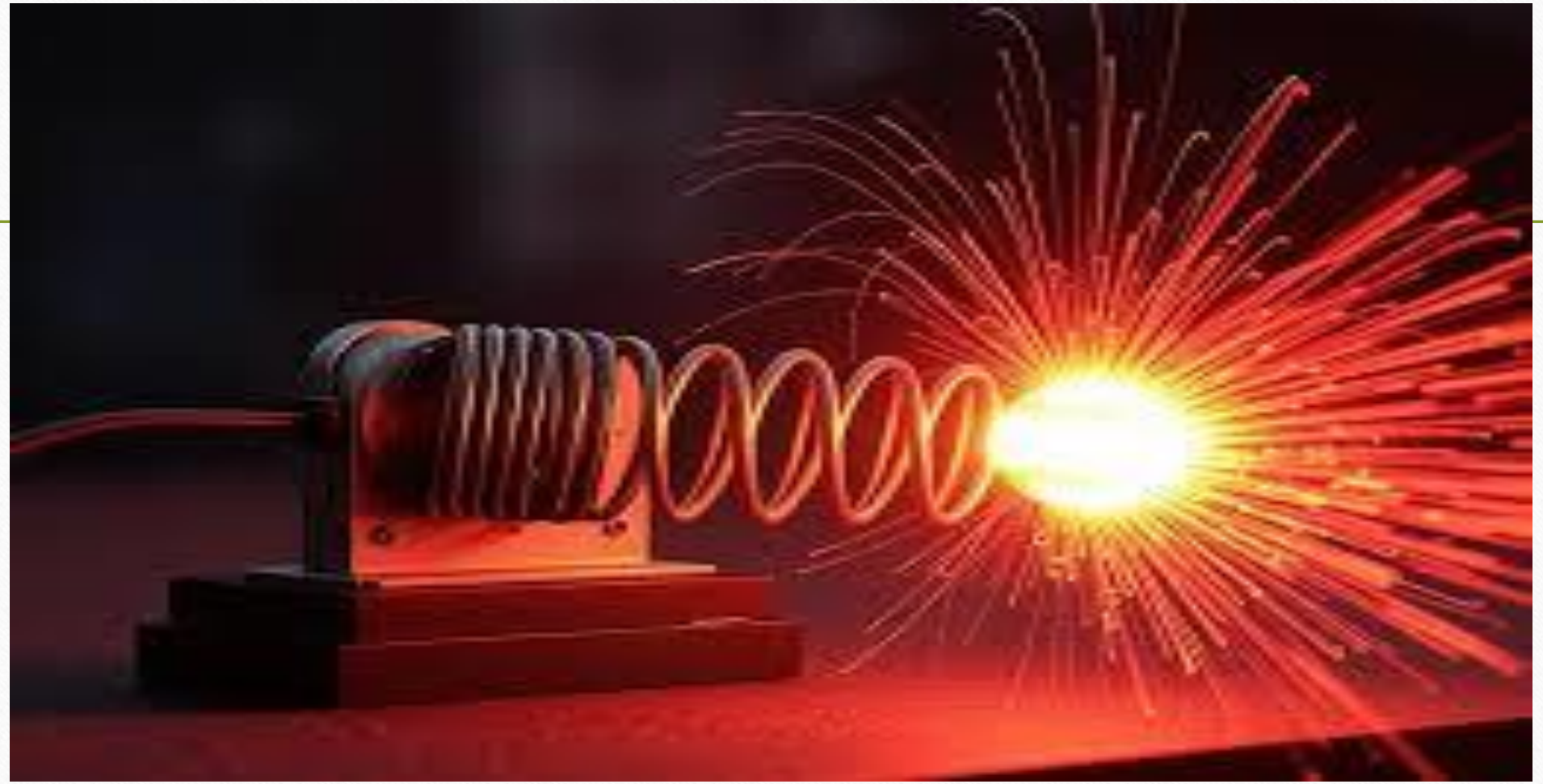
ELECTROMAGNETIC WAVES

- An electromagnetic wave is a wave made of vibrating electric and magnetic fields.
- which move together through space, carrying energy.
- These waves includes radio waves, microwaves, visible light, xrays and gamma rays.


ELECTROMAGNETIC WAVE
y
Magnetic Field
z
x
Electric Field

ELECTROMAGNETIC INDUCTION

- Electromagnetic induction is the process by which a changing magnetic field produces an electric current or electromotive force (EMF) in a conductor.
- When a magnet moves near a wire (or a wire moves through a magnetic field), it causes electricity to flow in the wire this is called **electromagnetic induction.**



ELECTROMAGNETIC DEVICES

Many modren technologies rely on the principle of electromagnetism, including electric motors, transformers, antennas, and various eletronic devices like smartphones and computer.


Thank you