

CH # 01 INTRODUCTION TO PHYSICS

PHYSICS:

"Physics is the branch of science that deals with the study of properties of matter and energy and the interaction between them."

BRANCHES OF PHYSICS

1. MECHANICS:

"It is mainly concern with the motion of particles or bodies under the action of given forces."

2. ELECTRICITY:

"It is concern with physical phenomenon involving electric charges and their effects when at rest and in motion."

3. ELECTROMAGNETISM:

"It is concern with the observation and laws relating electricity to magnetism."

4. SOLID STATE PHYSICS:

"It is concern with the property of crystalline material only that is of material in which the constituent atoms are arranged in three dimensional lattices."

5. ATOMIC PHYSICS:

"It concern with structure and properties of atoms as determine by the electrons outside the nucleus."

6. NUCLEAR PHYSICS:

"It concern with structure and properties and reaction between the nuclei of an atom."

7. PLASMA PHYSICS:

"It is concern with the properties of highly ionized atom forming a mixture of bare nuclei (nuclei without electron) and electron."

8. BIO PHYSICS:

"It is concern with the application of physical method and types of explanation to bio physical systems and structures."

9. ASTRO PHYSICS:

"It is concern with the application of modern physics to the problems of astronomy."

IMPORTANCE OF PHYSICS/USES OF PHYSICS:

The physics is playing a vital role in framing our life style and other way of thinking. Here are some applications of physics in different fields.

1. IN ELECTRICAL APPLIANCES (ELECTRICITY):

We use several electrical appliances for example electric fan, electric bulb, refrigerator, air conditioner, juicer, grinder etc they all use electricity.

2. ENGINES (THERMODYNAMICS)

Buses, cars, railway carriages, aeroplanes etc are run by engines. Engine of these are manufactured on the principle of thermodynamics.

3. ELECTRONICS DEVICES (SOLID STATE PHYSICS):

We listen radio programmes and telecast from T.V station. In all electronic devices solid state physics plays a vital role.

4. USES OF LASER TECHNOLOGY (ATOMIC PHYSICS):

Laser technology is widely use in defence system, metallurgy, medical science and astronomy which has its root in atomic physics.

5. POWER PLANTS (NUCLEAR PHYSICS):

Production of nuclear energy and control and utilization of nuclear energy is area of nuclear physics.

ERROR:

“The difference between measured and actual value is called error.”

TYPES OF ERROR

There are three types of error.

1. PERSONAL ERROR:

“Error arises from a faulty procedure followed an observer is called personal error.”

2. SYSTEMATIC ERROR:

“Error due to imperfection of the instrument or faulty adjustment of the instrument.”

3. RANDOM ERROR:

“Error arise due to a suddenly change of experimental condition. It may be due a suddenly change in temperature pressure, humidity or due to voltage fluctuation etc.”

CONTRIBUTION OF MUSLIM SCIENTISTS

IBN-UL-HAITHAM (965-1039A.D):

Introduction:

He was born at Basra (Iraq) was a great scholar of physics, Mathematics, Engineering, Astronomy and medicine.

Books:

Kitab-ul-Manazir (deals with optics science in which he proved Ptolemy's and Euclid's theory about light to be wrong).

Discoveries And Invention:

- Ibn-ul-hathiam for the first time declared light as a form of energy.
- He constructed pin hole camera with the help of which he obtain image of sun eclipse.
- He gives two laws of reflection.
- He describes luminous, non-luminous, opaque and transparent objects.
- He gives principle of least time according to which while passing through any medium takes a path which takes the least time to travel.

AL-BERUNI:

Introduction:

Abu Rehman Muhammad Bin Ahmed Al Beruni was born in Afghanistan in 973 A.D.

Books:

- His famous book is Qanoon-al Masoodi, in which he discussed the measurement and the movements of the earth, sphere of the moon, movement of planets etc.
- He wrote more than 150 books on various subjects such as mathematics, Physics, cosmology, geography, history, culture, civilization, archeology, comparative religions, geology, chemistry and biology etc.

Discoveries And Invention:

- He gives the method of determining the longitude and the latitude at the place.
- He determines the density of metals.
- At Pind Dadin Khan he measured the circumference of the earth. He declared the Indus Valley to be once the Basin of an Ocean.

YAQUB KINDI:

Introduction:

Yaqub Ibn Ishaq AL-Kindi was born in Basra in 800 A.D. He was the governor of Kufa.

Discoveries And Invention:

- He did extensive research in metrology, specific gravity and tides.
- He did valuable work in the field of Geometrical optics, one of his work is optics was translated in Latin
- He discusses music from scientific point of view and expressed different notes of music in term of their frequencies.

MUHAMMAD BIN MUSA KHAWARZMI:

Introduction:

Muhammad Bin Musa Khawarizmi was born in 780 A.D in the city of Khwarizmi. He was an important member of Bait-UI-Hikmat.

Books:

His famous book is Aljbar Wal Muqabala, which was the first basic book on algebra.

Discoveries And Invention:

- He introduced a method of counting and the decimal system in hisab. Decimal system is now being used all over the world.
- Due to his system all mathematical operations have become very simple.
- He used geometrical constructions to solve various problems in algebra.

NASIR-UD-DIN TUSI:

Introduction:

Nasir Ud Din Tusi was born in Tus (Iran) in 1201 A.D. He was a philosopher and mathematician.

Discoveries And Invention:

- He established an observatory and a library at Margah.
- He prepared precise table about the planetary motion.

DR.ABDUS SALAM:

Introduction:

Dr.Abdus Salam was born in Jhang, a small city in Pakistan in 1926. He was awarded scholarship for higher studies in U.K. He was awarded Noble prize in Physics in 1979 for his work on Grand Unification Theory (GUT).

Discoveries And Invention:

- He established an observatory and a library at Margah.

- He was the only Noble price winner scientist from the Muslim world.
- In 1979 he put forward his famous Grand Unification Theory (G.U.T).
- He held a chair at the Imperial College London.
- He established center for theoretical physics at Trieste (Italy) for scientist from the developing world.

DR ADUL QADEER KHAN:

Introduction:

Dr.Abdul Qadeer was born on 1st April 1936.

Discoveries And Invention:

- He is highly respected nuclear scientist of Pakistan.
- He established nuclear research laboratory at Kahuta, where a large number of Pakistani scientists engaged in research work in the field of nuclear physic.
- Recently scientist under the guidance of Dr.Abdul Qadeer khan successfully conducted several nuclear test and prove beyond any doubt Pakistan's nuclear capability to the world.

FAHAD AKHTER